

= Trams in Adelaide =

Until 1958 , Trams in Adelaide formed a network spanning most of suburban Adelaide , with a history dating back to 1878 . Adelaide ran horse trams from 1878 to 1914 and electric trams from 1909 , but has primarily relied on buses for public transport since 1958 . Electric trams and trolleybuses were Adelaide 's main public transport throughout the life of the electric tram network . All trams except the Glenelg Tram were closed in the 1950s . The Glenelg line remains in operation and was upgraded and extended in 2007 @-@ 2010 .

The early use of trams was for recreation as well as daily travel , by entire families and tourists . Until the 1950s , trams were used for family outings to the extent that the Municipal Tramways Trust ( MTT ) constructed gardens in the suburb of Kensington Gardens , extending the Kensington line to attract customers . By 1945 the MTT was collecting fares for 95 million trips annually ? 295 trips per head of population .

After the Great Depression , the maintenance of the tramway system and the purchase of new trams suffered . Competition from private buses , the MTT 's own bus fleet and the growth of private car ownership all took patrons from the tram network . By the 1950s , the tram network was losing money and being replaced by an electric and petrol @-@ driven bus fleet . Adelaide 's tram history is preserved by the volunteer @-@ run the Adelaide Tramway Museum at St Kilda ( commonly called the " St Kilda tram museum " ) , and the continuing use of 1929 H type trams on the remaining Glenelg tram line .

The Glenelg Tram was extended to Adelaide railway station in 2007 and to Adelaide Entertainment Centre in Hindmarsh in 2010 . The upgrade included the first new tram purchases in more than 50 years . Three types of electric tram , built in 1929 , 2006 and 2009 respectively , now run on the line .

= = Horse trams = =

In early 1855 , less than twenty years after the colony was founded , South Australia 's first horse tram began operating between Goolwa and Port Elliot on the Fleurieu Peninsula . Just over twenty years later Adelaide became the first city in Australia to introduce horse trams , and eventually the last to discard them for more modern public transport . Although two trials of street level trains were run , the state of Adelaide 's streets , with mud in winter and dust in summer , led to the decision that they would not be reliable .

Sir Edwin T. Smith and W. C. Buik , both prominent in Kensington and Norwood Corporation then Adelaide City Council ( and both later mayors of Adelaide , spent some time inspecting European tramways during the 1870s . They were impressed with horse tram systems and , on returning to Adelaide , they promoted the concept leading to a prospectus being issued for the Adelaide and Suburban Tramway Co . ( A & ST ) . Private commercial interests lobbied government for legislative support , over Adelaide council 's objections related to licensing and control . As a result , the Government of South Australia passed an 1876 private act , authorising construction of Adelaide 's first horse tram network . It was scheduled for completion within two years , with 10 @.@ 8 miles ( 17 @.@ 4 km ) of lines from Adelaide 's city @-@ centre to the suburbs of Kensington and North Adelaide . Completed in May 1878 , services began in June from Adelaide to Kensington Park with trams imported from John Stephenson Co. of New York , United States .

Until 1907 all horse tram operations were by private companies , with the government passing legislation authorising line construction . Growth of the network and rolling stock was driven largely by commercial considerations . On the opening day , the newly founded Adelaide and Suburban Tramway Co . ( A & ST ) began with six trams , expanding to 90 trams and 650 horses by 1907 with its own tram manufacturing facility at Kensington .

A Private act , passed in September 1881 , allowed the construction of more private horse tramways and additional acts were passed authorising more line construction and services by more companies . Most of the companies operated double @-@ decker tram , although some were single level cabs with many built by John Stephenson Co . , Duncan and Fraser of Adelaide , and from

1897 by the A & ST at Kensington . The trams ran at an average speed of 5 miles per hour ( 8 km / h ) , usually two horses pulling each tram from a pool of four to ten .

= = = Horse tram network = = =

Various companies expanded the network from its initial line to Kensington , with eleven companies operating within six years , three more having already failed before constructing tracks . The Adelaide to North Adelaide line opened in December 1878 , a separate one from Port Adelaide to Albert Park in 1879 , Adelaide to Mitcham and Hindmarsh in 1881 , Walkerville 1882 , Burnside , Prospect , Nailsworth and Enfield in 1883 , and Maylands in 1892 . Various streets were widened especially for the tram lines including Brougham place , North Adelaide by 10 feet ( 3 m ) and Prospect road to a total width of 60 feet ( 18 m ) .

All but one line was built in 4 ft 8 1/2 in ( 1 3/4 @, @ 435 mm ) standard gauge with the exception from Port Adelaide to Albert Park . This line was built in 5 ft 3 in ( 1 5/8 @, @ 600 mm ) to accommodate steam engines , also requiring some of the line to be raised on embankments to avoid swampy ground and flooding . There were 74 miles ( 119 km ) of tramlines with 1062 horses and 162 cars by 1901 and isolated lines from Port Adelaide to Albert Park and Glenelg to Brighton , as well as a network joining many suburbs to Adelaide 's CBD by 1907 .

The network had termini in Henley Beach , Hindmarsh , Prospect , Nailsworth , Paradise , Magill , Burnside , Glen Osmond , Mitcham , Clarence Park , Hyde Park and Walkerville . To accommodate the specific needs of horses , most streets were left unsealed . The horses ' urine needed an unsealed surface for absorption and their hooves a soft surface for good traction .

= = Electric trams = =

Adelaide 's first experiment with electric powered trams was a demonstration run on the Adelaide and Hindmarsh Tramway company 's line . A battery powered tram fitted with " Julien 's Patent Electric Traction " ran in 1889 to Henley Beach . The trial was unsuccessful due to the batteries poor capacity , and the promoters ' deaths in a level crossing accident shortly after precluded further experiments .

As with horse trams , commercial interests pursued government support for the introduction of electric tramways . The most influential was the " Snow scheme " , promoted by Francis H. Snow largely on behalf of two London companies , British Westinghouse and Callender 's Cable Construction . The scheme involved the purchase of major horse tramways , merging into an electric tramway company with twenty @-@ one years of exclusive running rights . Legislation was passed in 1901 , a referendum held in 1902 , but the required funds had been spent and the scheme collapsed . Adelaide 's council proposed their own scheme backed by different companies , but couldn 't raise the required capital , and J.H. Packard promoted various plans of his own devising that also never eventuated .

By 1901 Adelaide 's horse trams were seen by the public as a blot on the city 's image . With a population of 162 @, @ 000 the slow speed of the trams , and the lines subsequent low traffic capacity , made them inadequate for public transport needs . The unsealed roads the horses required became quagmires in winter and sources of dust in summer . The 10 pounds of manure each horse left behind daily , was also not well regarded . Under these various pressures the government negotiated to purchase the horse tramway companies . A 28 March 1906 newspaper notice announced that the government had purchased all of the city tramways for £ 280 @, @ 000 . Bill No.913 , passed 22 December 1906 , created the Municipal Tramways Trust ( MTT ) with the authority to build new and purchase existing tramways .

Not all tramway companies were purchased , as the Glenelg to Marino company continued operating separately until its failure in 1914 . The government purchased the properties , plant and equipment of existing tramways but did not purchase the companies themselves . The equipment included 162 trams , 22 other vehicles and 1056 horses . By 1909 at the launch of Adelaide 's electric tram services there remained 163 horse trams and 650 horses under the control of the MTT

Due to the time required to electrify the network the MTT continued to run horse trams until 1914 . The cost of purchasing the tramways was funded by treasury bills and the act capped total construction costs at £ 12 @, @ 000 per mile of track . £ 457 @, @ 000 was let in contracts to March 1908 for construction of the tramways , trams , strengthening the Adelaide bridge over the River Torrens and associated works . The official ceremony starting track construction was in May 1908 , with tracks originally laid on Jarrah sleepers .

On Monday 30 November 1908 there were two trial runs , from the MTT 's depot on Hackney Road to the nearby Adelaide Botanic Garden and back , the evening trial carrying the Premier and Governor . At the official opening ceremony on 9 March 1909 , Electric Tram 1 was driven by Mrs. Price , wife of Premier Thomas Price . Mrs Price opened the tramway and drove the tram from the Hackney Depot to Kensington and back , assisted by the MTT 's chief engineer .

= = = Municipal Tramways Trust = = =

The MTT was created in 1906 and became part of the State Transport Authority in 1975 . It was created as a tax @-@ exempt body with eight members , mostly by appointed local councils but with some government appointees . They established a 9 acres ( 3 @. @ 6 ha ) tram depot site near the corner of Hackney Road and Botanic Road with a depot building , twenty @-@ four incoming tracks and a large administration office . William George Toop Goodman was appointed as its first engineer , later general manager and remained as general manager until his 1950 retirement .

To cater for family outings the MTT constructed gardens in the current suburb of Kensington Gardens , extending the Kensington line to attract customers . By 1945 the MTT was collecting fares for 95 million trips annually , representing 295 trips per head of population ( 350 @, @ 000 ) .

By 1958 the tram network was reduced to just the Glenelg line ( see Decline of the network ) . The MTT continued to operate most of the local bus routes in the inner metropolitan area . In 1975 the services of the MTT became the Bus and Tram division of the State Transport Authority and the MTT ceased to exist .

= = = Electric tram network = = =

At the 1909 opening , 35 miles ( 56 kilometres ) of track had been completed with electricity supplied by the Electric Lighting and Supply Co . The electric tram system ran on 600 Volts DC supplied at first from two converter stations , No.1 converter station on East Terrace with 2 @, @ 500 kW of AC to DC capacity and No.2 station at Thebarton with a capacity of 900 kW . To cope with variable loads on the system , very large storage lead ? acid batteries were installed , the initial one at East Terrace comprising 293 cells and a 50 ton tank of sulphuric acid .

The Adelaide @-@ Glenelg line was , from 1873 , a 5 ft 3 in ( 1 @, @ 600 mm ) steam railway that ran at street level into Victoria Square . Originally privately owned it was taken over by the South Australian Railways then transferred to the MTT in 1927 . The line was closed to be rebuilt to 4 ft 8 1 ? 2 in ( 1 @, @ 435 mm ) standard gauge , electrified at 600 Volts DC and converted to tramway operation , reopening in late 1929 .

The Port Adelaide line , which until that time had still used horse trams , began to be converted to electric operation in 1914 and opened 3 April 1917 A line from Magill to Morialta opened in 1915 for weekend tourist traffic with only a single return service on weekdays . The line ran in the valley of 4th creek , a tributary of the River Torrens , across farmland and along unmade and ungazetted roads .

All services on the Morialta line were replaced by buses in 1956 . The last tram line built in Adelaide was the Erindale line which opened in early 1944 . At maximum extent the lines connected Adelaide with the sea at Henley Beach , Grange and Glenelg , reached the base of the Adelaide Hills at Morialta and Mitcham and had Northern and Southern limits of Prospect and Colonel Light Gardens

= = = Electric tram types = = =

From 1908 to 1909 , a hundred electric trams were manufactured by Duncan and Fraser of Adelaide at a cost of approximately £ 100 each . Up to its last tram purchase in 1953 , the MTT commissioned over three hundred electric trams , some of which have been kept in service for over seventy @-@ five years . TransAdelaide , the publicly owned company now operating Adelaide trams , began introducing a new type of tram in January 2006 in the form of the Bombardier Flexity Classic . Another new series of trams ( Alstom Citadis ) started to enter service in December 2009 .

\* The original 103 was damaged during shipping from Germany . In its damaged form , it is now held for parts at TransAdelaide 's Glengowrie depot . The replacement 103 was the final tram that was delivered , and is now in service . Type 100 Note : The Type 100 trams are occasionally referred to a S type trams due to their resemblance to VGF 's S class trams in use in Frankfurt am Main or NGT8 trams which is the designation used in Dortmund

\* The 6 Citadis trams in Adelaide were originally purchased for use in Madrid by Mintra / MetroLigero for use on their system as part of an order for 70 Citadis trams . At the time of arrival , these 6 cars ( along with several others ) were deemed surplus to requirements and were placed in store from new . TransAdelaide acquired 6 cars ( originally numbered 165 - 170 ) and were subsequently shipped to Australia and renumbered 201 - 206 in the TransAdelaide fleet .

= = = Type A = = =

Type A trams were the most common on the newly opened lines with seventy of the initial hundred trams made in this single truck combination style . They incorporated a closed central saloon and open crossbenches on the same tram . Capable of up to 22 miles per hour ( 35 km / h ) , they had a seating capacity of twenty in the saloons with an additional twenty in the open benches . The bodies were made by Duncan and Fraser , who had built horse tram cars for the AS & T as well as bodies of electric trams for Melbourne service . All 70 A type trams were originally fitted with Brill Winner style seats in the saloon section but in 1937 , 20 cars ( numbers unknown ) had their seats replaced with Hale Kilburn fixed rattan seats , removed out of the 20 C type cars . The removed A type seats were then fitted into the C type trams . These trams were never fitted with airbrakes throughout their service lives and instead used a handbrake for normal use and a magnetic track brake for emergency use .

On 9 March 1909 the first type A was the lead car in the procession at the tramway systems official opening . From 1917 , 6 A type trams were used on the isolated Port Adelaide system which closed in 1935 . During the last part of 1936 , tram 100 was briefly renumbered 100A , E1 type tram 101 having been temporarily renumbered 100 for its part in the South Australian Centenary celebrations in 1936 ( more details in the E1 type section ) . A type 100 had its original number restored soon after . Most were removed from the lines and stored in the 1930s , returning to service in 1941 due to petrol rationing increasing passenger numbers . Fifty @-@ eight were permanently joined in " Bib and Bub " ( named after comic characters by May Gibbs ) pairs to conserve manpower and used this way until 1950 . Although the bib and bub pairs still required a conductor per tram to collect fares , they needed only one driver per pair resulting in a twenty @-@ five percent reduction in labour . All type As were withdrawn from service by May 1952 , with the formerly coupled trams being the last to go . Tram 30 was withdrawn from service three months earlier in February 1952 after sustaining accident damage . Many were sold for use as shacks , although trams 10 , 69 and 92 had been sold in 1936 to the State Electricity Commission of Victoria .

The 58 A type trams that were coupled into the ' Bib and Bub ' sets were formed as follows : 1 / 2 , 4 / 5 , 6 / 12 , 8 / 9 , 11 / 13 , 14 / 16 , 17 / 18 , 19 / 20 , 21 / 23 , 22 / 24 , 25 / 26 , 27 / 28 , 29 / 30 , 61 / 64 , 62 / 65 , 66 / 68 , 70 / 72 , 71 / 74 , 73 / 75 , 76 / 78 , 77 / 79 , 80 / 81 , 82 / 83 , 84 / 86 , 85 / 88 , 87 / 89 , 90 / 91 , 94 / 95 , 97 / 98 .

= = = Type A1 = = =

Seventeen B type ' toastrack ' trams were rebuilt by Duncan and Fraser ( though it is believed that car 45 was rebuilt in house by the MTT at Hackney Workshops ) were converted into A1 type ' California Combination ' trams , similar to the A and later C types although the ends didn 't drop down on the A1s . They were converted primarily for the isolated Port Adelaide tram system which was run by the MTT and ran between 1917 and 1935 . These trams retained their previous B type numbers ( refer to fleet table above ) . All cars had Hale Kilburn fixed rattan seating in the saloon except for car 44 which had wooden seats running along the sides of the saloon . Wooden seating was fitted to the open ends and these cars had the same passenger capacity ( seated as well as ' crush load ' ) as the A type . These trams were never fitted with airbrakes throughout their service lives and instead used a handbrake for normal use and a magnetic track brake for emergency use .

All of these cars entered service on the Port Adelaide tram system from 1917 and ran in service there until final closure of the system in 1935 . Several were withdrawn from service after closure and were stored in Port Adelaide depot , then transferred to Hackney Depot / Workshops until they were scrapped . After closure of the Port Adelaide system , a few A1 type trams managed to see quite varied ' inoperable ' use by the MTT . Car 44 was used as a first aid room at Hackney Depot between 1946 and 1961 . Cars 45 , 48 and 52 were used as store rooms at Hackney Workshops to house the spare parts originally ordered for the proposed H1 fleet , a ' service ' they finished in 1954 . Car 47 was used as a lunch room at Hackney Workshops while car 50 was partly converted into a ' driver instruction ' car in the early 1950s . The work involved mounting the body of car 50 onto the underframe and running gear of sprinkler car S2 . This work was however never completed . A few of the A1 type trams managed to see further service after the closure of the Port Adelaide system and were transferred to the main system . Like the A type , 4 A1 type trams were converted into coupled sets known as ' Bib and Bub ' sets . The trams involved were 55 / 56 and 57 / 58 . These cars were the last A1 type trams to be withdrawn from service in November 1950 along with the sets of A type trams not converted back into single car operation . They were subsequently scrapped .

===== Type A2 =====

The A2 type trams were again converted from B type ' toast rack ' trams and also entered service on the Port Adelaide tram system in 1917 , although the conversion work was this time undertaken in house by the MTT at Hackney Workshops . Unlike the A1 type which had traditional wooden sides , the A2 type trams had flat steel plates fitted and rivetted to the sides forming the saloon . Unlike the A , A1 and C types , the A2s had three large windows instead of 5 as per the other types . Despite the different body work for the saloon section , the seating and standing capacity for these trams were the same as the A , A1 and C types . These trams were never fitted with airbrakes throughout their service lives and instead used a handbrake for normal use and a magnetic track brake for emergency use .

The A2 type were introduced for service onto the Port Adelaide system in 1917 and ran until closure of the system in the 1930s . However , they were transferred to Hackney Workshops where they remained until 1946 . During that year , the bodies of 41 and 43 were sold ( and eventually found their way to the Fleurieu Peninsula , where they reportedly still remain ) but 42 was retained at Hackney Workshops so it could store advertising material . It remained in this capacity until 1958 when it was made available to the AETM ( St Kilda Tramway Museum ) for eventual restoration . It has since been rebuilt into its original B type configuration .

===== Type B =====

Thirty of the initial trams became known as Toast rack trams due to their open structure . They were open trams with passengers seated on cross @-@ benches , and no weather protection on the cars ' sides . Duncan and Fraser built them with summer excursions in mind but they had limited utility due to the lack of weather proofing . These trams were never fitted with airbrakes throughout their service lives and instead used a handbrake for normal use and a magnetic track brake for emergency use .

Twenty of the cars were converted to combination trams in 1917 and redesignated as types A1 and A2 . B type 38 was rebuilt in 1929 as a ballast motor for use on the Glenelg line conversion . The rebuild involved removal of the entire body work and most of the end cabins with the trolley pole mounted on a steel pole in the middle of the now all flat deck . All type B , A1 or A2 cars , except for trams 38 and 42 , were withdrawn from service in 1936 and scrapped in 1946 . Some vehicles ( including 42 ) found other uses around Hackney depot such as store rooms and even as a fuel tank in the case of B 38 which was converted to that use after some years as a ballast motor .

===== Type E =====

Due to public antipathy to imported trams , type E trams were built by J.G. Brill & Co in Philadelphia , United States , then imported in parts and assembled by Pengelley & Co of Adelaide from 1910 to 1912 . They were partially open trams with passengers sitting on cross bench seats and a closed saloon at one end . As combination trams , the E type could carry 54 seated passengers with a total ' crush load ' of 150 . In 1918 , all 20 E type cars were remotored with more powerful GE 201 traction motors ( rated at 65 hp each ) replacing the original GE 202 units ( rated at 50 hp each ) . The original traction motors were used in the construction of the 20 C type ' Desert Gold ' cars which were being built at the same time .

Their main use was on the Glen Osmond and St Peters routes , also taking picnic parties to Burnside and Magill . Type E trams were rebuilt into type E1 in 1936 . Tram 118 was acquired by the St Kilda Tramway Museum as an E1 type but is currently being converted back to its original E type configuration as well as being returned to operational order .

===== Type E1 =====

When converted from Type E trams , the crossbenches were removed and the saloon extended the entire car length . The original timber saloon seats were transferred to the newly converted saloon section while the original saloon received new upholstered seating . One of the original crossbenches ( attached to the motorman 's bulkhead ) was retained after conversion . As before conversion , these trams were used mainly on the Glen Osmond and St Peters routes . Tram 101 was temporarily renumbered 100 , painted in ivory and gold , and used in the 1936 South Australian centenary celebrations .

===== Type D =====

Similar to Type E with crossbenches and a saloon , type D trams also had sliding doors at the end of the benches giving weather protection . Four similar cars were built in 1912 for the Prahan & Malvern Tramways Trust , Melbourne , on sold to the Hawthorn Tramways Trust then purchased by the MTT in 1925 becoming trams 191 @-@ 194 . After injuries to conductors collecting fares while standing on the footboards , a centre isle was cut through the centre bulkhead and four of the six crossbench seats of the trams in 1934 . Trams 191 @-@ 194 had been similarly modified in Melbourne prior to their purchase by the MTT .

===== Type C =====

A planned purchase of large trams was delayed by World War I. Type C trams were small combination cars , built in 1918 ? 1919 as an interim measure . They were similar in basic design to the older A type but had a more modern curved roof rather than a clerestory roof . During their construction , the old motors from the E type ( General Electric 202 motors ) were fitted to these new trams . Rated at 50 hp each compared to the 33 hp units fitted to the A types , these trams were considerably faster .

Due to their consequent higher speeds they became known as Desert Gold trams , after a New Zealand racehorse that had won races in Australia at the same time . This speed became useful in

competition against unlicensed buses in the 1920s , and they were used in peak service until 1952 with the last use for the royal visit of 1954 . Trams 181 to 190 inclusive were allocated to the Port Adelaide system for a short period in the 1930s before closure of the system , mainly used on the Port Adelaide - Albert Park line . During the 1930s , the original Hale Kilburn seating fitted to these trams were replaced with Brill Winner seats taken out of 20 A type trams ( numbers unknown ) .

One of the Type C Trams has found a home at Port Parham and been in the possession of the Jenkin family since the 1950s . Its number was 190 . It retains many of the fittings internally . Photo taken and provided by Michael Jenkin . This is an infrared photo .

= = = = Types F and F1 = = = =

The F and later F1 type trams were built between 1921 and 1929 were mostly by Pengelley & Co with three F1 type trams being built ' in house ' by the Municipal Tramways Trust at Hackney Workshops . The F series trams being built from 1921 to 1925 with the F1 series being built from 1925 to 1929 . These trams became known as ' Drop Centres ' since the centre section of the tram had been lowered in height to ease boarding and alighting . They were the first trams to be fitted with airbrakes in Adelaide and were designed so that six streams of passengers could board or alight on each side of the tram at the same time , with a large capacity and reportedly comfortable ride . The F and F1 series trams were the most common trams used in Adelaide from their introduction to the closure of the main tram network with a total of 84 of the drop centre trams built for use in Adelaide . The main difference between the two types lay in the construction of the underframe , with the F types having a combined steel and timber frame construction while the later F1 type having an all @-@ steel underframe . There were other variations in the fleet which will be detailed later on .

With such a number of trams in service , it should come as no surprise that a number of detail variations occurred in the fleet , only the main variations are listed here . In 1929 , cars 274 and 275 were fitted with additional air brake pipes for use in hauling the horse transport cars between the City and Morphettville Racecourse on the Glenelg line . These airpipes were later removed , most possibly after the suspension of the horse transport service in 1936 . As originally built , all the drop centre trams were built with General Electric PC5L2 and later PC5K2 control equipment ( except for nos 251 - 261 which had English Electric control equipment ) . However , in 1952 ? 1953 , cars 259 , 260 and 261 had their English Electric control gear replaced with General Electric control gear . At the same time , 251 - 258 and 264 had English Electric controllers of a different type fitted . The original control gear from 264 ended up in the solitary H1 car , 381 .

While all 84 cars had completely timber seats in the drop centre section , the enclosed saloons had several different styles of seating . Cars 201 @-@ 261 all had rattan seating in the saloons except for 250 . All these cars except for 250 had imitation leather seating fitted after 1946 . 250 and 262 had moquette seating . 263 @-@ 284 had wooden seating fitted .

From October 1953 , a number of F and F1 type trams were repainted from Tuscan and Cream livery into Carnation Red and Silver . The trams repainted were 201 @-@ 204 , 213 , 216 , 218 @-@ 219 , 224 @-@ 225 , 227 @-@ 231 , 246 , 248 , 254 , 256 @-@ 257 , 260 @-@ 261 , 264 @-@ 265 , 267 @-@ 269 , 271 @-@ 279 , 283 and 284 . Cars 224 , 255 and 262 all had minor variations to the livery . Most ( though not all ) of the repainted cars had an emergency exit door fitted behind the motorman 's compartment reducing the seating capacity in these trams from 60 to 56 . A few un repainted cars were also fitted with these doors .

Cars 201 @-@ 262 had been fitted with Brill 77E2 type trucks and 263 @-@ 284 had been fitted with cast Commonwealth Steel type trucks . However , by the final year of operations in 1958 , F type cars 234 , 245 and 249 had been retrucked with the Commonwealth Steel type trucks taken off of 266 , 284 and 263 , the retrucked Fs taking the F1 numbers in that order . By this time , most of the original F type cars had been withdrawn from service . The F1 type tram was the last type of tram to see service on the main Adelaide street tramway system with F1 269 making the final run to Cheltenham and return on 22 November 1958 , Adelaide tramway operations ceasing that night with the exception of the Glenelg line .

#### ==== Type G =====

As a means of more economic operation over the lightly patronized Port Adelaide system , four ' Birney Safety Cars ' were constructed by J.G. Brill and were imported complete by the Municipal Tramways Trust . Numbered 301 to 304 , this small class of four trams were built with features such as folding doors and steps as well as being the only trams in Adelaide able to be operated by one man ( thereby doing away with the need for a conductor ) . These were the only trams built new for the Port Adelaide system , the other trams in the fleet allocated to Port Adelaide being either transferred from the main system or converted from the B type toast rack trams ( into A1 and A2 types ) . Until the arrival of the Flexity and Citadis trams over 80 years later , these were also the only trams in Adelaide to be entirely constructed overseas . Introduced into service from December 1925 , these four trams only ran on the Port Adelaide system for 10 years before the system was completely closed in July 1935 .

In January and February 1936 , the four were sold to the State Electricity Commission of Victoria for use in Geelong and were renumbered 27 to 30 in the SEC Geelong fleet and joined two other Birney trams acquired from new for use in Geelong making 6 in all there . In 1947 , the four former Adelaide ' Birney ' trams were transferred to Bendigo to operate on the tramway system there , also owned by the State Electricity Commission . The two Geelong ' Birney ' cars were also transferred to Bendigo arriving in 1949 . While in service in Bendigo , these trams ran in revenue service until 1972 when the system was closed down , with part of the track retained by the Bendigo Trust for tourist operation . All 6 of the ' Birney ' trams that made it to Victoria have all been preserved in operational condition with former Adelaide tram 303 returning to South Australia in 1976 .

#### ==== Type H =====

Known as Glenelg trams , The Hs are a long rigid body tram that is end loading with a full length saloon and were built by Pengelley and Co in 1929 specifically for the Glenelg line , they commenced operations on 14 December 1929 . Incredibly , 4 of the cars remained in limited heritage service on the Glenelg line at the start of 2009 , nearly 80 years after they were introduced . They also saw service on the Henley North , Kensington Gardens and Cheltenham routes until their closure . They were built with Tomlinson automatic couplers and were also fitted with General Electric PC5L2 control gear and could be operated in multiple , either in pairs or until 1937 , as triple car sets . After a few years in service , they were also fitted with air horns . Although specifically designed for use on the Glenelg line , the H type trams saw service from 1935 on the Henley North line and then on the Kensington line from 1952 .

A total of 30 H cars were built for service on the Glenelg line with the first cars ( 351 and 352 ) being run under trial for the first time in October 1929 , these two cars opening the line on 14 December 1929 . Until February 1937 , some services on the line were run with triple @-@ car sets until an accident at Grovane ( now called Glengowrie ) which saw the practice discontinued .

During the 1930s , 5 H type were experimentally fitted with pantographs of 5 different patterns . 376 was fitted with a Siemens Schukert pantograph , 377 was fitted with a Fischer bow collector , 378 was fitted with an ASEA pantograph , 379 was fitted with a Metropolitan Vickers pantograph and 380 was fitted with an English Electric pantograph . The pantographs on 376 , 379 and 380 were all fitted on a small pantograph tower while 377 and 378 had their pantographs mounted on the roof itself . During the experiments , the pantographs were only used on the reserve track section which at the time was fitted with a railway @-@ like catenary overhead system rather than the traditional tramway @-@ style overhead used on the rest of the system . Because the overhead at the time was not staggered to suit pantograph operation , the pantographs fitted all suffered from uneven wear and as a result the experiment ceased . Ironically , all the surviving H type trams were fitted with pantographs 50 years later in October 1986 .

The next major round of changes to the H types occurred in the 1950s , starting in c.1952 with a repainting of most of the fleet from the traditional Tuscan and Cream to a new Carnation Red and



Silver livery with an Ashbury Green interior which had been completed by the end of the decade . The first H types to be withdrawn from service were also taken out of service during the time ( 352 in December 1957 and the first 380 in May 1959 . 351 was renumbered 380 at this time ) . This was the first in a series of renumberings of the H cars , designed to keep a consecutively numbered fleet for rostering purposes ( i.e. 363 @-@ 364 or 371 @-@ 372 ) . A table of the renumbered cars is listed further down . During 1956 , the entire fleet had their original Dick Kerr motors replaced with English Electric motors originally intended for the H1 fleet . In 1968 , 366 and 377 ( original numbers ) were scrapped with cars 353 and 354 renumbered to replace them ( refer to renumbering table further below ) with the result that the H type fleet had been reduced to 26 cars .

From 1971 onwards , cars 351 , 357 , 358 , ( 2nd ) 363 , ( 2nd ) 366 , 367 , 368 , 369 , 370 , 371 , 372 , 373 , 374 , 375 , 376 , ( 2nd ) 377 , 379 and 380 were all refurbished and repainted into their original Tuscan and Cream livery except for 363 and 364 which originally entered service after refurbishment in an experimental Carnation Red and Grey livery in 1971 . These two were repainted into Tuscan and Cream in 1973 . Most of these cars had their original varnished timber interior restored too , although there were a few variations in the refurbishment program . 377 was also repainted into a one off black and gold livery to celebrate the 50th anniversary of the Glenelg line in 1979 . 377 retained this livery for a few years afterwards . 380 was also briefly repainted in 1979 into a special livery by a number of Glenelg area students as part of the SA schools ' Come out ' festival of that year .

During the 1980s , most of the remaining unrefurbished cars ( 355 , 356 , 360 , 362 and 378 ) were disposed of , bringing the operating fleet down to 21 cars . In October 1986 , along with the opening of a new tram depot at Glengowrie , 369 became the first car to be fitted with a pantograph on a permanent basis after the overhead had been altered to make the wire ' zig sag ' to minimise wear on the pantograph . All the other cars in the fleet were subsequently fitted with pantographs and roller bearings on the trucks replacing the old plain bearings . For a short period after installation of pantographs , a trolley pole was retained at one end ' just in case ' but was finally removed soon afterwards . In 1987 , the last of the silver trams ( 361 ) was refurbished under a new program which introduced a few more modern features to the cars . Eventually , 10 H types were refurbished under the new program ( 357 , 358 , 361 , 364 , 365 , 368 , 369 , 371 , 372 and 373 ) .

Interestingly , 378 , which had previously been disposed of in 1986 , was repurchased and refurbished for use as a restaurant tram and was launched on 1 November 1990 as the ' Adelaide Tram Car Restaurant ' , run by a private operator . It was not successful and the tram was later purchased by TransAdelaide and renamed ' Grand Lady ' . As with the private operator , the operation was not a success under TransAdelaide . The tram was retained but very rarely used and was last seen on the mainline in 2001 . For some years it was stored at Glengowrie depot , then in 2006 it was sold to the South Australian History Trust , which made it available to the St Kilda Tramway Museum , where it has been run on occasions .

In 2001 and 2002 , cars 351 , 367 , 370 , 374 and 380 were again refurbished to the extent of a complete rebuild . New modern chopper controls were added replacing the original GE PC5L2 control gear . From 2007 the five trams have seen service for weekend , public holiday and charter trips . With an in service operational life of 80 years , these five trams are the oldest public transport vehicles still in service in Australia ( although 374 hasn 't been in service since 2004 after sustaining some underframe damage ) . With the purchase of replacement trams , sixteen Type H trams were disposed of with some sold , for a total of \$ 65 @,@ 000 , and the remainder donated . They were destined for uses as varied as a restaurant , an attraction at a bed and breakfast boarding house and a tourism display at Glenelg , Adelaide .

=== Type H1 ===

Until the arrival of the Flexity trams in 2005 , H1 type car 381 was the most modern tram in Adelaide.Originally part of an order for 40 H1 type cars , 381 was just completed by JA Lawton & Sons of Adelaide when the reconstitution of the MTT caused cancellation of the remaining thirty @-@ nine cars . A partly constructed 382 was scrapped before it was completed as a result of the

change in policy . Like the H type upon which 381 was based on , it was fitted with PC5L2 type controllers although in this case , they were taken out of F1 type tram 264 ( more details to be found in the F1 type section ) . Originally fitted with a standard link and pin type coupler , 381 was later fitted with a Tomlinson automatic style coupler ( although it was not able to operate in multiple with the H type ) . Power operated doors were also fitted .

381 ran its first trial run on 22 January 1953 and entered service the following month . For most of its short operational life , 381 was used on the Kensington and Henley North lines ( which were through routed the same year 381 was built ) . 381 was also the last tram to operate over the Kensington line before closure in February 1957 . It was withdrawn from revenue service in December 1957 when it was stored at Hackney Depot / Workshops . In June 1958 , it was then moved to City Depot on Angas Street . In May 1959 , it was again moved for further storage , this time to the permanent way depot at Maylands where it remained until 1965 when it was donated to the St Kilda Tramway Museum . As a result , it has spent many more years in preservation than it did in revenue service .

== Flexity Classic / Type 100 / Type I ==

Beginning in January 2006 , 30 metres ( 98 ft 5 in ) long , articulated , low @-@ floor Flexity Classic Light Rail vehicles , built by Bombardier in Germany , began operation . Eleven trams were ordered at a total cost of \$ 58 million to replace most of the then seventy @-@ seven @-@ year @-@ old Type H trams on the Glenelg line . Bombardier won the supply tender against one other bidder , receiving an initial order for nine trams in September 2004 . , another two Flexity trams were ordered for use on the Victoria Square to City West extension , opened in October 2007 . Several of the earlier Flexity cars were unloaded at Outer Harbor in Adelaide while the later deliveries were shipped to Melbourne and offloaded there before being road hauled to Adelaide . Flexity 111 was noted running evaluation trips around parts of the Melbourne tram network before delivery to Adelaide . Station platforms were lowered to match the new trams lower floors , and some of the track and sleepers replaced to provide a smoother ride . There have been problems with the tram 's airconditioning systems , during Adelaide 's very hot summer weather , but these were rectified with engineering changes to the trams .

Classification terminologies have been varied . The trams are generally referred to as Flexities or Flexity type by TransAdelaide , although they are also referred to as Type 100 ( from their fleet numbers ) or the Type I , following on from the MTT classification system . Other classifications deriving from designations in use on other systems with Flexity Classic trams , including S Class ( VGF , Frankfurt ) , M06 ( Norrköping ) and NGT8 ( Dortmund ) , have also been used .

By 2008 the state government was considering lengthening the trams , instead of purchasing more , to accommodate increasing passenger numbers . In September 2008 , an order was placed with Bombardier for an additional 4 Flexity Classic trams to be used on the City West to Adelaide Entertainment Centre section . These have been numbered 112 ? 115 . Despite being a fairly new tram , already there have been a couple of variations , most notably the constantly changing ' all @-@ over advertising ' that changes the appearance of the tram quite considerably . Vehicle 102 has also had traditional leather hand holds installed instead of rubber hand holds which are fitted to the rest of the fleet .

== Citadis 302 / Type 200 ==

The newest trams in Adelaide are six Alstom Citadis model 302 trams which were purchased second hand from the Spanish city of Madrid . Compared to the Flexity Classic trams already in service , they have a higher ' crush loading ' ( 186 compared with 115 ) but 10 fewer seats . They are also 2 metres longer and are formed of five articulated sections rather than three .

Originally built as part of an order for seventy Alstom Citadis trams by Spanish operator MetroLigero for service in Madrid , six Citadis trams were acquired by TransAdelaide for service on the Glenelg line as well as to provide services for the new line to the Adelaide Entertainment Centre

. Although originally planned to be used on the Madrid network , a subsequent scaling down of plans there resulted in a number of Citadis trams being placed into storage upon arrival in Madrid and never turned a wheel in service . The six trams bought by TransAdelaide came out of this stock . Five of the purchased trams had never run in Madrid and one ( MetroLigero 169 ) saw just a couple of weeks service as a demonstration tram in Stockholm ( demonstrated by the Manufacturer Alstom ) . The six trams purchased were modified at the Preston Tramway Workshops in Melbourne before arriving in Adelaide . They were renumbered from MetroLigero numbers 165 ? 170 to the TransAdelaide 200 series with vehicle numbers 201 ? 206 .

= = Trolleybuses = =

During the Great Depression the MTT needed to expand services but finances prevented laying new tracks . A decision was made to trial trolleybuses , and a converted petrol bus began running experimentally on the Payneham and Paradise lines in 1932 . A permanent trolleybus system opened in 1937 , and trolleybuses continued running until July 1963 .

= = Decline of the network = =

From 1915 onwards the MTT had to compete against unregulated private buses , often preceding the trams on the same route to steal fares , which the MTT countered by opening their own motor bus routes from 1925 . The South Australian government began regulating buses within the state in 1927 , although some private operators used a provision in the Australian constitution to their advantage . By notionally marking each ticket as a fare from the pickup point to Murrayville , Victoria ( but allowing passengers to board or alight sooner ) companies avoided having to abide by the regulation for some time . Up until the end of World War I , most Adelaideans were dependent on public transport for daily journeys . The introduction of private automobiles decreased passenger numbers until petrol rationing during World War II led to a resurgence in patronage ; patronage remained higher than before the war , until rationing was discontinued in 1951 .

From the start of the great depression until the closure of the network only one lot of trams was purchased by the MTT . Due to shortages there was minimal maintenance of the network during World War II and post @-@ war shortages prevented the purchase of new trams . In 1951 ? 1952 the MTT lost £ 313 @,@ 320 and made the decision to convert the Erindale , Burnside and Linden park lines to electric trolleybuses . The last trams on these lines ran on 24 May 1952 with the lines lifted from 18 April 1953 . A 1953 royal commission was held to inquire into the financial affairs of the MTT resulting in a completely reconstituted board . Late the same year , with driver safety concerns about the conflict with increasing traffic on the road , the Glen Osmond line was temporarily converted to motor buses . The line was never converted back to trams and much comment was made about the continuing maintenance of unused overhead lines .

Trolley buses gradually made way for motor buses until the last electric tram or bus service ran on 12 July 1963 leaving only the Glenelg tramline as a remnant of a once extensive light rail network . Except for the Glenelg Type H , the trams were sold or scrapped . Some were used as shacks , playrooms or preserved by museums .

= = = Remaining line = = =

The Glenelg line , part of the integrated Adelaide Metro public transport network , is a 11 @.@ 9 @-@ kilometre ( 7 @.@ 4 mi ) route from the centre of Adelaide to the beachside suburb of Glenelg . Recently extended at its northern end , it is currently Adelaide 's only remaining tramway . Trams run at approximately twenty @-@ minute intervals , . Until January 2006 , Type H cars provided all services on the Glenelg line . In 2005 , the entire Glenelg line was upgraded with new track and improved tram stops , then in 2006 , eleven , thirty metre long articulated low @-@ floor Flexity Classic Light Rail vehicles , built by Bombardier in Germany , have since replaced the Type H trams in regular day @-@ to @-@ day service , although five refurbished Type H trams have been

retained and operate a restricted ' heritage service ' timetable on Saturdays , Sundays and Public Holidays . They have been fitted with safety measures similar to those of the new trams , including vigilance control and electro @-@ magnetic track brakes .

A 1 @. @ 2 @-@ kilometre ( 0 @. @ 75 mi ) extension from Victoria Square , along King William St and North Tce opened to the public on 14 October 2007 . Further extensions were the subject of public debate . Tourism minister , Jane Lomax @-@ Smith , in 2007 , expressed support for the line to be extended to North Adelaide and Prospect although the Transport minister stated that this was not a practical option , with his preferred option the creation of a fare free city loop .

In the 2008 state budget , the government announced that it would extend the tram line further . The first extension , completed in early 2010 , was from the existing North Terrace terminus to the Adelaide Entertainment Centre in the inner north @-@ west suburb of Hindmarsh , with a park and ride service set up on Port Road . Following the expected electrification of the Outer Harbour and Grange rail lines , new tram @-@ trains are to run to West Lakes , Port Adelaide and Semaphore by 2018 .

Travel on certain sections of the Glenelg line without a ticket is permitted ; the two sections being the last two stops in Glenelg and the stops from South Terrace till the Entertainment centre . Travelling outside these zones without tickets will be fined by Police or Inspectors .

= = = Adelaide trams in museums = = =