

THE INTERNATIONAL LIGHT RAIL MAGAZINE

# TRAMWAYS & URBAN TRANSIT



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MARCH 2024 No. 1035

## PARIS: A NEW FACE FOR CITY SUBURBS



### T4 & T9: Expanding light rail's reach in France's capital



#### New tramways

Worldwide LRT lines due to open in 2024



#### Rhine to Ruhr

Mixed fortunes for industrial heartland

- › China: 350km of new track in a month
- › Alstom to build first Saudi Arabia line
- › Prague deal with Škoda for new trams



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# CONTENTS



**NEWS** **84**  
China continues metro boom with 14 new systems in a month; Saudi Arabia opens first tramway; Rome signs new CAF deal.

**SYNCING IN DARMSTADT** **88**  
A series of investments have set this German town on track to achieve its mobility goals.

**TRAMWAY OPENINGS 2024** **93**  
Despite optimism not coming to fruition in 2023, there is still scope for a promising number of new LRT lines around the world to open in 2024. Mike Taplin provides his annual round-up of the year ahead.

**FROM RHINE TO RUHR** **99**  
Germany's industrial heartland is connected by an integrated transport system; Andrew Thompson summarises its mixed fortunes to date and the plans for its future.



**SYSTEMS FACTFILE: PARIS T4 & T9** **105**  
The T4 and T9 lines in the Greater Paris area are both light rail replacements of other transport modes – and both have proved successful. Neil Pulling visits the vast network where these two lines now form an integral part.

**WORLDWIDE REVIEW** **71**  
Toronto awards new Metrolinx contract; Brno approves tramway extension; Dresden's new link gains approval; Potsdam seeks new tramline; Magdeburg opens new line; Canary Islands unveil new LRT plan.

**CLASSIC TRAMS: SANTA TERESA, RIO DE JANEIRO** **115**  
Only a handful of tramways remain of the plethora that used to span South America – yet the Santa Teresa line in Rio is one such survivor. Mike Russell reviews its current operation.

## Seven miles of new metro in China - every day!



Firstly, I am very saddened to report the passing of John Symons, who has compiled the UK news content of this magazine for almost 40 years. We pay full tribute to him on page 114 of this issue.

For any country to commission 218 miles (350km) of new urban transit routes across a decade would be considered as really going some. In China, it's been achieved across 14 cities in a single month (see news pages).

Despite slowing economic growth figures, the country's five-year transportation and infrastructure plan continues to support the mode in delivering new systems.

We once thought that it was only the UK that cancelled light rail schemes that had already gone out for tender (remember Liverpool, Bristol, Leeds and South Hampshire being axed in 2004), but now there's another casualty in Auckland, New Zealand, where the coalition government has pulled the plug on a project that has taken six years and cost NZD228million (EUR128m) to achieve precisely nothing. The city's narrow streets may now be jammed with unsuitable buses for another generation, and it's another lesson in what can go wrong when you give politicians, planners and consultants a free hand.

Let's be positive again. There's still time to book for the 2024 European Light Rail Congress in Seville, Spain on 13-14 March, which will bring together key decision-makers and leading professionals across Europe, with an exclusive behind the scenes visit to the award-winning Metro de Sevilla.

Looking forward, Mainspring's next UK Conference is in Leeds on 17-18 July. We're busy pulling together the schedule and finer details, so keep an eye out for more information being announced in the coming months.

*Matt Johnston, Editor*

**COVER: An Île-de-France Citadis Dualis weaves along Rue de l'Église in Montfermeil on 20 November 2023.**  
Neil Pulling

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# China's metro boom continues

Almost 350km of new lines in 14 cities open in just over a month - from Beijing to Wuhan

China has been at the forefront of metro construction in recent times and 2023 was no exception. Nearly 350km (218 miles) of new line were opened in 14 cities between 28 November and 30 December alone.

Between 28 and 30 December, the following lines opened:

- Beijing: Three metro extensions opened on 30 December: Line 11 from Jin'anqiao to Moshikou; Line 16 from Yushuzhuang to Wanpingchen; and Line 17 from Workers' Stadium to Future Science City North. Total: 28.9km (18 miles).
- Chongqing: The 19 stations of Line 18 opened between Fuhuala and Tiaodengnan. This included the Lijiatuo Double-Line bridge across the Yangtze River, where the metro runs parallel with a four-lane highway. Total: 29km (18 miles).
- Guangzhou: Line 5 from Wenchong to Huangpu New Port and the extension



▲ Two Chongqing metro trains cross the Lijiatuo bridge across the Yangtze river on 28 December. TYLin International

of Line 7 from Higher Education Mega Center South to Yanshan. Total: 29.7km (18.4 miles).

- Nanjing: Line 7 opened from Yingtiandajie to Xishanqiao. Total: 10.7km (6.6 miles).
- Tianjin: Metro Line 11, linking Dongjiangdao and Dongliliujinglu was inaugurated. Total: 13.7km (8.5 miles).
- Wuhan: The new metro

Line 19 that links Wuhan railway station's West Square Xinyuexi Park opened. Total: 23.3km (14.5 miles).

- Zhengzhou: The new Zhengxu Line, a new commuter rail line in the south-east suburbs, opened from Chang'an Lu Bei to Xuchangdong. There is interchange with Chengjiao Line C at Gangqu North. Total: 67.1km (42 miles).

New lines also opened in Chengdu, Guiyang, Harbin, Hefei, and Shenzhen. One of the shortest extensions opened on 8 December. This was the 1.6km (one mile) extension to the automated mini-metro in the Special Administrative District of Macau (the former Portuguese colony) where a new tunnel provides access to Macau island itself.

Beijing's is the world's largest metro. It is now 836km (519 miles) long and, in 2023, carried 3.4bn passengers. There are plans to expand the metro by an additional 230km (143 miles).

China has 12 further entries in the 'Top 20' of the world's largest metro systems: Shanghai, Guangzhou, Chengdu, Shenzhen, Chongqing, Hanzhou, Nanjing, Wuhan, Zhengzhou, Qingdao, Xi'an and Tanjing. The top nine have all built more than 460km (286 miles) of network since 1971. By comparison, London has 402km (250 miles) of metro whilst New York has 399km (248 miles).

## Olsztyn first tramline extension opens



▲ Three Solaris trams on Lines 4 and 5 at the new terminus, Pieczewo, on 2 January. A. Thompson

Services on the first extension to the Polish city of Olsztyn's tram network started on 30 December. The 5.9km (3.7-mile) extension to the south-eastern suburb of Pieczewo, which includes a 270m viaduct, cost PLN455m (EUR104m) to build.

Line 4 connects Pieczewo with the railway station (Dworzec PKP), while Line 5, which began service on 1 January, runs to the Wysoka Brama transfer

hub near the city centre. The new extension required 12 new *Panorama* trams, ordered from Durmazlar at a cost of PLN107m (EUR24m), while the depot needed extending to house them.

Olsztyn's first-generation tramway, which opened in 1907, closed in 1965. A new 11km (seven-mile) standard-gauge tramway system opened in December 2015.

## Firenze, Italy, to build new Line 4 tramway

A consortium of Alstom, Hitachi Rail Italia and ComNet has been awarded a EUR50m (GBR42m) contract to build the first part of the new Line 4 in Firenze (Florence), due to open in 2026.

The contract covers Line 4.2, which links Campi Bisenzio to Le Piagge, a distance of 5.3km

(3.3 miles). There is an option for 6.3km (3.9 miles) between Piagge and Leopolda (Line 4.1).

Alstom will supply infrastructure, electrification equipment and a depot, plus improvements to roads and parking. Hitachi will deliver eight trams.

## Roma signs 40-tram deal with CAF

ATAC SpA, the Italian capital's public transport operator, signed a EUR130m (GBP111m) contract with CAF for 40 new trams on 21 December. The 33.5m five-section *Urbos* low-floor cars will carry the 2013 red livery.

With a capacity of 215 passengers (68 seated), they will

support the OESS battery system for off-wire operation. The first is due to enter service in June 2025, with the last delivered in 2026.

Visitors to Roma should note that, due to rebuilding work at Porta Maggiore depot, all tram services will be suspended from June to October 2024.



▲ The CAF tram design for Roma, showing off the new red livery. ATAC



▲ AlUla's new Alstom trams will have historical overtones. Alstom

# Alstom clinches deal for first Saudi Arabia LRT line

Alstom to supply 20 *Citadis* for world's longest battery-operated tramway

Alstom has been awarded an SAR2bn (EUR500m) contract to build and maintain Saudi Arabia's first tramway. The 22.4km (14-mile) overhead-free line will connect UNESCO World Heritage tourist sites around the historic city of AlUla.

Alstom will supply 20 *Citadis* battery trams for what will be the

world's longest battery tramway. Its 17 stops will be equipped with the SRS ground-based static charging system.

Part of the route will utilise the trackbed of the old Hedjaz Railway. When complete, it will be operated by RATP Dev.

AlUla's Royal Commission signed a ten-year deal with France in 2018 to develop and

promote the city, which has been settled since 5000BC, as an international tourism destination. The Royal Commission describes the new line as a "fusion of historical routes with climate-adapted trams, to enrich the region's cultural heritage while reducing carbon emissions at the same time".

# New trams to join London's fleet

Transport for London (UK) is to replace its fleet of *CR4000* trams. The Bombardier-built units have worked between Croydon, Beckenham and Wimbledon since the network opened in May 2000. They have since been joined by two batches of six

Stadler *Variobahns*, introduced in 2012 and 2015 respectively.

TfL commissioner Andy Lord told a City Hall meeting: "Our intention this year is that we will start procurement for the new tram fleet. The vast majority of our trams are coming up to 25

years old."

It is estimated that procuring the new fleet could cost GBP50m (EUR59m) but it is unclear whether this will come from the GBP250m (EUR288m) funding package that was agreed with the UK Government in December

# Muni to introduce CBTC

The San Francisco Municipal Transportation Agency (SFMTA) is to replace the current automatic train control system on its Muni Metro network with communications-based train control (CBTC). SFMTA hopes that this will help deliver faster, more reliable services.

The existing system uses 1980s technology and is prone to failures. The CBTC project is now in the planning phase and will be rolled out in stages across the network, with completion scheduled for 2029.



▲ Siemens and AnsaldoBreda Muni cars on the Embarcadero. S. J. Morgan

## Katowice gets back to normal

Reconstruction of the Silesian Interurban network in Katowice (Poland) was completed in late December. Route changes between Bytom (ul. Sadowa) and Bytom (Stroszek depot) came into effect from 30 December.

Line 10 now operates from Zaborze Pętla via Chebzie Dworcowa, Chorzów Targowisko and Bytom Plac Sikorskiego to Bytom Medical School. Frequency is every 20 minutes daily.

Lines 19 (Stroszek Depot - Eagiewniki old depot) and 46 (Stroszek Depot - Bytom Plac Sikorskiego) will resume operation.

The new timetable for Line 38 in Bytom soon encountered problems and was replaced by a new version from 12 January with a 15-minute service.

Bytom depot resumed operational status from 30 December. Routes that had been temporarily worked from Gliwice, using displaced Bytom cars and staff, reverted to normal.

## Maglev for Berlin?

Berlin's senators are backing a plan proposed by the CDU political party for a maglev line through the city centre, via Central station. It is planned to use technology developed by construction company Max Bögl and is claimed to 'revolutionise the future of mass transit'.

A 3.5km (2.2-mile) demonstration track is being built by the project's Chinese partners in Sichuan province. The scheme is considered to be a cheaper alternative to *U-Bahn* construction.

The German capital's Senate has also approved a 7km (4.3-mile) tramway link from Jungfernheide to Reinickendorf via the former Tegel Airport site. Meanwhile, the 6.2km (3.9-mile) extension of tram line 60 from Johannisthal to U-Bhf Gropiusstadt is planned to open in 2029.

## Big changes for Zurich

Zurich's transport authority, VBZ, plans to implement a revised timetable that it claims should accelerate services and allow travellers from *S-Bahn* stations to reach all parts of the Swiss city without changing trams. The plans have been submitted to the canton's transport association and, if successful, should be confirmed in March.

Under the new plans, Lines 5 and 13 will serve Albisgütli while Line 17 is to be diverted to Wiedikon. Line 8 will run to Kirche Fluntern instead of Klusplatz, with Line 2 diverted to Klusplatz. Line 11 will run to Tiefenbrunnen instead of Rehalp, while Line 4 will do the opposite.

## Metrolink extends deal...

Transport for Greater Manchester (UK) has agreed a new deal that means that KeolisAmey Metrolink (KAM) will continue to operate and maintain Metrolink until July 2027. The new contract has an increased emphasis on operational performance together with more planned network improvements, while also committing more frontline staff to tackle fare evasion and antisocial behaviour.

KAM has operated and maintained Metrolink since July 2017. Danny Vaughan, TfGM's Head of Metrolink, said: "Since coming on board with us, KeolisAmey Metrolink has become an invaluable partner to TfGM.

"There is still a lot of exciting work for us to do to deliver the best possible experience for our customers, and I am delighted that KAM will continue to be a part of this journey for the foreseeable future."

## Sheffield prepares to go 'in house'

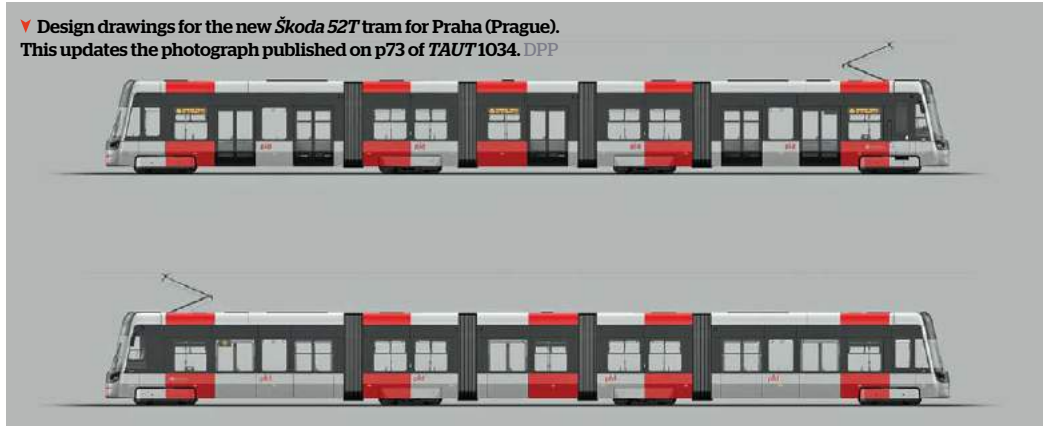
As Transport for Greater Manchester extends its operating concession, across the Pennines, South Yorkshire Mayoral Combined Authority (SYMCA) prepares to take Sheffield Supertram 'in house'. The UK network has been operated by Stagecoach since the 1990s, but South Yorkshire Future Trams will take over on 22 March.

However, *Rotherham Business News* (RBN) has reported that Doncaster, Rotherham and Barnsley local authorities will have to help cover Supertram's GBP6.3m (EUR7.4m) losses after the Stagecoach contract ends.

These local authorities, together with Sheffield, pay a transport levy. According to RBN, a report to the SYMCA board said: "All these income streams are not enough to cover the tram system's day-to-day running costs. In 2024-25, the operating deficit is forecast to be around GBP6.3m (EUR7.4m).

"SYMCA has set aside sufficient resources (GBP5-7m [EUR5.9-8.2m] per annum) from the South Yorkshire Transport Levy (paid by each of the four local authorities in proportion to their population) to cover the cost of the operating subsidy."

▼ Design drawings for the new Škoda 52T tram for Praha (Prague). This updates the photograph published on p73 of *TAUT1034*. DPP



# Prague orders from Škoda

Full delivery of trams would allow complete Czech fleet replacement

Prague's tram operator DPP signed a contract with Škoda Group for 40 100% low-floor *ForCity Plus 52T* trams on 27 December. The deal for the Czech capital is worth CZK82.5m (EUR3.3m).

Delivery of the first 20 (9501-20) from Škoda's Plzeň factory is due to be completed by December 2025. Each 2.5m-wide tram will carry up to 243 passengers (70 seated). There is an option for a further 160

single-ended, 32m five-section vehicles which would enable DPP to replace all the high-floor trams operating in the Czech capital.

The new vehicles boast an air-conditioning system that uses an ecological refrigerant. The design also incorporates a multi-link vehicle with swivelling bogie and asynchronous motors with longitudinal drive. The design of the intermediate bogies will allow a freer flow of people throughout the car.

An electro-mechanical braking system was chosen for its efficiency and sustainability, with lower noise levels and elimination of hydraulic fluids.

► Meanwhile, a CZK1.2bn (EUR50.5m) three-year contract for restoring the tram line through Vaclavske namesti (Wenceslas Square) was signed with Eurovia on 10 January. Trams last used this historic thoroughfare in 1980. See *TAUT 1033* for more.

## Dublin's record transport figures

New figures from Ireland's National Transport Authority have revealed that a record number of passengers used Dublin's public transport system in 2023. 308m people used the

city's buses, trams and main line rail network last year, and the tram system – Luas – recorded a 25% increase over 2022, carrying 48.2m passengers.

Transport for Ireland said:

"The increase in journeys signifies not just a recovery but a significant growth compared to previous years. It's evident that public transport has become the backbone of city mobility."



## LRSSB appoints Lowder as Chair

The Light Rail Safety & Standards Board (UK) has appointed George Lowder, Chief Executive of Transport for Edinburgh, as its new Chair.

LRSSB Chief Executive Carl Williams said: "We're delighted to have George on board... his guidance and support for the board will prove invaluable as the LRSSB continues to grow and evolve, leading in all areas of light rail safety."

## Isle of Man Manx report published

SYSTRA has recommended against closing parts of the Manx Electric Railway (*TAUT 1033*). It has also suggested that there is a "strategic case" for resurrecting the Douglas Bay Horse Tramway from Esplanade to Sea Terminal.

The Isle of Man's parliament, Tynwald, commissioned the international consulting group to assess the future of its historic railway network. This long-awaited report said that the MER, together with the Isle of Man Railway, the Snaefell Mountain Railway and the Douglas Bay Horse Tram, should be seen as "an asset to [the island's] economy as well as an important cultural and historic asset".

Withdrawing MER services between Castletown and Port Erin would create a "new disbenefit" because the cost savings "were relatively small". However, while closing Laxey – Ramsey would have offered some savings, this "excluded the impact on visitor spending".

While extending the horse tram beyond Esplanade would "require [a] very large increase in passenger numbers", the report suggested that "this is an example where the change in emphasis around capital spending could produce benefits".

The report made 13 recommendations. Chief of these is to form a strategy to take the network through to 2040.

# Napoli chooses Bozankaya

Italian city to re-open sections of long-closed tramway with new trams

**T**urkish manufacturer Bozankaya is to supply 20 new double-ended low-floor trams for the Italian city of Napoli.

The EUR63m (GBP54m) contract came at the expense of local manufacturer Hitachi Rail Italia (formerly AnsaldoBreda). Its Napoli factory supplied 22 low-floor trams to the city in 2004-06.

Napoli's new trams are expected to be based on the 31 five-section 295-passenger cars already delivered to the Turkish city of Kayseri. They are to be built in Ankara.

Napoli plans to re-open parts of its system that have been closed for several years in order



▲ A Bozankaya tram, similar to those destined for Napoli, in service in Kayseri, Turkey. Bozankaya

to create a four-line network. Currently, three lines run on

11.8km (7.3 miles) of track from San Giovanni depot.

## Auckland LRT project cancelled

The Auckland Light Rail project has been cancelled. New Zealand's Prime Minister Christopher Luxon made the announcement on X (formerly Twitter) on 14 January, calling

the scheme a "wasteful and unfit for purpose project, which never delivered one metre of track in six years".

He added: "We will deliver the transport infrastructure that

New Zealand actually needs."

Auckland Light Rail Limited, which was promoting the 24km (15-mile) line, had been given the notice to stop work in November (TAUT 1034).

## Class 555s need more tests

Nexus has announced that its new Stadler Class 555 EMUs require further tests before they can enter passenger service. In a statement released on 25 January, the operator of the UK's Tyne & Wear Metro said: "With the testing process well underway, we've identified that further testing of some of the systems on the new trains in very specific conditions is required, and we are working together with our partners at Stadler on this.

"This, unfortunately, will impact the current delivery timescales but we won't know the extent of this until the additional testing is concluded. We will still continue to make progress with the wider testing programme while this is happening."

Stadler has completed the GBP70m (EUR82m) Gosforth Metro Depot, near Newcastle upon Tyne. The new depot has been designed around the new Class 555s and built on the site of the old depot.

Cathy Massarella, Managing Director of Nexus, described the depot as "another step on the road to a brighter future for the Tyne and Wear Metro."



▲ The first Stadler Tramlink ready for its entry into service on 16 December 2023. N. Eckhardt

## Jena orders new Stadler Tramlink

The German city of Jena ordered 24 Tramlink 100% low-floor trams from Stadler in 2020 to help replace its 33 ADtranz GT6M low-floor trams built in 1995-2003. Now, the Thuringia Ministry of Infrastructure and Agriculture has committed funds to exercise an option in that 2020 contract for nine more Tramlink vehicles.

These will be the 32m version of what has been christened 'Lichtbahn'. Their arrival in 2026 will allow the withdrawal of the last of the ADtranz trams.

The new Spanish-built metre-gauge vehicles can carry 180 passengers (58 seated) and are to have a maximum speed of 70km/h (43mph).

## Weather disrupts Portland MAX

Portland's MAX light rail system (USA) suffered the most extensive disruption in its history in mid-January when hit by a combination of snow, high winds and freezing rain. There were widespread tree falls and power cuts, which put electric turnout heaters out of action.

Service on most of the MAX system was suspended for three days from 13 January, but it was six days for the Yellow line and

a full week for the Green and Orange lines. Operator TriMet has 25 LRVs equipped with ice cutter pantographs but these could not be operated, due to fallen trees and frozen points. All MAX services had returned to normal by the end of 21 January.

Portland's Streetcar system was also affected. East side services were suspended for three days but the north-south line continued to operate.



▲ A Portland Streetcar on Montgomery St, coping with the effects of snow and ice in mid-January. Oregon Online

▼ Darmstadt Hauptbahnhof, the main railway station, is served by tram lines 1, 2, 3 and 5. From here there are fast and frequent train links to both Frankfurt and Heidelberg. The track configuration around the station has a loop, an operational necessity for Darmstadt's entirely single-ended fleet of modern LRVs.



## DARMSTADT: SUSTAINABILITY IN

Andrew Thompson visits Darmstadt, Germany, where a series of extensions and infrastructure investments have synced the town's goals of sustainable mobility and quality of life.

► RIGHT: This photo from 15 January 2024 shows the highly modular design of the Stadler TINA trams, with their alternating long and short module sections. Also noticeable are the particularly wide, postcard-frame windows, which are another hallmark of these LRVs. Here TINA 22103 is seen on the approach to Louisenplatz, the city's main square, which also doubles as the principal tram and bus interchange in Darmstadt.







▲ ABOVE: Running westbound to Griesheim Platz Bar-le-Duc, ST14 0788 has just departed from the Wagenhalle stop, where there is an additional turning loop. Pictured is the listed functionalist depot from 1926, which was built following electrification of the Griesheim route and was needed to stable the new electric cars.

**W**ith a population of roughly 162 000, Darmstadt is a mid-sized German city that benefits from its close proximity to Frankfurt-am-Main as well as Mannheim and Heidelberg. The region has traditionally been anchored by the pharmaceutical industry with associated research institutes and laboratories. Over the past few decades IT and communications have also become important backbones of the local economy, while Darmstadt also hosts numerous higher education institutes and is the seasonal home of about 50 000 students.

In 2021, Darmstadt became a UNESCO World Heritage site thanks to its unique Art Nouveau landmarks and early 20th Century artisan colony at Mathildenhöhe.

To match all of these parameters the city boasts a medium-scale tramway with a current network size of 42km (26 miles) and ten lines, including the 8.5km (5.3-mile)

interurban line from Eberstadt to Alsbach at the southern end of the system. To the west, one long branch reaches the neighbouring town of Griesheim with its 30 000 residents.

Darmstadt's metre-gauge tramway dates back to 1886, when steam-hauled services were first introduced on routes within the city centre as well as overland to Griesheim and Eberstadt. Although new electric routes were added to the network in 1897 and during successive years in the early 20th Century, steam would remain in use to Eberstadt until 1914 and to Griesheim until 1922. As part of gradual service integration and system amalgamation, the centralised tram operator Hessische Eisenbahn-Aktiengesellschaft (HEAG) was established in 1912. This publicly-held company remains in charge of public transport in Darmstadt today, using the HEAG mobilo brand for tram and bus services.

Since 2000 the Darmstadt network has been extended four times: in 2003 with the north-eastern branch from Rhönring to Kranichstein Bahnhof; the 2008 southern extension to Alsbach am Hinkelstein; the 2011 northern route from Arheilgen Löwenplatz to Arheilgen Dreieichweg; and most recently in April 2022 the opening of the new 1.1km (0.7-mile) tram branch to the university campus in the east of the city.

With the inauguration of the new terminus at TU-Lichtwiese, students and university employees gained access to light rail.

▼ Luisenplatz is the main square in the city centre of Darmstadt and also the central tram and bus interchange. The site is dwarfed by the 39m high column dedicated to Grand Duke Ludwig I (1753-1830). Here ST13 9856 shows off its technical profile and three-coach design.



**SYNC**





Correspondingly, tram line 2 to the campus only runs on weekdays between 05.00-21.00, with buses operating late in the evening and at weekends.

The light rail line to the university is known in Darmstadt as Lichtwiesenbahn and was only built after prolonged political debate and related squabbling over significant cost overruns. The final price tag for the comparatively short branch with one intermediate stop at the sports stadium Hochschulstadion came in at over EUR28m, an excess of more than EUR7m over the original estimate. Planning for the new line commenced in 2013, with shovels in the ground by November 2019. Originally the line was supposed to open by December 2021 but due to the pandemic this date had to be pushed back to April 2022.

Since its inauguration, the line has proved popular with students and university employees, streamlining commutes, accelerating journey times and enhancing peak hour capacities as intended.

Recent light rail infrastructure investments in Darmstadt have not just focused on extensions, but also on renewal of existing tracks. From summer 2022 to autumn 2023 the route section from Willy-Brandt-Platz to Rhönring was closed to all tram traffic, as the roughly 800m alignment along Frankfurter Strasse was modernised. During this time, trams could not run through to the north of the city and instead rail replacement buses were in service, though from Kranichstein depot an isolated tram service between the peripheral northern termini Kranichstein Bahnhof and Arheilgen Dreieichweg was operated, thus still serving the sprawling industrial estate of the pharmaceutical giant Merck for commuters.

Darmstadt's tram network will continue to grow during the coming decade as city officials are preparing a number of schemes, the most advanced of which is the southern extension of line 3 from its current terminus of Lichtenbergschule to the Marienhöhe junction with the trunk route to Eberstadt and Aisbach. This roughly 1km (0.6-mile) extension will help connect the housing development at Ludwigshöhviertel that is set to become home to 3000 new residents. Running along the streets Ludwigshöhstrasse and Cooperstrasse, the new route will connect two existing branches and provide enhanced travel options both north to the city centre and south to the neighbouring communes.

On the rolling stock front, HEAG mobilo still relies on ten high-floor type ST12 double-articulated units supplied by the Waggon Union and AEG consortium in 1990-91. These were supplemented in 1998 with 20 type ST13 low-floor units from Linke-Hofmann-Busch/Adtranz, the first accessible vehicles in Darmstadt.

In 2007 another 18 type ST14 low-floor cars were delivered by Alstom. These are more commonly referred to as NGT8 in Braunschweig, Magdeburg and Gera, where this class is also in use. Darmstadt's classification system for its different tram vehicles is quite simple, as the ST just refers to Strassenbahn-Triebwagen (powered car) and the number to the sequential vehicle generation.



**▲ ABOVE:** Although produced as late as 1990-91, the distinctive type ST12 high-floor trams have all the hallmarks of 1980s light rail design. In order to provide barrier-free access, HEAG mobilo typically deploys these single-ended units paired with SB9 low-floor trailers. The ST12 series carry the names of Darmstadt's partner cities - 9115 is named after Bursa, Turkey. Running inbound on the northern branch from Arheilgen, the set leaves behind the Merck corporate headquarters from the namesake Merck stop.

In January 2020, HEAG mobilo became the lead customer for Stadler's new *TINA* design, placing an order for 14 of these air-conditioned, five-coach LRVs, with options for 30 more. In July 2021, an additional 11 *TINA* trams were ordered. Locally classified as *ST15*, with a length of 43.95m they are by far the longest trams in Darmstadt's history.

The first *TINA* arrived in Darmstadt in December 2022 and after extensive commissioning, revenue services started in October 2023. The total of 25 *TINA* LRVs represent a EUR100m investment in the future of Darmstadt's tramway, and will gradually replace the last high-floor *ST12*.

Darmstadt's example shows how mid-sized cities can keep urban development, economic growth and public transport expansion in sync, in order to ensure sustainable mobility alongside a vibrant quality of life. **TAUT**



▲ ABOVE: On the approach to Willy-Brandt-Platz north of the city centre, trams pass under an elegant archway that connects two adjacent court buildings dating from 1905. In this case *ST14* 0781 is seen on a westbound service to Hauptbahnhof.



▲ ABOVE: Darmstadt's Baroque city palace dates from the 18th Century and is surrounded by a large turning loop for trams, which is used only in exceptional circumstances. Next to the front facade of the building is the Schloss stop, where car 9873 stands on an inbound service.



▲ ABOVE: The dark yellow livery of the *TINA* trams is a departure from the established blue, white and orange colour scheme. Instead it corresponds to the paintwork of the newest electric buses in Darmstadt, as seen to the right with a latest generation Mercedes *eCitaro*.



▲ ABOVE: On 6 June 2022, *ST13* low-floor car 9855 stands at the university terminus TU-Lichtwiese/Campus with a line 2 service that will shortly depart to Darmstadt Hauptbahnhof. At that point, the newest extension of Darmstadt's tramway had only just been in use for six weeks.

▼ BELOW: Befitting of its rich history and steam background, Darmstadt is actually one of only three cities in Europe to boast a street-running steam tram. Unlike in Bern, Switzerland or Brno, Czech Republic, the locomotive in Darmstadt is a former industrial 0-4-0 tank engine, rather than a tramway locomotive original to the city. Locally known as 'Feuriger Elias' and operated by volunteers of the preservation group ARGE Historische HEAG Fahrzeuge, the vintage locomotive 7 dates from 1919 and was originally built to 900mm gauge for operation on the Philipp Holzmann AG factory network. The sturdy loco can haul up to four coaches and typically operates six days a year, usually spread out over three different weekends. On this picture from 5 June 2022, it and its train is pictured departing the southern interurban terminus at Alsbach Hinkelstein.



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# NEW TRAMWAYS FOR 2024



▲ ABOVE: The first run of a CAF tram through the streets of Liège, Belgium. CAF

Michael Taplin presents his annual round-up of the new tramways planned to open over the next 12 months.

**A** year ago an optimistic view was that up to 14 new tramway operations could start in 2023, but in the event the number was limited to eight, although spread across the world. Reasons for delays are becoming repetitive: supply chain difficulties, COVID, the temporary closure of the Suez Canal, the war in Ukraine, shortages of qualified engineers and rampant inflation.

UK readers will find it surprising that there seems in many cases a lack of effort to drive projects through to conclusion, despite heavy investment expenditure already incurred, but political pressures are not the same in other parts of the world, and nor is public pressure (at least not in the media).

**ALGERIA** .....Mostaganem  
**CANADA** ..... Edmonton Green Line  
**FINLAND** ..... Helsinki (Raide-Jokeri)  
**FRANCE** ..... Paris T10 and T12  
**ISRAEL** ..... Tel Aviv Red Line  
**JAPAN** ..... Utsonomiya  
**TAIWAN** ..... Taipei (Ankeng)

No new tramways opened in China during 2023, despite lines in Delingha and Dujiangyan being complete in construction and equipment terms. In the Middle East the city of Doha is still running only 5.5km (3.4 miles) of its 28km (17.4-mile) four-line system, more than a year after the start of the initial operation. And in Canada Toronto suburban lines Eglinton Crosstown and

Finch West did not achieve passenger service despite extensive testing.

Looking ahead it is possible that 2024 will see 11 or 12 tramway openings. The provisional list looks like this, but as the individual stories make clear, it is likely that some could drift into 2025:

**AUSTRALIA** ..... Parramatta  
**BELGIUM** ..... Liège  
**CANADA** ..... Eglinton Crosstown and Finch West, Toronto Mississauga  
**CHINA** ..... Delingha, Dujiangyan  
**ROMANIA** ..... Resita  
**SOUTH KOREA** ..... Busan  
**SPAIN** ..... Jaen (re-opening)  
**UK** ..... South Wales Metro  
**USA** ..... Santa Ana (Orange County) ►

## AUSTRALIA

In the western suburbs of the Australian city of Sydney, the town of **Parramatta** (population 30 000) is the latest community in the greater Sydney area to benefit from investment in tramway infrastructure. The independent tramline, which is due to start carrying passengers in 2024, will run for 12km (7.5 miles) with 16 stops between Westmead and Carlingford, on street track without overhead, and with overhead on the former railway line to Carlingford (closed in 2020).

The project cost is AUD3.5bn (EUR2.8bn), with AUD1bn (EUR602.7m) coming from the New South Wales government. The CAF/Transdev-led Great River City Rail Light consortium is building the line and will operate it for eight years (with the option of a further ten years).

CAF is providing 13 45m seven-section *Urbos 3* 100% low-floor double-ended trams with lithium batteries and the Greentech Freedrive technology to permit operation away from overhead wires; also the traction system, signalling and control and communication systems.

A second stage will be a branch to Sydney Olympic Park, planned to open in 2031.



▲ ABOVE: The 12km Parramatta line under construction - a project that has cost the NSW government AUD3.5bn and is set to launch this year.

John Cowper



▲ ABOVE: An *Urbos 100* vehicle - one of 13 to be provided by CAF - pulls up to the Yallamundi stop on Parramatta's new light rail system, which should open in 2024.

John Cowper

## BELGIUM

Although electric trams (two systems) ran in the Walloon city of **Liège** from 1893 to 1967, regional political leaders started to discuss a modern tramway in 2008. The regional government gave the go-ahead at the end of 2011, but the bureaucratic details took several years to sort out due to the need to comply with EU tendering regulations.

On 19 September 2018 the Wallonie transport agency awarded a 31-year PPP contract to the Tram'Ardent consortium formed by CAF, Colas and DIF capital partners. Originally valued at EUR429m, the contract had to be boosted by EUR79m in order to keep the consortium on board during the COVID pandemic. The contract covers 11.7km (7.3 miles) of tramway, including 3km (1.9 miles) without overhead (the seven-section 45.4m double-ended CAF trams will use the OESS ultracapacitor system), 21 stops, 20 trams, a depot and two park-and-ride sites.

The east-west line links Sclession and Coronmeuse through the city centre with a 1.3km (0.8-mile) branch to Bressoux (site of the depot). Originally the line was planned to be 19.1km (11.9 miles) long from Seraing to Herstal, but the full length will form a second stage.

The first tram was delivered in July 2022, but it was not until 10 October 2023 that the first test run outside the depot could take place. By then it was clear that the planned opening date of 25 April 2024 could not be met. Passenger service is now tentatively planned for October 2024, but it is acknowledged that this could drift into 2025.





## CANADA

**Toronto's** provincial agency Metrolinx is building two separate suburban tramlines, to standard-gauge rather than the odd 1495mm-gauge of the main city system of the TTC (though TTC will operate both). Eglinton Crosstown (line 5) is a 19km (11.8-mile) light rail line with 25 stops from Mount Dennis to Kennedy (feeding TTC metro lines 2 and 3).

Rolling stock is 76 *Flexity Freedom* from Alstom (formerly Bombardier) delivered from early 2019, with ATC on the 10km (6.2-mile) tunnelled western section.

The route was planned to open for service in 2020, but the Crosslinx consortium building the line has fallen well behind schedule and although test running is taking place, there seems to be no certainty that opening will take place until June 2024.

Finch West is a 10.3km (6.4-mile) line from Humber College in Etobicoke to Finch West metro station. Alstom has delivered 17 *Citadis Spirit* for the line; these were part of an order for 61 placed in 2020, when it seemed Bombardier would have difficulty building *Flexity Freedom* in a timely manner. The balance are destined for another Metrolinx line, in Mississauga.

The CAD2.5bn (EUR1.7bn) Finch West is being built by the Mosaic Transit Group and is now due for completion in spring



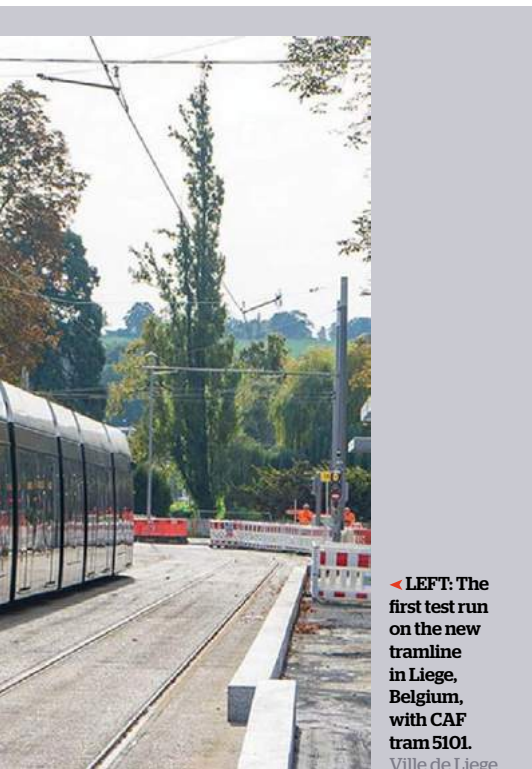
▲ ABOVE: Eglinton Crosstown light rail vehicle testing in Toronto. The new midtown line is scheduled to open this year. Metrolinx

2024 with passenger service in June.

**Mississauga** in Ontario is building the 18km (11.2-mile) Hurontario north-south surface light rail line linking the city with Brampton through a CAD5.6bn (EUR3.8bn) 30-year PPP contract with the Mobilinx consortium from provincial transit agency Metrolinx.

Construction of the 19-stop line started in 2020 and it is expected to carry passengers towards the end of 2024 with a 7.5-minute headway at peaks.

Rolling stock will be 28 Alstom *Citadis Spirit* of the same type as delivered to Finch West in Toronto; they will operate in coupled pairs so the station platforms are 90m long. There will be interchange with GO regional rail service at the southern terminus Port Credit.



◀ LEFT: The first test run on the new tramline in Liege, Belgium, with CAF tram 5101. Ville de Liege



## CHINA

◀ LEFT: Tram testing in progress in the Chinese panda city of Djungyan. Government of Sichuan Province

Information about new tramlines in China tends to be delivered in real time, and despite the retreat of the COVID-19 pandemic, it is not surprising that little information is available about forthcoming tramway openings. The two cities listed have certainly built a tramway, but for different reasons have yet to offer passenger service.

**Delingha** is the capital of the Haixi Mongal Tibetan autonomous prefecture with a population of about 80 000. The city is built 2982m above sea level and is connected by rail with China using trains equipped with oxygen supply. A 14.4km (8.9-mile) two-line tramway has been built and CRRC Qingdao Sifang has delivered 25 two-section 100% low-floor 168-passenger trams (under Škoda licence) featuring energy storage by supercapacitors and lithium-titanate batteries specially adapted for the high altitude power delivery.

After missing earlier deadlines, trial operation started in May 2020 but an April 2021 opening deadline passed amid financial disputes and bribery accusations. There has been no news since 2021.

Dujiangyan in Sichuan province, south-west China (population 716 000), started test running on a 7km (4.3-mile) demonstration tramway in January 2022. In 2024 this is expected to form part of a 14.2km (8.8-mile) north-south line branded M-TR with two branches at the southern end (3.4km and 2.4km/2.1 miles and 1.5 miles); 32m five-section trams delivered by CRRC carry panda graphics, referencing one of the city's attractions.

A 21km (13-mile) tramway has been under construction on **Baoshan** (Yunnan province) since 2018 under a PPP contract, but there is no recent news.

## NORTH KOREA

**Wonsan** is a port city on the east coast of the Democratic People's Republic of Korea. Its population is about 330 000. In 2013, the city was designated a summer destination with resorts and entertainments. With the support of General Secretary and Supreme Leader Kim Jong Un, the 4km (2.5-mile) Kalma beach area has been redeveloped with hotels and restaurants, and a new airport was built. Work was still in progress when COVID hit in 2020, bringing progress to a halt, but restarted in 2023.

Wonsan city is served by trolleybuses, but in 2019 work started to build an 8.5km (5.3-mile) single-track metre-gauge tramway loop serving Kalma. Infrastructure was completed in 2020. Single unit bogie trams, modelled on the Czech *EVO-1* design, were to be delivered by the Kim Jong Thae Locomotive Works. However, the effective closure of the resort area during the COVID pandemic seems to have meant the tramway has never carried passengers.

Work to install the overhead restarted last year, so summer 2024 may finally see the goal of carrying passengers achieved. Photos have emerged showing finishing work taking place on an open-sided tram, whether to supplement the conventional fleet or not is unclear.



▲ ABOVE: The tourist tram for Wonsan under construction. KCTV



▲ ABOVE: Tram testing in the Romanian city of Reșița. City of Resita

## ROMANIA

The city of **Reșița** was one that received a new tramway during the Ceausescu 'electrification era' but the poor quality of the trams and infrastructure meant that it ran only from 1988 to 2011, despite the arrival of second-hand trams from Dortmund and Frankfurt-am-Main. After the 2016 elections the new mayor initiated planning for the re-introduction of trams and finance for a 9km (5.6-mile) line (including EU funding) was agreed

in December 2019.

A RON268m (EUR53.8m) contract for the infrastructure works was signed with PORR in April 2022, and 13 18m double-ended low-floor trams were ordered from the Turkish company Durmazlar at a cost of RON135.4m (EUR27.2m); the first was delivered on 29 January 2023.

Drivers are being trained in Timisoara and despite thefts from the construction site, it is hoped that passengers can be carried from April 2024. It is also hoped to extend the line in two more phases.

## SPAIN

A 4.7km (2.9-mile) tramway was built in the Andalusian city of **Jaén** in 2009-2011 at a cost of EUR75m, but operated carrying passengers for just two weeks in May 2011 before a political and financial dispute between regional and city governments resulted in service being suspended.

In December 2021 it was announced that EUR4.5m from the EU Next Generation Fund would be used to help finance a EUR5.2m contract aimed at getting the tram moving again in 2022, though this has now drifted to 2024.

Five Alstom *Citadis* trams were delivered in 2011, and after 13 years of storage need considerable work to make them operable again.

▼ Artist's impression of the battery tram for Busan's Oryukdo line. Dawonsys



## SOUTH KOREA

The first tramway in South Korea since the 1968 tramway closure in **Busan**, the 5.2km (3.2-mile) Oryukdo line is a catenary-free demonstration project linking Kyungsung University station on metro line 2 and Oryukdo Skywalk. The line is being developed by the Korea Railroad Research Institute and will feature Korean-built low-floor battery trams (recharged at stops) built by Dawonsys.

Although originally announced for 2023, passenger service is now expected to start in 2024.





**UK**

The local railway network serving the Welsh capital **Cardiff** is being revamped by Transport for Wales for GBP1bn (EUR1.2bn) as **South Wales Metro**, an integrated network of rail, bus, cycling and walking routes. The Core Valley Lines covering 137km (85 miles) linking Cardiff with Aberdare, Coryton, Merthyr Tydfil, Rhymney and Treherbert are being upgraded and electrified at 25kV ac with new stations.

A GBP100m (EUR116.6m) depot and control centre has been built at Taff Wells to provide space for new rolling stock built by Stadler: 36 class 398 *Citylink* tram-trains with the capability to run on street alignment tracks (in Cardiff Bay beyond the existing terminus to Porth Teigr) will run to Treherbert, Aberdare and



Merthyr Tydfil; 24 class 756 *FLIRT* tri-mode (diesel/electric/battery) three and four-car multiple units; 35 four-car diesel-electric *FLIRT* DMUs for heavy rail lines. The operator is KeolisAmey Wales.

Service with the class 398 tram-trains is due to start in late May 2024.

▲ **TOP: The South Wales Metro under construction.**  
South Wales Metro

▲ **ABOVE: One of the 36 class 398 Citylink trams arrives in readiness for the start of the South Wales Metro this year.**  
South Wales Metro

## EXTENSIONS

There are over 420 tramways around the world and of course many of them will be opening new extensions in 2024. Blackpool North railway station should see trams again this year, over a year adrift from its original timescales. In the West Midlands there are tramway extensions being built to Eastside and Dudley, but it seems that passengers will not be able to ride these lines until 2025; however, part of the Wednesbury - Brierley Hill may open in 2024.

There are always tramway extensions under construction in mainland Europe. Amsterdam will open its new line to Uithoorn on 21 July 2024, as a 4.4km (2.7-mile) extension of line 25 from Westwijk. In Den Haag line 19 should finally reach Technopolis on a 3.1km (1.9-mile) extension that seems to have been under construction for years (and even saw some new track lifted before it had been used).

The era of new lines in Paris seems to be over, but another extension of line T3b from Port d'Asnières to Porte Dauphine (3.2km/two miles) will open in April in time for the summer Olympic Games.

Bruxelles/Brussel will start service on 5.5km (3.4 miles) of new line running as line 10 from Rogier to Neder-Over-Hembeek (Hôpital Militaire), probably in the autumn.

In Germany Düsseldorf will see Rheinbahn service on line U81 from the airport (Flughafen) to Arena/Messe in time for the Euro 2024 football tournament in June. Another airport tram link will come before the end of 2024 when Luxembourg opens its 4km (2.5-mile) extension from Luxexpo to Findel. The Estonian capital Tallinn hopes to be able to open its new 2.2km (1.4-mile) Harbour tram line in 2024. In Barcelona the new link along Diagonal bringing the two separate tram systems together should open in the second half of 2024.

Looking further afield, the first tram line in the Israeli city of Jerusalem (2011) is being extended at both ends: Mount Herzl to Tahon (1.4km/0.9 miles) and Neyl Ha-Avir to NevebYa'akov (2.3km/1.4 miles). Probably the first extension of the year will be in Phoenix (Arizona, USA) where a 2.6km (1.6-mile) northern extension of the city's light rail line from 19th Avenue/Dunlop to Thelda Williams Transit Center opened on 27 January.

Ottawa, Canada, should re-open its diesel light rail Trillium line this summer, equipped with seven new Stadler *FLIRT* (to join the six Alstom Coradia *LINT*) and extended by 16km (9.9 miles) to Limebank with a branch to Macdonald-Cartier International Airport, after four years of upgrading work.



▲ **ABOVE: A new Stadler FLIRT for Ottawa's Trillium line outside the new maintenance centre.** OC Transpo



**USA**

▲ **ABOVE: A Siemens S200 streetcar on test in Santa Ana.** Orange County

The Orange County Streetcar is a 6.7km (4.15-mile) standard-gauge tramline running through the southern Californian city of **Santa Ana**. Construction on the project started in November 2018, linking the Santa Ana Regional Transportation Center (Metrolink commuter rail service to Los Angeles) with downtown and over former Pacific Electric interurban right-of-way (1905-1950) to Garden Grove (Harbor Transit Center). A new double-track bridge has been built across the Santa Ana river as the old PE single-track bridge was considered structurally unsound.

An end-to-end trip will take 22 minutes, with ten stops in each direction. Service will be provided 06.00-23.00 (01.00 at weekends). Passengers will ride on eight Siemens S700 27.4m (90 ft) trams costing USD51.5m, with four required for a 15-minute service. However, late delivery threatens the timely completion of the project.

The estimated cost for the project is USD509m, with USD175m coming from the federal government. It was hoped the contractors could hand the system over to Orange County Transportation Authority before the end of 2023, although that was not achieved. It is almost certain that passenger service will start in 2024.

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## ROLLING STOCK ORDERS 2024

Despite delays affecting many deliveries worldwide, new CAF, Škoda and Stadler orders continue apace. Mike Taplin provides a round-up of the LRT market.



## THE NEXT LEVEL: OLSZTYN, POLAND

Andrew Thompson visits Poland's newest tram network, which has successfully opened its latest phase to deliver a thoroughly modern tramway.



## SYSTEMS FACTFILE: EDINBURGH, UK

Extending coverage to Leith and Newhaven in June 2023 gave an extra boost to the Edinburgh system's popularity. Neil Pulling reports.

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# FROM RHINE TO RUHR: MIXED FORTUNES

Andrew Thompson summarises the ups and downs of light rail in the towns of Germany's industrial heart.



**▲ ABOVE:** Eagerly awaited and much needed, the three-coach, double-ended Flexity NF4 vehicles will not only transform public transport in Duisburg in the medium-term by significantly boosting the low-floor accessibility of the city's stock, but in the short-term are required to finally offer a reliable timetable without service cancellations, overcrowding or bus substitutions. Car 2002 is with a northbound line 903 service at Marienhospital.

**T**he densely-populated region along the Rivers Rhine and Ruhr, from Düsseldorf to Dortmund, is Germany's industrial heartland and historically served by an interconnected, interurban public transport system. A vast network of standard-gauge railway lines and overland tramways provides multi-modal links. A beneficiary of Germany's post-war tunnelling boom in the 1960s and 70s, numerous trunk lines are

built as formidably-engineered underground routes and can be described as pre-metro light rail. In Germany this type of system is commonly referred to as *Stadtbahn*.

From Krefeld, the country's westernmost tramway, via Neuss, Düsseldorf, Duisburg, Mülheim, Oberhausen, Essen, Gelsenkirchen, Bochum, Herne and Hattingen, the tracks extend all the way east to Witten in what is Europe's largest interurban network.

As the crow flies, from St. Tönis Wilhelmsplatz, the westernmost terminus of the Krefeld tram system, to Marienhospital, the easternmost stop in Witten, the distance between these peripheral points is exactly 59.9km (37.2 miles).

Unlike Poland's similar system in the Upper Silesian conurbation centred on Katowice, the Rhine and Ruhr region does not have a centralised operator like Tramwaje Śląskie. Instead the different cities have their



own municipal companies. While the level of cooperation between the numerous operators is generally smooth, diverging political agendas and alternating funding priorities can create significant differences in service quality and timetable frequency from town to town.

Historically, the amalgamated operator has been Bogestra (Bochum-Gelsenkirchener Straßenbahnen AG), which was already established in 1896, but more recently Essen's EVAG and Mülheim's MVG merged in 2017 to form Ruhrbahn. Just like Bochum, Essen and Mülheim also feature the combination of a standard-gauge, largely underground *Stadtbahn* with a metre-gauge tramway that relies primarily on street running.

In recent years various network additions have been made, such as the February 2016 opening of the 3.4km (2.1-mile) cross-city tram tunnel in Düsseldorf (commonly referred to as Wehrhahn line), the January 2018 line 701 2km (1.2-mile) extension from Rath *S-Bahnhof* to the new terminus Am Hülserhof, the October 2017 extension of the eastern Bogestra network from Laer Unterstrasse to Langendreer Markt and Langendreer *S-Bahnhof*, and the January 2023 opening of the 900m branch from Laer Mitte to O-Werk. However, there has also been some contraction.

In December 2019 the Bogestra line 310 ran for the last time on the comparatively idyllic overland section from Unterstrasse via Am Honnengraben to Papenholz, and 11 months later its replacement opened on a new alignment from Langendreer Markt to Papenholz. This had the advantage of serving a much more populated and central part of Witten. As a corresponding service enhancement to make the most of this new infrastructure, line 309 was introduced in November 2020 to provide a direct link from Langendreer *S-Bahnhof* via Langendreer Markt and Papenholz to Heven Dorf, the regular terminus of line 310.

Throughout the past decade the most significant tramway closures in all of Germany have been implemented in

**▲ ABOVE:** Since the withdrawal of the last high-floor Duewag M8C, Krefeld's metre-gauge tramway with its four lines and 38km (23.6-mile) network is solely covered by the 31 Bombardier Cityrunner, which were delivered in two series in 2009-10 and 2014 and are non-sequentially numbered 601-619 and 660-671. In summer 2023 Krefeld's southwestern branch of line 042 from Hauptbahnhof to the steelworks at Stahldorf was closed for infrastructure renewal and then re-opened in September 2023. In this picture from mid-August 2023, Cityrunner 665 is seen at Krefeld's easternmost tram terminus at Rheinhafen, with silos and storage houses framing the scene.

Mülheim an der Ruhr (population 171 000), with no less than three different routes being axed since 2012. In April of that year the 1.9km (1.2-mile) southeastern section of line 104 from Hauptfriedhof to Flughafen was mothballed and abandoned in favour of buses, officially due to the poor condition of the alignment. Eleven years later, the tracks were removed in order to make way for a cycle path.

October 2015 saw the closure of the 1.8km (1.1-mile) branch from Mülheim-West to Friesenstrasse. The turning loop at the former Friesenstrasse terminus has been removed, but many of the other tracks are still *in situ*.

Despite considerable public and political opposition from both local and state-level actors, the municipal authorities in Mülheim proceeded with their anti-tram policy in early August 2023, when the 2.8km (1.7-mile) alignment of line 104 from Evangelisches Krankenhaus (formerly Wertgasse) to Oppspring was shut down, once again replacing electric trams with diesel buses.

Until a new turnback facility is built for double-ended LRVs at Evangelisches Krankenhaus, line 104 has been temporarily re-routed to terminate at the nearby interchange of Kaiserplatz. This closure was forced through, even though the infrastructure was in sound condition and several sections of the route had been modernised in this century.

Although the closure of Mülheim's tram routes is in direct contrast to the stated climate protection goals and modal shift

targets of the German federal government, at the city level decision-makers in Mülheim simply sought to reduce infrastructure maintenance costs and lower departmental overhead expenses.

To the north, Mülheim's tram network is directly linked with that of Oberhausen and the two cities share the major trunk line 112, which is currently the sole route in Oberhausen and was purpose-built between 1994-96. Indeed, Oberhausen is one of the few cities in Germany to boast a second-generation tramway, after the original system was closed in stages between 1963-74. The city has a much more favourable light rail policy than Mülheim, and it is currently planned to extend line 112 from its present terminus at Neumarkt in the Sterkrade district further northwest to Schmachtendorf.

Additionally, Oberhausen and Essen also want to link up by tramway by the end of this decade, with the planned extension of line 105 from Essen Frintrop to Oberhausen Sterkrade, connecting planned residential districts and the major Centro shopping centre in the process.

In Essen the most recent extension of the sprawling metre-gauge tram network opened in October 2014 with the completion of the 1.3km (0.8-mile) link between ThyssenKrupp and Alfred-Krupp-Schule, which is served by line 109 on the southwestern branch to Frohnhausen Breilsort. In summer 2023 the southern branch of line 108 was made barrier-free and suitable for low-floor trams. ➤



**A ABOVE:** A DUEWAG in its namesake city, with the classic *G78SU* on the west bank of the River Rhine at Luegplatz. It is just about to pass over the major Oberkasseler Brücke with an eastbound U75 service to Eller.

**▼ BELOW LEFT:** Running with a line 104 service on the penultimate day of operations on 5 August 2023, Ruhrbahn car 8014 is seen in Mülheim an der Ruhr on the now-closed Kahlenberg route beyond Evangelisches Krankenhaus.

**▼ BELOW:** Oberhausen's trams feature a green and yellow livery. Operator STOAG has a fleet of six low-floor, double-ended DUEWAG *MGT6D* LRVs dating from 1995. Three more such vehicles sport Ruhrbahn's yellow livery. The sole line 112 connecting Oberhausen with Mülheim is jointly operated by STOAG and Ruhrbahn. Here STOAG's car 207 has just reached the southern line 112 cemetery terminus in Mülheim. It was the 1.9km (1.2-mile) continuation of the line from here to Flughafen which was the first of Mülheim's three different tram routes to be closed since December 2014. The Hauptfriedhof terminus still has a turning loop, but this is no longer needed as line 112 is served by double-ended vehicles, and hence the loop is slated for removal to further reduce costs.



**▼ BELOW:** With their broad profile and 2.65m width, the two-coach, six-axle, 28m-long Alstom *HF6* make for an impressive and dominant appearance, especially when appearing on street-running sections. Here such a high-floor Rheinbahn tandem is seen on the dual-gauge approach to Krefeld Hauptbahnhof, while running westbound on the interurban line U76 between Düsseldorf Hbf and Krefeld Rheinstrasse.





▲ ABOVE: In what is now already an historic photo, Duisburg Duewag GT10 NC passes over the River Ruhr on the old Karl-Lehr-Brücke on 11 August 2023, as the new bridge waits to be moved into position in its place. By December 2023, after several weeks of tramway closure, this structural replacement had already been made and the new steel span was in place, allowing for the re-opening of Duisburg tram line 901 on this section.



▲ ABOVE: In Germany the summer holiday period is traditionally used to implement annual engineering works that require partial network closure. During this period of less intensive demand, various diversionary routes are implemented and trams often use 'rare track'. In this picture, the metre-gauge Bombardier Flexity M8D-NF 1518 is at the Helenenstrasse loop, which is attractively framed by the local church.

On the rolling stock front, the 21 high-floor Düwag M8C trams have been gradually replaced by the 34 low-floor Flexity NF4 in Essen since 2021. The last of these articulated cars dating from 1980-90 are expected to be withdrawn in 2024, although some might be kept for limited reserve duties. In Krefeld this process has already been completed, with all M8C formally withdrawn, although car 844 from 1981 remains operational.

By far the most beneficial has been the long-overdue and repeatedly delayed delivery of the first two of 47 Flexity NF4 in Duisburg in April 2023. Because of teething problems with damaged pantographs, the two prototypes only lasted two weeks in regular service, before having to be withdrawn for two months in order to complete rectification works. Eventually the Flexity returned to frontline duties in July 2023.

As a result of all the delays and technical troubles incurred with the Duisburg Flexity, Alstom and the city authorities have quietly agreed to increase the order scope by two trams to a total of 49, without disclosing the price for the add-on.

Duisburg's municipal operator DVG has been plagued by poor vehicle availability and a protracted shortage of both stock and staff for many months, and in the process has been forced to cancel services *en masse* or resort to implementing tram replacement bus services, particularly on weekdays and during peak periods with intensified interval patterns. From the total of 38 Duewag GT10 LRVs delivered from 1986-96 and later retrofitted with a low-floor section, at times fewer than 20 have been operable. Even when serviceable, these 32.6m cars lack air-conditioning, only have a 20% low-floor ratio, and do not



▼ BELOW: Buer Rathaus is the northernmost point of the expansive Bogestra network and an important tram and bus interchange in the Gelsenkirchen part of the system. Here the double-ended Stadler *Variobahn* 533 passes the namesake municipal building from 1912, with its landmark clocktower. The metre-gauge tram is running southbound with a line 301 service to Gelsenkirchen Hbf.

**“The level of cooperation between the operators is generally smooth [but] diverging agendas can create differences in service quality.”**

provide sufficient capacity for a city with Duisburg’s population of roughly half a million inhabitants.

Because of this, public transport in Duisburg has become brandished as one of the least comfortable and least reliable in Germany, with the services that do run being prone to significant overcrowding. At the same time, there is unlikely to be a quick fix, until all 49 *Flexity* are in service.

As a result of Duisburg’s chronic stock shortage, Düsseldorf’s operator Rheinbahn has been forced to fill the breach with its own stock on the vital, jointly-operated U79 interurban light rail line between the two cities. In Düsseldorf the new *HF6* high-floor LRVs have been in revenue service since late spring 2022, and after initially being deployed only on the cross-river route to Neuss are now starting to spread their wings on various *Stadtbahn* routes, including the important U76 interurban line to Krefeld.

Rheinbahn has a total of 59 of these sleek and wide cars on order, making it the second operator after KVB in Köln (Cologne). Meanwhile, the iconic 1970s vintage Duewag *GT8SU* soldier on, especially on lines U75, U77 and U78. Those *GT8SU* that have already become surplus to requirements in Düsseldorf have been sold by Rheinbahn to Kraków in Poland.

Even with the numerous challenges that it currently faces, public transport in Germany’s Rhine and Ruhr conurbation has proved to be indispensable and resilient, keeping this vibrant and dynamic region moving and ensuring its significant contribution not only to Germany’s GDP, but also achieving one of the highest economic performance benchmarks worldwide. **TAUT**



▲ ABOVE: The line to O-Werk is the newest network extension of the Bogestra system. The 900m branch opened in January 2023. Formerly the site of an Opel automotive factory, the industrial estate has been converted to commercial use and now features office buildings, thus prompting the connection to the light rail network. The site is a designated urban development hotspot that currently already boasts 3000 jobs on its premises, with the campus expected to eventually serve 10 000 jobs.



◀ LEFT: Buerer Strasse in Gelsenkirchen is the northern terminus of Essen’s standard-gauge U11 *Stadtbahn* line. This is where the Ruhrbahn and Bogestra systems intersect and exemplary connections are provided for passengers. This set-up also illustrates how many interchange points are designed in the entire Rhine and Ruhr conurbation. While Essen’s high-floor *Stadtbahn* LRV calls at the purpose-built raised platform, the metre-gauge tracks of the Bogestra network frame the high standard-gauge platform left and right and also provide dedicated lanes for town buses.

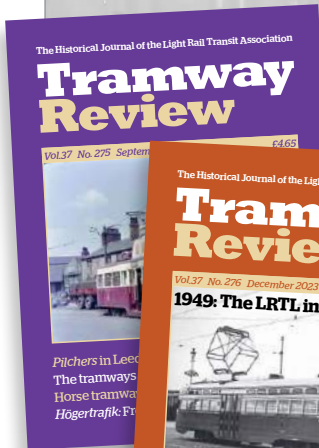
# Tramway Review

Published quarterly in association with the Light Rail Transit

Association, *Tramway Review* is the leading historical journal dedicated entirely to British and overseas tramways of yesteryear.

With articles and essays from light rail historians and often featuring never-before seen images, maps and diagrams, *Tramway Review* seeks to educate and inform on the tramway's heyday of the late 19th and early 20th Centuries, right up to their abandonment and subsequent removal in many cities worldwide.

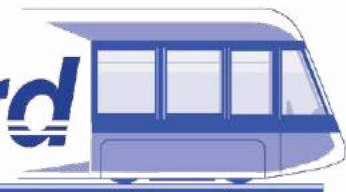
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Opening day in Walsall  
The Hellingly Hospital Railway  
Leeds in the 1950s: Part 1  
From breweries to bars: Part 1



## TramForward



### Light Rail Transit Association Campaigns Group - Vacancy for Media and Publicity Officer

The LRTA is a not-for-profit UK based organisation and has members throughout the world. Free of any trade or political affiliation, it is the world's leading organisation concerned with the achievement of better public transport through light rail, tramway and metro systems in towns and cities worldwide.

There is currently a vacancy for a **Media and Publicity Officer** to work with the LRTA Campaigns Group. The post is a voluntary one, although reasonable expenses will be covered by LRTA. If required, the various responsibilities of the post could be split between two or more persons.

The Campaigns Group (formerly the External Relations Group) was set up in 2009 as one of four working groups reporting to the LRTA Council. It is responsible for organising the LRTA's campaigning activities, including liaison with other organisations, national and local politicians, and others to promote the case for investment in light rail, tramway or tram-train projects. The Group's responsibilities also include the Development Forum, which has its own Chair and Minutes Secretary, and the LRTA Development e-Group.

The Group meets four times per year, currently in Birmingham.

The Media and Publicity Officer will organise and coordinate the issuing of press releases, and coordinate responses to consultations, calls for evidence etc, as well as overseeing a presence on selected social media on behalf of the LRTA. All these tasks will be carried out with the full support of members of the Campaigns Group.

If you are interested in taking up this position, in whole or in part, please contact [press@tramforward.lrta.info](mailto:press@tramforward.lrta.info).



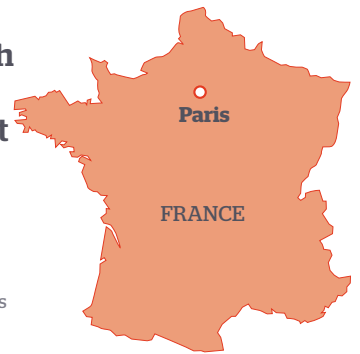


# SYSTEMS FACTFILE

No. 197 Île-de-France  
T4 and T9, France

Lines T4 and T9 in the Greater Paris area each represent a successful replacement with light rail of former public transport modes.

Words and pictures  
by Neil Pulling



**L**ight rail coverage of the Paris conurbation grew rapidly after the first modern line (T1) opened in 1991, with the mode serving areas well beyond the city's mainly sub-surface metro of the time. The identity of public transport has shifted from being overtly Paris services to those of Île-de-France, the region with the French capital at its core. The title of its transport division, Île-de-France Mobilités (IdFM), is increasingly evident across the network. New light rail stock is delivered in its branding and older vehicles are being re-liveried, as is the case for metro, regional trains and buses.

Distinct tram and tram-train fleets work over largely free-standing lines which primarily interchange

▲ ABOVE: Alstom Citadis Dualis TT423 passing the church of Saint Pierre and Saint Paul on the single-track section near Montfermeil terminus on 20 November 2023.

with other modes, as opposed to a unified system. This Factfile pairs lines T4 and T9 as both are primarily outer suburban operations. Each is run by bodies other than Paris' historically main public transport provider, Régie autonome des transports parisiens (RATP) which dates from 1949.

## Île-de-France T4

Sited well to the east of Greater Paris, the initial T4 dates from November 2006. Operated by tram-train stock, it owes operation by the national railway body, SNCF, to having origins as a heavy rail route. In contrast however, line T2 which opened on the west side of Paris in 1997 also had railway origins, yet became an RATP operation with tram vehicles.

On main lines from Paris Gare du Nord and Gare de l'Est respectively, Aulnay Sous Bois and Bondy stations were radially linked by the approximately 8km (five miles) of the 'Coquetiers Line'. A current T4 stop, Les Coquetiers, recalls the area's historic trade in eggs. In the final years as part of the national network, the line was mainly worked by locomotive-powered push-pull sets. Re-using the railway as the basis of T4, the change to light rail and its associated regulations allowed for at-grade crossings to become less restrictive for road users. Track was doubled throughout, including on a new flyover to avoid conflict with the N3 road between Gargan and Lycée Henri Sellier stops. Converted stations brought better passenger access and the number of stops was increased to

## THE FLEET

The now complete withdrawal of the *Avanto* fleet numbered TT01-15 began in 2022. They were also used for the Esbly-Crécy la Chapelle service. The replacement SNCF U53700 version of Alstom's *Citadis Dualis* tram-trains, TT401-415, have wheels compatible with the original T4 line and the extension's grooved track. Assembled near Valenciennes in northern France, they are 2.65m wide and 42m long

with four sections, each having a double door on both sides. There is low-level entry, with the continuous flooring having some height variations. Capacity is for 251 passengers, 92 seated.

All T9 services are operated by 22 (Nos.901-922) fully low-floor, bi-directional Alstom *Citadis XO5* trams, 45 metres long with seven sections. Assembled in La Rochelle, they were built 2019-2020 and have capacity for 314,

74 seated. Dubbed 'Lumière' due to a distinctive internal and external use of LED lighting, they have different indications for doors available for use, closing or unavailable. The trains have Wi-Fi and USB charging points. A separate fleet of the same type is used on IdFM T10 opened in June 2023, also on the south side of Paris. The T4 and T9 fleets both carry the Île-de-France Mobilités livery.

account for contemporary demand. Using dedicated platforms, Aulnay Sous Bois and Bondy became the T4 termini. Coupled with these changes, a more intensive timetable made the new service better patronised than its railway predecessor. Aside from the termini, the main reminder of T4's origins is the alignment. Classified as SNCF network No. 958, it has large radius curves, largely sited within fences, and is bordered by houses set well back on roads on both sides of the tracks.

Until replaced by Alstom *Citadis Dualis* which have become standard equipment on several SNCF outer Paris lines, T4 was initially operated by bi-directional Siemens *Avanto* (SNCF classification U25500). It was the first fleet use of tram-trains in France. The *Avantos* carried a mainly blue livery, as then applied to SNCF stock working the longer distance Transilien routes. Maintenance was provided near Noisy le Sec station, west of Bondy along the Paris-Strasbourg/Mulhouse main line. A connection with the main SNCF tracks just east of Aulnay Sous Bois station has been severed. The present 'L'atelier du tram train' (maintenance centre) at Noisy le Sec opened in 2016. It handles T4 and T11 *Dualis* stock, which now also works the Transilien Esbly-Crécy la Chapelle line P branch.

In 2019 the initial T4 line with 11 stops was joined by coverage of more easterly communities featuring high-density estates and many school/college sites. Buildings used for T4 control at Gargan in Livry-Gargan commune were demolished to create space for a south-to-east junction, the starting point of a 6.5km (4.1-mile) extension with nine stops. It also marks the change from the 25kV supply for the original route to 750V as used on the extension.

Bringing street-running to T4, construction begun in 2015 led to an opening to Arboretum in December 2019. The remaining nearly 1km (0.6-mile) section to Hôpital Montfermeil terminus was added in August 2020. In contrast with spacious settings elsewhere on the extension, it is mainly single track and follows the narrow and winding Rue de l'Église. This operational limitation should be removed by the projected addition beyond the terminus, creating a uni-directional loop east of Notre Dames des Anges stop. Another contrast with the original's fairly level course (except for the added viaduct ramps), east from Gargan has a mix of gradual and substantial gradients on ascent to the Montfermeil plateau.

All T4 stops are within Seine-Saint Denis department, with Hôpital Montfermeil 17km (10.6 miles) from 'Point Zéro' near Notre Dame de Paris cathedral. Currently well beyond metro coverage, T4's interchanges



▲ ABOVE: From the original and now withdrawn Siemens *Avanto* fleet, southbound TT05 is at Les Coquetiers on 15 April 2008.

➤ RIGHT: The holding area west of the separate arrival and departure T4 platforms at Bondy. The busy station on the main line from Gare de l'Est handles Transilien trains and RER line E services to Haussmann-Saint Lazare.



➤ RIGHT: Taking the initial T4 route, an Aulnay-Sous-Bois service runs over the junction at Gargan. An illuminated sign above TT421 marks the power supply change for the on-street Montfermeil extension.





▲ ABOVE: Near République-Marx Dormoy stop on the Montfermeil line: figurines indicate a crossing near a school.

**“A more intensive timetable made the new service better patronised than its railway predecessor.”**



◀ LEFT: The maintenance centre opened in 2016 next to the main line at Noisy le Sec handles T4 and T11 stock.



▼ BELOW: An Île-de-France Mobilités Alstom Citadis Dualis.



▲ ABOVE: Aulnay-Sous-Bois station has dedicated T4 platforms.

**“Rather than having route fashioned by linking dispersed traffic generators, most of T9 as installed on an established transport corridor.”**

➤ **RIGHT:** Descending towards Gargan, TT419 approaches Clichy sous Bois-Mairie stop.

▼ **BELOW:** The flyover across the N3 road north of Gargan stop, a major work in the transformation from heavy to light rail.



▲ **ABOVE:** With the standard T9 stop fittings, Mairie de Vitry-sur-Seine is unusual in having staggered platforms.



are primarily with buses and the RER/Transilien trains at each end, although metro line 16 is due to open by 2026 with a station at Clichy-Montfermeil. The basic service pattern is alternating Bondy-Aulnay Sous Bois (scheduled for 20 minutes) and Bondy-Hôpital Montfermeil (31 minutes), thus stops south of Gargan enjoy a more intensive service. Not usually associated with trams, an aural aspect of T4 stops is SNCF's *da-da-DA-da* jingle alert before announcements, as used at main line stations.



▲ **ABOVE:** An Île-de-France Mobilités T9 Alstom *Citadis* 'Lumière' - the arrow-head lights are at doorways, with green indicating a door set available for use and red for the non-platform side.

◀ **LEFT:** The site of Trois Communes stop beneath a motorway viaduct is a rare deviation of the T9 from the near-straight D5.

## Île-de-France T9

Rather than having a route fashioned by linking dispersed traffic generators as is widely the case on French tram systems, most of T9 was installed on an established transport corridor. As such, it became amongst the least varied of such services in terms of alignment and surroundings, mainly following the D5 road. With tram coverage between 1875 and 1933 and trolleybuses 1950-66, this busy thoroughfare comprises a sequence of differently named roads. It runs south-east from just inside Boulevard Périphérique, the motorway ring that loosely defines 'Paris proper'.

## NETWORK FACTS

- **Opened:** T4 (2006); T9 (2021)
- **Approx. weekday hours:** T4 04.30-01.00; T9 05.30-01.15
- **Line frequencies:** T4 5 20 minutes; T9 7-15 minutes
- **Gauge:** 1435mm
- **Power:** T4 25kV AC + 750V dc overhead supply
- **Power:** T9 750V dc overhead supply
- **Fleet:** T4 15; T9 22
- **T4 operator:** Transilien SNCF Voyageurs [www.sncf-voyageurs.com](http://www.sncf-voyageurs.com)
- **T9 operator:** Keolis Ouest Val-de-Marne [www.keolis.com](http://www.keolis.com)
- **Regional network:** Île-de-France Mobilités [www.iledefrance-mobilites.fr](http://www.iledefrance-mobilites.fr)
- **Civic information:** [www.iledefrance.fr](http://www.iledefrance.fr) and [www.metropolegrandparis.fr](http://www.metropolegrandparis.fr)
- **Tourist information:** [www.visitparisregion.com](http://www.visitparisregion.com)



▲ ABOVE: French tram projects often have associated art works, although Jean Dubuffet's 'Chaufferie avec cheminée' at Place de la Libération Vitry-sur-Seine pre-dated T9.

Approval for T9 came in 2015 and construction began in summer the next year. Much of the space which was redeployed for the tracks gained grass coverage, with safety improvements for pedestrians and cyclists. Following delays related to the pandemic and a month of *marche à blanc* (ghost running), normal services began in April 2021. With consistent styling and facilities throughout, the stops are marked by tall masts with Île-de-France Mobilités branding.

Porte de Choisy terminus is the only T9 stop inside the Paris boundary, with the other 18 being in Val de Marne department communes. The Porte de Choisy platforms are separate from the same-named stop on line T3a. It is about 100 metres between the two, similarly for interchanges with the Métro M7 station. The holding area for T9 trams is alongside T3a revenue tracks, although there is no connection between them. Just over 8km (five miles) of T9's total 10.3km (6.4 miles) follow a near-straight course, mainly set between the D5 carriageways. This central area was previously road space, reserved for bus use which included line 183 (now re-routed), then the region's second busiest service. The scheduled journey time between T9 termini is 32 minutes.

Four-Peary stop marks a break from the straight alignment, the beginning of an arc towards Orly-Gaston Viens terminus. Paris Orly, the capital's second main airport, is partly in Orly commune. There is potential for a T9 extension to serve the airport site and the Rungis industrial zone,

although T7 from the north and the westerly RER+Orlyval link already give coverage. A southern T9 Orly extension also has the potential for transfers with future metro lines. Amongst the variations in IdFM tramways is one which may have implications for service integration in the Orly area, that of T7 and T9 respectively having 2.4m and 2.65m wide stock. Away from revenue tracks with access between Christophe Colomb and Les Saules stops, the T9 depot and administrative centre is on a 4.4-hectare site between railway lines. It has the space to accommodate a bigger fleet for line extensions and increased services.

Although demand along the route was proven by established public transport loadings, T9 broke new ground due to being the first light rail service in the region to have the operator decided by competitive tender. Including Val de Marne's Bord de l'Eau bus network, the contract for 5.5 years was awarded to Keolis Ouest Val-de-Marne in July 2019. There is an indirect link with T4 operation, for 70% of the winning bidder's parent company, Keolis, is owned by SNCF.

As well as at Porte de Choisy, T9 has designated interchanges with RER line C at Choisy-le-Roi and Les Saules stations, both near to rather than adjoining tram stops.

A potential northwards extension to Place d'Italie – allowing direct transfer to more intensive metro services – would further improve network connectivity, although the works would require crossing the busy Boulevard Masséna. **TAUT**



▼ BELOW: Designed to maximise natural light and recall the styling of the area's former factories, the T9 maintenance and control centre is within a fork of main lines near Les Saules station.

▼ BELOW: Porte de Choisy T9 terminus on 21 November 2023, with a tram in the outgoing Paris RATP livery in the background, close to the T3a stop on Boulevard Masséna.



▲ ABOVE: Arrival and departure platforms at Orly-Gaston Viens terminus: currently used for holding stock, tracks beyond this stop would be the start of the T9 extension to the airport district.

## ESSENTIAL FACTS

**Local travel:** Complementing excellent website content including line diagrams, IdFM has printed sector maps available at Metro ticket offices. The region has a unified zone-based, cross-mode fare structure within which are duration options. The ticketing best suited to a given traveller should take into account likely journeys in a given time, also whether to incorporate airport travel as both main airports are in outer zones. All tickets need validation. Rechargeable card and phone-based ticketing gives lower fares than the outgoing paper versions, with the latter starting at EUR2.15 for single maximum 90-minute journeys. Even if not using the full duration, the all-zone Navigo Weekly Ticket at EUR30.75 per week is perhaps the best value for many. The Paris Visite range is for those wishing to incorporate tourist attractions with access by public transport. Overall the conditions and means of purchase can be complex: advance study of [www.iledefrance-mobilites.fr/en/tickets-fares](http://www.iledefrance-mobilites.fr/en/tickets-fares) is recommended (fares quoted as January 2024).

**What is there to see?** Although appealing to those interested in urban transport and useful in the context of the wider network, neither T4 or T9 have surroundings usually associated with Paris as a tourist destination. Conversely they give insights to the metropolitan area and how urbanisation incorporated communities, as manifested by large modern structures mingled with houses that would once have been rural. T4 borders Parc Arboretum de Montfermeil, a landscaped 11-hectare hillside park with free access and a literary association with Les Misérables.

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# Worldwide Review

## AUSTRALIA

**PERTH.** Trial operation on the Joondalup commuter rail line's 14.5km (nine-mile) extension to Yanchep started on 22 December. Passenger services are due to commence later this year. *IRJ*

**SYDNEY.** The first test run on the Parramatta tramway took place on 21 December using one of the 13 CAF Urbos trams now being delivered. *DS*

## AUSTRIA

**INNSBRUCK.** A reduced timetable, introduced on 10 December due to staff shortages, is set to last until 31 March 2024. With Line 5 running with coupled sets, Line 6 to Igls only operates hourly 06.00-20.00 from Bergisel. It is hoped to extend services to Hbf in the spring. *BS, TR*

**WIEN (Vienna).** New Flexity 370 carried its first passengers on Line 60 on 17 January. A new S-Bahn ring service could start by 2032, by extending S45 trains from Handelskai to Praterkai. *BS, RGI*

## BELGIUM

**BRUXELLES (Brussels).** The European Investment Bank has loaned EUR475m (GBP405m) to help finance the conversion of the 5km (3.1-mile) pre-metro subway to full metro operation. New 3200-series trams were used on Line 82 from 8 January. *IRJ, T-2000*

## BOSNIA-HERZEGOVINA

**SARAJEVO.** The canton authorities have exercised an option to add ten more trams to an order of 15 Stadler Tangos. While deliveries are progressing, the additional ten will arrive in 2025. *TP*

## BRAZIL

**CAMPOS DO JORDAO.** Most of the 46.7km (29-mile) interurban tramway has closed. A landslide was compounded by the theft of overhead line equipment. The 7.6km (4.7-mile) section from Emilio Ribas to Portal provides an hourly tourist service with two 1924-built MAN cars. The rest of the fleet is stored at Pindamonhangaba. *BS*

**SALVADOR.** The 3km (1.9-mile) Line 1 metro extension from Campinas to Águas Clares opened on 26 December. *urbanrail.net*

## CANADA

**EDMONTON.** Phase 1 of the Northwest LRT extension was completed on 20 January when NAIT/Blatchford Market station



▲ Two of Tramwaje Śląskie's latest PESA Twist trams pass each other at Dąb Huta Baildon, where there is a junction of the new Grundmann network extension with the existing east-west trunk route between Katowice and Chorzów (Poland). Car 1023 in the foreground is turning onto the new route and crossing the purpose-built tram bridge that spans the busy road beneath, while 1046 in the background is coming off the new line to turn onto the trunk route west to Park Śląski Wejście Główne. A. Thompson

opened, replacing a temporary station 300m (328yd) further east. A further station is being built at Blatchford Gate as part of the CAD291m (EUR199m) project. *MISSISSAUGA.* The provincial government plans to extend the under-construction Hurontario Light Rail Transit system from Brampton Gateway Terminal into the city centre. The HLRT is due to open this September. *skycrapercity*

**OTTAWA.** Coupled sets resumed operation on the LRT system on 8 January. They were withdrawn following problems with wheel wear last summer. *CBC*

**TORONTO.** Metrolinx has awarded the contract to build the 9.2km (5.7-mile) Eglinton Crosstown West Extension to AECOM while the Pape North Connect consortium has won the contract to build the 3km (1.8-mile) Ontario Line Pape Tunnel and Underground stations project. *RGI*

**CHINA**

**HONG KONG.** Metro trains built by Metro-Cammell in Birmingham in 1979 are to be replaced on 28 January when 13 new CRRC-built trains enter service. *IRJ*

**CZECH REPUBLIC**

**BRNO.** The city council has approved a 1.4km (0.8-mile) tramway extension from Ecerova to Kamechy, including a 320m tunnel. It's to be completed in 2027. The city has ordered another 15 Škoda 45T ForCity Smart

vehicles with delivery due to start this November.

**OSTRAVA.** The first of 25 Tatra T6 trams left for the Ukrainian city of Konotop on 18 December. *BS*

**PLZEŇ.** Skoda 40T ForCity Smart 396 arrived on 18 January. The 125th anniversary of electric trams will be celebrated on 15 June. *M. J. Russell*

## EGYPT

**EL QAHIRA (Cairo).** Metro Line 3's 6.6km (4.1-mile) extension from Kit-kat to Rod El Farag Corridor opened on 1 January. *urbanrail.net*

## FRANCE

**AUBAGNE.** Work has started on the 14.4km (8.9-mile) tramway extension to La Bouilladisse. It is due to open in December 2025. *BS*

**RENNES.** A transformer fire led to buses replacing services on Metro Line B from 18 November to 18 December. *TR*

## GERMANY

**BADSCHANDAU.** Storm damage forced services to be suspended on the Kirnitzschtalbahn from 24 December to 6 January. Works tram 201 011, built in Dresden in 1959, has joined the fleet. *BS*

**BERLIN.** Stadler handed over the first JK small-profile metro train to BVG on 11 January, although it will not carry passengers until late summer.

Last month's news reported that Line M41 was 134.7km long. It should have said 13.47km (8.4 miles). *BS*

**BOCHUM-GELSENKIRCHEN.** Stadler has carried out a full rebuild on B80D Stadtbahn cars 6001/003. They have been renumbered 6101/103. *BS*

**DARMSTADT.** Of the 16 Stadler TINA trams delivered by the end of 2023 (22101-22116), only three have entered service. *BS*

**DRESDEN.** Alstom delivered the last of 30 2.65m-wide NGTDXDD trams just before Christmas. Seven more may be ordered.

Planning permission has been granted for the new 1.7km (one-mile) EUR256m (GBP218m) tramway link from Löbtau to Südstadt. Completion is expected in 2026. *BS*

**DUISBURG.** Line 901 resumed operation over its full route from 18 December using the new Oberbürgermeister-Karl-Lehr bridge. However, a vehicle shortage means only off-peak services run from Laer to Obermarxloh.

Alstom had delivered 20 GT8NDs by the end of 2023 whilst Windhoff has delivered a new track scrubber, which replaces eight-axle car 3051. The delivery of new Stadtbahn cars has been delayed by 16 months. *BS*

**DÜSSELDORF.** A timetable change was implemented from 7 January: Line 701 was diverted to Eller; Line 705 to AmSteinberg; Line U71 now runs to Volmersworth; Line U72 now runs to Benrath. Line U74 ceased but Line U76 was extended to Holthausen, and Line U77 to Lierenfeld. Line U83 now terminates at



▲ The Hitachi Rail Italia Sirio tram for Firenze (Florence). *GEST*

Volmersworth. *HF6 Stadtbahn* 4331 was delivered by the end of December. *BS*

**ESSEN.** *NF4* low-floor tram 1079 was delivered in December. *BS*

**FRANKFURT-AM-MAIN.** The ground-breaking ceremony for the Regionaltangente West light rail line took place on 22 December.

Services on Lines U4 and U5 will be suspended from 23 March-14 April in order to install digital train control equipment.

New class 430 trains have entered service on *S-Bahn Flughafen* service S8. *BS*

**GÖRLITZ.** The tram fleet at 1 January included 14 *Tatra KT4Ds* (2301/2/5/6/8-14/6/7/9), party tram 322 (ex-Mannheim Düweg) and heritage trams 29 (built 1897) and 23 (built 1928). *BS*

**HAMBURG.** A new arrangement of *S-Bahn* lines came into effect on 10 December: S1 Wedel – Flughafen/Poppenbüttel; S2 Altona – Aumühle; S3 Pinneberg – Neugraben; S5 Stade – Elbgastrasse. *BS*

**HANNOVER.** The LRV fleet at 1 January included LHB eight-axle 6163/94, 6206-14/16/18-60, LHB six-axle 2001-06/08-48, 2501-96, and HeiterBlick six-axle 3001-3153. On order are 42 six-axle cars from CAF (4001-42). *BS*

**KÖLN (Cologne).** A lack of both drivers and new trams has led to a reduced timetable which will remain until 2 April. Cancellations have been a feature of KVB operations for some months. However, it has bought 87 000m<sup>2</sup> of land in Wesseling for a new depot, which should open in 2030.

Delivery of *HF6* trams reached 5329 by the end of 2023. *BS*

**MAGDEBURG.** The new Elbbrücke (Elbe Bridge) opened on 22 December. The ceremony involved preserved tram set 23+138. The bridge is used by Lines 4 and 6. The last three *Tatra T6s* are to be withdrawn by the end of March. These are the final *T6s*

in passenger service in Germany, which were to tour the system on 28 January. *BS*

**MANNHEIM.** A so-called Stabilisation Timetable was introduced from 17 December due to staff shortages. Headways have been extended and Line 8 now operates between Oppau and Mannheim Hbf at peak times, while Line 15 has been withdrawn. *BS*

**MÜNCHEN (Munich).** Scheidplatz station will remain closed until 18 February, leaving Line 23 isolated. Trams 2213 and 2805-07 have worked this line from 22 January.

The city council approved final plans for Phase 1 of Tram Nordtangente on 20 December, including the overhead-free section through the Englischer Garten. The first *S-Bahn class 424* sets entered passenger service on 18 December. *BS*

**POTSDAM.** Planning permission is being sought for a new tramway from Campus Jungfernsee to Krampnitz and Fahrland, to be built in 2027-29.

The bodies of 13 new Stadler low-floor trams are being fabricated at Środa Wielkopolska in Poland. Two will go to Valencia (Spain) for fitting out, while 11 will be completed in Berlin-Pankow. The first should arrive this summer. *BS*

**ROSTOCK.** A cyber-attack on 18 November disabled all IT systems, including ticket machines. By early January, they were still only accepting cash payments. *BS*

**WOLTERS DORF.** The local authority agreed to finance a fourth *Modertrans* tram on 6 December. *BS*

**WÜRZBURG.** An emergency timetable and extended use of Düweg cars remained in force at the end of 2023 while the *GT-N* tram fleet remained out of use. The vehicles are expected to return in mid-February. *BS, DS*



▲ The three new CAF Urbos delivered to the Granada tramway in Spain (right) differ in design from the original batch. *CAF*

**ZWICKAU.** Line 3 resumed operation to Eckersbach from 23 December after 950m (0.6-mile) of double track was re-laid and a bridge refurbished. *BS*

## HUNGARY

**BUDAPEST.** CAF is expected to start delivering 51 new *Urbos* low-floor trams in September 2024 at the rate of two a month. *TR*

## JAPAN

**OSAKA.** The 2.5km (1.6-mile) Minoh-Kayano extension of the Kitakyu Namboku metro is due to open on 23 March. *urbanrailnet*

## MALAYSIA

**JOHOR BAHRU.** The 1.7km (one-mile) bridge that will carry the 4km (2.5-mile) international metro to Woodlands in Singapore was completed on 11 January. Passenger services are due to start in December 2026, using eight four-car trains from CRRC Zhuzhou. *RGI*

## NETHERLANDS

**AMSTERDAM.** Line 14 was cut back to Indischebuurt on 8 December; on the same day, Line 24 was cut back to Frederiksplein, ending 140 years of trams on Vijzelstraat. Line 25's extension to Uithoorn is to open on 21 July. *OR*

**DEN HAAG.** Stadler should deliver the first five *TINA* trams in mid-2025, with the remaining 51 in 2026-28. They have batteries to permit overhead-free running. A mock-up, comprising two sections, has been moved to a training school. *GTL* tram 3123 has been scrapped. *OR*

**ROTTERDAM.** The city council approved the new EUR1.6bn bridge across the Nieuwe Maas river at De Esch on 21 December. The project includes building a tramway linking Zuidplein and Kralingse Zoom. It should open in 2033. *OR*

## NORWAY

**OSLO.** CAF had delivered low-floor trams 401-22/24/26/27/29/41/43-46/49/51/55 by the end of 2023. However, cars 407 and 412 have returned to Spain for repair. *BS*

## PHILIPPINES

**MANILA.** Test running on the 6.7km (4.1-mile) light rail extension to Cavite took place on 20 December. An opening date has yet to be announced. *RGI*

## POLAND

**GORZÓW WLKP.** Opening the new Line 4 on 2 January brought trams back to the railway station for the first time in 12 years. The single-line extension to Fieldorfa-Nila is served by just one tram, providing an hourly service between 06.00 and 17.00. *TP*

**GRUDZIĄDZ.** Plans are being prepared for two new tram lines: a 2.5km (1.6-mile) line to the Mniszek housing estate, and a 1km (0.6-mile) line that would terminate close to the railway station. A decision on both could be made later this year. *TP*

**KRAKÓW.** Tram lines 18 and 50 started using the new 700m (0.4-mile) Papierni Pradnickich – Gorka Narodowa extension from 8 January. *urbanrailnet*

**ŁÓDŹ.** The 125th anniversary of electric tramways was marked on 23 December with a parade that ranged from cars dating from 1929 to *Moderus Gamma* 2379. *transphoto.org*

**OLSZTYN.** The PLN454.5m (EUR104m), 5.9km (3.7-mile) Pieczewo extension opened on 30 December. Line 4 serves the railway station, while Line 5 (which commenced on 1 January) serves Wysoka Brama. Meanwhile, a depot extension – to house 12 new Durmazlar *Panorama* trams – was brought into use from 28 December. *urbanrailnet, TPi*

**POZNAN.** Lines 18 and 50 started using 700m of new tramway





▲ The first Stadler TINA tram for Basel's BLT network is already on test. BLT

between Papierni and Górká Narodwa on 8 January.

*urbanrail.net*

**WROCLAW.** The first of 24 PESA trams was due to be delivered from the Bydgoszcz factory in January.

TP

#### ROMANIA

**GALATI.** A RON80m (EUR16m) contract with Astra Vagoane was signed on 15 January for ten more *Autentic* 18m air-conditioned trams, to be delivered in 2025. Eight are already in service. *RGI*

**TIMISOARA.** Turkish builder Bozankaya is to supply a further 17 five-section 100% low-floor battery-equipped trams by the end of 2024 in a deal worth RON180m (EUR36.2m).

Line 6 is suspended until March due to construction work.

*cs-dopravak, stiridetimisoara.ro*

#### RUSSIA

**YAROSLAVL.** UKVZ delivered the first 71-628 bogie tram on 25 December. *transphoto.org*

#### SOUTH KOREA

**GWANGJU.** A ground-breaking ceremony for the second phase of circular metro line took place on 13 December. The 20km (12.4-mile) line is to be completed in 2029. *RGI*

#### SPAIN

**ADEJE.** The Canary Islands regional authority has unveiled plans for a 15km (9.3-mile) tram line between Adeje and Playa de las Americas. There is no construction timescale yet. *BS*

**GRANADA.** The first three of eight new CAF *Urbos* trams were delivered in December and January. *vialibreffe.com*

**MADRID.** Madrid Metro has signed an agreement for funding that will enable it to purchase 80 new trains (TAUT 1032). *IRJ*

**VÉLEZ-MÁLAGA.** The implementation of a low-emission zone from 1 January has caused the

local authority to agree to revive the tramway that closed in 2012. It is hoped to obtain grants from the European Next Generation fund. *G. Pratt*

#### SWEDEN

**GÖTEBORG.** The last of 40 33m M33 trams from Alstom/Kiepe was delivered in December. Production will now switch to the 60 45m M34 cars that are on order. *UTM*

**NORRKÖPING.** The section of Line 3 from Folkets Park to Klockaretorget was closed on 10 December to allow complete reconstruction to take place. The work is likely to take a year to complete. *BS*

#### SWITZERLAND

**AARAU (AVA).** Stadler delivered 471, the first of five *Abe4/8 Saphir IIs*, in December. *Be4/4 21* has been withdrawn after a level-crossing accident, while *ABts 56* and *61* have been sold to TPC for use on the *Aigle - Les Diablerets* service. *EA, TR*

**BASEL.** A total of 2905 passengers responded to a consultation on future tram seat design: 55% voted for a covered seat, 27% favoured a wooden seat with shaped recess and 18% for a plain wooden seat.

Stadler delivered the first of 25 45.5m *TINAs* to BLT on 20 December. *Be8/10 4201* is an 85% low-floor car with high floor just over the end bogies. It should enter service over the summer while the last *TINAs* are to be delivered by the end of 2025. *BS*

**BERN.** Car 918 was the final *Tramlink* delivered in 2023. Work on the new extension to Ostermundigen will start in June and take a year to complete. *BS*

**BERN-SOLOTHURN (RBS).** Stadler *Be4/10 Worbla 15-17* are due to enter service in 2024. *BS*

**LAUTERBRUNNEN-MÜRREN (BLM).** Although one of three new Stadler units for the

4.3km (2.7-mile) mountain-plateau light railway was delivered last October, the other two will not arrive until May. They will enable the line's voltage to be increased from 525 to 750V dc, and the maximum speed increased from 30km/h to 50km/h (31mph). *EA*

**NEUCHÂTEL.** Tram line 215 (Place Pury - Boudry) has been redesignated R15. *BS*

#### TAIWAN

**KAOHSIUNG.** The Hearts of Love River - Kaisyuan Park tramway opened on 1 January. This 4.9km (three-mile) section completed the 23km (14.2-mile) circular line, which uses nine CAF *Urbos* and 15 Alstom *Citadis XO5* trams. *urbanrail.net*

#### THAILAND

**BANGKOK.** The BTS Skytrain Green Line metro is to be extended by 7.5km (4.7-mile) from Bang Wa to Taling Chan. *skyscrapercity*

#### UKRAINE

**HORLIVKA.** Four refurbished *Tatra T3s* (088/91/94/102) have arrived from Mariupol. *BS*

**KHARKIV.** Line 12 (South Station - Central Park) resumed operation on 31 December. It has taken since 24 February 2022 to repair damage caused by the Russian invasion. *transphoto.org*

#### USA

**CHICAGO, IL.** The rapid transit Yellow Line re-opened on 5 January, having been shut since a train/snowblower collision on 17 November. The speed limit has been reduced from 88km/h (55mph) to 56km/h (35mph). A National Transportation Safety Board report is still awaited. *JMay*

**CINCINNATI, OH.** One million passengers had travelled on the tram line by 24 November in 2023; for the whole of 2022, that figure had been 846 622. *JMay*

**LOS ANGELES, CA.** A federal grant of USD1bn has been offered for the Inglewood Transit Connector. This would cover half the expected cost of the 2.6km (1.6-mile) line. *Mass Transit*

**MIAMI, FL.** Tri-Rail commuter rail service was extended to Miami Central Station from 13 January, initially as a shuttle to the Metrorail Transfer Station. *local10.com*

**NEW YORK, NY.** Phased closures of Subway Line G from 28 June to 2 September will allow Communications-based Train Control to be installed. *W.Snowden*

**PITTSBURGH, PA.** Electrical and mechanical faults forced the closure of the 150-year old Monongahela Incline from 2 January. It had not re-opened by the time this issue closed for press. *Mass Transit*

**SACRAMENTO, CA.** The RTD board has approved the construction of an additional light rail station at North 12th Street in the Dos Rios area. It should open in 2025. *JMay*

**SAN FRANCISCO, CA (BART).** Alstom had delivered 672 of 775 *Future* cars by 31 December 2023. The order is expected to be completed USD394m under budget. *Mass Transit*

**SEATTLE, WA.** Replacing rails on the light rail line in the central area in January caused problems with the timetable and left platforms crowded. The work will continue into February. *JMay*

#### UNITED KINGDOM

**BIRMINGHAM.** West Midlands Metro increased fare prices by 5% from 2 January. It is the first price rise since June 2022.

**BLACKPOOL.** Services were interrupted on 11 January when a car and tram collided on the segregated section of tramway along the Pleasure Beach. Emergency services were present. While the tram had de-railed, no injuries were reported.

**BOB HODGES TRANSPORT DVDS**

**NEW! NEW TRAMWAY DVDs FOR 2024 NEW!**

**10215: Edinburgh Trams 2014 - 2023.** Trams on the whole length of the route from the airport via the city centre including the extension to Newharrow opened on 7th June 2023, running time 74 minutes.

**10217: Antwerp Tramways 150.** 2023 was the 150th anniversary of the Antwerp tramway system, there was a parade and trams from the museum were in public service, also included are trams in the city centre & suburbs, plus a chapter featuring the coastal tramway, new CAF trams in service alongside the final year of BN tram operation. Running time 70 minutes.

**10219: Isle of Man Year Of The Railways.** Manx Electric Railway 130th anniversary events including Laxey shed visit, Snaefell Mountain Railway, including Laxey shed visit, plus Douglas Bay Horse Tramway in action. running time 72 minutes. All DVDs wide screen, PAL (UK) system.

These DVDs and many more available from [www.bhtransportdvds.co.uk](http://www.bhtransportdvds.co.uk)  
Order from our internet shop or send cheque/PO to Mr R Hodges, 41 Camphill Road West Byfleet, Surrey, KT14 6EG UK. Cheques payable to R.Hodges.



▲ 2024 will be a year of change for the Lauterbrunnen - Mürren light railway in the Swiss Alps, with new rolling stock taking over in June. Theo S.

**DUDLEY.** The first test run of Coventry's Very Light Rail vehicle took place at the VLR National Innovation Centre in late 2023. Both track and car will be monitored for vibration, sound and stresses.

**MANCHESTER.** Metrolink has held trials to see if non-folding

bicycles can be safely carried onboard its trams.

**NOTTINGHAM.** Nottingham Express Transit offered a special discounted price for its annual adult season ticket during January 2024, which also included free parking at seven park-and-ride sites.

## MUSEUM NEWS

**BEAULIEU (UK).** The National Motor Museum's 1.6km (one-mile) monorail celebrates its 50th anniversary this year. Its train has run 370 000 miles and carried ten million passengers since 1974.

**CESKY TESIN. (CZ).** A replica of a 1911 Ringhoffer two-axle tram has been unveiled by the border bridge to Poland. BS

**CHRISTCHURCH (NZ).** Tram 24, built by Boon & Co in 1920, joined the heritage fleet in December. Saved in 1968, restoration started in 2011.

*Christchurch Tramway*

**DRESDEN (DE).** The transport museum is open between 11.00-16.00 on the first Saturday of each month (April, June and November excepted). On 1 June, it opens 11.00-14.00. Prototype Tatra T4D 2000 is being overhauled. BS

**SEATON (UK).** The 838mm-gauge tramway, built on the old Southern Region railway, has bought the Jurassic Centre from EastDevon District Council. A new exhibition, 'Jurassic Discovery' should open in Spring 2024.

**USTI-NAD-LABEM (CZ).** The city museum has rescued a 1900 Weyer car from a garden. Built for Krefeld, car 32 served in Usti from 1911 until 1966. BS

## CONTRIBUTORS

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UK and Ireland items; please e-mail [uknews@lrta.org](mailto:uknews@lrta.org)

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## Obituary: John Richard Symons (1945-2023)

It is with regret that we have to record the death of John Symons on 22 December 2023, after a prolonged illness.

John was born on 3 December 1945, an only child to Tom and Esther Symons. He initially lived in Small Heath, Birmingham, before the family moved to Yardley. He did well at school gaining entrance to King Edward's Grammar School, Camp Hill. Holidays were spent exploring the various transport operations in the West Midlands, and later visits were made around the UK on excursion trains. These were undertaken with his cousin Roger, and later a school friend and LRTL/LRTA member Eric Pounder.

On leaving school at the age of 18, he joined the Town Planning Department of Birmingham City Council, but in the mid-1970s obtained a position at Stoke-on-Trent. This required a move to Werrington in North Staffordshire, where he was joined by his mother following the death of his father.

By 1992 John was Assistant Director (Planning) for the city, looking after bus operations. Five years later he gained responsibility for overseeing bus services and the tendering of socially-necessary services.

John remained in his career until retirement on 1 December 2006. He never learned to drive, and it was arranged that part of his final trip home would be on one of First Bus' FTR articulated vehicles.

John's interest in public transport led him to three main transport organisations. His interest in transport tickets firstly led

him to join the Ticket & Fare Society (later Transport Ticket Society) in 1962, and he immediately started supplying the group with information on bus ticket news.

This extended to foreign intelligence when he started travelling abroad, and from 1980 he took on the Overseas Road Editorial role for the *TTS Journal*. With his wide knowledge of foreign transport operations, road and rail, (and of tickets and ticketing system) he held that post for 40 years.

Latterly, he served on the TTS Committee and also undertook eBay sales of surplus ticket stocks to generate funds for the society, something he also did for the LRTA London Area and the Omnibus Society.

John joined the Light Railway Transport League (later LRTA) about 1972, and was a regular attendee at Birmingham Area meetings from 1973, even after having moved to Werrington.

He was also a regular on LRTL/LRTA tours visiting Portugal, the USA, the USSR and various satellite countries, plus Scandinavia, Germany, Switzerland, Italy, Austria and the Low Countries. He had a special liking for the Netherlands and the Isle of Man.

Not being restricted to LRTA events, on private tours he visited Indonesia, Singapore, Malaysia, and Hong Kong, and also took part in London Underground Society and Electric Railroad Association tours in Europe. Later on he participated in some tours organised by Ian Longworth, including those to Russia and Australia, until illness restricted his movement.

He was also an active member of the Omnibus Society.

Following the resignation of Paul Heywood as Home News Editor of *Modern Tramway* in 1985, John was asked to take over this position, which he held until his death. It was an interesting time with a large number of local authorities considering light rail, and John's knowledge of town planning enabled him to have a realistic understanding of these schemes. He took the job seriously and would put press dates ahead of other things, foregoing trips or events.

In retirement he would ride bus services for the local authority, reporting on how well used they were. He was highly amused, and pleased, when having told his employers he could not carry out such a survey the following week as he was going on a tram tour, they immediately organised some holiday pay for him!

John was a private person, who would happily socialise but was equally at ease pursuing his own hobbies. He was a good leader, being able to lead groups around various cities with his solid memory for the layout of these.

Sadly, he became ill about four years after retirement, and last travelled abroad to the 125th anniversary of the opening of the Société Nationale des Chemins de fer Vicinaux in Ostende in 2010.

He remained single and had no siblings, his nearest relatives being his cousins Trevor and Roger Wilks and their families, to whom we extend our condolences.

**MVB. With thanks to Trevor and Roger Wilks, Chris Salmon, the Transport Ticket Society and the Omnibus Society.**

# RIO'S GREAT SURVIVOR

South America was once awash with tramways. Now only a handful remain, of which the Santa Teresa line in Rio de Janeiro is the most enduring. Mike Russell reviews its current operation and recent history.

**A**lthough news reports from Rio de Janeiro appear in our columns from time to time, it is almost half a century since we published anything approaching a full survey of the remarkable Santa Teresa line. So now seems an opportune time to take stock, review its history, current operations and future prospects.

Few tramways can justifiably lay claim to the description 'The Great Survivor' more than the Santa Teresa line in the hilly district to the south-west of the city, the capital of Brazil from 1763 to 1960, when the seat of government was moved to Brasilia. The whole area is spectacularly beautiful, with a world-renowned coastline surrounded by precipitous hills and mountains, and a bay area lined with imposing streets and avenues.

The present installation is one of the oldest surviving electric tramways in the world. Rio was the propitious location for a plethora of separate tramway companies, and several operators of horse-drawn services set up operations from 1859 onwards. The city at one time or another was the location for, successively, the first animal, steam and electrically-propelled tramways in Brazil. Rio was by far and away the country's biggest network (taking the summation of all the separate lines).

The first tramway to serve the lower, flat part of Santa Teresa district was an 820mm-gauge horse-drawn car line opened on 25 August 1875. The full length of the eventual line was too steep for horse-drawn cars and whilst a separate line of 914mm gauge opened on higher ground in 1877, the intermediate section was served by an inclined plane railway. In 1879 the lower line became part of the Carris Urbanos group, formed by amalgamation of four separate tramways.

## Seeking higher ground

A plan to reconstruct the separate lines and form a through service to the higher ground was first proposed in 1892, and

reconstruction work for electric traction started in 1895. A fleet of two-axle cars was ordered from John Stephenson & Company of New York and fitted with Peckham trucks. The first section of the newly-electrified line was opened on 1 September 1896 from Largo da Carioca to Largo do França.

An extension to Dois Irmãos followed in December 1896 and the final one of 3.5km (2.2 miles), on what was to become the main line, to Silvestre in February 1897. That June a branch line was opened from Largo Guimaraes to Paula Mattos.

An outstanding feature of the line is the use of the top level of a disused 18th Century aqueduct to connect the Santa Teresa region with the city terminal. The continued operation of classic open-sided trams along the single track laid on the aqueduct is one of the line's most memorable features and also resulted in the unusual choice of gauge – 1100mm, this being the widest that could safely be accommodated on the aqueduct.

The whole installation was referred to as the Carioca tramway and was the first fully-electric tramway in South America. The name derived from the location of the initial terminus; over the years this has been repeatedly relocated although always within the same general area of Santo Antônio in the city's business district. The present terminal loop is located on the roof of a private car park belonging to the Petrobras oil company.

In 1910 the company started building its own car bodies; this was a common practice in Brazil and persisted on this line for many years, with trucks made in the USA and electrical equipment imported from Great Britain. By 1950 the Carioca line had 26 motor cars, 21 trailers and nine works cars, all to serve 15km (nine miles) of single-track.

A natural disaster struck the city on 10 January 1966 when a hurricane demolished, *inter alia*, almost all the overhead wiring and caused extensive collateral damage. The section between Dois Irmãos and Silvestre was closed, never to re-open to regular traffic, and a branch line along Rua F Muratori, built

in 1926, was also closed though the track remained connected to the main line, as it does today. The Dois Irmãos and Paula Mattos sections, however, were re-opened, whilst track relaying took place on the closed sections to Silvestre and along Rua Muratori.

Over the years there have been a number of attempts, all still-born or quickly aborted, to reopen the line beyond Dois Irmãos to Silvestre. It was nominally reopened in 1997, and in September 1999 it was officially announced that this section would have a limited service from that December. However, in practice nothing happened as the authorities deemed the operation of trams two ways along single-track at the edge of the road too dangerous. It was subsequently reported that two daily return trips to Silvestre were resumed from 9 April 2003.

## Reviving a monument

World Bank funding for rehabilitation of the tramway was approved in 2004 and a plan evolved to buy 14 new cars to be produced by a local firm. Before this aspect could be progressed, disaster struck. On 27 August 2011 car 10 suffered brake failure and derailed on one of the steeply-graded sections of track, resulting in the death of six passengers and injuries being sustained by around a further 50. The problem of overloading will be evident from the fact that the notional seating capacity of the cars was 32; the carriage of passengers travelling on the footboards by hanging on to the pillars was a practice not discouraged at the time in order to preserve the unique character of the line. Operation of the entire system was immediately suspended and remained so until 2015.

The entire installation enjoys national monument status so it was desirable that after any necessary safety upgrades, the whole line should reopen. New vehicles were to replace the previous fleet and in 2012 it was reported that 14 new tramcars had been ordered from Brazilian manufacturer



1



2

1. The new and the old at a crossover close to Largo do Curvelo with car 23 on training duties using the crossover and a mural of car 01 of the previous generation alongside.  
Luc Koenot

2. Occasional glimpses onto the city below and the Atlantic Ocean beyond can be obtained. Car 19 heads towards the city from Dois Irmãos at Largo do França.

TTrans of Três Rios for delivery in 2014. The first car of the new series (numbered 16, following the numbers of the old fleet) was delivered in August 2014 and others have followed at intervals. The vehicles are built to a traditional design and resemble the old fleet but incorporate many design changes and safety improvements, not least the fitment of track brakes. The trams are open-sided and fitted with eight benches each accommodating four passengers, but unlike their predecessors there is a lifting wooden baton running the length of the saloon to prevent unauthorised egress and access. With retractable running-boards too, the carriage of hangers-on has been firmly discontinued.

Operation with the new fleet started on 27 July 2015 for 1.7km (1.1 miles) between Carioca terminus and Largo do Curvelo, and was extended to Largo Guimarães on 28 December of that year. The full extent of the previous operation to Dois Irmãos has since resumed, but there is still no regular service on the Paula Mattos branch.

The Santa Teresa tramway has quite rightly been described as serpentine in character, with its almost continuous descending gradient towards the city giving it a very distinctive character. The line is flanked by

large dwellings and apartments and conveys an air of genteel prosperity and bohemia.

The depot is a short distance from Largo Guimarães and reached by a single-track connection. The track layout here is complicated by the fact that the Dois Irmãos line is terraced with the inward track at a higher level than the outward, which it shares with the depot-connection track and the start of the Paula Mattos line.

### Future reopenings

Although originally laid for the benefit of residents, the line is predominantly used by tourists; however, it enjoys wide support from the local community, which has on several occasions campaigned for its retention and improvement in the face of moves towards abandonment. Services operate 09.00-18.00, with a morning frequency of every 30 minutes rising to every 20 minutes in the afternoon. A return fare is BRL20 (GBP3.22).

Now the wheel has turned and it is reported that funds are to be made available for rehabilitation of the section between Dois Irmãos and Silvestre and also the Paula Mattos branch, where both track and wiring are intact. Reopening to Silvestre would permit interchange with the Corcovado

railway, which takes passengers to a point below the famous statue of Jesus Christ overlooking the city and the bay.

Finally a few words should be said about the security situation in Rio. For many years the city suffered from an appalling reputation for street crime, with tourist passengers on the Santa Teresa tramway particularly targeted. Conscious of the dreadful reputation being inflicted on the city and its adverse effect upon tourism, security arrangements have been greatly improved, with frequent police patrols along the line and changes designed to deter inhabitants of the hilltop *favelas* from intimidating passengers. Whilst visitors should obviously take the same sensible precautions as they would in any other big city, the specific Rio situation is a huge improvement on that of even a few years ago. Special care and attention should still be taken in the area around the outer end of the aqueduct, where street crime is reportedly still a problem. **TAUT**

> *Historical information has been extracted from The Tramways of Brazil by the late Allen Morrison. Readers are also referred to the article by Geoffrey Claydon and the late Graham Mather in Modern Tramway for August 1977.*



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**3.** The spectacular scenery which surrounds the Santa Teresa tramway is illustrated in this image of car 21 city-bound between Dois Irmãos and Largo do França.

**4.** Largo do Curvelo is an intermediate station provided with a central loading island. Cars 21 (towards city) and 23 (on driver training) are in attendance. The information display seems to indicate that the branch to Rua F. Muratori is served, although the track is deemed disused.



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5. The serpentine nature of the steadily falling gradient for city-bound tramcars is brought out in this image of car 19 taken in Rua Almirante Alexandrino at a point above the junction with Rua F. Muratori.

6. A view of the split-level track and junction at Guimarães. Car 21 on the lower level is bound for the outer terminus at Dois Irmãos, with car 22 city-bound on the upper track.

7. The constricted nature of the tramway surmounted on the aqueduct and the reasons for adoption of the 1100mm-gauge are well illustrated in this image of car 21 crossing the structure towards the city Carioca terminus.  
*Bernhard Kussmagk*

8. Some of the wide variety of buildings that line the route are shown in this view of car 22 descending towards the city.

9. Car 19 on the higher-level inward track at Guimarães junction, despite the indicator still being set for the outward direction.

10. Car 19 at the start of its long ascent of Rua Almirante Alexandrino that will take it to Guimarães and Dois Irmãos. As usual, the erroneous destination display can be ignored (in this case showing the temporary terminus of the line after its reopening in 2015). To the left are the long-disused tracks in Rua F. Muratori.

11. Seen from ground level, car 22 crosses the aqueduct on the start of its climb towards Dois Irmãos terminus..  
*Luc Koenot*

12. Car 19 departs from the Dois Irmãos terminus against a background of Corcovado hill, with the famous statue of Christ at its summit.

13. Car 08 is a survivor of the old series taken out of service after the 2011 accident, but survives on the head-shunt at the city terminal for use as a works car.



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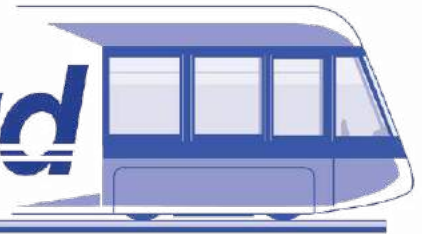


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*All photography by Mike Russell on 28 and 29 November 2023 except where otherwise stated.*



# TramForward



NEWS FROM THE LIGHT RAIL TRANSIT ASSOCIATION

## Bringing light rail to Bath and Bristol

As the LRTA continues campaigning for a number of new light rail schemes in the UK, the group's efforts to bring trams to Bath and Bristol are summarised here.

**B**ath and Bristol Area Trams Association (BABTA) started campaigning about seven years ago, initially for trams in Bath. A report was commissioned which showed that at least two routes were likely to be viable with low-cost tram tracks.

However, it was quickly realised that the key to getting anything in Bath was to promote a route from the far side of Bath through the city, connecting via Saltford and Keynsham and other outlying settlements to the centre of Bristol.

Early on they gained the attention of the Conservative Bath Council, who commissioned a study by Atkins that showed there were no showstoppers for four routes within Bath.

The Association has organised four or five day-long conferences and engaged with the local West of England Combined Authority Mayor, having held several online meetings with him. However, they are somewhat disappointed in the lack of engagement. Nevertheless, trams are now on the agenda, and there is a consultant looking at routes for rapid transit from Bath to Bristol.

The Bath and Bristol Trams website has a unique set of information about trams, essentially explaining why they are much better than buses, with each point fully referenced by experts. Whilst it is centred around Bath and Bristol, all the points made are valid for any campaigning group, so we welcome campaigners to peruse it.

The best way to do this is to ask Google a question such as, "Why are trams more attractive than buses?", adding "Bath trams" or "What is the relative carrying capacity of trams and buses, Bath Trams?" etc. This will force Google to search and highlight our website.

Links have also been established with Bristol campaigning groups, who have produced a route from Bath to Bristol. This is largely off-road and can be built without causing serious traffic congestion, so negating one objection to having such a tram line.

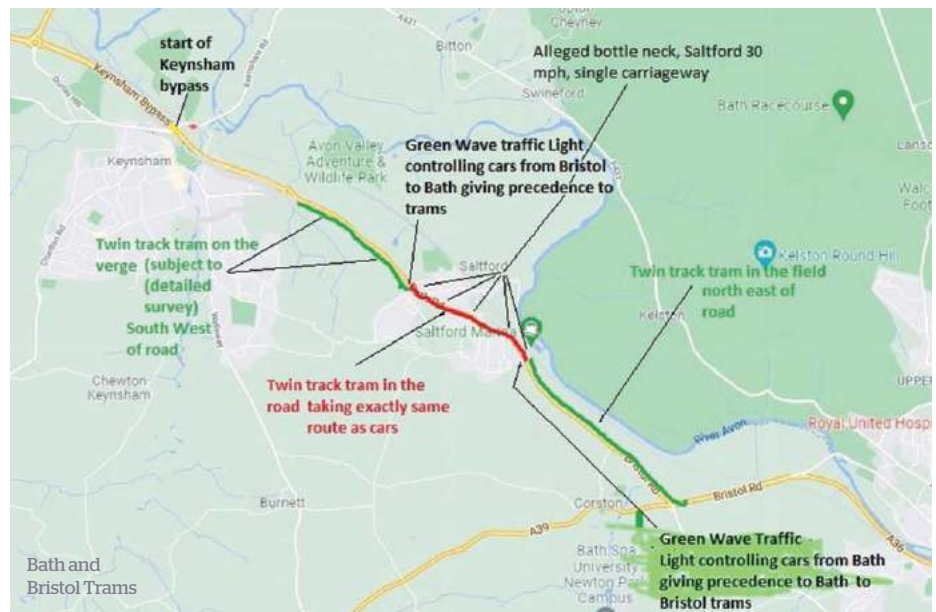
The map below shows this route, but can also be viewed on a larger scale at: <https://bathtrams.uk/bath-to-bristol-street-running-tram-via-saltford-bottleneck-reduces-not-increases-congestion/>

The group engages in campaigning via the local NextDoor app, which is a very good way of reaching local people and recommending this to others. Every time there is a positive tram news item, we load it onto NextDoor.

BABTA makes a point of emphasising the concept of Green Wave Traffic Light Pre-emption to explain to non-experts how a tram can proceed rapidly even though the road may have been congested. We show that such systems speed up traffic. We also correct misconceptions about whether trams can ascend all the hills in Bath.

Further information can be found at:

- <https://bathtrams.uk/bath-trams-report-jan-2018/#:~:text=The%20West%20of%20England%20Joint,transit%20connecting%20Bristol%20with%20Bath.>
- <https://bathtrams.uk/green-wave-traffic-light-pre-emption-work-tram-coming-bathford-via-batheaston/>



## MEETINGS & EVENTS

Compiled by the LRTA. For a full list of the year's events and meeting places, including online meetings, visit [www.lrta.org](http://www.lrta.org)

### MARCH

- ▶ **Tuesday 5.** Southampton, 19.30. John Laker: Tram and urban rail on ciné. Eastleigh Railway Institute, £3. (LRTA/SEG)
- ▶ **Thursday 7.** Brentford, 14.30. Martin Jenkins: Tram & trolleybus closures

1952 & 1962. London Museum of Water and Steam, Brentford, TW8 OEN. Contact [thamesvalley@tlrs.info](mailto:thamesvalley@tlrs.info). £5 inc. refreshments. (TLRS)

- ▶ **Saturday 9.** Coatbridge, 13.00. 3D printing Edinburgh trams. Summerlee Museum, Coatbridge ML5 1QD. Contact: [scotland@tlrs.info](mailto:scotland@tlrs.info) (TLRS)

- ▶ **Monday 11.** Leeds, 19.30. John Holmes: Narrow gauge railways. The Engine House, Leeds LS10 2JG. Contact [leeds@lrta.org](mailto:leeds@lrta.org). £1 inc. light refreshments. (LRTA/LTHS)
- ▶ **Saturday 16.** Taunton 14.00. Gordon Bartlet: Transport videos from countries ending in A. West Monkton

Village Hall, TA2 8NE. Contact [westofengland@tlrs.info](mailto:westofengland@tlrs.info). £2.00 inc. light refreshments. (TLRS)

- ▶ **Monday 18.** Merseyside, 19.30 for 19.45. Update on Manx Electric Railway: Andrew Scarffe. Sefton Park Community Association, Liverpool L17 3AG. [merseyside@tlrs.info](mailto:merseyside@tlrs.info). (TLRS)

For more information on the Association and its activities visit [www.lrta.org](http://www.lrta.org)

Order online from [www.lrta.info/shop](http://www.lrta.info/shop) - or by post from:

LRTA Publications, 38 Wolseley Road, SALE, M33 7AU

(Please provide telephone contact details and quote LRTA membership number if applicable)

Outside UK = Airmail to Europe (includes all of Russia) / Surface mail to rest of world; Airmail Zone 1 = outside Europe excluding Australia, New Zealand & USA; Airmail Zones 2/3 = Australia, New Zealand & USA

## March Madness: The LRTA 1-2-3 sale!

Buy any one, two or three books at these crazy prices

**Tramways of Metropolitan Middlesex and North London** (was £28.50)

**Tramways & Stadtbahnen in Hannover** (was £32.50)

**Nottingham's Growing Tramway** (was £16.50)

**Innsbruck's Alpine Tramways** (was £17.50)

**PCCs of Western Europe 1950 - 2010: The tram that Belgium made** (was £14.50)

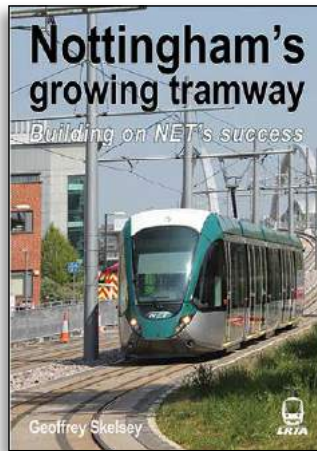
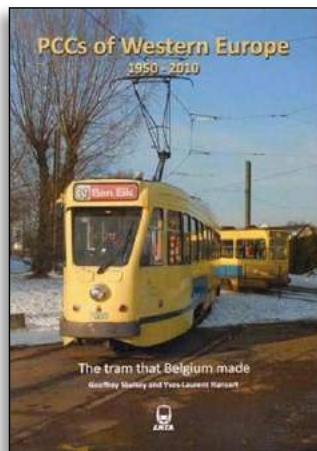
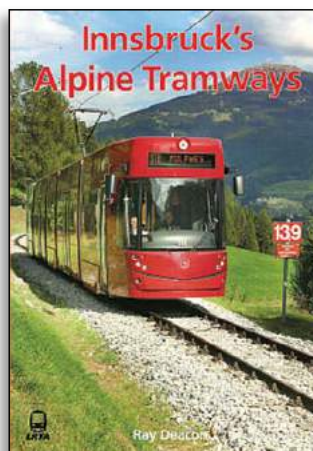
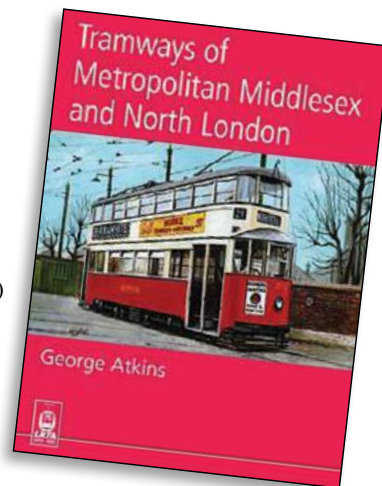
ONE book for **£7.50** - TWO books for **£12.50** - THREE books for **£17.50**

Prices including postage & packing:

UK addresses - **£9.50** (one book); **£16.00** (two books); **£20.00** (three books)

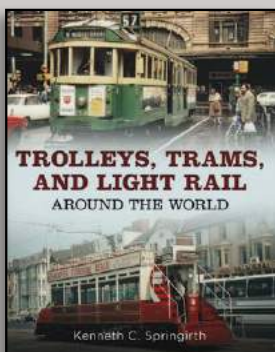
Outside UK - **£11.50** (one book); **£20.00** (two books); **£27.50** (three books)

Air Mail not available on these offers. No LRTA member discount.



For further details of all these books go to our website.

## Order direct from the website shown (not from the LRTA)



### Trolleys, Trams and Light Rail around the World

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➤ 275 x 215mm softback; 128 pages; 215 colour pictures, 19 maps.  
**£19.25** - [www.fonthill.media](http://www.fonthill.media)



### Trolleybuses in Lublin 70th Anniversary 1953-2023

A colourful album featuring the trolleybus network of this interesting Polish city through the years of its development into an ultra-modern system, employing in-motion charging of the vehicles to enable off-wire operation. Enterprisingly self-published in English by local enthusiasts.

➤ A4 hardback; 60 pages; 88 colour pictures, five maps.  
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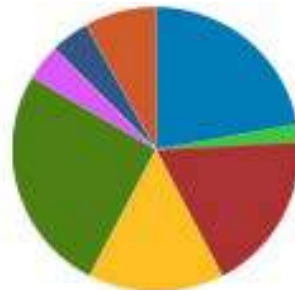


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