

http://m.infobus.pl/city-class-tram-wyjatkowy-prototyp_more_14006.html#
(Literal translation) (Website fully illustrated)

City Class Tram unique prototype

In the world of rail vehicles, there are also medium and quite small companies next to production giants. And this is one of these small companies we present in this article

TRAM Power Ltd. The whole project was created at TRAM Power Ltd., based in Great Britain. The mission of this private enterprise is to design, manufacture and promote rail technology because it is safe, efficient, reliable and affordable.

To these slogans you probably do not need to convince any readers who know very well problems related to the greenhouse effect, air pollution from cars, traffic jams in cities or galloping prices of liquid fuels. Therefore, the electric traction and rail transport are again on the wallpaper, which suddenly (due to the increase in oil prices) becomes cheaper.

TRAM Power Ltd. is working to raise the awareness of the need to return light rail vehicles to British cities. Tram Power has developed its own concept of a rail vehicle currently known as City Class Tram, which will be approximated later in the article. However, this vehicle is in development, and Tram Power also offers other services.

These services are the traction network for light rail vehicles and a new type of rail used in sections in the roadway. Both solutions have been developed in such a way that, with unchanged operational parameters, they are less material-intensive and, as a result, they give cost savings. Tram Power has registered international patents for these solutions.

The prototype City Class Tram City Class Tram started life as a project on paper in 1987 and focused on the problem of weight reduction in rail vehicles, which would reduce costs. This project was supposed to be something like PCC for the USA. Since then, it has been constantly developed and tested this time on computers. In 1993, a 4-ton model of the vehicle was built. The first experiments were gained on the rebuilt used tram from 1933.

A new type of drive bogie was installed on the tram, which assumed the transfer of the engine to the floor of the vehicle and driving individual wheels (not axles) using the transmission system. The tram ran from 1995 to 1997 in Blackpool. After this period the bogie was dismantled and checked for wear of the parts. Simultaneously with the operation of the reconstructed tram, the construction of a new vehicle began.

Its features are partly low floor, length 29 meters and weight of 22 tons. The tests took place between 1998 and 2000, when the Tram Group sponsoring the project lost funds. The City Class tram was supposed to be a cheap alternative to expensive competition vehicles. Savings were to be created

during construction, thanks to the use of standard modules and in operation, thanks to the use of all allowed parameters in the full range

A prototype tram was provided for 200 passengers, where 82 could travel on seats. There is also space for two wheelchairs. The prototype was put on a side track and waited until 2005, when Tram Power Ltd. collected enough money to return to the program. Before returning to test rides, the tram was completely dismantled at the Birkenhead Tramway Depot and rebuilt because of weather damage. Some elements were also replaced with more modern ones.

For example, the original electric motor weighing 1 ton, 90 kW and 700 mm in diameter was replaced with one weighing 750 kg, with a power of 100 kW and a diameter of 550 mm. Such progress has been achieved in only 10 years. Then the rebuilt streetcar was driven in traffic monitored 5 days a week, 8 hours a day between September and December 2005 on the Birkenhead tramway. During these trips the correctness of the construction work was constantly monitored.

In December 2005, the tram was taken to Blackpool to complete the tests. On the spot, the tram had to be adapted to the characteristics of the old network in the city. After the modifications made, the tram returned to the route in November 2006, when it obtained the mileage required for approval. Then it started scheduled driving, which lasted until October 2006. However, on January 24, 2007, the prototype tram during the descents to Rigby Road depot was set on fire.

As a result of the fire, one driver's cabin was very damaged. The driver jumped out of the tram and was not injured, the passengers were not inside. As a result of the investigation of the fire brigade and the accident investigation committee, it was found that the vehicle had no manufacturing defects and the fault of the fire was not with the builder. On February 21, the vehicle was taken to heavy equipment repair facilities, where it is currently undergoing reconstruction. Part of the changes will be the construction of smoke and heat detectors.

Construction of the City Class Tram As already mentioned before, the prototype tram has a length of 29 meters, a weight of 22 tons and takes 200 passengers on board, where 82 can travel on seats, while the rest are passengers standing on the standard of 4 people per square meter. The tram has two driveable end bogies, having four independent wheels driven by one electric motor and a set of gears. This solution gives significant savings in weight while improving the traction properties of the vehicle.

Due to the low weight (vehicle empty 22 tons, loaded 38 tons), significant energy savings can be achieved. For comparison, competing vehicles have 10-15 tons more weight. The vehicle's frame is made of stainless steel, which guarantees a long service life, up to 50 years. The floor in the interior is 300 mm high in the low floor and 760 mm above the bogies. In the case of 10-year vehicle use, the savings offered by this vehicle allow (according to the manufacturer) to cover the costs of its purchase.

In addition, thanks to the reduction of energy consumed, you can reduce the costs of the overhead contact line, which can be made of a smaller wire diameter. The costs of building the traction substations required for heavy trams is decreased. You can also increase the frequency of service without the need to expand substations built for heavier rolling stock. Another advantage of low axle load is the possibility of using lighter bridge constructions or the lack of modernization of older ones.

The tram has a modular structure that allows to offer vehicles with a width of 2.4 to 3.5 meters. Also the length is a relative thing, where the shortest vehicle is to have 16 meters (one-piece), the second is 29 meters with a short mid-section, while the longest vehicle is to be 38 meters and it is created by replacing the short mid-section with one 10 meters long. Everything revolves around 1.5-meter modules (with a window or door) on the basis of which any system can be created.

The final arrangement of the wheels (the manufacturer gave up the axles for independent wheels) and the door is also a matter of the recipient. The prototype tram is two-way, two-sided, but there is no obstacle to order a one-way vehicle. The manufacturer also allows a different shape of the forehead depending on the order.

City Class Tram basic technical data

	Prototype vehicle.	A range of vehicles
Track gauge	1435 mm	To order
Voltage	600V	550 - 800V
Axle system	B'1 B'	To order
Length	29 m	16, 29, 38 m
width	2,4m	2,4 –3,5m
Seats	82	To order
Total capacity	200	To order

City Class Tram is an example of how modern technology and solutions without financial support are wandering through life without finding their place. This tram brings a lot to the world of rail vehicles, where you can see the savings resulting from weight reduction. The patented bogie is also very interesting, where the axle has been replaced by a transmission system.

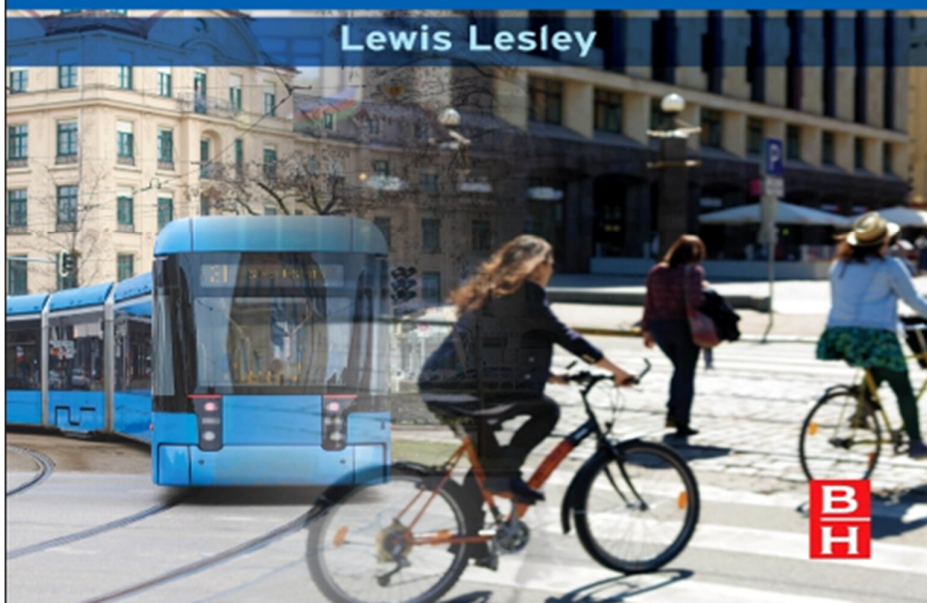
So perhaps the problem of this tram was modernity and the fact of patenting solutions without the participation of large corporations. Therefore, these do not see the point in buying something that they did not invent themselves. The future of the project will be interesting. Looking at the prototype vehicle, you can see a strong archaic style that reveals the time of the prototype. However, the presented contemporary visualizations present the trend in style of rail vehicles. Only if there is finally a connoisseur of this technology, or companies just waiting for the patent protection period to pass.

I am reading your rebuttal, and will let you have some comments. In the meanwhile perhaps you can add these two modern publications (2025 & 2026):



EMBEDDED RAIL TRACKS

Lewis Lesley



EMBEDDED RAIL TRACKS

Lewis Lesley

Establishing reliable and sustainable public transport services is a top development priority for cities that face ever-growing urbanization trends and pressures to meet zero-carbon goals. Creating new transport corridors is always a challenge, so existing roads end up providing attractive routes for public transit. When this involves using rails, it becomes even more of an engineering feat.

Embedded Rail Tracks is a comprehensive resource on this high-performing type of trackway system, which provides minimal disruption to wheeled vehicles sharing the same public roads. The volume opens by briefly reviewing the history of embedded tracks, especially tramways and light railways, to then analyze the design, installation, and operation of existing embedded track systems. Accounts of reasons for failure and evidence-based maintenance and repair methods are also included. The book surveys the latest innovations, presents case studies, and includes considerations related to the environment, energy use, and safety that lead to insightful conclusions for future investments in more robust and less costly transport infrastructure.

Key Features

- Combines academic knowledge and industry-relevant, practical outcomes to benefit a variety of audiences
- Features case studies from across the globe
- Reviews a range of proven design proposals

About the Author

Lewis Lesley is an acknowledged expert in urban public transport, with over 200 refereed publications. His career has seen him transition from academic (Liverpool John Moores University, 1975-2003) to practitioner and, finally, consultancy. He also organized the first "Electrifying Urban Public Transport" conference and exhibition in Blackpool in 1983. Thirty years of experience within the academic realm of transport have allowed Dr. Lesley to develop a vast portfolio of research and collaborations with some of the most eminent engineers in transport, traffic, and vehicle design. As the Technical Director of Tram Power Ltd., Dr. Lesley prepared plans for a commercial tramway in Preston (UK), which has gained planning permission. Currently, his focus is directed toward the Southwark Supertram Project, a design which entails the development of a 5.3km street-running tram scheme to improve both connectivity and costs.



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