All Party Parliamentary Light Rail Group

Light Rail (UK)

House of Commons
London SW1A 0AA
Ref: LR Applrg Parliamentary Tea v. 2012

MODERN SMALL TRAMWAYS

Courtesy:
JPMP 14 Sept 2015

PPM Class 139 hybrid chassis from 2016 onwards

Recent technical advances have broken through important cost barriers and have made the urban tram mode affordable for smaller towns and districts

Reconciling Conflicting Objectives

Problems caused by traffic congestion are experienced by small and large urban centres and, increasingly, suburban districts. The presence of too many private cars competing for road space, circulating while searching for a place to park and intruding into what would otherwise be attractive public spaces causes planners to try to achieve conflicting objectives. How to ease access to central zones, preserving their appeal and not sacrificing valuable space for the free movement and accommodation of private cars has been achieved largely by means of effective but expensive investment in transportation systems or vast car parks.

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Warrington, Cheshire, England,
United Kingdom WA2 8TY
Tel 01925 243500, Fax 01925 243000
, 07724278228
Mr Jim Hoskins FCILT
www.applrguk.co.uk
Email applrguk@aol.com
www.lightrailuk.com

RSVP to applrguk@aol.com

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The cities of Manchester, Dublin and Nottingham, and, more recently, Edinburgh, have attained this seemingly impossible outcome, as have Melbourne, Toronto and numerous European cities. The solution for all of the above has been 'Supertrams' swift, clean, quiet means of getting large numbers of people from outer districts into the places where they work, receive education, do their shopping, or just relax. 100 years ago, however small, trams fulfilled this in virtually every British city and large town.

In post-Millennium Britain despite having already transformed places like Manchester and Nottingham, the number of new tramway projects is unlikely to reach double figures. The 'entry point' to becoming a Supertram Town is formidable. The scale is too big; it takes too long and costs too much for the smaller municipality even to consider. By contrast the trams that once ran in over 200 towns and cities were bus sized, relatively simple vehicles, and affordable.

Why are trams returning as 'Supertrams'? We got rid of the trams didn't we? So we can't admit we were wrong and bring them back again. Supertrams are different, just like a Boeing 777 is different from a Dragon Rapide biplane. So the scale of endeavour will look like a completely new thing.

Whereas our Victorian forebears once they saw a good thing got on with replicating it, our current culture is wary of change and there is sometimes a 'conspiracy of slowness' by the professional classes whose accumulated earnings are all the more the longer the process of study and consultation takes. The more expensive the end project, the easier it is to justify years of the elaborate preparatory activities. Sceptical attitudes may be an expensive indulgence, but are generally tolerated by the public. There is however a short cut route to dispel many doubts and that is to demonstrate small tram technology in actual operation by installing a portable set of equipment for the public to experience for themselves without depending on expert reports interpreted by officials.

Significantly, Parry People Movers Ltd has made the strategic decision that its entry into the market for low floor, street-running trams need not await completion of the development of the 4 axle bogie version of its Class 139 railcars that are essential for modernising railway branch lines. Four new factors make the use of small, bus-sized rail vehicles more apposite to city centre operation than previously judged possible.

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Small is possible, and sensible

1. Excessively long vehicles cause problems especially at junctions. Three cities; York, Swansea and London which had previously implemented bus services using 18m long articulated vehicles have withdrawn them in favour of shorter, 2 axle, rigid vehicles, i.e. ordinary buses.
2. Use of proximity-sensors, and telematics are making it possible to introduce semi-autonomous control of trams which can lead to improvement of both capacity and productivity of vehicles in the 50-100 passenger range.
3. Parry People Movers Class 139 railcars are currently built to run from 950mm high rail platforms. An advance in the chassis design makes it possible to reconfigure its highly-efficient hybrid traction arrangement into a 100% low form for street level access with low step accessibility feature of the successful electric supertrams which are the main type of vehicle presently used in street-running rail systems.
4. Successful introduction of precast concrete slabs or panels is greatly speeding up the process of installing light rail systems and promises to be especially well suited to non-electrical systems.

Parry People Movers Ltd and their operating company 'cousins', Pre Metro Operations Ltd, will negotiate with interested local authorities a time-limited contract to supply, install and operate a length of tramway in the 'black top' surface layer of an urban street up to 1Km in length and provide a 10 minute interval shuttle service for public appraisal of the mode in a new modern scaled-down form.

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The framework of the body comprises a semi-stainless steel welded fabrication as used in modern bus construction.

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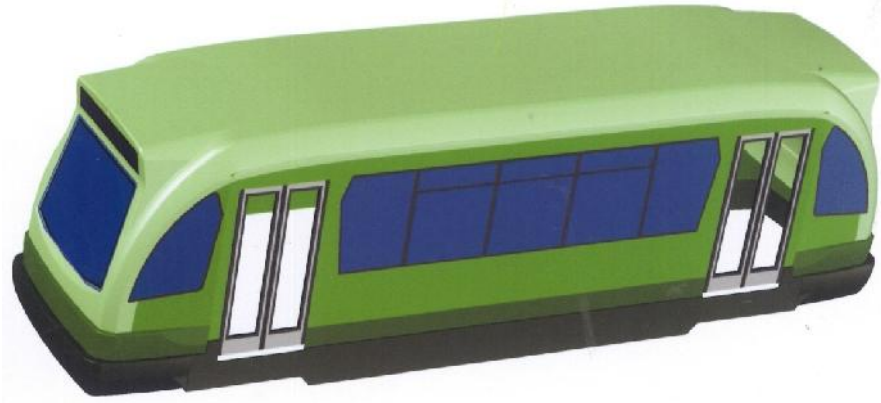
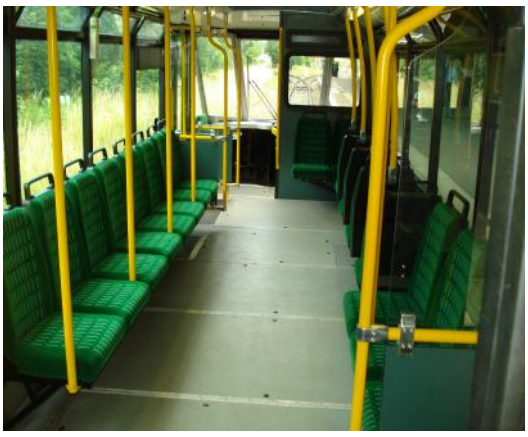
Below floor, the main frame of the Class 139 has been lowered with additional vertical strengthening around the doors which provide extra longitudinal stiffening. The traction equipment is housed mainly below floor but with engine and wheels within seat podiums.

GRP mouldings are bonded to the body skeleton with door frames and window glazing contributing to the stiffness which equates to railway light railcar standards, but will also be acceptable in a street running tram.





Internal trim arrangements as in the PPM, 60 passenger Class 139 light railcars, approved to maximise passenger capacity, including standing space providing for up to 4 passengers per square metre. The Class 139 railcars have proved to be economical, reliable and popular in branch line railway use after 6 years of timetabled services and over 3 million passenger journeys provided. The street tram version is already on the drawing board.

It

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Steering a vehicle accurately and safely autonomously is routine and goes back years, and by remote control even longer. Some of the rockets which are now taking a look at the moons of distant planets were built at the time of the Ford Cortina. They are being steered and their cameras swung this way and that by some scientists who were not born when they were launched. The stuff used to feedback information just gets better and better. Formula 1 racing cars are festooned with so many cameras and sensors that you'd think there would be no room for the driver. If one of Lewis Hamilton's tyres is beginning to blister the fans in their armchairs can see it as clearly as he can.

However, if there are any old folk in central Milton Keynes, they may well be disconcerted by the sight of a driverless vehicle trundling in their direction across a plaza. Pedestrians who are factory-workers perfectly used to autonomous electric trucks with flashing lights and beepers taking components between work stations, can predict where those are heading because the track is designated and marked with lines clearly painted on the floor. 'Free-ranging' vehicles will be more disconcerting in a pedestrianised town centre.

But we are told that driverless cars are coming and will be accepted and so will be public transport vehicles. The best way to ensure this acceptance is to have the paths along which they travel clearly marked. This is automatic in the case of tramlines and could be line marked for autonomous road vehicles.

A Tram is a Tram

UK Tram has dwelt a great deal on a decision whether or not to accept 'ULR' (Ultra-Light Rail) as within its field of attention. Categorisation in other fields is easy and not size-dependent. A Wren is not a 'birdlet' or an Ostrich a 'superbird' – They are both birds. Long ago, when working in Borneo, my office messenger was bitten by a creature so thin that it looked like the brake cable on his bicycle, and a month later my dog, Ben, had a noisy encounter with a python with a girth as big as a tyre of a bus. Both of these creatures were snakes.

Whether 10 metres or 30 metres long, a tram is a tram.

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Where it comes to public transport economics definitions and categorisations become important, and the word 'mode' can be accompanied by an appropriate adjective. The London Underground railway is a 'mass transit mode' the roads between villages are served by the bus mode, and trains that run between towns and cities, are in the rail mode.

People Movers are a form familiar to most people as an autonomous, driverless rail mode connecting different areas of an airport, as at Gatwick or an airport and train station as at Birmingham International. Being automated they are called 'APMs', Bring the same vehicles out of the airport into the local town will be possible but full autonomy, with everything under the control of a computer is inappropriate. We cannot 'eliminate the Human Factor', nor should we.

This is where the feedback equipment; cameras and sensors come in with a Control Room where the reassuring 'Human Factor' is present and controllers can speak to railcar passengers if there is no driver on board. The tens of thousands of passengers using the Docklands Light Railway have become totally relaxed about not having a driver at the front.

Follow the Buses

There was a discussion recently with a senior figure in UK Tram who was presented with the following question. When trams are more successful attracting patronage than buses, why in Britain is there only one tram for every 100 buses? Is it something to do with the fact that the standard model of the modern tram is extremely long and the experience of bendy (articulated) buses in London, York and Swansea is that they caused so many traffic blockages that they have had to be phased out? So why is there so little discussion about introducing shorter length trams?

His response was the simple issue of labour productivity. Experience in London is that for every bus in service there is a rostering requirement of seven drivers. Public transport operators' conclusion is that to achieve the productivity needed trams would have to continue to be the length that they are now (which may be too long for 95% of the city districts and towns which might otherwise benefit from them) which will therefore 'have to' be content with buses.

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Unless the tram builders can come up with a shorter tram that will fit on the streets of hundreds of towns and cities such as Leicester, Stoke-on-Trent, Hereford, Hastings and Exeter (all of which had successful tram systems, once-upon-a-time) the growth of the industry will stall at around 10 applications. Remote control will come when it comes and will eventually knock the productivity argument against shorter vehicles on the head – but what to do in the meantime?

Follow the buses. It is clear that the attempt to introduce 18m long articulated buses as commonly used in airports, has not been a success. The relocation of much of London's bendy bus fleet to Malta has even brought the citizen's out on protest marches because of the problems these buses have navigating narrow public roads. Back in Britain new models of double deck buses, including replacements for the popular 'Routemaster', are giving the product a better image. While it will be technically difficult to run taller trams under the existing overhead electric catenary, new systems can be built with the wires raised to suit or, with the development of non-electric hybrid vehicles, there will be no overhead wires anyway.

Presuming the construction of an additional top deck on a derivative of the Class 139 railcar, it is realistic to anticipate that the existing 60 passenger capacity can be increased to over 100 even allowing for space needed for stairs between the decks.

Traditional double deck electric tram with open Balcony ends manufactured in 1913

Modern equivalent on PPM Class 139 hybrid Chassis from 2016 onwards

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