

LIGHT RAIL INNOVATION: the potential of the ultra light rail industry

Submitted to the PTEG / APPLRG inquiry 'Light Rail and City Regions: a 21st century mode of transport' by:

Go! Co-operative

Lightweight Community Transport

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Executive Summary

1.1 Concerted action to encourage short, feeder rail schemes based on innovative lightweight rail technology and existing railways would represent good value for money by delivering large and immediate benefits at affordable costs.

1.2 This paper recommends modest policy proposals that would enable widespread adoption of low-cost light rail schemes reviving unused and underused branch lines. The advantages are:

- carbon reductions: when comparisons are made on a like for like basis, light rail has the lowest emissions per passenger km of any transport mode other than walking and cycling
- access for smaller communities: where track already exists self propelled light rail options are scalable to make services to smaller towns and even large villages commercially viable.
- Support for the rail network: light rail 'feeds' passengers to the rail network, meaning that long and short journeys alike can be undertaken without the need for a car
- community enterprise: this form of light rail lends itself particularly well to schemes that are owned by local people, or are otherwise responsive to users' needs
- rapid delivery: schemes that make better use of existing infrastructure can be developed and implemented rapidly, with little complex finance or funding requirements, planning consents or environmental impact assessments
- experience: the use of lightweight rail on these short lines will create a body of knowledge and an industry that can then bring forward viable proposals for new and longer routes.

Ultra Light Rail

2.1 We are working to encourage the adaptation of freight railways, heritage railways and other underused railways to public transport using 'Ultra Light Rail' technology. Ultra Light Rail (ULR) is generally defined as an intermediate transport system that runs on fixed track, may be self powered or externally powered and

- has emissions of around 40g per passenger km (buses 89g; light rail 65g)
- can run on standard railways, on purpose designed track, or on tracks laid in the street surface
- carries traffic of 350 - 9,000 p/h/d
- costs between 75% and 30% less than standard light rail

2.2 The adoption of lightweight, self propelled vehicles on the Stourbridge branch as part of the London Midland franchise has proved that much smaller, simpler vehicles can operate on conventional rails without modification to the infrastructure and deliver a perfectly acceptable passenger experience. Indeed in many ways, the quality of service has improved as a result of the change – to say nothing of the financial and environmental benefits. The Southport Pier Tram is another example of a successful ULR operation, and important trials have been conducted in Northallerton and Birkenhead (in this case, a lightweight tram designed by Trampower).

2.3 The National Audit Office report, ‘Improving Public Transport in England Through Light Rail’ (April 2004) concluded that recently-completed light rail schemes in England have focused on key aspects such as patronage levels, relieving congestion and mode shift. The report goes on to say that such evaluations did not fully examine “...*the potential impact of the tram on regeneration and social exclusion, economic development, the environment and the extent the scheme integrates with other forms of transport. These factors should form part of the core arguments in assessing the impact of light rail schemes.*”

Barriers to ULR

3.1 So why are more local authorities not proposing light rail projects? Conventionally, light rail routes are assumed to cost in excess of £10 million per mile. A line with these specifications may be justifiable where there are in excess of 30,000 people living within 400m of a stop, but that is possible only in a few large cities in the UK. In addition, UK government support for light rail is proportionately much lower than for bus rapid transit schemes. These two factors have caused many local authorities to discount light rail as an option. In fact, existing track is sometimes lifted to make way for a guided busway; even though buses are inherently less efficient than light rail, they attract favourable subsidies.

3.2 In many settings, the option under consideration should in fact be ultra light, rather than light rail. Where there is an existing line – a freight branch, a heritage line, a threatened branch line, a mothballed line or a preserved rail alignment – costs can be very low indeed. In the best case – a well maintained but lightly used line conveniently located to population centres and a mainline connection – a ULR shuttle could begin operation with expenditure under £250,000. Even where track needs to be relaid or extended, £1M per mile may well be quite sufficient for a single track (though there is substantial variation

between sites). The small vehicles, each carrying as few as thirty people, and hence costing much less, make it viable in the relatively low population densities common in many towns and almost all cities. But modest figures such as these rarely make it into consultants reports, due to a culture of overspecification for light rail. Recognition of ultra light rail as a separate category, with much simpler requirements and hence lower costs, would transform transport planning.

3.3 This is a form of light rail that can be adopted in many market towns, outer suburbs and even in some cases in rural settings. Because it makes highly efficient use of infrastructure that is low cost – and even extant – it is not restricted to the metropolis as conventional light rail is. There are thought to be as many as seventy sites where existing railway branches could be used for ultra light rail with good cost/benefit ratios.

The ULR sector in the UK

4.1 There are now a number of enterprises in the UK that are developing and supporting ULR technology. This sector is small at present, but has the potential to make a significant contribution to employment, exports, and expertise if they have the opportunity to grow.

4.2 The ultra light rail industry represented in this submission demonstrates that all the components are in place for widespread delivery, including consultancy, manufacture, leasing and operation. Lightweight Community Transport's role is to raise matched funding, create rolling stock leasing schemes and to act as expert advisor to the local group that would sponsor and operate the service. Parry People Movers, TDI and Trampower each produce slightly different variations on the ultra light rail theme, and each will find that certain applications ideally suit the rolling stock and infrastructure they produce. As operators, Go! and Pre Metro are keen to realise the opportunities for passengers around the UK; many other operators would undoubtedly share this interest, if the sector were able to achieve its potential.

Implementation

5.1 Our core proposal is that significant societal benefits could be achieved across the country by the introduction of such local rail services, and that the initial implementation could in fact be brought about relatively easily by the use of existing railways (in particular, heritage railways where the track is already in place and used for passenger-carrying services; but also freight lines and other underused branches). The quick results that can be achieved here can then be built on with extensions at street level, or on old trackbed.

5.2 Widespread adoption of our proposals could result in a rapid, inexpensive enhancement of the National public transport systems. However, it is difficult for small private organisations to make the knowledge of what is possible widely known, to convince cautious investors and to pass our schemes individually through the bureaucracy of planning and safety approvals.

5.3 For such a scheme to be completed on the back of local activism, the work to be done involves:

1. Raising awareness and understanding among decision makers and the local community
2. Stakeholder commitment to a project
3. Obtaining necessary consents and approvals
4. Provision of finance
5. Appointment of contractors by competitive bidding against performance objectives
6. Provision of infrastructure and rolling stock
7. Commissioning (including training) by the appointed operator
8. Opening

5.4 The fact that passenger operations at Stourbridge have already commenced and operated successfully for several months confers considerable credibility on the concept, and a Government programme to promote and assist such schemes could provide the following further benefits:

- The credibility gap would disappear.
- Therefore, schemes would be more attractive to private finance.
- Developers will more readily contribute to tram project costs
- The range of lines that could be brought back into service would widen, with substantial repairs or re-laying of track becoming feasible
- Local and regional authorities would gain the confidence to take the initiative on branch line operations outside the rail franchises
- The private sector, Local Government or Regional Development Agencies could fund the market research on a shared-cost basis.

Our proposals

6.1 So what kind of action are we looking for to unlock the potential of this sector?

6.1.1. Introducing ULR operations to existing track is unnecessarily complex. The Government could instruct the Office of Rail Regulation (ORR) and Network Rail (NR) to

create, from existing resources, a single multi-disciplinary part-time team to deal with permissions, agreements and technical arrangements, initially using as models such precedents as Stourbridge and Wensleydale. A standard procedure and model documentation would rapidly develop, thus streamlining the procedure for further applications.

6.1.2. Standardise a set of derogations suitable for allowing light railcars on the national rail network, and adopt simple, safe and efficient protocols to allow ultralight railcars to use track that is used by other vehicles (for example, freight trains) on a 'one train in service' basis

6.1.3. Modest grants and technical aid for independent railways wishing to operate lightweight community services.

6.1.4. The Railway Inspectorate (now part of the ORR) could be asked to provide a specific set of standards for these lighter, simpler vehicles that reflect the different nature of feeder routes that are fully segregated from heavy rail.

6.1.5. In some places, track is being removed and replaced by guided busways not because any cost saving is achieved, but because central government funds a lower proportion of light rail schemes than it does for guided busways. Ultra light rail is in most cases a realistic alternative to guided busways, and similar funding regimes should apply for both.

6.1.6. Where government funds are available for improvements to 'road transport' this should include street running trams. At present they are arbitrarily excluded.

6.1.7. The government should fully implement the recommendations made by the National Audit Office in 2004, in their report on light rail.

6.1.8. Clear guidance from the DfT is needed that ultra light rail is a distinct category, separate from Supertrams and other intensive light rail systems, so that Local Transport Plans and funding bids will in future include it as an option worthy of consideration.

6.2 With this kind of support in place, the members of this group will be able to enlarge and implement their services.

6.3 ULR barely exists in this country, and yet it is the optimum form of public transport in the towns and cities that account for the majority of our population. The barrier lies not in the technology or the economics, but in institutional conservatism and perverse incentives. We can deliver a high quality transport experience at modest costs and with minimal

environmental impact. Allowing ULR to make good use of the railways that exist is a crucial first step towards a much wider modal shift.

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Appendix 1

The organisations that have participated in this document are (in alphabetical order):

Go! Co-operative: a newly registered IPS co-operative, formed in 2009 to become the first community owned rail operating company. It is presently working through the licencing process and intends to provide a range of integrated transport services – conventional open access rail services, light rail branches, bus services and car clubs.



Lightweight Community Transport: a society for the benefit of the community formed in 2008 to act as a leasing company for lightweight rail operations. It is working with line owners and operators to identify opportunities and put in place finance options for the development of a service. It is particularly keen to work with community owned operators, and is raising finance with a 'community share issue' – withdrawable shares issued to social investors.



Parry People Movers Ltd: suppliers of environmentally-friendly lightweight rail vehicles featuring flywheel energy storage, formed in 1991. Prototype vehicles demonstrated in numerous independent railway locations (including Brighton, Birmingham, Swansea, Barking, Bristol [with the



involvement of Sustraco], Severn Valley Railway, Great Central Railway, Chaewater Railway and Wensleydale Railway. In 2005-06, over 4,000 trips were operated by a 'PPM 50' railcar in Sundays-only service on Network Rail's Stourbridge Town branch. This led to the selection of this technology for full public service at Stourbridge under the London Midland franchise, for which two 'PPM 60' or Class 139 railcars were financed by Porterbrook Leasing Company.

Pre Metro Operations Limited: Pre Metro was formed as a rail operating company that could specialise in in light rail, and it became licenced in 2005. Its first operation on the national network was a trial of the Parry People Mover on the Stourbridge branch on Sundays, and now it is operating the weekday service on behalf of London Midland.



Sustraco Ltd: registered in 2003 with the objective of developing, demonstrating and promoting Ultra Light Rail (ULR) public transport systems worldwide. The Chairman of Bristol Electric Railbus Ltd (BER), James Skinner, founded Sustraco to bring ULR to the wider market in UK and overseas. A demonstration



service of a zero-emission PPM tram along the Bristol Harbourside on existing standard gauge rail from 1998 to 2000, carried over 50,000 paying passengers. An independent market study of the demonstration showed a highly positive public response. Bristol City Council included a ULR project in its Local Transport Plan – but it was shelved because of the more favourable financial conditions given by DfT to bus schemes.

Sustraco's mission is to promote innovation in public transport in order to achieve the following aims: reducing the cost and environmental impact of implementing light rail transport; minimising carbon and toxic emissions from public transport operation, and enhancing energy security, by using renewable fuels; increasing energy efficiency to maximise passenger kilometres per unit of energy.

The company undertakes vehicle specification and procurement planning to meet local needs and the formation of consortia to undertake turnkey system delivery projects including design, maintenance, and operation of ULR services.

TDI: With offices in the UK and Australia, Transport Design



International Ltd (TDI) is a world leading industrial design and engineering consultancy. Founded in 1987, the company specialises in developing bespoke solutions for both road and track based transport applications. TDI is also the lead partner in the development of the electric "Minitram" urban transit system. This low cost, environmentally friendly transport mode is available in both electronically guided and ultra light rail (ULR) versions.