

## **To Harrogate Line Supporters Group Members - Special Bulletin No.19**

### **HARROGATE – LEEDS BRADFORD AIRPORT RAIL CONNECTION OPTIONS**

You may have seen our comprehensive articles on the proposed Parkway Station on the existing Harrogate Line by Leeds Bradford Airport connected initially to Leeds, Harrogate, Knaresborough and York and also potentially to Bradford and Skipton via a novel Leeds "cross-city line". This was a double-page spread in the latest edition of Railwatch No 150 which responded to a previous article by Paul Abell in Railwatch No 149 proposing "tram-trains" on the Harrogate Line. Scanned copies of both can be provided on request.

The Secretary of the All Party Parliamentary Light Rail Group James Harkins responded to our article in Railwatch 150. It is copied in full below a following rebuttal of his arguments in favour of Tram-trains by our Technical Adviser Mark Leving. Of particular concern is the proposal that this new technology should be adopted on the Leeds-Harrogate-York Line, including a spur to the Leeds Bradford Airport and an unspecified street-running loop around Leeds City Centre.

As the dialogue about the claimed benefits of "tram-trains" is continuing in the local media, Mark has agreed that we should circulate his technical and commercial objections to tram-trains to all members of the Harrogate Line Supporters Group for information and future reference.

An additional point that is potentially very important is the question of current and potential line speed improvements. The line speed analysis that Mark has undertaken clearly demonstrates that speeds in excess of the current 60mph limit are both possible and desirable in a number of selected locations in order to reduce transit times. We need 80-90mph in some stretches and 75 in others. The route was resignalled with a 75 mph limit between Leeds and Harrogate in 2014. The Harrogate to York section is also due to be resignalled and partially double-tracked in the next phase of investment of this line.

Having achieved the current franchise commitments to a 15 minute frequency between Harrogate and Leeds plus a two-hourly service between Harrogate and London Kings Cross well before the end of this decade, any further in-depth bids to operate tram-trains on this line could well jeopardise what has already been promised.

Comments and questions for Mark Leving will be welcome so that the optimum improvements are planned for both the line and the rolling stock.

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#### **-----Original Reply to James Harkins from Mark Leving -----**

To: James Harkins FCILT MTPS, Secretariat,  
All Party Parliamentary Light Rail Group

Dear James,

Thank you for your recent responses to Brian Dunsby. Whilst these may in part address one issue (walking distance to Leeds rail station) we remain extremely concerned at the approach, particularly of tram vehicles generically and especially of tram vehicles and street running and which seek to consume scarce capacity on existing rail corridors out of a perceived convenience. There is no issue per se of using lighter vehicles or "light-rail" sharing the same tracks, provided capacity exists and they are compliant with relevant operational and safety standards that apply to standard rail vehicles. In this latter respect, it appears clear that the capital cost of such vehicles significantly exceeds that of comparable conventional rail vehicles globally making the implicit assumption that "light rail equals lower costs" fundamentally misleading,

We therefore have no issue whatsoever with light rail/rapid transit provided it is properly considered and fit for the 21st century (i.e. segregated and automated, and any proposal provides the best value for money of all options considered for the taxpayer). Our specific issues arise from the use of tram vehicles with street running, lack of automation and tendency to focus on using (and to the detriment of) existing rail corridors thus overlooking significant areas of greater demand/need that are not already rail served.

Firstly, the new signalling on the Harrogate line provides a minimum technical headway of approximately 7 minutes. We expect after the inclusion of required contingencies the minimum planning headway will be approx. 8-9 minutes. A 15-minute off-peak and approximate 10-minute peak interval is already envisaged and committed for Harrogate/York trains. Unless the route is re-signalled again, it is difficult to see how any meaningful capacity can be released for other additional services irrespective of the type of equipment used.

On the issue of street running, we cannot escape the facts that it is extremely slow, astronomically expensive to build and imports a whole range of new and increased safety risks. Furthermore, it is unlikely that it can ever be automated. This is of major importance for any scheme using public funds because of the massive operating costs incurred when every small vehicle requires a person in the cab to operate it. For the 21st century we must have automation and segregation in any new transportation system. In this respect, DLR in London is a fine example as I am sure you will agree. It is light rail, but not tram. The Metrolink system in Manchester and elsewhere are unimpressive. The frequency is inadequate, comfort poor and journey times unattractive. It is quicker and more reliable to walk between Victoria and Piccadilly stations in Manchester for example. The limited cost recovery through fare box revenue is also unsustainable from a taxpayer perspective. The cars are too large for British streets in the main. The factors that get people out of their cars and on to public transit is frequency and transit time. This benefit is not specific to trams as you appear to suggest.

What Leeds needs is a proper segregated modern subway system or DLR clone that can be automated to provide the frequencies and safety that stakeholders expect in the 21st century. It must not diminish the quality and capability of the existing main line system but supplement it, targeting areas that are not already in reasonable proximity to existing rail networks. It also needs to focus on the key areas of demand in the city within a 5-10-mile radius which can make an adequate contribution to the operating costs through the fare box. It needs a system that does not seek to consume existing conventional rail routes out of convenience.

On the issue of tram vehicles, it is patently clear that the capital cost in comparison with an off-the shelf standard electric rail vehicle are significantly higher. Any perception that light rail equates to lower cost is a complete myth. Not only do tram vehicles cost more to acquire and operate than conventional rail, they also seat fewer people and in comparative discomfort, resulting in the cost per seat representing poor value.

On the issue of safety, safety statistics for tram systems are not collated nationally, or regionally, so we have to look at each individual operation to extract any meaningful data. It is clear from what we have seen, that the safety standards for users and road users are increasingly of concern and significantly lower than those demanded and enjoyed by passengers riding conventional rail services.

The short-cuts that light rail has previously enjoyed may indeed have lowered some areas of infrastructure and operating costs in part but with each and every accident, the requirements increase, with accident reports demanding (quite rightly) that the same standards applicable to main line systems need to be applied to tram systems. Last month's crash in Croydon is an unfortunate reminder of this. As you will know, it was not the first event in which loss of life has occurred.

My point is this, that Tram or light rail does not equate to lower costs or better value as promoters wish to perceive and influence others. Tram in particular is comparatively less safe per passenger mile. The London Underground on the other hand is the safest form of transportation in the UK (RSSB statistics) with "heavy" rail closely behind.

I have to agree that the walking distance between tram and station at Leeds *may* be short. However, it could import significant passenger inconvenience if outside the barrier line at the station. Leeds station is one of the most significant interchange hubs in the UK. Tram vehicles are extremely unfriendly to passengers with luggage. There is simply nowhere to put it without blocking seats or aisles. Most passengers, even commuters carry luggage.

Your statement that one tram can carry 250 people appears to be a somewhat misleading statistic. Presumably this applies to a modern 2 or 3 section articulated unit. The data we have shows that a typical recent tram vehicle, costing £2.1-£2.5m carries 206 passengers of which 72 are seated i.e. only 35% are seated over a total vehicle length of 32 metres. A single fully loaded London Underground surface car can carry a similar full load of around 200 passengers in a shorter length (18-20 metres) and costs considerably less to both acquire and operate. A two-car pacer unit seats between 102 and 120 passengers over a length of 31 metres thus making them perversely potentially more attractive than any tram proposition. The point is, that requiring passengers to

stand in order travel will *not* encourage them out of their cars. Carrying the demand is best dealt with by more frequent and longer trains of the conventional type by any measure.

The improvement in business activity you note is not solely attributable to tram as a mode as you appear to suggest. The same and higher rates of growth arise through any form of rail transport improvement. Around the world, the highest economic growth rates arise from proper subway systems or heavy rail 25kV Regional Express (RER) systems. Evidence from elsewhere in the world supports this. Toronto probably has the world's largest tram (Streetcar) system. However, new developments and investments are focused towards segregated running and automation both of the subway system and the main lane commuter network which is being upgraded to RER. This follows extensive business case analyses which repeatedly show electric conventional rail and subway systems to offer the best value for money for taxpayers and stakeholders for trips over approx. 5 miles. Over \$23Bn is now being invested in upgrading the conventional diesel network into a high frequency two-way all day RER system because this provides the most cost effective approach providing the best value for money for taxpayers. Toronto has very wide streets but the streetcar system is slow and disproportionately ineffective (even using new articulated cars) at meeting the city's needs and generates a considerably lower value benefit for a considerable cost.

More conventional or heavy rail (and I include a classic subway system or fully segregated and automated light rail system like DLR in this description) has the ultimate ability to carry more passengers than any other mode. Economic analyses repeatedly show it to provide the most robust business cases and value for users and taxpayers. It can operate at headways of 2-3 minutes. The Victoria line operates at a 90 second headway in the peak using CBTC technology. Modern heavy rail EMU's can handle 4-5% gradients from a stand and indeed already do at several locations in the UK. The implied assertion that modern heavy rail is intolerant of gradient is therefore incorrect.

Trams and street running are a reminder of a bygone age. They are inappropriate for meeting modern transit needs, astronomically expensive to build and operate with poor fare box recovery of the costs. Supporters repeatedly state that costs will fall but there is no evidence of this occurring in the UK or that they can better conventional rail. This is unsurprising because they are by definition more complex and carry fewer seated passengers.

In this region, we wish to promote modern sustainable rapid and safe systems of transportation that are affordable. Tramcars and street running simply cannot meet the challenge either physically or economically. Conventional heavy rail and/or conventional segregated LRT/subway systems, despite numerous issues is both cheaper to build and operate/maintain.

Serving Leeds-Bradford Airport using an existing rail corridor and services along with a short bus transit (or people mover) connection is entirely the best solution. Bus transfers between aircraft and terminal at some airports (e.g. Heathrow) are already greater in distance than that between the proposed station and airport terminal at LBA. Taking the train to the front door of the terminal is largely irrelevant given the likely levels of usage. All the economic evidence we have seen from Airports and the DfT clearly shows that regional airports outside London cannot sustain the costs of dedicated services. We must show due regard to the taxpayers of this region whilst connecting it to the main line rail network using existing rail and airport bus shuttle services.

The Leeds City Region and equally importantly the city itself needs its transportation system to better penetrate areas which are not already rail served and there is a huge swathe across the northern side of the city that requires attention. This will not be addressed by using a cost inefficient "light" rail vehicle on existing rail corridors.

To reiterate, we are in favour of rail and electrification but we cannot support approaches and pet projects which are inappropriate and represent poor value to taxpayers. Time after time, we see "light rail" schemes which fail to achieve the desired capital or operating costs and then fail to achieve the forecast revenue targets. Light rail which includes street running and/or which does not achieve better value, despite the "light" title needs to be fully and properly assessed. Our approach is to be objective and not fixated by specific types of vehicle which are less efficient carriers than what already exists.

Leeds has a potential network of disused (since 1959) segregated tram route segments serving areas of the city likely to generate the highest demand and fare box contribution to the costs. They could be re-used to help create a segregated automated system, taking a leaf out of the Zurich handbook e.g. using metre gauge cars for central area routes which are far easier to accommodate within the space typically available in UK cities and impart lower tunnelling costs. This should be in parallel with upgrading the conventional rail routes into an 25kV Regional Express system. The requirements of RER and shorter distance urban city transit are largely incompatible in terms of having to share the same tracks. Track capacity can be more than halved when additional stops are inserted for the "light" rail services.

We should not seek to diminish the output capability of existing rail corridors with light rail vehicles and urban services because it appears convenient. The main line rail system should continue to be upgraded to RER

standard (which is what is required for the Leeds-Harrogate-York and other corridors in the Leeds City Region). This is without doubt the best and most cost-effective approach for users, taxpayers and stakeholders. It is supported by the Government and the relevant local authorities.

Light rail most certainly has a place but that place is *not* in diminishing the capability or otherwise consuming scarce capacity on existing rail corridors which continue to grow and provide and meet a subtly different service proposition within wider economic and city regions.

I hope that you appreciate our approach is not incompatible in any way with the development of appropriately specified and scoped light rail schemes, rather one to use available technologies cost effectively and to best overall advantage for users, stakeholders and taxpayers.

Yours sincerely

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-----Original Message to Brian Dunsby from James Harkins -----

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Brian

TramTrain is a format that has been gathering momentum since being pioneered in Karlsruhe in south-west Germany. This first and largest scheme for through-running between a heavy rail infrastructure and an urban tram system began in September 1992.

In your article in Railwatch 150, I would like to bring to your attention to several errors as follows:-

First objection:

*"the existing heavy rail will be converted to light rail between Leeds, Harrogate, Knaresborough and York"*

It is not the intention to convert the line to Light Rail anywhere on this line but to track share on part of it. It was the intention in the original plan produced by Dave Haskins, but when I presented this proposal, I pointed out that it was on the wish list to go all the way in the fullness of time!

It is our proposal and intention to use a street running tram from adjacent to Leeds station to a point suitable north of the station and join the Harrogate line which hopefully will be electrified by then to point and build/adapt/upgrade a parkway or gateway station, just south of Bramhope tunnel possibly, Horsforth and leave the line and run cross country into the airport. This small track sharing section will give additional services between Leeds and Horsforth

It will also relieve the pathing congestion especially when HS2 arrives

This will enhance the whole "rail experience" and add to the success that you claim for your Leeds cross-city link in the North

Second Objection:

*"that it will affect the planned upgrade and franchise arrangement"*

The time scale is good for the planned upgrading of the line, the TramTrain will use exactly the same voltage, gauge, slightly narrower and lower profile and most importantly be fast enough. There are hybrid vehicles available if planned upgrade doesn't happen. We don't see it interfering with the upgrade for any length of time for after all how long does it take to add in several points/switches

Third Objection: *"the inherent technical and financial weakness of TramTrain technology"*

*a, technical*

The inherent technical weakness of the TramTrain trials are being carried out as we speak in Sheffield. Many of the remaining issues are institutional. The format has also been adopted with various permutations elsewhere, as in Nordhausen and Kassel in Germany which introduced diesel and electric hybrid vehicles. Used on the 25kV ac self-contained T4 light rail line in Paris, the Siemens Avanto is due to work proper TramTrain two-voltage operations into Mulhouse in south-east France. In the Netherlands, the two-system Alstom Regio Citadis has been deployed to integrate Randstad Rail with Den Haag's tramway.

*b, financial*

The production costs are dearer than a standard town tram but this will come down with bulk ordering as happened with the Paris T4 order with Siemens.

I would agree with the Government's statement that Leeds/Bradford Airport needs a rail line but a heavy rail is too expensive. The hilly geography of the area means that any direct rail link to the area will tend to involve gradients uncomfortably challenging for heavy rail vehicles but well within the capability of Light Rail. For some of the NGT legacy funds, the proposed TramTrain line will address that need with funds to spare and also act as a starter line for Leeds City Region which will complement your cross city link in a similar way London Underground does in that city.

West Yorkshire Combined Authority as you say are assessing the alternative road and rail transport requirements and will have to now take cognisance of the transport pollution caused by diesel engines road and rail and health consequences highlighted by recent reports, I refer you to [www.applrguk.co.uk](http://www.applrguk.co.uk) and [www.clientearth.com](http://www.clientearth.com)

I agree that 10% of NGT legacy can buy a lot of platform for both light and heavy rail.

I feel that there is scope for your Leeds cross city link for enhancement using where appropriate TramTrain & Tram street running vehicles and that your last statement about line of sight is nonsense, line of sight is generally used for street running, signalling is used on railway type alignments.

Don't forget the purpose of what we are doing! - to get people out of their cars, better air quality, cut congestion and prosper by better connectivity).

I hope the above will persuade you to join the march forward that other countries have pioneered in Rail technology.

Yours aye,

James Harkins FCILT MTPS  
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