

APPLRG / pteg: Light Rail and the City Regions

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Session 4 – Network Rail and Department for Transport

Questions 196 - 218

PLEASE NOTE THIS IS NOT A FULL TRANSCRIPT
BUT A NOTE OF THE SESSION.
DUE TO A TECHNICAL FAULT NO TRANSCRIPT IS AVAILABLE.

Q196 Tim Kendell: I am Tim Kendell – Technical Manager Infrastructure in the Technical and Professional Directorate of the DfT National Networks Group. I would like to thank the All Party Parliamentary Light Rail Group for inviting me to appear at this inquiry on the subject of the Tram Train Trial. I am pleased to be able to give a statement and answer questions on the Department's view on the technical and operational aspects of this trial. The Department for Transport supports this trial as the results will help to confirm whether or not the Tram Train concept is a suitable transport offering for the UK. The Department recognised the potential that Tram Train operations could offer, but also recognised the differences between tramway and main line practice. This was also recognised by other European countries that wished to adopt tram train operations and most have had an initial trial or pilot. Indeed one has just completed in Holland on the Gouda to Alphen aan der Rijn line, and we understand this has been considered a success. The Department also recognise there are significant differences between the main line railways in the European Countries where tram trains currently operate and the railways in the UK. The Objectives of our trial are:

1. Understand the changes to industry costs of operating a lighter weight vehicle with track brakes on the national rail network;
2. Determine changes to technical standards required both to allow inter-running of light weight tram vehicles with heavy rail passenger and freight traffic and to gain the maximum cost benefit from tram-train operation;
3. Gauge passenger perception;
4. Determine the practical and operational issues of extending tram-trains from the national rail network to on-street running.

The Department in partnership with Northern Rail and Network Rail agreed to undertake a trial that would address the above objectives and conclude whether tram train operations were feasible in the UK and what benefits could be gained. Potential trial routes were evaluated and initially the route from Huddersfield to Sheffield via Penistone was selected which would address the first three objectives and with a follow on phase to address the issues associated with interfacing with a street tramway. The first phase of the trial would have required Diesel Electric tram trains, similar to those used in Kassel in the Nord Hessen region of Germany. Following changes in EU emission regulations the need to develop a new diesel powerpack for this type of unit made the diesel electric tram train unaffordable as the development costs would fall on the first order. Accordingly the Rail Minister Chris Mole MP, announced the re-phasing of the trial on 15th September at Meadowhall South. The extents of the trial route are expected to be Sheffield City Centre and Rotherham, bringing South Yorkshire PTE into the partnership. While the tender for these units was underway, the development and understanding of the infrastructure issues was progressed. The main issues affecting operation of tram trains on the heavy rail network were identified and evaluated. Comparisons were made with the European

administrations such as Germany and Holland where tram trains operated, and their solutions or operating restrictions. It was noted that there were some very significant differences in detail between the systems used in these countries and the UK systems although the principles were generally applicable. The main areas where UK systems are not directly comparable relate to the wheel rail interface, gauge clearance, platform height and the train detection and protection systems.

Wheel Rail Interface: A new wheel profile will be required that is optimised across the three rail inclinations, and two flange widths. The wheels will need to have narrow tram flanges to suit the groove in the road and heavy rail switch and crossing layout adjusted to avoid the potential for derailment.

Gauge: The tram trains common in Europe have a cross-section similar to main line train except at the top corners where they are squarer to carry the power equipment and tend to protrude outside the normal profile of a train. This could be a problem at arch bridges and tunnels and would require investigation.

Platform Height: Tram trains and UK tramways, except for Manchester, have low floors that work with platform at a height between 300 and 380 mm above rail level. Normal heavy rail platforms are 915 mm above rail level, and thus reduced height platforms are required.

Detection and protection systems: Tram trains, however, have a lower resistance to collision impact with heavy rail trains as they are both built to a lighter standard and the levels of the draw bars/buffers are lower than heavy rail trains. We are proposing to mitigate the risk of collision through enhancements to the signalling system in a similar manner to that used in Europe but with the current UK systems.

All these enhancements are being fully risk assessed by the project partners to ensure that they comply with their safety management systems as duty holders. This will assist the project team to determine and justify the changes to standards that will be required to enable the future introduction of tram trains onto the network. The learning that has been gained from the studies to date is being incorporated into a “Learning Report” that will be made available to the industry. The current phase will add the opportunity to trial low cost electrification in a tramway style but on heavy rail infrastructure. By the end of the trial we expect to understand the issues and cost attributable to bringing tram trains onto the main line.

Simon Coulthard: I am Network Rail’s Senior Sponsor for the Tram Train Trial. I would like to thank the All Party Parliamentary Light Rail Group for inviting Network Rail to appear at this inquiry on the subject of the Tram Train Trial. I am pleased to be able to give this statement and answer questions on Network Rail’s view on the trial and application of tram train on its network. We are pleased to be involved in the Trial and were, in conjunction with the Department for Transport and ACoRP, responsible for its origins trial and objectives. We understand the potential benefits of tram train technology and are keen to test and demonstrate its functionality through means of a trial. Our interest in the outcome of the trial falls into the following areas:

Increased System Capability: tram train offers the potential to reduce demand for train paths into busy main line stations by diverting existing local services onto adjacent on-street alignments.

Assessment of a new public transport solution: tram train is a possible solution to meet the urban public transport needs of the 21st century. It offers a solution to growing demand for local public transport and a credible alternative to car dependency.

Reducing the costs of the network: we wish to understand if this technology can be applied at a capital cost that is lower than comparative heavy rail enhancements; and, whether the operation of a tram train system may reduce the operating cost of the network.

A single technical solution: we are already engaged with promoters of tram train projects throughout the country. We look to the trial to determine the technical standards and safety authorisation route for these and future tram train schemes. We believe that there is an opportunity to save future development costs by establishing a single authorisation route for tram train on the national network.

At the time of its hibernation we have identified the necessary infrastructure solutions to give effect to Phase 1. These solutions have yet to be designed in detail and be subjected to a detailed risk assessment. We will put into hibernation all the information on Phase 1 until such a time as it is reinstated. We are transferring the learning from Phase 1 to the development of Phase 2 and identifying the remaining knowledge gaps that need to be addressed. The collective learning from Phase 1 (including that gained by the Department for Transport and Northern Rail) is being placed into a learning report that will be made available to the industry during 2010. Phase 1 would have required tram trains to significantly interwork with other heavy rail services, including heavy freight trains and long distance passenger services running up to 90mph. This was a key challenge for the safety authorisation of the project and a major learning opportunity. For Phase 2 tram train services will interwork with freight and local passenger services but not to the same frequency or linespeed as Phase 1. Phase 2 will bring forward the trial of the “raison d’être” of tram train, that is the through operation between heavy rail and tramway/on-street networks and the delivery of a new product in the public transport mix. We will be gaining knowledge and experience in the technical and operational requirements for this system and also measuring passenger reaction and changes in demand. Phase 2 will be delivered as a 750V DC overhead line system throughout. This type of system is not standard on our infrastructure and we will be using expert knowledge from those who have installed similar systems in the UK and Europe to help us find the most cost effective solution. In order for us to deliver the trial it will be necessary to secure safety authorisation for the tram train system on the heavy rail infrastructure. The key risks have been identified and we are working with our partners to create solutions that will provide the safety assurance required. The main issues are:

Wheel Profile: a wheel profile that is compatible between heavy rail and on-street systems has yet to be identified. The final choice may require additional infrastructure intervention on the heavy rail network to reduce derailment risk.

Crashworthiness: tram train vehicles do not meet current crashworthiness standards for heavy rail passenger vehicles. Additional measures related to reducing collision risk through enhanced signal protection are being investigated.

Vehicle Detection: tram train axle weight and design may increase the risk of non track circuit operation for certain types of track circuit on the national network.

Low Height Platforms/Differences in Safety “Aura”: the introduction of low height platforms onto the national rail network may give rise to an increase in trespass and misuse at stations. The joining of on-street and heavy rail systems drives the need for greater public education about the differences in safety “aura” between the two systems. In particular a passenger joining from the street must accept a change in behaviour once the service is on the heavy rail system.

We have issued guidelines on the key technical and strategic themes that our planners and promoters of tram train solutions need to bear in mind when considering the application of the technology on the national network. The technical themes prompt consideration of the whether tram train is the right technical answer to the relevant problem or opportunity. These themes also prompt consideration of the likely infrastructure enhancements needed to support the service and also the assumed depot and maintenance arrangements. The strategic themes prompt consideration of the business case for using tram train and in particular the extent to which the proposition meets medium/long term growth targets and/or gaps within existing Route Utilisation Strategies.

Q197 Paul Rowen: How much has been spent on the abortive Phase one of the Tram Train trial?

Tim Kendall: We do not have the complete figure at present. It should be noted that phase one is not considered to be abortive as there have been considerable developments in technical understanding for the introduction of tram trains.

Simon Coulthard: Network Rail is still completing workstreams on Phase 1 prior to its hibernation. Our final cost for this phase will be known later in 2010. We consider that the majority of this spend is not truly abortive as it has a transfer value to Phase 2.

Q198 Paul Rowen: What is the timing of Phase 2 and when will the Tram Train be running?

Tim Kendall: Procurement depends on the source of vehicles. If second-hand vehicles from the Netherlands are used, they should be available in 2010, but modifications to make them suitable for Sheffield might take six months. If new vehicles are ordered, they will not be available before 2012 and the trial would start in late 2012 or 2013.

Q199 Clive Betts: What are we developing here? Are we looking at tram running on a heavy rail system or a vehicle fit for heavy rail which happens to come into the city centre?

Tim Kendall: The vehicle is basically a tram, with low floor and protected moving parts to address safety and security issues on road and which is adapted to run on the heavy rail network.

Q200 Clive Betts: Are we avoiding engineering something that all the costs of both systems? Will we end up with something that is not cost-effective?

Tim Kendall: We have looked at Karlsruhe, Kassel and the Netherlands and we would use a type of vehicle that is already available, which will be more cost-efficient than a new design.

Q201 Clive Betts: What about crash-worthiness? Is protection provided through signalling?

Tim Kendall: Yes, protection is to be provided to keep trains apart through enhancements using existing UK systems, although the crash-worthiness of the vehicles themselves needs to be somewhat higher than for ordinary trams, because of the higher speeds involved.

Simon Coulthard: We are working on the basis of having a standard tram train that complies with EU requirements, which falls short of heavy rail crashworthiness requirements. Our challenge is to prove a safe operating system for this vehicle without detriment to the capacity or capability of the rail network.

Q202 Clive Betts: Looking to the future, how long a period is required for evaluation?

Tim Kendall: One to two years; certainly not less than one year. Understanding the passenger perceptions may require longer than a year. Understanding the technical

elements of exposing Tram Train to mainline operation and impacts on capacity on mainline is important and will require at least one year to ensure that a complete rotation of the seasons is studied. For the wider roll out it is important that tram train shouldn't impact on mainline capacity – unlike on the Tyne & Wear extension to Sunderland where there are impacts on the railway capacity.

Q203 Clive Betts: From what you have said it could take another three years to start the trial and a further two for it to be evaluated and a conclusion reached. Looking ahead, if we are saying that everyone else needs to wait for these results in five years time before getting another scheme underway, it could be at least another three years on top of that before any other tram train scheme is in operation – i.e. eight years in total.

Tim Kendall: Yes on that basis. It might be possible to look at wider Tram Train application earlier than that, using emerging results, but that would be a matter for City & Regions part of DfT.

Q204 Clive Betts: Should we get authorities to express an interest in Tram Train applications earlier, subject to a successful trial?

Tim Kendall: Yes, but the correct costs may not be known. Schemes are already being developed but using only the promoters estimates of costs, as actual costs will not be confirmed before the results of the trial are available.

Q205 Paul Rowen: Might we not have an idea of indicative costs from elsewhere in Europe?

Simon Coulthard: There are cost estimates available from Europe. However, our discussions with European partners have shown that many schemes on the continent are not driven for cost-saving purposes but in terms of their economic and environmental benefits. In Karlsruhe, for example, we were told that schemes required a benefit to cost ratio of one, because local government had already determined a positive policy towards light rail as its local transport solution. We are already talking to local authorities, such as Cardiff and Leeds, about Tram Train, so we are not delaying while the trial takes place. We do not, however, want to end up with different solutions for different places. We want a standard product that can be applied everywhere, therefore saving long term development costs.

Q206 Clive Betts: Some of the rail lines with potential for Tram Train are not electrified. Could Network Rail electrify these quickly if required?

Simon Coulthard: Network Rail would respond to the circumstances of each application. It is difficult to generalise but, once major electrification begins through the Electrification Strategy, it might be easier to fit in small infill projects into that strategy.

Q207 Clive Betts: They would not just go to the back of the queue?

Simon Coulthard: The Trial is separate from the wider electrification strategy. We would look to fit future tram train schemes into this strategy.

Q208 Paul Rowen: On safety, what has been learnt from preliminary work on Phase 1 that would apply to Phase 2?

Simon Coulthard: Most of the lessons have been learned from Phase 1. Work has been done on platform heights, train protection and gauging. There is still detailed design work to do as well as work on overhead line equipment. Work is to understand the specific solution for Phase 2 and to complete the whole system risk assessment.

Tim Kendall: Work has been done on safety standards to demonstrate that safety can be achieved and this will need to be confirmed prior to entry into service.

Q209 Paul Rowen: Including to Europe-wide safety standards?

Tim Kendall: UK rail safety is comparable to other European countries. UK is covered by the EU directives on rail safety and standards.

Q210 Paul Rowen: How many accidents have involved Tram Trains in Europe?

Tim Kendall: There have been minor accidents in Karlsruhe, mainly slow speed derailments, but there have been no injuries and no collisions with heavy rail vehicles. They have a more sophisticated (and more expensive) train protection system than Network Rail.

Q211 Paul Rowen: Will there be trains running at speed?

Simon Coulthard: This would have been the case with Phase 1, with trains passing at 90mph. On Phase 2, there will be less frequent trains passing at 40mph.

Q212 Paul Rowen: What heavy rail speeds are encountered in Europe?

Tim Kendall: Tram trains are allowed to operate on lines where trains are permitted to run at 160kph.

Q213 Paul Rowen: Will Tram Train improve the business case for light rail in urban areas?

Tim Kendall: You should ask John Dowie (of DfT Cities & Regions). Personal view is that using existing rail line with minor changes should be much cheaper than building from scratch, although, where lines are converted to dedicated tram use, there will be a loss of railway capacity.

Q214 Paul Rowen: Is Network Rail happy with the mixed usage on the national network, as implied by the Tram Train concept?

Simon Coulthard: Yes, that is why we are involved with the trial. We wish to develop a single solution and defined criteria for introducing Tram Train in missed traffic with minimal impact on capacity and capability.

Q215 Paul Rowen: There will be a new diesel Tram Train design in Europe in due course; will we be using it here?

Tim Kendall: Yes, it's possible. The problem with the Phase 1 trial was that only a small number of vehicles were required. The manufacturer put the whole cost of developing the new diesel pack on that one small order making it unaffordable. If the new pack is

developed elsewhere or if we have a large order, the affordability of the diesel option would be improved.

Q216 Clive Betts: What form will the contract with the operator take?

Tim Kendall: This is still at an early stage of discussion. We are talking to SYPTE and Northern Trains.

Q217 Clive Betts: What arrangements will there be for through ticketing?

Tim Kendall: It is too early to say.

Q218 Clive Betts: This should be looked at – lack of through ticketing works against modal switch.

Tim Kendall: That is something we shall be looking at.

ENDS