
**Meeting of Executive Members for
City Strategy and Advisory Panel**

14 July 2008

Report of the Director of City Strategy

York – Harrogate - Leeds line Tram-Train Feasibility update

Summary

1. This report provides an update on work undertaken to assess the feasibility of proposals to introduce a tram-train service in the Leeds City Region, with particular reference to the operation of such a service on the York to Harrogate to Leeds line, including options considered for developing tram-train within the York area its potential impacts. In addition it details the national trial of tram-train technology that has recently been announced

Background

2. The York-Harrogate-Leeds line is a key part of the MetroTrain and North Yorkshire rail network serving the prosperous commuter market North West of Leeds and the Harrogate to Leeds/York markets (parallel to the congested A59 and A61 roads).
3. In April 2003 a consortium comprising METRO, North Yorkshire County Council and City of York Council appointed Faber Maunsell to undertake a study to devise the 'Harrogate Line Route Strategy' for the York-Harrogate-Leeds rail line. The main aim of the study was to understand the reasons why the line carries fewer rail passengers into Leeds and York than comparative lines in West Yorkshire. Once this had been established the study was to determine the optimum rail journey times and frequency as part of a holistic programme of infrastructure, signalling and rolling stock improvements to provide a "step change" in quality.
4. This study demonstrated that there is significant opportunity to both encourage transfer from road to rail as well as increasing trip making levels by current rail users. Furthermore, through developing an holistic approach to upgrading the route, the Harrogate route rail market will be in a strong position to expand significantly.
5. One of the key recommendations for the York – Harrogate section of the line was to investigate the potential for increased rail frequencies to two trains per hour between Knaresborough and York (together with 3 trains per hour between Leeds and Knaresborough).

6. Following on from this, Arup was commissioned in April 2005 by the same consortium to undertake a further study entitled 'Harrogate Line Development, Delivery Plan' reviewing the current and future operation of the Leeds – Harrogate – York heavy rail line, including the future use of alternative technologies. This study suggested a series of short, medium and long-term improvements to the line, encompassing:
 - Timetabling and Operations;
 - Track Infrastructure;
 - Rolling Stock;
 - Station Infrastructure, and
 - Alternative Technology

7. The report considered improvements to the conventional 'heavy rail' service and the potential benefits of using Tram-Train as an 'Alternative technology'. The key benefits of tram train over heavy rail were felt to be:
 - Lower costs overall, particularly in the short term, as vehicles can be introduced without major infrastructure changes;
 - The opportunity to incrementally develop the desired network;
 - Any new link to Leeds Bradford International Airport (LBIA) is likely to be cheaper than heavy rail;
 - It allows better penetration of Leeds (and York) centre(s); There is possible future connectivity across identified employment zones;
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 - Likely to be lower maintenance costs in the long run as the vehicles are 'lighter' on the track and station infrastructure is not so onerous to maintain, and
 - It would form part of a longer term vision of a transport network between the key centres in West Yorkshire, supporting the economic growth aspirations of the Leeds City Region (of which, City of York Council is a member authority).

8. In March 2007, the Leeds City Region published the Leeds City Region Transport Vision and Investment Plan. It realised that committed schemes, as well as those currently planned by local authorities, would not fully meet the anticipated travel needs of the city region. Therefore, it includes additional measures that, amongst others, seek to
 - Develop packages of rail, road, bus and integration measures on corridors to increase capacity or to provide greater choice, and
 - Improve existing services, by introducing new modes, such as tram-train replacing heavy rail (under the scope offered to local authorities in the Rail White Paper in 2006).

9. Following the publication of the Transport Vision and Investment Plan a fact-finding visit to look at existing tram-train services in Germany was made by selected officers of the Leeds City Region authorities and representatives of Network Rail to ascertain some of the operational issues of such services.

10. Subsequent to this visit in November 2007, Arup were, again, commissioned to undertake the Leeds City Region Tram-Train Feasibility Study to consider the potential for introducing tram-train technology onto routes set out in the Leeds City Region Transport Vision.
11. The study considered the high-level feasibility of introducing tram-train onto the following routes:
 - Leeds – Harrogate – York;
 - Leeds – Lower Aire Valley – Five Towns;
 - Horsforth – Leeds Bradford International Airport (– Guiseley);
 - Bradford Forster Square – Guiseley; and
 - Five Towns – Wakefield.
12. Whilst the study was on-going, the Government announced, on 18th March 2008, it had “given the green light for a pilot service featuring ‘tram-trains’ along the 37-mile Penistone Line” (Huddersfield-Barnsley-Sheffield). Consequently, this report also gives details of this national trial of tram-train technology.
13. In addition to supporting improvements to provide a “step change” in quality on the York-Harrogate-Leeds line, City of York Council have had aspirations to re-open local rail stations for approximately eleven years. At a meeting of the Council on 30th June 2008 the Motion by Councillor Gillies From Cllr Gillies *“That this Council instructs officers to investigate, and report back through City Strategy EMAP, with the appropriate agencies the feasibility of developing a dedicated rail service to run between York Railway Station and Strensall, with intermediate stops at York District Hospital and Haxby, utilising the existing railway infrastructure.”* and “The Council also registers its support for future light railway/tram train systems for the City of York.” Restated this aspiration.
14. A brief history of the endeavours made to secure the introduction of new stations in the York area is, therefore, contained at Annex A.

The Leeds City Region Tram-Train Feasibility Study and its findings

15. A draft final report for this study, which was also partly funded by City of York Council and Leeds Bradford International Airport, has now been completed. It has considered the following key issues:
 - Current and future levels of demand on each line (see paragraph 11);
 - Operational feasibility of tram-train services on each line;
 - Physical feasibility and cost of conversion to tram-train on each line; and
 - Evaluation of different types of tram-train rolling stock that are currently available.
16. The draft findings of the study, with particular reference to the York-Harrogate section of the York-Harrogate-Leeds line and links from York to LBIA, are summarised below:

Passenger Capacity

17. The Harrogate Line services are severely overcrowded in the peak and the volume of trips that could transfer from car/bus indicates a suppressed demand;

Operational and Physical Feasibility

18. The findings are:
 - The Harrogate Line has been identified as being the most suitable line for the initial introduction of tram-train technology in operational and infrastructure terms;
 - Alignments into development sites in York and residential areas have also been identified, but there are some operational constraints that affect their feasibility. These are outlined below and described further in paragraphs 20 – 25:
 - Implementation of a rail-based park & Ride on the A59 at Poppleton would need to be closely coordinated with any bus-based scheme;
 - Links into York Northwest (York Central and British Sugar) would need to cross rail lines;
 - A city-centre loop would require on-street running on a route that is somewhat remote from the city centre attractions;
 - A Park & Rail service for the potentially relocated Askham Bar Park & Ride will need to be compatible with the operation of East Coast Main line and York-Leeds services. In addition track layout for the station would be affected by any extension to Copmanthorpe;
 - A station at Copmanthorpe may be attractive to walk-on passengers in the area, but would not be suitable for Park & Rail services due to the access and environmental disbenefits to local residents, and
 - Providing a connection at York station for stations north of York without adversely affecting links into York Central or other inter-city traffic would be difficult.
 - A link between LBIA and the Harrogate Line is feasible (at an estimated cost of £17-£25m) and would provide a direct connection from the Airport to Leeds City Centre. An initial frequency of 2 services per hour is considered feasible. However, a direct link between York/Harrogate and LBIA is not considered feasible and therefore interchange at Horsforth will be required for these journeys;

Rolling stock evaluation

19. A number of different types of tram-train rolling stock have been considered to assess their suitability for introduction into the Leeds City Region. The work has considered the suitability of different types of energy sources suitable for operating on both the heavy rail network and over on-street routes.
20. In light of issues relating to the cost of electrification on heavy rail routes where there are tunnels and other structures, diesel-electric vehicles (as

operated in Kassel, Germany) may provide the most cost effective solution. Scope exists for electric operation in Leeds city centre.

Costs

21. The estimated capital costs for the York related elements of the potential tram-train strategy are shown at Annex B. It should be noted that these costs are indicative at present, showing a £2-4m range between the lowest and highest estimate for each element. It is expected that the national tram-train trial (see paragraph 21) will establish greater certainty of the costs for implementing tram-train technology.

Implications for York

22. **A59 Park & Ride** – In February 2008, City of York Council submitted its bid for 'Access York Phase 1: Park & Ride Development' to the Regional Transport Board for it to be included in the Regional Funding Allocation programme. The bid, for three park and ride sites, including one on the A59 to the west its junction with the A1237 Outer Ring Road (ORR) was accepted for inclusion in the programme and a Major Scheme Business Case is to be submitted by the Council to the Department for Transport later this year. The proximity of the site, (depending on which of the two potential sites is taken forward) may be sufficiently close to enable a spur off the York-Harrogate-Leeds line to the Park & ride site, thereby offering a 'Park & Rail' service. However, significant infrastructure (see also Annex B for cost estimate) will need to be put into place to realise this. Any such service will also need to be closely coordinated with bus-based Park & Ride services.
23. **York Northwest** – The strategic development of the area encompassing the former British Sugar site and the York Central site (largely railway land west of York station) is the subject of the York Northwest Area Action Plan, which forms part of the city's Local Development Framework (LDF). The public consultation on the 'Issues and Options' relating to York Northwest has been recently undertaken and is currently being evaluated. Depending on the outcome of this process, the opportunities for integrating tram-train within the development can be more rigorously investigated to ascertain its contribution to reducing the potential resultant traffic impacts of developing these sites. It would appear at this stage that train-tram access to these sites would require crossings of the existing rail lines to avoid conflict with existing rail services through York.
24. **York City Centre** – The feasibility of developing a city centre loop or spur to a terminus in North Street was examined. The report indicates that the North Street terminus is not feasible due to the operational risks and the potentially expensive connection to York station. The city centre loop, (chosen to avoid detracting from the attractive pedestrian environment in the city centre) requires extensive running on road space currently serving as the inner ring road and, therefore, has limited attractiveness, as it is relatively remote from the city centre. In addition construction of the route would cause considerable disruption and could suffer from delays due to road traffic once operational.

25. **Askham Bar Park & Ride** – Access York Phase 1 also includes the relocation of the Askham Bar Park & Ride to a former landfill site, south-west of its current location. The new site is adjacent to the East Coast Mail line and the York to Leeds line and would appear to be suitable for operating Park & Rail services. However, initial findings are that there is insufficient space to install a new dedicated track to York and, therefore, train-tram services would need to run along the York-Leeds line, which although possible, will require engagement with Network Rail to assess the performance risks of amending various train services to accommodate them. Furthermore, the station/halt would need to be constructed on the west side of the lines, necessitating a step free footbridge for passengers to get to the Park & Ride site. Any such service will also need to be closely coordinated with bus-based Park & Ride services.
26. **Copmanthorpe link** – A potential station in Copmanthorpe would provide greater access to York for residents in this area and would be attractive to walk-to passengers from the village. This location would not be suitable for Park & Ride, since the access roads would not support a significant volume of traffic, and would (in addition to the performance risks referred to in paragraph 23) create access and environmental problems for local residents. In terms of siting the station/halt, a location in the centre of the village would be the most effective to serve the local catchment. However, this could create a number of adverse environmental problems, in terms of lighting, visual intrusion and noise, particularly for the residents adjacent to the playing fields. This halt would be developed as a terminus, so the land take required would be higher, compared with a halt only used for through services. Alternatively, the terminus halt could be located at either the northern or southern end of the village. Whilst these locations would reduce the environmental impact, the remote locations would reduce the attractiveness of tram-train for the walk-in catchment.
27. **Routes north of York** – The two main issues considered are the examining the potential demand for the service and the technical constraints of establishing a route from the west of York station to the north / east. Extending a tram-train service to Haxby and Strensall may be attractive for the local population catchments and may also be a way of improving access to the District Hospital. It may also complement the proposed 'Clifton Moor' Park & Ride service on the B1363 Wigginton Road as part of Access York Phase 1. However, when considered with the availability of existing Park & Rides at Monk's Cross and Rawcliffe Bar and the lack of other trip generators along the B1363, it could limit the demand for a Park & Rail service, particularly among longer-distance drivers. Other options for improving access on this corridor may be more cost effective and the council is currently consulting with Network rail and First Transpennine Express to ascertain the viability of introducing a new station at Haxby for heavy rail services to call there. With regard to the technical constraints, the two options for connecting into York station (or York Central) could either limit the potential for running tram-train within York Central or require significant remodelling of the rail lines and/or platforms at York Station, in addition to potential rail performance risks.

National trial of Tram Train technology

28. The national trial of tram train referred to in paragraph 12 is due to start in 2010. The main points to note are:
- The overall aim is to determine the suitability of tram-train technology for the UK environment. Areas that will be covered include:
 - Technical feasibility;
 - Environmental benefits;
 - Operating costs, and
 - Passenger perceptions
 - Network Rail will contribute £15 million for track and station alterations with the DfT contributing £9 million for the operation of the trial;
 - It is intended, through discussions with stakeholders involved in the trial, to consider ways in which information on establishing a programme for developing feasibility and business cases for routes, and other findings, such as procurement of vehicles, can be more widely shared, and
 - The anticipated timescale is two years, but may be extended to incorporate a second stage for testing tram-trains on the Sheffield Supertram network.

Recommendations

29. The Arup report details the potential route through to delivery of tram-train operation for prioritised options. For reasons covered below (in paragraph 30), the report does not provide timescales for delivery but focuses more on the sequencing of activity to achieve the identified milestones and outcomes. These are set out below in terms of the York-Harrogate-Leeds Line issues:
- Replacement of existing heavy rail vehicles with tram-train vehicles on a like-for-like timetable;
 - Enhanced frequency of operation between Knaresborough and York;
 - Construction of on-street alignment in Leeds City Centre to resolve platform constraints at Leeds City Station and operational thresholds west of the station, and
 - LBIA link implementation; and Enhanced frequencies, initially from LBIA to Leeds, providing additional passenger capacity through this section
30. More detailed work relating to the cost and capacity trade-offs on other potential corridors is required to confirm the most appropriate technology for future operation.

Suggested next steps

31. Ahead of further development of tram-train proposals, a clear picture of the perspectives of key stakeholders (in particular, Network Rail, Northern Rail and the other 'Open Access train operating companies) will need to be established. This is critical since there are significant dependencies relating to the current tram-train trial.

32. In light of the timescales relating to the trial, there is a need to consider the process for developing tram-train proposals for the Leeds City Region, since it is unlikely that the DfT would accept any Major Scheme Business Cases for tram-train schemes until the trial had been fully evaluated (i.e. post 2012 and possibly no earlier than 2014).
33. The next stage in the process will be, together with other members of the consortium (see paragraphs. 3 and 6), to hold discussions with Northern Rail, Network Rail and DfT Rail (who are partners in the tram-train trial) to establish the extent to which Metro as consortium's lead authority are involved in the trial, and to agree a protocol for the sharing of knowledge as information emerges from the trial. Ongoing dialogue with other current tram-train promoting authorities should also be maintained to take advantage of synergies that may exist.
34. The developed programme of activity for the delivery of tram-train on identified corridors will need to be embedded within the overall Leeds City Region Transport Vision 'refresh'. Work will also be required through the City Region Engagement Strategy to lobby key industry players for the early introduction of tram-train in the Leeds City Region.

Corporate Objectives

35. A tram-train scheme, would, subject to confirmation from the results of a national trial, appear to contribute to the following Corporate Priorities:
 - Reduce the environmental impact of council activities and encourage, empower and promote others to do the same. *There is considerable scope for encouraging a shift from car use to rail travel for people located along or near the York-Harrogate-Leeds line. The use of tram-train technology could provide a more energy efficient and less polluting and attractive (to passengers) option than conventional heavy rail for improving rail services on this line to achieve the potential shift.*
 - Increase the use of public and other environmentally friendly modes of transport. *There is considerable scope for encouraging a shift from car use to rail travel for people located along or near the York-Harrogate-Leeds line. The use of tram-train technology could provide a highly attractive service to achieve this potential shift.*
 - Improve the economic prosperity of the people of York with a focus on minimising income differentials. *The potential improvements to the service on the York-Harrogate-Leeds line would enable people to reach job opportunities within York and the wider Leeds City Region that would have otherwise been unreachable due to lack of available and affordable transport.*
 - Improve the health and lifestyles of the people who live in York, in particular among groups whose levels of health are the poorest. *The potential improvements to the service on the York-Harrogate-Leeds line would enable people to reach job opportunities within York and the wider Leeds City Region that would have otherwise been*

unreachable due to lack of available and affordable transport, thereby (through increased income) improving their ability to buy more healthy food. Good quality pedestrian and cycle routes to stations/halts on the line would widen opportunities for people to exercise on the way to and from them.

- Improve our focus on the needs of customers and residents in designing and providing services. *The potential improvements to the service on the York-Harrogate-Leeds line would enable people to use attractive and more frequent services reach job opportunities within York and the wider Leeds City Region that would have otherwise been unreachable due to lack of available and affordable transport.*
- Improve the way the Council and its partners work together to deliver better services for the people who live in York. *The council has contributed to studies undertaken to date, through guidance and /or funding, as one of the members of a consortium that commissioned them. It is anticipated that any future work will be commissioned by the consortium, which will work with the rail industry to devise the optimum solution for meeting the aspirations of the Leeds City Region.*

36. Local Transport Plan 2006-2011 (LTP2): The scheme would contribute to several of the aims of the recently submitted LTP2, namely:

- To reduce the need to travel, especially by car, and encourage essential journeys to be undertaken by more sustainable modes;
- To improve economic performance in a sustainable manner;
- To reduce the levels of actual and perceived safety problems;
- To enhance opportunities for all community members, including disadvantaged groups, to play an active part in society;
- To improve the health of those who live or work in, or visit, York, and
- To reduce the impact of traffic and travel on the environment, including air quality, noise and the use of non-renewable resources.

Implications

37. This report has the following implications:

- **Financial** - There are no financial implications for the council at this stage. Once the outcomes of the national tram-train trials become clearer, future work may need to be commissioned, but the exact scope and scale of this is yet to be determined.
- **Human Resources (HR)** – There are no HR implications for the council.
- **Equalities** - The potential improvements to the service on the York-Harrogate-Leeds line would enable people to reach job opportunities within York and the wider Leeds City Region that would have otherwise been unreachable due to lack of available and affordable transport.

- **Legal** – There are no legal implications at present.
- **Crime and Disorder** – There are no legal implications at present.
- **Information Technology (IT)** – there are no IT implications at present.
- **Property** – No comments.
- **Sustainability** – No comments.
- **Other** – No comments.

Risk Management

38. In compliance with the Council's Risk Management Strategy the main risk that has been identified in this report could lead to the inability to meet the council's objectives (Strategic).
39. Measured in terms of impact and likelihood, the risk score for the recommendation is less than 16 and thus at this point the risks need only to be monitored as they do not provide a real threat to the achievement of the objectives of this report.

Recommendations

40. That the Advisory Panel advise the Executive Members to:
 - i. Note this report (including, at Annex A, the brief history of endeavours to re-open local rail stations in the York area);
 - ii. Endorse the approach to the further development of tram-train schemes as set out in paragraphs 31 – 34, and
 - iii. Support the development of future light railway/tram train systems for the City of York.

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Report Approved

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Wards Affected:

All

Acomb, Holgate, Poppleton, Micklegate, Woodthorpe & Dringhouses, Rural West York, Huntington & New Earswick, Haxby & Wigginton and Strensall (directly by potential services running through wards)
All others by potential travel benefits of new services if introduced

For further information please contact the author of the report

Background Papers

'Harrogate Line Route Strategy' for the York-Harrogate-Leeds rail line. *Faber Maunsell*

'Harrogate Line Development, Delivery Plan' - *ARUP*

Leeds City Region Transport Vision and Investment Plan *Leeds City Region*

Leeds City region Tram-Train Feasibility Study – *ARUP*

Annexes

Annex A - History of endeavours to secure the introduction of new stations in York

Annex B - Indicative costs of York related Train-train strategy element