

Transport for the North

Rail North Committee Meeting

Item 7.0

Subject: Rolling Stock Update

Author: Tom Davidson, Transport Planner

Sponsor: David Hoggarth, Strategic Rail Director

Meeting Date: Thursday 20th June 2019

1. Purpose of the Report:

- 1.1 The Committee is asked to note the position of the two train operators with regard to the delivery of new rolling stock. The report also summarises work on alternative fuel trains in the North.

2. Executive Summary:

- 2.1 Northern have stated that they intend to start operating the first of their new trains from the 1st July 2019. They are projecting that by the end of 2019 almost 70% of the original order of new trains will be in service.
- 2.2 TransPennine Express have stated that the first Nova 3 trains are now expected to start entering customer service on an initial basis during this summer. All 44 of their new five carriage trains will be introduced for customer service in 2019.
- 2.3 The updates supplied by the train operators are provided in Sections 3 and 4 below. Section 5 summarises the position regarding business case development for alternative fuel rolling stock.

3. Northern: New Rolling Stock Update

- 3.1 Northern intend to start operating the first of our new trains from the 1st July 2019. These will initially operate through Cumbria, Lancashire, Greater Manchester and West Yorkshire and South Yorkshire.
- 3.2 This initial tranche represents nine in passenger service, with a further ten units supporting crew and maintenance staff training against our initial order of ninety-eight. This is comprised of 12x 4-car electric

- multiples units (EMU), 25x 2-car diesel units (DMU) and 61x 3-car DMU / EMU sets. (A further 3x 3-car DMU order will follow on).
- 3.3 There are currently thirty-four new units in the country; the balance of which are going through either pre-acceptance compliance testing by manufacturers CAF and our engineers across our network or being initially assembled into units and tested at the Edge Hill facility in Liverpool.
- 3.4 In order to ensure customers benefit from improved rolling stock as quickly as possible, we will continue to introduce our new fleet in the coming months as they become available after acceptance, by 'dropping-in' further tranches of units outside main timetable change dates as crew training and vehicle testing progresses.
- 3.5 At this time, we are projecting that by the end of the year almost 70% of our original order will be in service, but we are of course striving to better that. Whilst we are disappointed this is not as expansive a deployment as initially envisaged, we are confident that the majority of customers will be benefitting from new and modernised trains with our programme for internal and external vehicle refresh around 80% complete by this stage.
- 3.6 The delay in full new train rollout is primarily due to the manufacturing process and we have been actively working with CAF since early 2017 to investigate and exploit opportunities to accelerate the build and recover lost production to support delivery and commissioning plans.
- 3.7 Mitigations that were introduced included a second production line in Northern Spain and a further manufacturing line in Newport, South Wales. Whilst these were in a large part successful, the publicised coupler problems at the start of 2019 had a regrettable further adverse impact on train delivery and testing.
- 3.8 This does mean that introducing all the stock by the end of this year is now an increasingly compressed activity and introduces practical challenges in completing the testing and acceptance of the remaining trains; in addition to training over 3000 colleagues who will crew and maintain them.
- 3.9 However, our December 2019 timetable (which is not dependant on any significant infrastructure upgrades) will offer customers further increased services and more journey opportunities.
- 3.10 We will continue to work with partners to plan how best we can utilise our available fleet and continue to explore any short-term options that may come available to supplement our fleet from outside of Northern.

4. TransPennine Express: New Rolling Stock Update

- 4.1 Over the coming months TransPennine Express will introduce 220 new carriages into its fleet, and investment of more than £500m providing additional seats and capacity across its network.
- 4.2 Three fleets of five carriage trains are being introduced: Nova 3 which will operate between Liverpool Lime Street and Scarborough as well as between Manchester Airport to Middlesbrough; Nova 2 which will operate on the West Coast Main Line between Manchester Airport and Glasgow/Edinburgh as well as between Liverpool Lime Street and Glasgow; and Nova 1 which will operate on the East Coast Main Line between Edinburgh/Newcastle and Liverpool Lime Street/Manchester Airport via Leeds and Manchester.
- 4.3 As new trains enter into service existing trains (Class 185s) will increasingly operate as six carriage trains, doubling seats provided on core corridors including Cleethorpes/Sheffield to Manchester Airport and Manchester Piccadilly to Hull.

Nova 3

- 4.4 13 five carriage Nova 3 trains hauled by class 68 locomotives will be introduced for customer service this year. Each train will have 291 seats (261 in standard and 30 in first class) which is 110 more seats than a class 185 train. All of these trains have now been built by Construcciones y Auxiliar de Ferrocarriles (CAF) and two of these trains have been accepted by TransPennine Express following the completion of a comprehensive approvals process, with more scheduled for acceptance in the next few weeks. As previously advised deliveries of these trains to TransPennine Express has been delayed as a consequence of technical issues which the manufacturer has been working to resolve.
- 4.5 Based on the progress made, the first Nova 3 trains are now expected to start entering customer service on an initial basis during this summer, with a progressive roll-out of the remainder of the fleet planned over the rest of the year.

Nova 2

- 4.6 12 five carriage Nova 2 electric trains will be introduced for customer service this year. Each train will have 286 seats (264 in standard and 22 in first class) which is 84 more than a class 350 train. All of these trains have now been built by Construcciones y Auxiliar de Ferrocarriles (CAF) and there are three of these trains in the UK for the comprehensive approvals process. This process is expected to be concluded this summer 2019, when the first trains will be delivered to TransPennine Express for staff training with introduction into customer service expected to take place this autumn 2019.

Nova 1

- 4.7 19 five carriage Nova 1 bi-mode trains will be introduced for customer service this year. Each train will have 342 seats (318 in standard and 24 in first class) which is 161 more than a class 185 train. Construction is largely complete by Hitachi Rail Europe and there are six of these trains in the UK for the comprehensive approvals process. This process is expected to be concluded this month, when the first trains will be delivered to TransPennine Express for staff training with introduction into customer service expected to take place starting in autumn 2019 between Liverpool Lime Street, Manchester and Newcastle, extending to Edinburgh Waverley at the December 2019 timetable change.

5. Alternative Fuel Rolling Stock

- 5.1 TfN's Strategic Transport Plan aims to support the UK in meeting commitments under the Climate Change Act 2008 by collaborating with Partners and stakeholders to deliver a low carbon Northern transport network, including a zero-carbon public transport network, by 2050. TfN supports:

- The removal of diesel trains from Britain's railways by 2040.
- Delivery of a low carbon Northern transport network, including a zero-carbon public transport network, by 2050.
- Delivery of the Birmingham Declaration on zero emission vehicles in meeting the goals of the Paris Agreement.
- The development of a joined-up plan between Government and TfN's Partners for strategic electric vehicle charging infrastructure to enable the mass adoption of electric vehicles.

- 5.2 TfN will be developing a 'Pathway to 2050' which will set out a clear programme of phased introduction and implementation of key policies and measures through the interventions promoted, and their projected contribution to meeting carbon budget targets, through to 2050. Greener and cleaner rolling stock will be one of a number of key investments that can support this goal.

- 5.3 The text below summarises the background and current status of two projects being developed to assess the potential of alternative fuel rolling stock.

Hydrogen Trains – Tees Valley

- 5.4 The Tees Valley rail network comprises of a number of rail services centred on Middlesbrough and radiating out to Darlington, Bishop Auckland, Whitby, Redcar, Saltburn, Stockton, Hartlepool and Newcastle. The network is currently diesel operated, only touching the electrified East Coast Main Line (ECML) at Darlington and Newcastle.

- 5.5 Hydrogen technology is now sufficiently developed to permit its application to railway traction, with some small schemes already in operation in other parts of the world. However, it has not yet been applied on a sufficiently large scale to be properly tested and its performance assessed.
- 5.6 The Tees Valley network is an ideal location for the deployment of an operational fleet of Hydrogen trains, being compact, yet offering a variety of urban, inter-urban and rural routes. In addition, Teesside is home to a significant chemicals industry, giving it a strong skills base in the field of manufacturing, handling and use of gases such as hydrogen.
- 5.7 In response to the Secretary of State's request for the development of alternative fuel rolling stock solutions, Arriva Rail North (ARN) have developed a proposal for the introduction of Hydrogen Multiple Unit trains (HMUs) to serve the Tees Valley from potentially December 2022 (subject to DfT investment approvals).
- 5.8 Hydrogen powered traction can offer environmental benefits and this project represents an innovative opportunity to evaluate the technology and fuel supply potential on a significant regional network, whilst aiding its development as a future replacement for diesel traction.
- 5.9 It is considered that the application of hydrogen technology, to meet the service requirements of Tees Valley, is technically and operationally viable. In the longer term, it is anticipated that this project will also provide learning for potential applications both across the North and the UK rail industry as a whole.
- 5.10 However, at present, the Renewable Transport Fuel Obligation (RTFO) policy does not offer support for fuels for use in fuel cell trains and changing this to bring fuel cell trains within scope of the legislation would require legislative amendment. It is recognised that hydrogen as a fuel is currently expensive in comparison with diesel fuel. However, in common with all new technologies, prices are expected to decrease as industry confidence and usage increase. Bringing fuel cell trains into the RTFO would help support this, an option which is currently being evaluated by the DfT Low Carbon Fuels Team.

Battery Trains – Windermere

- 5.11 Arriva Rail North (ARN) have also developed a proposal for the introduction of Battery Electric Multiple Unit (BEMU) trains to serve the Windermere Branch, whilst also meeting the service requirements for 100 mph services on the electrified West Coast Main Line and handling the heavy passenger volumes carried in the Manchester area.

- 5.13 A potential entry in to service date from December 2022 (subject to receipt of DfT new investment approvals) has been suggested.
- 5.14 The proposal is aimed at providing a comprehensive solution that will work across ARN's Electric Multiple Unit (EMU) fleet and can accommodate the demanding gradient and stopping pattern between Oxenholme and Windermere. Essentially the BEMU units will operate under battery power between Oxenholme and Windermere and under wires to Manchester Airport and back.
- 5.15 This project represents a unique opportunity to gain the benefits of electric traction on a railway route running within an area of outstanding natural beauty without incurring the significant costs of electrification.
- 5.16 It is anticipated that this project will not only provide a solution for the Windermere Branch but also enable the learning from this application to determine the direction of future roll-out of battery trains and supporting infrastructure interventions.

Next Steps

- 5.17 There is currently no firmly allocated funding for these projects beyond the feasibility stage. They are subject to DfT's normal business case protocols to secure investment.
- 5.18 Further updates will be provided to the Committee as the projects progress. More detailed information can be provided on the alternative fuels plans. For example, rolling stock owners have offered to present to a future meeting of the Committee.

List of Background Documents:

There are no background papers to this report.

Required Considerations

Equalities:

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|-------------------------|--|----|
| Age | | No |
| Disability | | No |
| Gender Reassignment | | No |
| Pregnancy and Maternity | | No |
| Race | | No |
| Religion or Belief | | No |
| Sex | | No |
| Sexual Orientation | | No |

| Consideration | Comment | Responsible Officer | Director |
|----------------------|---|----------------------------|-----------------|
| Equalities | A full impact assessment has not been carried out because the report is for noting. | David Hoggarth | David Hoggarth |

Environment and Sustainability

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| | No |
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| Consideration | Comment | Responsible Officer | Director |
|---|---|----------------------------|-----------------|
| Sustainability / Environment – including considerations regarding Active Travel and Wellbeing | A full impact assessment has not been carried out because the report is for noting. | David Hoggarth | David Hoggarth |

Legal

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| | No |
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| Consideration | Comment | Responsible Officer | Director |
|----------------------|---|----------------------------|-----------------|
| Legal | There are no legal implications for Transport for the North – the rail franchise contract authority is the DfT. | David Hoggarth | David Hoggarth |

Finance

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| | No |
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| Consideration | Comment | Responsible Officer | Director |
|----------------------|--|----------------------------|-----------------|
| Finance | There are no financial implications for Transport for the North. | David Hoggarth | David Hoggarth |

Resource

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| | No |
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| Consideration | Comment | Responsible Officer | Director |
|----------------------|---|----------------------------|-----------------|
| Resource | There are no resource implications for Transport for the North. | David Hoggarth | David Hoggarth |

Risk

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| Consideration | Comment | Responsible Officer | Director |
|----------------------|------------------------------------|----------------------------|-----------------|
| Risk | A risk assessment is not required. | David Hoggarth | David Hoggarth |

Consultation

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| Consideration | Comment | Responsible Officer | Director |
|----------------------|--|----------------------------|-----------------|
| Consultation | A consultation has not been carried out because the report is for noting and discussion. | David Hoggarth | David Hoggarth |