

West Anglia Main Line

Progress Report

March 2009

1. Introduction

1.1 In March 2008, the Secretary of State for Transport¹ announced plans to develop a long-term strategy for the West Anglia Main Line (WAML), with the detailed work to be taken forward by Network Rail in conjunction with the railway industry, during the forthcoming railway Control Period 4, which runs from 2009 to 2014.

1.2 This is with a view to undertaking infrastructure improvements beyond 2014, should a suitable scheme be identified, and subject to affordability and value for money considerations.

1.3 To guide and support these plans, the Department for Transport has been assessing a range of potential improvements for both passenger and freight customers. DfT will shortly agree an output specification with Network Rail, to inform their detailed development work.

1.4 Before doing so, the Department wishes to report details of this assessment to WAML stakeholders and the rail industry. This report sets out the progress made since the Secretary of State's previous announcement. Section 2 sets out the context for this study. Section 3 describes the emerging findings from the Department's recent work. Section 4 sets out the next steps.

2. The route

2.1 The WAML runs from London Liverpool Street to Cambridge and Kings Lynn. There is a parallel route (the Southbury loop²) between north east London and Cheshunt, used for local suburban services, freight and diversions. In addition there are a number of important connecting lines to Stratford, Chingford, Enfield Town, Hertford East and Stansted Airport, as shown on the figure below.

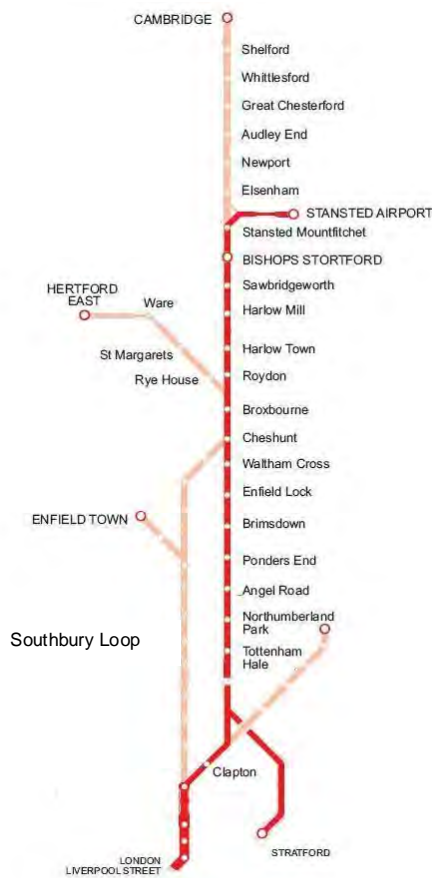
2.2 Train Operating Companies (TOCs) running services on the route are National Express East Anglia (NXEA), who run services into London Liverpool Street and Stratford, plus Arriva Cross Country, who operate trains between Stansted Airport and Birmingham. First Capital Connect (FCC) also operate services into Cambridge and Kings Lynn at the northern extent of the route.

2.3 Freight operators are important users of the route. Rail freight has experienced significant growth in recent years. The route is expected to play an increasing role in longer distance freight movements from the Thames ports to the north. Relevant Freight operators are DB Schenker (formerly EWS), First GB Railfreight and Freightliner, plus also Direct Rail Services (DRS).

¹ WMS entitled 'Long term road and rail capacity in the East of England', dated 3 March 2008.

² Stations from Liverpool Street via Seven Sisters and via Southbury to Cheshunt.

The West Anglia Main Line



The capacity challenge

2.4 Demand patterns are dominated by commuting to central London, but there are a number of other important markets, including growing demand at Docklands, Stansted Airport and Cambridge.

2.5 Passenger growth of around 30% has been experienced over the past ten years, and further increases are forecast in the longer term, due to housing and employment growth. The number of passengers at Stansted Airport using rail has been growing steadily. The airport already has the highest proportion of air passengers using public transport as part of their journey.

2.6 This growth is placing a strain on capacity on the route. The different requirements of these markets, also tend to lead to compromises in the way rail service are offered to passengers and rail freight.

2.7 To deal with this, the DfT and industry have been working together to bring forward significant improvements on the WAML. In 2007, DfT published its High Level Output Specification (HLOS)³ which defined the targets to be achieved in Control Period 4, 2009 to 2014. This anticipates additional demand growth on the route of 31%⁴.

2.8 Within the HLOS programme, DfT has confirmed plans for a significant investment in additional carriages to provide longer trains. The plan is that the additional capacity will provide for 12-car trains in the peak period on services between Liverpool Street and both Stansted Airport and Cambridge, plus carriages for longer trains in the peak period on services between Liverpool Street and Enfield Town, Cheshunt, Chingford and Hertford East.

2.9 Network Rail has begun work on the necessary infrastructure improvements on the route. In parallel, Train Operators will introduce the new carriages. The commercial negotiations between DfT and NXEA, and NXEA's procurement of the new trains, are progressing. If these are successfully concluded, then the additional carriages will be amongst the first introduced within the 1,300 additional vehicles committed nationwide for service before April 2014. The new carriages are expected to enter service on the WAML by 2012.

Longer term challenges

2.10 The Department recognises that there is likely to be a case for further investment on the route in the longer term, for example to:

- improve journey times and performance, which are affected by the need to operate services with a variety of stopping patterns;
- provide further capacity enhancements to deal with long term commuter growth, particularly in peak periods;
- meet the needs of potential long term demand for air travel at Stansted Airport, in terms of rising rail mode share, hours of operation, and rising capacity, including if plans for the expansion of the airport be approved and implemented;
- new and higher performing trains on all services;
- provide for a growing rail freight market;
- consider a more frequent service to stations in the lower Lea Valley area, where this represents value for money.

2.11 Network Rail leads planning and development work for the railway. Network Rail published its Route Utilisation Strategy (RUS)⁵ for the Greater Anglia network in 2007. This is an important part of the planning process and has helped shape the DfT's recent work on a long-term rail strategy, in terms of how these issues and opportunities might be dealt with.

³ White Paper 'The Future of Rail', July 2007.

⁴ Passenger km (pkm) growing from a forecast 1,561 million pkm in 2008/9 to 2,043 by 2013/14.

⁵ Network Rail Greater Anglia Route Utilisation Strategy (RUS), dated December 2007.

2.12 There are some notable challenges to overcome if longer term objectives are to be met. In particular there are three distinct and sometimes conflicting markets to cater for, namely inner suburban, outer commuter and leisure, and Stansted Airport traffic. In addition, route capacity within the existing timetable structure and mix of fast, semi-fast and stopping trains will become an increasing constraint. This is also affected by the configuration of two track lines, with at-grade junctions and inadequate provision for train service recovery in perturbation.

2.13 There are also a significant number of level crossings on the route. With more frequent trains, these would be closed to road traffic for longer periods. This already has an effect on the local environment and transport services in the vicinity of these crossings, so it is important that longer-term developments on the railway are considered in conjunction with communities adjacent to the railway, and which are served by it.

2.14 There has already been much consideration of longer-term solutions. These have, however, tended to be aimed at meeting individual objectives in relation to passenger growth. This has led to proposals that do not deal with the likely long term passenger and freight requirements of the West Anglia route network as a whole. In order to develop solutions that best balance and resolve potentially conflicting objectives, a holistic approach is necessary.

3. Progress on development of a long term strategy

3.1 The DfT has been examining the case for potential long term improvements to the overall train service, including options to deliver better performance, capacity, journey times and improved frequency of services. This work has sought to look at the requirements of all stakeholders and markets, including outer commuter, suburban markets, airport user and rail freight.

3.2 Work has taken account of the forecast demand growth, and the findings of work done by the industry to date, including the region's development plans and multi-modal studies, and Network Rail's RUS. This work has also been undertaken in conjunction with planning for the region's strategic road network, led by the Department and the Highways Agency.

3.3 Transport for London (TfL), which has responsibility for London Underground and London Overground, has also been consulted. TfL has published its own long term rail strategy covering part of the route⁶. One of TfL's policy objectives is to provide a regular 'turn up and go' service of four trains per hour for passengers at all stations within the Greater London Authority area. On this route this is relevant to the stations in the lower Lea Valley.

3.4 The DfT's work has also considered potential impact of developments at Stansted Airport. BAA has submitted plans⁷ for the expansion of its facilities which would, if approved, generate additional traffic on the route.

⁶ TfL's 'A Rail Strategy for London's future'.

⁷ The Generation 2 or 'G2' Planning Application.

Long-term objectives

3.5 From these and other drivers the DfT has considered the case for long term improvements, based on the following objectives for the route:

- to provide sufficient capacity for long term growth across all passenger markets;
- to provide sufficient capacity to enable the railway to support the potential expansion of Stansted Airport, including the provision of suitable train connections for early and late flights at the airport;
- to provide faster journey times between London and the longer distance commuter growth areas;
- to provide sufficient capacity for long term freight growth along the length of the route;
- to enable the railway to perform reliably and resiliently;
- to consider the case for an improved connectivity to stations in the lower Lea Valley.

3.6 The DfT has recently concluded its initial work, to test how these objectives might be delivered, in the context of a solution or solutions that would represent value for money from taxpayer's expenditure. This is intended to support future decisions on rail network investment priorities for the period beyond 2014, in accordance with the process set out in the DfT publication *Delivery a Sustainable Transport System (DaSTS)*, November 2008.

3.7 The work carried out by the Department during 2008 indicates that there is likely to be a business case for the investment in the period beyond 2014 to deliver further improvements to services, building on those already committed.

3.8 Significant improvements in journey times are possible. For example, a typical peak period journey between Liverpool Street and Cambridge could be reduced from 76 to 65 minutes. Journey times between Liverpool Street and Stansted Airport could be reduced from 52 to 37 minutes through a combination of fewer station stops and higher line speeds. These, and other journey time savings elsewhere, would offer improvement on today's service for a significant majority of WAML passengers.

3.9 There is also an opportunity to provide more frequent peak trains on key flows. For example, serving stations such as Cheshunt, Broxbourne, and Hertford East, plus more frequent stops at those stations south of Cambridge where significant spatial development is forecast over the long-term.

3.10 It is possible to meet the TfL policy objective for all stations within London to be served by four trains per hour. The Department's work, which has included information from TfL, indicates a potentially poor business case for this, as certain stations are very lightly used and future potential demand there does not appear to justify high investment levels. This will, however, be the subject of further business case and options testing in the next stage of strategy development.

3.11 The rail freight market can and should also be provided for. It is clear that a reliable freight path in either direction in the standard off-peak hour is both necessary and achievable. This is intended to be consistent with the strategy set out in detail in Network Rail’s RUS. More work will need to be done on freight requirements for the WAML in the next phase. This is with a view to developing an integrated solution for all adjacent routes, cognisant of the North-South freight study work currently being led by Network Rail.

3.12 Passengers using Stansted Airport are expected to benefit from improvements committed in the next few years, including new trains. A further opportunity exists in the longer term to provide for additional off-peak semi-fast services to connect to stations into Liverpool Street. Passengers could also benefit from earlier departures in the morning from Liverpool Street, and from Stansted to London later at night, to enable additional flights to have good train connections.

Indicative train service

3.13 To test the potential improvements described above in business case terms, the Department has outlined an indicative train service that could be operated on the upgraded route. This possible service is summarised as follows:

Cambridge – Liverpool Street	2 tph ⁸ (4 tph peak)
Stansted Express – Liverpool Street	4 tph (all day)
Stansted Airport – Liverpool Street (semi-fast)	2 tph (all day)
Northumberland Park – Stratford (– Richmond) ⁹	4 tph (all day)
Hertford East – Liverpool Street	2 tph (all day)
Hertford East – Stratford	2 tph (peak)
Peterborough – Cambridge – Stansted Airport	2 tph (all day)
Freight	1 tph (off peak)

Indicative infrastructure options

3.14 It is clear from the DfT’s assessment that, because of existing constraints on the route, long-term service improvements would need to be supported by a range of infrastructure enhancements. The Department’s study has identified that the scope of enhancements must be carefully optimised, and prioritised to deliver train service improvements in accordance with the need to achieve value for money in public expenditure. It is also important that any infrastructure is flexible to cope with a range of train service and demand scenarios that may occur over time.

3.15 Detailed infrastructure options that meet the long term objectives of the route would be brought forward by Network Rail as part of the detailed development work proposed in the period to 2014. Work undertaken so far has identified the following elements that have the potential to add the most significant benefits:

⁸ tph = trains per hour (each direction).
⁹ A shuttle link Northumberland Park-Tottenham Hale to Stratford, or London Overground’s North London Line extended from Stratford to Northumberland Park via Tottenham Hale.

- grade separation of Coppermill Junction, south of Tottenham Hale, to segregate the routes to Stratford and to Liverpool Street, and then unlock capacity and achieve performance benefits;
- four-tracking of the constrained stretch from Coppermill Junction through Tottenham Hale, plus significant alterations at Tottenham Hale station;
- possible improvements at Cheshunt to facilitate improved service resilience;
- an additional track from Tottenham Hale to Northumberland Park to permit the reversal of Stratford Shuttle/London Overground trains from Stratford;
- remodelling of the track layout at Broxbourne and the Hertford East branch junction, which is a key pinch-point on the route;
- line speed improvements to 100mph wherever practicable, to be the 'ruling train speed' along the route;
- removal of many road and footpath crossings, with alternative crossings provided;
- enhanced 'Access for All' (DDA compliant) footbridges and access, where stations are upgraded;
- a second tunnel on the Stansted Airport branch and platform capacity improvements at the airport station;
- signalling changes, to allow for extended hours of operation of services to Stansted Airport, without disruption to route maintenance requirements.

Four tracking options

3.16 Four tracking of part of the route is one component of a possible improvement strategy. In fact, the value of four tracking is potentially misunderstood. It is not a long-term solution on its own. It would not deliver significant improvements without a package of other interventions also being provided along the route, some of which are more important than the length of any four track section.

3.17 The Department has examined work undertaken by others on the possibility of a more extensive stretch of four tracking, to potentially as far north as Brimsdown or Broxbourne. Parts of this section of the route have a constrained layout, and would be particularly expensive and disruptive to four-track, adding relatively few benefits. For example, a more extensive four tracking of the lower Lea Valley would only assist links to a limited number of lightly used stations.

3.18 This may risk weakening the overall business case for improvements, and will require further detailed assessment, with a number of four-tracking options tested in the next stage. This will need to be based on a clear understanding of the train service benefits and value for money this provides given the cost to the taxpayer.

Level crossings

3.19 One of the most challenging features of the route is the presence of a number of level crossings, many of which carry significant volumes of road traffic. The combination of longer and more frequent trains, peak and off peak, would cause many level crossings to be closed to road traffic for long periods. Retention of the crossings would not, in itself, prevent enhanced train services operating, but the delays to other transport networks and in particular bus services could be significant.

3.20 It is expected that diversion of road traffic and/or bridging the railway to mitigate the impacts of level crossing closures will require changes to established routes across the railway for all road users, including buses. The impact of this, positive and negative have not been assessed at this stage, though estimated scheme costs include for crossing modification or replacement.

TfL policy objectives

3.21 The Department recognises that, whilst the emerging strategy greatly improves links between Tottenham Hale and Stratford, and services to Northumberland Park, it does not yet have the evidence from the business case and demand projections from TfL to support their policy objective of four trains per hour at stations from Angel Road to Waltham Cross in the off-peak period (Angel Road, Ponders End and Brimsdown in the peak period).

3.22 Current levels of patronage at these stations are low, and do not appear to justify the cost of additional four tracking to allow additional trains to call. Notwithstanding this, any long-term scheme brought forward should be compatible with the ability to provide four-tracks north of Northumberland Park at a later date, should it emerge that such investment is appropriate in the longer term.

3.23 The Department will work closely with TfL and Network Rail to establish whether there is a business case for meeting TfL's policy objective, in support of the long-term regeneration of the lower Lea Valley. This work will also need to examine whether there are other options to provide improved transport links to the communities in this corridor.

3.24 The DfT and Network Rail will also need to work with TfL to ensure that the proposed Masterplan for the re-development of the Tottenham Hale interchange is compatible with long-term needs of the route. Major improvements are likely to be needed there, including to provide for cross-platform interchange for WAML trains and a more frequent service to Stratford (four trains per hour, rising to six in the peaks) that will enhance links to the development around Stratford and Docklands.

Stansted Airport

3.25 The need to stimulate and accommodate further improvements in rail's market share, satisfactorily handle long term growth in demand at Stansted Airport, and to continue to provide an effective service for passengers to the airport, is a key objective for the route. The Department's work has shown that there may be a case for an enhanced level of service, building on the improvements committed in the short-term, especially for off-peak and extended late night/early morning services.

3.26 There is currently some uncertainty over the future ownership of the airport and on plans and timescales for expansion of the airport. This follows the recent decision by the Competition Commission¹⁰, and the delay to the start of the Generation 2 Planning Inquiry proposed in order to consider the findings of the Competition Commissions final report. The Department's initial work has, however, indicated a positive business case for improvements, even without further expansion beyond that already approved¹¹. There will, however, need to be further work undertaken to identify the optimum solution applicable with or without expansion, and not risk developing a solution which is predicated upon any one scenario.

Crossrail

3.27 In autumn 2008, Government approval for the Crossrail scheme was granted. The completion of Crossrail, scheduled for 2017, will have a significant effect on the Great Eastern Main Line, and on the capacity available into Liverpool Street station. It will affect demand patterns on the WAML. For example, there may be an increase in the numbers of passengers interchanging at Liverpool Street rather than at Tottenham Hale, to achieve faster and more convenient journeys to locations served by Crossrail, including Docklands, the West End and Heathrow.

3.28 Operationally there will also be the opportunity to revise the way platforms are used at Liverpool Street by different service groups, and to accommodate additional trains, once Crossrail has been opened. For the purposes of examining a possible WAML strategy in Control Period 5, no change to the use of Liverpool Street have been incorporated, though this will need to be addressed in the next stage to ensure that the strategy for the WAML is fully compatible with longer term options and opportunities that may be brought forward post Crossrail.

Indicative business case

3.29 The Department's initial assessment is based on the committed programme of enhancements as a base or starting point for considering longer-term opportunities. These HLOS improvements will provide a significant enhancement in the period 2009 to 2014. Only incremental benefits and costs beyond this point are considered for the longer term programme.

3.30 The forecasts of passenger demand is a key driver for improvements and are based on:

- regional demand growth, based on DfT's TEMPRO¹² forecasting suite, which incorporates the planned growth in areas such as Harlow and Uttlesford, as set out in the East of England Plan;
- population growth planned under the London Plan for 2016, using TfL's estimates for London and stations to Broxbourne and Hertford East;
- government's latest assumptions on GDP growth;

¹⁰ BAA airports market investigation report on the supply of airport services by BAA in the UK, dated 19 March 2009.

¹¹ High Court decision on the Generation 1 expansion, dated 13 March 2009.

¹² TEMPRO Version 5.4.

- DfT's recently published air passenger forecasts, tested with and without a second runway, assuming a third runway at Heathrow;
- the impact of planned developments on the national roads network and effect on demand induced or captured from other modes due to the proposed improvement in rail services.

3.31 The main WAML benefits identified are due to significant journey time improvements, increased capacity and thus reductions in the level of crowding, revenue gain, and wider societal effects, including benefits from modal shift.

3.32 Capital costs for the infrastructure enhancements have been estimated at Q4 2007 prices. These include all development, preparatory, statutory, management and construction costs, including an allowance for disruption.

3.33 The most significant costs arise from the grade separation at Coppermill, the rebuilding of a number of major stations such as Tottenham Hale, the four-tracking work, the second tunnel into Stansted Airport and replacement of a number of important road crossings. Operating costs assume improved rolling stock¹³, and include for the additional passenger train mileage operated.

3.34 For the option indicating the best value for money the Department has estimated the capital cost for the works described above as £930 million¹⁴. This would have a Benefit:Cost Ratio¹⁵ (BCR) of around 1.8:1. Costs would rise to well over £1 billion if four tracking were to be extended to Brimsdown, with the BCR falling to around 1.3:1. Costs assuming four tracking from Brimsdown to Broxbourne would be considerably higher, with the BCR reduced further.

3.35 Cost estimates exclude costs for the second Stansted Airport line tunnel and capacity improvements at Stansted Airport railway station. These are likely to be around £300m (again including optimism bias), but it has been assumed for these purposes that they would be funded by BAA or any new owner of the airport. This cost is included in the appraisal, in line with DfT appraisal guidance.

Summary

3.36 Whilst the Department's appraisal has indicated a medium¹⁶ value for money business case for improvements, this is by no means clear cut. It will be important, therefore, for industry wide development work led by Network Rail over the early part of Control Period 4, to test a number of train service and infrastructure options, to ensure that an optimum long-term strategy can be identified.

¹³ High density inner suburban trains and outer-suburban high performance trains.

¹⁴ Including 66% Optimism Bias, as per appraisal guidelines at the current level of scheme development.

¹⁵ Ratio of incremental benefit and cost compared to the committed CP4 HLOS programme.

¹⁶ Medium value for money (VfM) is where the Benefit to Cost Ratio (BCR) is between 1.5 and 2.0.

3.37 Options will need to balance costs and benefits, whilst focusing on meeting the overall objectives. Options that lose passenger benefits and revenues or which require significant infrastructure and therefore cost, can quickly turn the economics of the scheme from positive to negative and is clearly a key issue in relation to the extent of any four tracking work.

4. Next steps

4.1 The Department's work indicates there is an emerging business case for improvements in the long term, once the existing programme of capacity enhancements has been completed.

4.2 This work highlights a number of infrastructure options that could be brought forward along the route. It also shows that there are a number of ways this infrastructure could be used. It is important that further consideration is given to what interventions are most valuable, and offer flexibility to cope with a number of possible train service and timetable scenarios, to benefit of all passenger and freight customers.

4.3 Network Rail has some funding for the development of potential Control Period 5 schemes within its budgets for Control Period 4, and which could be used to progress the next phase of work on the WAML. The Department aims to agree a remit with Network Rail, in the near future, for Network Rail to progress work on design development and any necessary powers for the various potential enhancement packages.

4.4 The Department will then, by 2012, set out an output specification for potential enhancement options to be developed in more detail by Network Rail in the period to April 2014. This will follow the introduction of additional and new carriages to address the immediate capacity requirements.

4.5 No long term decisions on options for the WAML will be made until the necessary development work has been completed. Allowing for statutory processes, the earliest scheme delivery could start would be in Control Period 5 (2014-19).

4.6 More immediately, timescales proposed by DfT are that further work on strategy and option development will be undertaken by Network Rail in the first year of Control Period 4, 2009/10. More detailed assessment is envisaged in 2010/11. This work will consider what statutory powers may be required, and address long lead time elements such as new rolling stock and power upgrade requirements. This schedule is consistent with government and regulatory timescales for decisions on rail network investment priorities for the period beyond 2014, which are expected to be made in 2012.

4.7 All plans remain subject to further detailed development, assessment in terms of cost, affordability, and on proving an overall business case which demonstrates good value for money to the public purse.

4.8 It is not for the rail industry alone to undertake this work. Local stakeholders will have a part to play, as the benefits from any long term developments on the WAML will be felt largely by the communities along the route. It will be important for stakeholders to contribute fully, such as in relation to the provision of advice on spatial developments, integrated local transport, provision of car parks alongside station improvements, dealing with important changes to level crossings, plus also support in relation to grant and other potential funding options.

4.9 This is an important opportunity for stakeholders and industry to offer comments and feed back to the Department, and to inform its specification to Network Rail, ahead of more detailed development work on longer term WAML options.

4.10 If you have comments on this report and on plans for the long term development of the WAML route, then please email: westanglia.mainline@dft.gsi.gov.uk, or put these in writing to: WAML Strategy Sponsor, Department for Transport, Zone 4/29, Great Minster House, 76 Marsham Street, London SW1P 4DR.