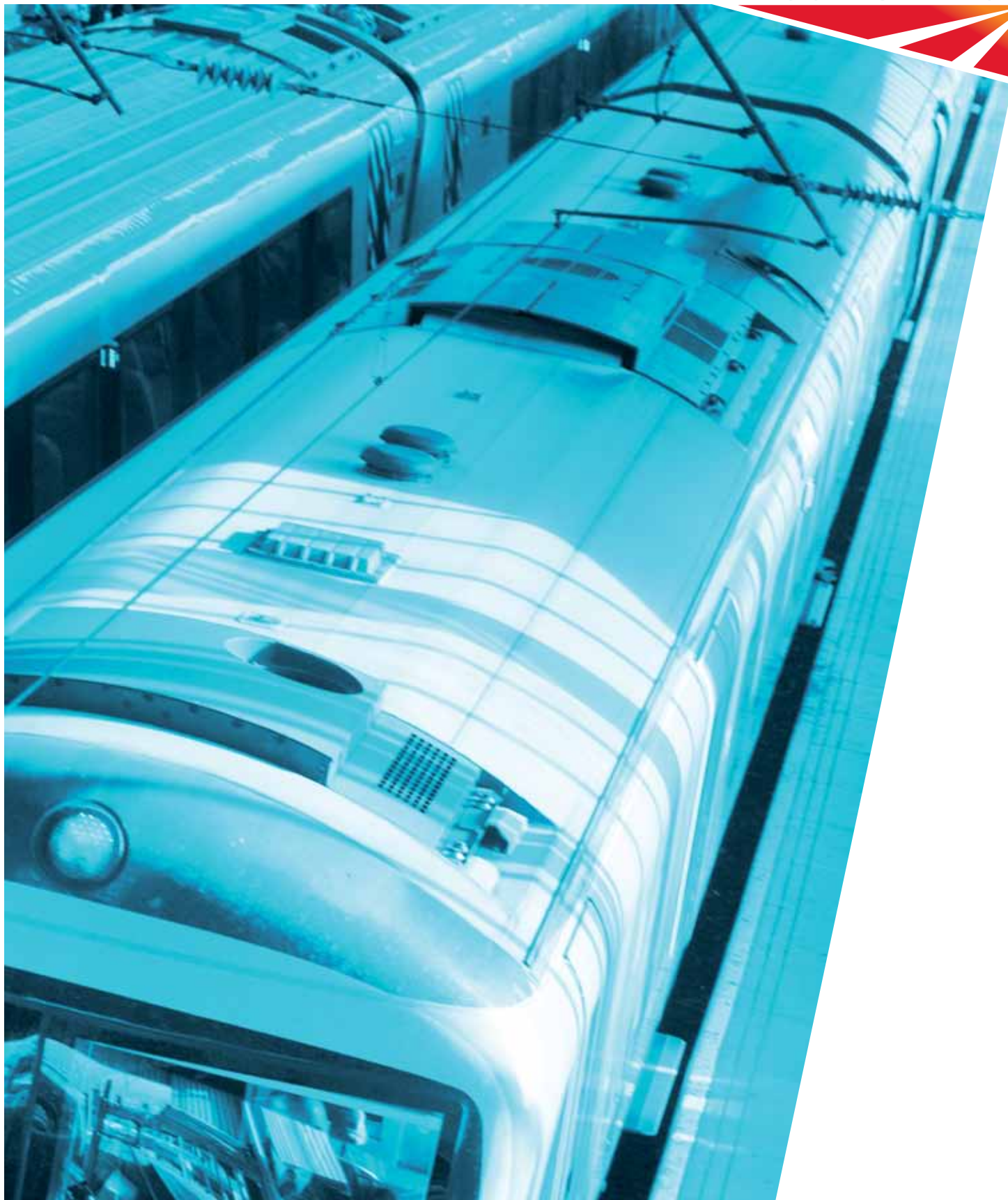


July 2011

# *West Coast Main Line*

## *Route Utilisation Strategy*

**NetworkRail**



# Executive Summary

## Introduction

*The West Coast Main Line Route Utilisation Strategy (RUS) is published following almost a decade of major investment to upgrade the route from London Euston to Scotland, culminating with the implementation of the December 2008 timetable. This resulted in a considerable increase in the number of long distance high speed services, freight paths and a significant reduction in journey times.*

This is the last of the first generation of geographic RUSs that Network Rail is required to publish under the Network Licence to establish a strategy for the most effective and efficient use of the network. The RUS has been formulated in consultation with industry colleagues through a Stakeholder Management Group (SMG), and is timed to inform the next High Level Output Specification (HLOS) by feeding into the rail industry's Initial Industry Plan in 2011.

additional rolling stock and an ongoing delivery plan for capability changes, examples of which include capacity and performance schemes in the Stafford area and the electrification of additional routes in the North West.

Also, concurrent with the RUS workstream, there are a number of franchises being renewed prior to 2014, the first of which is the InterCity West Coast (ICWC) franchise which is scheduled to be renewed during 2012.

The RUS is therefore intended to address issues from a base year of 2012, considering gaps and options in detail through to 2024, then to comment on a higher level strategy for the period beyond, including the impact of the Government's preferred high speed network.

The RUS uses a reference specification, provided by the Department for Transport (DfT) outlining the minimum level of service expected to be provided by the ICWC franchise using the resources of the long distance rolling stock fleet. This specification has been used as a basis for assessing gaps and resultant options in the RUS.

## Forecast changes in demand

### Passenger

Two growth scenarios have been used in the RUS to mitigate against the uncertainty arising in longer-term forecasts. Growth is forecast to continue in both scenarios, with a considerable increase in the long distance market. The London to Manchester market is forecast to be the fastest growing long distance London market with passenger demand predicted to increase by between 54 and 61 per cent between 2009/10 and 2024.

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## Scope and planning context

The study considers the geographic route from London Euston to Carstairs South Junction (Carstairs South Junction to Glasgow Central having been considered in the Scotland RUS and the Scotland RUS Generation Two), together with branch lines and diverging routes as shown in **Chapter 2**.

The RUS recognises that the recent significant infrastructure upgrade, the December 2008 timetable pattern and the recent recession have all had an impact on the level of passenger demand to the extent that the market is still developing. In addition, the periodic review process has established a defined and funded strategy for the current control period to 2014. This includes investment in

For non-London long distance markets, flows to and from Scotland are forecast to grow the fastest with services between Birmingham and Scotland predicted to grow by between 34 and 107 per cent depending on the scenario being used to 2024. There is also strong growth forecast for the shorter distance commuter flows to London from the stations on the Northampton to London Euston corridor.

These forecasts represent 'background' growth, ie growth due to factors external to the rail industry such as population, economic growth, fuel prices and road congestion. They do not include further growth that may be stimulated by improvements in the quality of service offered to passengers.

### Freight

Freight forecasts were produced for 2019 and 2030 as part of the Strategic Freight Network (SFN). Freight demand is forecast to grow on the route which is driven by expansion of the container market. A contributing factor to the growth in container traffic is the continuing development of freight facilities in the North West and the West Midlands. Coal flows are forecast to decrease as coal fired power stations close.

### Gaps and options

The SMG identified seven generic gaps between the capabilities of the infrastructure in the baseline year of 2012, the services assumed to be operating on it and the forecast demand for passenger and freight services that would be required by the end of the RUS period. The generic gaps identified are:

- on-train capacity
- freight capacity/capability
- journey times
- regional links
- reactionary delay
- network availability
- station passenger handling capacity.

Options were generated against each gap. Those considered to address reactionary delay, network availability and station passenger handling capacity are considered below. The options leading to RUS recommendations to address on-train capacity, journey times, regional links and freight capacity and capability are summarised in the RUS strategy.

### Reactionary delay

Analysis of the route since the implementation of the December 2008 timetable shows that, despite an initial period of poor performance, there has been a steady rise in performance and reliability. Stakeholders agreed that the

levels of reactionary delay were not at a level requiring strategic intervention, but recommend that improvements in performance continue to be achieved with particular focus given to the long distance service groups between London, Birmingham, Manchester and Scotland.

### Network Availability

Stakeholders advised that the levels of weekend access did not meet their requirements to operate a consistent level of service. It was agreed that the improvements detailed in Network Rail's Control Period 4 (CP4) Network Availability Plan are a step towards Seven Day Railway operation.

### Station passenger handling capacity

Stakeholders identified two stations on the route where significant levels of platform and concourse crowding occur, although these generally relate to the layout of information, announcements and retail activity which are not issues that geographic RUSs would generally consider. The Network RUS: Stations Draft for Consultation, published in May 2011, considers a toolkit of options to address crowding issues at stations.

### Committed interventions

2012 is the baseline year for this RUS, and an overview of the committed interventions is included here. The committed interventions deliver, either in full or in part, many of the baseline assumptions on which the analysis for the longer term has been based.

### Franchising

The franchise for the Long Distance High Speed (LDHS) services to and from London is scheduled to be renewed in 2012. The franchise for the long distance services between Manchester Airport and Scotland also runs to 2012 with a potential extension of up to five years.

### Infrastructure

There are no specific major infrastructure schemes recommended by this RUS, however there are numerous schemes over the route that are being undertaken to improve junction capacity and journey time improvements (via linespeed increases) as part of the normal development processes.



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There are also schemes outlined in Network Rail's CP4 Delivery Plan which are key to helping address future demand. These include:

- platform lengthening for longer Class 390 trains
- West Coast Main Line (WCML) power supply upgrade
- Bletchley remodelling delivering 12-car length slow line platforms and a 775-metre bi-directional freight loop
- Stafford Area Improvement Project providing grade separation of the junction at Norton Bridge
- electrification of routes in the North West between Manchester and Liverpool, Manchester and Blackpool and between Liverpool and Wigan
- the Budget announcement of 23 March 2011 including funding for the Ordsall Chord and other associated infrastructure works in the Manchester area to be implemented by December 2016.

### Passenger train services

The reference specification used for analysis in the RUS assumes that the three inter-peak London Euston to Lancaster trains are extended to Glasgow Central forming an hourly service between London and Scotland and that the North West electrification scheme will facilitate the provision of electric trains on the Manchester Airport to Scotland services.

### Rolling stock

The RUS assumes that the additional Class 390 vehicles will have been delivered and be in service by 2012 and that the three-car Class 185 units are replaced with four-car Electric Multiple Units (EMUs) under the rolling stock cascade for the North West electrification. These four-car units have yet to be procured and may be specified as being capable of operating at 110mph. This would assist with timetabling north of Preston as it would reduce the speed differential between passenger services.



## **RUS strategy (2012–2024)**

This period of the strategy centres on the gaps identified by the RUS and presents the interventions recommended to alleviate them.

### **Passenger train services**

Despite the recent high levels of investment in infrastructure and increases in rolling stock during CP4, crowding is evident on some services and is forecast to grow significantly worse throughout the period to 2024.

Crowding issues are most acute for commuter and longer-distance services between Northampton, Milton Keynes Central and London Euston. Analysis shows there is a business case for an additional 44 vehicles to be provided (including 28 vehicles for train lengthening in both peaks) by 2024. The busiest existing trains

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with eight-car formation in the three-hour peaks should be lengthened to 12-car formations where operationally feasible to do so and this should be progressively introduced as rolling stock becomes available.

The RUS has identified one timetable slot in the morning high-peak hour and two timetable slots in the evening three-hour peak (one in the high-peak and one in the second shoulder-peak) that could be utilised for additional services on this corridor. In the current timetable structure these services would have to be operated using 125mph Enhanced Permissible Speed rolling stock and be no more than eight cars in length due to platform constraints at London Euston. However, no suitable commuter rolling stock is currently or likely to be available that meets these criteria. There may be the opportunity to provide additional paths using 110mph rolling stock if the timetable on the corridor was restructured. This should be considered for implementation as part of future timetable developments.

By 2024, if implemented, these proposed interventions reduce the numbers of passengers expected to be standing during the morning and evening three-hour peaks by 3,500 which will still leave 5,300 passengers standing. Of these passengers, around 34 per cent are expected to stand for more than 20 minutes.

The recommendations of this RUS aims to provide as much capacity as possible in the medium term, however the RUS has been unable to fully address the peak crowding gap.

There is a significant peak capacity gap on Milton Keynes Central to East Croydon services between Watford Junction and Clapham Junction during the three-hour peak. The option to lengthen these services from four to eight-cars has been developed in the London and South East RUS and is recommended for implementation as soon as rolling stock becomes available.

The RUS notes that crowding on these services is exacerbated by an uneven interval timetable frequency and there is a high level of suppressed demand on the route which will require additional capacity. The RUS recommends that the service frequency is increased to two trains per hour during the peak hours. However, this can only be achieved following additional dual voltage rolling stock becoming available upon completion of the Thameslink programme and the associated timetable rewrite of services on the West London Line and south thereof.

The increase in Class 390 rolling stock in CP4 can accommodate the majority of the anticipated growth in demand for LDHS services, to or from London Euston for much of the RUS period. However, analysis shows that by 2024 there will be significantly more services than today that are at or near capacity.

As with all operations it is firstly recommended that the longest train sets are deployed to the busiest services. The strategy to alleviate the remaining crowding is focused on optimising the rolling stock to provide capacity for an additional hourly off-peak service between London Euston and the North West and two options are recommended for further development.

The first option reduces the number of stops in the London Euston to Glasgow Central services in the off-peak hours and uses capacity identified in the fleet to run an additional hourly service from London Euston to the North West with a calling pattern to suit demand and compensate for the loss of stops from the Glasgow Central service.

The second option increases the frequency of services between London Euston and Manchester Piccadilly to four trains per hour on an even frequency, providing significant additional capacity to the busiest LDHS services on the route. This option is better able to meet the capacity gap.

As well as addressing crowding, the business cases for the two options are strengthened significantly by the reduction in journey times between London Euston, Preston and Glasgow Central in the case of the first option and generalised journey times between London Euston and Manchester Piccadilly in the second.

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Analysis conducted since the publication of the Draft for Consultation has demonstrated that the first option creates further conflicts in the timetable which cannot be resolved in the current timetable structure without significantly worsening anticipated journey times. The second cannot be accommodated without a timetable recast. It is therefore recommended that the options are considered by the Industry Timetable Working Group, led by Network Rail, which will be developing the future West Coast Main Line timetable, with the first iteration commencing in December 2013.

There is overcrowding on the LDHS services between Birmingham and Scotland at present and the existing crowding is forecast to become more severe during the period to 2024. The RUS recommends that in the short term the allocation of the rolling stock fleet should be optimised to operate the nine-car Class 390 rolling stock on the most crowded services between Birmingham New Street and Edinburgh Waverley, but notes that should this not be possible there is a case for lengthening a number of services on this route. As demand grows, an additional 16 vehicles will be required and it is proposed that consideration

be given to procuring vehicles which will allow the Class 221 trains currently utilised to become capable of being electrically or diesel operated.

Analysis of the Manchester Airport to Edinburgh Waverley services highlights crowding issues throughout Fridays and at weekends. The RUS recommends that services are lengthened to six-car formations using eight additional vehicles. Future growth levels need to be carefully monitored and if predicted growth materialises in line with the higher demand forecasts used in this strategy then services will need to be lengthened to eight-car formations, using 16 vehicles. Development of the Manchester Airport to Scotland services to provide a consistent hourly timetable structure is also recommended.

To improve the journey time between Birmingham and Manchester, the slowest of the long distance interurban services between these cities could be diverted to run from Stafford to Manchester Piccadilly via Crewe and Wilmslow. This has a high value for money case but further analysis since publication of the Draft for Consultation has shown that the anticipated journey time savings cannot be realised within the existing timetable structure.



This option should be further considered in the timetable development process.

The introduction of the December 2008 timetable severed a number of regional links that were previously served by direct rail services. The RUS has considered the case for addressing these gaps, including extending the existing interurban service between London Euston and Crewe to Liverpool Lime Street via Runcorn by diverting the service away from the Stoke-on-Trent corridor. This option has a good business case but would remove all services from Stone. Therefore it cannot be implemented until further timetable and business case work has been undertaken to replace capacity on the Stoke-on-Trent corridor.

The RUS has also highlighted overcrowding issues on the Derby to Crewe service and recommends that the busiest services are lengthened to two vehicles.

### Freight

The assessment of capacity to accommodate freight growth based on the Strategic Freight Network (SFN) 2019 and 2030 forecasts found that there is sufficient capacity for the additional timetable slots required (expressed as train paths per day).

The freight forecasts used make a number of assumptions regarding routeing, six-day operation and 640m train lengths. These assumptions are not currently funded but are based on establishing the market potential, whilst noting that the longer-term aspiration of freight operators is to run 775m trains. These assumptions are critical to the outcomes of the RUS freight capacity analysis.

North of Preston, analysis has shown that it will be possible to accommodate the majority of freight services running with heavier payloads than today alongside the options for changes to the passenger services contained in this strategy by altering the loops used (and additional looping). However, the majority of the loops along the route are not long enough to accommodate 640m trains and therefore interventions would be required to mitigate this as demand develops and train lengths increase.

The main constraining locations include the summits at Shap and Beattock in both directions. The extended running times for heavier trains can be partially or wholly offset by using more powerful traction which would reduce the amount of looping required. The type of traction used on freight services makes a considerable difference to freight journey times as a result of the steep topography on the route. This has a consequent effect on overall capacity as the speed differential between freight and passenger services widens. Conversion of freight services to electric traction would benefit

both end to end journey times for freight and the amount of available capacity for both freight and passenger services.

However, for this to be a viable proposition consideration needs to be given to the linking of freight terminals to the electrified network, along with further infill electrification to allow electric operation from origin to destination as changing traction type en-route is costly both economically and in terms of overall journey times.

The established Network RUS: Electrification Strategy also considers the case for further electrification of the network and this RUS supports that strategy.

Critical to any infrastructure solution is the timetable structure that is assumed to be in operation. Therefore, further work is being undertaken to look at alternative scenarios to those outlined above. This includes the impact of running 775m freight trains and what the effects of new passenger services may be following the introduction of high speed services. This work is being led by the SFN and work completed in both the Draft for Consultation and this RUS has informed the analysis. Any interventions found to be necessary north of Preston will then be appraised to determine whether there is a value for money case to undertake any work.

### Long term (beyond 2024)

As previously identified, the crowding issues worsen to 2024. Whilst there is the potential to run a small number of additional fast commuter services during the peak and extra LDHS services in the inter-peak, the WCML is then effectively full, particularly at the south end of the route. The lack of capacity will become even more acute beyond 2024 as demand continues to grow. The most effective and best value for money way to create additional capacity will be through building a new line.

The RUS, therefore, supports the development of the proposed new high speed line, initially between London and the West Midlands and then onwards to Manchester and beyond. The objectives included in the announcements about both the New Lines Programme and the high speed line explicitly include the creation of capacity on the WCML for both commuter and freight operations by switching the majority of LDHS services to the new infrastructure. The formal public consultation on the Government's proposed high speed strategy closes on 29 July 2011.

It is important that the opportunities available as a consequence of the capacity created by the preferred Government strategy for a high speed network are identified and continually reviewed as development of the new line progresses.