

# *Better Connections*

## *Options for the integration of High Speed 2*

**NetworkRail**



*July 2013*



<b>Contents</b>	<b>Page</b>
1. <i>Executive Summary</i>	4
2. <i>Introduction</i>	7
3. <i>Purpose</i>	8
4. <i>Methodology</i>	9
5. <i>Potential Approaches to Released Capacity</i>	10
5.1 <i>Do Minimum Approach</i>	10
5.2 <i>Incremental Approach</i>	10
5.3 <i>Integrated Connectivity Approach</i>	13
6. <i>Stakeholder Engagement</i>	15
6.1 <i>Approach</i>	15
6.2 <i>Workshops</i>	15
7. <i>Looking Ahead</i>	17



# Foreword

Over the last decade the number of journeys made by rail has increased by almost 50 % and there are over a million more trains running every year. This means that the busiest parts of the network are at capacity at peak times and our biggest stations are busier than Heathrow. But demand is still increasing. By 2020 another 400 million rail journeys will be made every year.

We have done our best to respond to increasing demand. We have worked hard to maximise the use of remaining capacity and, in some places, we have squeezed every last incremental improvement out of what we've got. As demand continues to grow, this becomes harder and in some places impossible.

That is why we need High Speed 2. It will deliver much-needed extra capacity on the busiest rail lines and help boost economic growth by transforming connectivity between our biggest cities.

The railway plays a vital role in the economic life of Britain. Railways don't just move people and freight, they generate and spread prosperity by opening up new markets for businesses, creating jobs and contributing to sustainable economic growth.

High Speed 2 provides an opportunity to fundamentally reshape our railway. It is a chance to stop playing catch-up on capacity and instead to look at how the rail network could deliver a step-change improvement towards key national

goals - economic growth, reduced carbon emissions and an improved quality of life for communities and individuals.

This study is part of a wider programme that looks at how the high speed and existing lines might work together as a single network. Focusing on the second phase of High Speed 2, which runs north from Birmingham, it sets out different approaches to its integration.

These approaches range from keeping the train services on existing lines broadly the same to a more holistic concept where all future services are planned to complement and work in conjunction with High Speed 2.

The first phase of the new line, between London and Birmingham, will free up much-needed capacity, particularly for commuter services, and the options for using this capacity were set out in a report we published with Passenger Focus in 2012, 'Future Priorities for the West Coast Main Line'.

This study, which will inform our long term planning process and on which we welcome comments, will be followed by more detailed assessments of how to maximise the benefits of the new high speed network.

**Paul Plummer**  
Group Strategy Director  
Network Rail

# 1. Executive summary

High Speed 2 (HS2) provides an unparalleled opportunity to improve connectivity and increase capacity on Britain's railway. Network Rail does not see HS2 as a separate line, but rather as part of a reshaped national network.

The Command Paper, "High Speed Rail, Investing in Britain's Future. Phase Two: The Route to Leeds, Manchester and Beyond"<sup>1</sup>, asked Network Rail to advise the Government on options for the future use of the existing rail network once Phase Two of High Speed 2 is operational.

Network Rail has conducted a series of internal and external workshops to determine capacity released by HS2 on the existing network. Using the latest information available, the workshops considered options on how this capacity could be used.

This work has concluded that there are three broad approaches that could be taken to determine how services could be run on the existing network and HS2 using any released capacity. These are:

## Do Minimum Approach

The Do Minimum Approach broadly maintains the 2032 train services that exist before HS2 Phase Two becomes operational (i.e. effectively minimal changes are made with the introduction of HS2 Phase Two). The capacity released by HS2 Phase One between London and the West Midlands will already have been used to increase London suburban peak services and reduce journey times between London and key commuter stations.

### Considerations

- The approach may not make optimum use of additional network capacity to provide increased services for commuter, inter-regional and freight travel as long distance fast services would continue to constrain capacity.
- The approach could be considered to offer increased choice to long distance passengers and reduced crowding on some long distance services, but not necessarily for commuter or regional services.

### Findings

This option could be implemented but would not provide the overall level of benefits that the other approaches could potentially deliver.

## Incremental Approach

The Incremental Approach identifies services on the existing network which are replicated to a greater or lesser extent by the new HS2 lines. An assessment of the transfer of passengers from the existing network to the high speed rail lines then allows for capacity released to be replaced aligning as far as practical with the market study conditional outputs. In most circumstances this would substitute long distance, fast services with inter-urban connectivity improvements or additional commuting capacity.

This approach has been explored for the West Coast Main Line (WCML), Midland Main Line (MML) and East Coast Main Line (ECML) in some detail, and shows that on WCML and ECML there could be complete train paths released due to duplicated services.

Nonetheless, on the MML there could be a transfer of passengers and as such there is a level of capacity released on all routes. This has the potential to provide a number of new journey opportunities and supports increased freight paths. The final service patterns would be considered as part of Network Rail's Long Term Planning Process (LTPP) and determined through the franchise processes.

### Considerations

- The transfer of passengers from the existing network to HS2 will be dependent on a number of factors such as journey time reduction, fares, ease of interchange and the ability to make onward connections.
- We have assumed that the level of fares on HS2 Phase Two would be the same on average as trains on the existing network in line with the Government's assumptions (as described in "Fares on Long Distance Rail and HS2 London to West Midlands"<sup>2</sup>).

1 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69738/hs2-phase-two-command-paper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69738/hs2-phase-two-command-paper.pdf)

2 [http://hs2ltd.files.wordpress.com/2011/05/fares-long-distance-rail\\_0.pdf](http://hs2ltd.files.wordpress.com/2011/05/fares-long-distance-rail_0.pdf)

## **Findings**

Several new journey opportunity options have been identified using capacity released by HS2. Some examples are:

- Additional services could be provided between Birmingham, Wolverhampton and Warrington stopping at one or more of the following intermediate locations: Sandwell and Dudley, Wolverhampton, Penkridge, Stafford, Crewe, Hartford, Winsford and Warrington Bank Quay.
- Additional services could be provided between the South Coast to Manchester stopping at one or more of the following intermediate locations: Southampton, Winchester, Reading, Oxford, Milton Keynes, Stoke, Macclesfield and Stockport.
- Additional services could be provided between Cambridge and Leeds stopping at one or more of the following intermediate locations: Doncaster, Retford, Newark, Grantham,

Peterborough, March and Ely (and could also be extended to Stansted Airport or London Liverpool Street).

- Additional freight services could be provided in a number of instances.
- Additional services could be provided between London King's Cross and Peterborough stopping at one or more of the following intermediate locations: Finsbury Park, Stevenage and Huntingdon.

In principle, the long distance fast services may to a large degree transfer from the existing network to HS2. This released capacity could then be used to improve inter-urban connectivity for places such as Wolverhampton, Sandwell and Dudley, Coventry, Rugby and Milton Keynes, which are not directly served by HS2.





### Integrated Connectivity Approach

An integrated, holistic approach to the introduction of HS2 Phase Two seeks to plan the services on the existing network to work in conjunction with HS2. The aspiration is that where appropriate, long distance high speed services would be provided by HS2, with services on the existing network set up in a feeder pattern to provide frequent and reliable connectivity between surrounding areas and the HS2 station (hub). This would lead to a step change in how passengers would view using long distance services, and allow additional opportunities to improve cross country services and the offering of services to other markets that cannot be currently served due to the capacity constraints on the existing network.

### Considerations

- For this approach to work, the cost of travel on HS2 needs to be comparable with that of the existing network, thereby allowing an unconstrained transfer of passengers to take place from the existing network to HS2.
- Ease of interchange between HS2 and existing services is another key element in the viability of this approach. Interchanging must be made simple, quick and effortless to make this option attractive to passengers.

- The concept of the overall 'end to end' journey time has to be considered; the local (feeder) services need to be reliable and integrated transport planning is required. Further analysis of this potential option will be undertaken at a later date.

### Findings

This approach could potentially offer benefits to passengers from HS2 and the existing rail network by fully integrating them to operate seamlessly. Released capacity on the existing network and a degree of restructuring of the timetable would allow the existing network to feed into HS2 hubs, provide onward connectivity either by rail or other modes and to deliver new journey opportunities.

### Further work

Network Rail is seeking feedback on the findings of this report and will also be conducting a separate, more detailed analysis of the potential options, which will be published in due course.



## 2. Introduction

Network Rail sees HS2 as a major benefit to rail travel in the UK and key to meeting forecast demand. Network Rail considers HS2 as presenting an unparalleled opportunity to fundamentally reshape the entire national network, delivering benefits of increased capacity and connectivity to rail customers.

The New Lines Study<sup>3</sup> conducted by Network Rail in 2009 concluded that a new railway line, in addition to the existing West Coast Main Line (WCML), Midland Main Line (MML) and East Coast Main Line (ECML), was the only viable way to provide the additional rail capacity which is essential to meet forecast growth. Without a new line, the existing WCML would become full by the mid 2020s. Despite all the investment committed, and the additional capacity that this has provided, and will deliver in the future, parts of the existing network will be unable to accommodate the forecast demand leading to significant overcrowding; in the peak, passengers may not even be able to board a train on some routes. Further, there will be no opportunity to accommodate the expected levels of increased freight traffic on the network.

The opening of both phases of HS2 will result in many traditional long distance journeys between London, the Midlands and the North being delivered by high speed trains predominantly on dedicated high speed rail lines. As such there will

be opportunities to improve the offered services for passengers and freight on the existing<sup>4</sup> network utilising capacity released through the provision of the high speed line and its services.

This study has considered how the existing network and the completed HS2 line could be integrated and services modified on the existing network to provide improved journey opportunities and connectivity as well as additional freight capacity.

In support of the Long Term Planning Process (LTPP), Network Rail has recently released draft Market Studies for consultation to external stakeholders. These draft Market Studies identify potential future growth in rail demand and conditional outputs for passenger and freight markets. The conditional outputs are desired outcomes for rail provision and whilst not currently constrained by cost/deliverability, they will be subject to the Government's affordability and value for money tests. The introduction of HS2 and the capacity released across the existing network provides the potential to meet a number of these conditional outputs and wherever practical this study seeks to align the desired outputs with use of potential released capacity.

This study presents Network Rail's initial findings on how capacity released from a fully operational HS2 could be used.



3 New Lines Study 2009 - <http://www.networkrail.co.uk/newlinesprogramme/>

4 "Existing" refers to the existing rail network (as of 2032) excluding High Speed Two, and will be used as a means to differentiate between the existing network and the new high speed rail lines in this context throughout the document.

# 3. Purpose

## Purpose of the study

By providing a new dedicated high speed line for much of the long distance existing inter-city rail traffic, HS2 offers the means for improving services, reducing journey times and increasing connectivity through integration with the existing network. This could enable the introduction of additional commuter, regional or freight services, making better use of the southern part of the existing network from 2026 and with wider reaching improvements once Phase Two is delivered in 2032. Understanding how this released capacity can best be utilised will be a key factor in realising the potential benefits of HS2 to the existing network.

The Command Paper, “High Speed Rail, Investing in Britain’s Future. Phase Two: The Route to Leeds, Manchester and Beyond”, asked Network Rail to advise the Government on options for the future use of the existing rail network after Phase Two of HS2 has been constructed and is operational.

This study has built on the analysis previously carried out by Network Rail and Passenger Focus<sup>5</sup> for Phase One and provides a set of approaches and options for how the existing rail network capacity could be used for Phase Two. This work will be used as part of the public consultation for HS2 Phase Two and to inform future decisions on the use of network capacity in areas and routes where rail usage will be affected by HS2.

## Consideration

The primary released capacity considered in this study is the section of the existing network (mainly WCML, MML and ECML) where HS2 Phase Two is geographically located (i.e. between Birmingham and Manchester/Leeds). It should be noted that there is little or no released capacity north of Manchester (Golborne Junction), between Crewe and Liverpool, or Leeds (Church Fenton) as the HS2 classic compatible services will run on the existing network. A separate study is planned to analyse these effects in more detail.



5 'future priorities for the west coast main line', network rail and passenger focus, January 2012  
[http://www.Networkrail.co.uk/uploadedfiles/networkrailcouk/contents/improvements/new\\_lines/documents/futureprioritieswestcoastmainline.Pdf](http://www.Networkrail.co.uk/uploadedfiles/networkrailcouk/contents/improvements/new_lines/documents/futureprioritieswestcoastmainline.Pdf)



# 4. Methodology

## Methodology of the study

This study has been undertaken at a relatively high level, conducted through a series of workshops with input from internal and external stakeholders building on the previous work undertaken by Network Rail and Passenger Focus.

In undertaking this study Network Rail has:

- Consulted with local, regional and industry stakeholders.
- Considered the outputs of the Long Term Planning Process (LTPP).
- Analysed predicted future passenger and freight flows and how future capacity might be best used to meet this forecast demand.
- Incorporated the committed schemes being delivered by 2019.
- Produced a set of indicative options for the possible future use of the rail network taking into account the operational, capacity and capability constraints of the network and future demand patterns following the introduction of HS2 Phase Two<sup>6</sup>.

In producing the set of options and outputs, Network Rail has not undertaken detailed analysis of service patterns or modelling as it is not required at this stage of development. The options have also not been assessed against business cases as this will follow through the LTPP.

## Long Term Planning Process

The LTPP is designed to enable the industry to take account and advantage of strategic investment being made in Britain's rail network. The LTPP builds on work completed in the preceding Route Utilisation Strategy process, and will enable an informed view to be taken of the role of rail in the economic life of Britain. Planning over 30 years clearly involves uncertainties. The process is designed to take into account strategic change in the economy, and Britain's approach to social and environmental responsibility, so that the rail industry can respond to change over the long term life of the assets used to operate the rail network.

There are three key elements to the LTPP:

- **Market Studies.** These will articulate strategic goals for each particular market sector, forecast future rail demand, and develop conditional outputs. Four Market Studies will be published:

- Long Distance passenger
- London & South East passenger
- Regional Urban passenger and
- Freight
- **Cross-boundary analysis,** which will consider options for services that run across multiple routes.
- **Route Studies,** which will develop options for future services and for development of the rail network.

The LTPP will provide a key part of the evidence base for future investment in the rail network, and will be the method that will be used to define the actual services that will be run in 2032.

## Identifying future market needs

The market studies from the LTPP have been the primary basis for understanding future passenger and freight demand and aspirations.

As the LTPP process has only recently commenced and will not be completed until 2015/16, the draft market studies could only inform the indicative options for the different approaches in this study rather than provide a quantified assessment of the transfer of passengers from the existing network to HS2.

The study seeks to identify potential options for improved connectivity, new or increased journey opportunities and freight usage as a result of released capacity. These options will need to be further examined as part of the LTPP and will feed into future Route Studies, which may identify other options.

## Passenger Focus

Passenger Focus conducted a detailed survey and report as part of the joint Released Capacity Study for Phase One (Future Priorities for the West Coast Main Line), which showed that increased capacity, more frequent, faster and reliable services were key requirements (of those that are applicable to this study) for passengers, and also that passengers prefer not to change trains. These findings were substantiated by further information provided by Passenger Focus (research material and their attendance at a workshop), and have been incorporated in to this study.

6 It should be noted that not all the options can be used

# 5. Potential approaches to released capacity

The workshops identified three distinct approaches that could be taken:

- Do Minimum
- Incremental change to the existing network
- Integrated connectivity

Each approach is described in the following sections.

## 5.1 Do Minimum Approach

The Do Minimum Approach broadly maintains the anticipated 2032 train services compared to before HS2 Phase Two becomes operational (i.e. effectively minimal changes are made to services on the existing network with the introduction of HS2 Phase Two).

Between London and the West Midlands, capacity released by HS2 Phase One will already have been used to increase the provision of London suburban peak services and reduce journey times between London and key commuter stations as described in the Future Priorities report.

With this approach, services from London to Manchester/Leeds and intermediate stations remain largely unchanged. They could be considered to offer an alternative choice to the HS2 service for long distance passengers. There would be the potential to adjust the frequency of some services and provide some improvements in connectivity from limited additional stops. In higher freight growth options, this approach may also be able to accommodate additional freight paths. As services are largely unchanged in this approach, it was not explored in detail.

Some of the long distance fast services running north of Manchester and Leeds will be replaced by HS2 classic compatible trains running on the existing network. This will be considered in more detail in a following study.

### Findings

With this approach, both HS2 and conventional long distance services would run in parallel, providing choice to the travelling public. The study determined that this approach could reduce overcrowding on the existing network due to a transfer of some passengers to high speed services and could provide the basis for delivering a more robust service.

However, the study also showed that there is a significant disadvantage of this approach, in that there would be limited opportunities to change any existing service patterns, thereby maintaining the current constraints that limit the ability to improve commuter, cross country, inter-regional and freight services as considered to be necessary in 2032.

## 5.2 Incremental Approach

The Incremental Approach identifies services on the existing network which are replicated to a greater or lesser extent by the new HS2 lines. An assessment of the transfer of passengers from the existing network to the high speed rail lines then allows for capacity released to be replaced, aligned as far as practical with the market study conditional outputs. In most circumstances this would substitute long distance, fast services with inter-urban connectivity improvements or additional commuting capacity.

This approach has been explored for the West Coast Main Line (WCML), Midland Main Line (MML) and East Coast Main Line (ECML) in some detail, and showed that on the WCML and MML there could be complete train paths released due to duplicated services.

Nonetheless, on the MML there could be a transfer of passengers and as such there is a level of capacity released on all routes. This has the potential to provide a number of new journey opportunities and supports increased freight paths. The final service patterns would be considered as part of Network Rail's LTPP and determined through the franchising process.

This option has been explored in some detail and with stakeholders for WCML, MML & ECML:

### Considerations

- The transfer of passengers from the existing network to HS2 services will be dependent on a number of factors such as journey time reduction, fares, ease of interchange and the ability to make onward connections.
- We have assumed that the level of fares on HS2 Phase Two would be the same on average as trains on the existing network in line with the Government's assumptions (as described in "Fares on Long Distance Rail and HS2 London to West Midlands").

A number of options for each of the respective routes were determined during the study, and a few examples are presented below (a full list is provided in Appendix 1). In each case, the transfer of services has been only considered for passenger services in order to maintain, and support freight service paths.

### **5.2.1 West Coast Main Line (WCML)**

As the West Coast Mail Line parallels HS2 from London to Birmingham and London to Manchester, this route has the most opportunities for released capacity. However, it should be noted that north of Manchester (Golborne Junction to Glasgow), HS2 classic compatible trains will replace a number of existing services and will need to be planned in the light of the network constraints on these routes in the same way as other passenger and freight services. A further study by Network Rail will consider the impact of these services.

In principle, long distance passengers may to a large degree transfer from the existing network to HS2. This released capacity could then be used to improve inter-urban connectivity. Improvements in inter-urban connectivity could address Wolverhampton, Sandwell and Dudley, Coventry, Rugby and Milton Keynes not being directly served by the high speed line.

#### **Capacity potentially released on WCML by HS2 Phase Two**

HS2 Phase Two can potentially release capacity on the WCML through:

- Diversion of HS2 Phase One services that join the network at Handsacre, to join further north (at Crewe, Golborne Junction), freeing up capacity on the WCML in the Stafford and Crewe areas, and between Crewe, Warrington and Golborne Junction.
- Inter-city services on the existing network between Handsacre, Stoke-on-Trent and Manchester Piccadilly predominantly being delivered by HS2.
- Birmingham to Manchester inter-city services from the Birmingham, Wolverhampton and Stafford corridor predominantly being delivered by HS2.

A few examples of possible options are described below with a more complete list of options provided in Appendix 1.

#### **Connectivity to HS2 services at Crewe and Stafford**

In line with a number of conditional outputs from the Market Study, an inter-urban (semi-fast) service at Stafford and Crewe from intermediate stations between Crewe and Warrington could be a potential option as Euston to Preston/Manchester via Wilmslow, Carlisle and Glasgow Central services will run on the dedicated HS2 line as far as Golborne

Junction. This new service for example could stop at Stafford, Crewe, Winsford, Hartford, Acton Bridge and Warrington, helping provide connectivity to HS2 at Crewe and better connect the local communities and region.

#### **South East Midlands to North West**

The London to Manchester service on HS2 Phase Two will duplicate the service currently being run on the existing network. As such, an opportunity arises with this released capacity to increase capacity and journey opportunities between South East Midlands and the North West, for example a long distance (fast) service such as Northampton - Rugby - Lichfield - Crewe - Wilmslow - Manchester.

#### **Midlands to North West**

The Birmingham to Scotland HS2 service on HS2 Phase Two will to a large degree replicate the service being run on the existing network. As such, an opportunity arises with this released capacity to increase capacity and journey opportunities between Midlands and the North West, for example an inter-urban (semi-fast) service such as Birmingham-Manchester/Chester/North Wales via Crewe.

### **5.2.2 Midland Main Line (MML)**

Unlike the WCML which parallels much of the HS2 Phase Two line, the HS2 service pattern does not directly replicate existing MML intermediate services. As such, the released capacity available on the MML is anticipated to be primarily increased on-train capacity due to the transfer of some long distance passengers from Derby, Nottingham and Sheffield to Meadowhall and/or East Midlands Hub (at Toton) HS2 stations. Whilst there will be some shift in long distance demand from the existing network to HS2, the requirement to maintain connectivity on the MML and North East to Midlands and the South cross country flows may justify the maintenance of a similar level of service as currently. This aspiration was strongly expressed at the stakeholder events, both by internal and external parties.

#### **South of Leicester**

A transfer of passengers from Sheffield (Meadowhall), Nottingham and to a lesser extent, Derby (both being served through the East Midlands Hub at Toton) will provide the potential to better serve the long distance outer suburban flows from Leicester and North Northamptonshire along with the London South East commuter flows into London during the peak.

The opportunity to provide additional calls at stations such as Kettering and Wellingborough and at Bedford, Luton, Luton Airport Parkway and St Albans is tempered by the need to deliver a faster, more frequent service from Leicester into London. These improvements can be delivered by extending some services from Bedford to Kettering.



## 5. Potential Approaches to Released Capacity

Infrastructure capacity limits the number of train paths available between Bedford-Kettering-Leicester and the conflicts between faster, more frequent services from Leicester and the North Northamptonshire commuter belt alongside LSE commuters will necessitate trade-offs to provide the optimum solution. This section of route is planned to be upgraded as part of MML Capacity and Electric Spine during Control Periods 5 (2014-19) and 6 (2019-24). Options are currently being developed to consider if these interventions would be sufficient to accommodate further passenger services on this section in line with the Market Studies.

One of the key considerations of this further work is the utilisation of all four lines south of Bedford and a review of the calling patterns for Thameslink services, particularly during peak periods. The likelihood is that a balance will be required between the future passenger service offer and freight growth through Leicester.

Government Strategy<sup>8</sup> to provide an 'Electric Spine' between Southampton – Oxford – Bedford and the North East over the next two control periods provides the opportunity to serve markets in the Thames Valley and South and West Country via Bedford. This could allow new journey opportunities and fast connections to be provided between cities such as Sheffield, Nottingham, Derby, Leicester, Oxford, Reading, Southampton, Swindon, Bristol and Cardiff via the MML. Splitting and joining at Leicester would provide the ability to serve these locations without the requirement for additional paths north of Leicester. This opportunity does not arise however, simply because of HS2 released capacity.

### ***North and East of Leicester***

The aspiration to maintain fast, frequent connections between Leicester and Nottingham, Sheffield and Derby along with catering for freight demand, again limits the potential opportunities for released capacity on this corridor. Within these corridors there are also significant passenger flows between Leicester - Loughborough and Loughborough - Nottingham which will need to be maintained or improved post HS2.

As a result of a potential reduction in passenger numbers on some of the Nottingham, Sheffield, and to a lesser extent Derby to London services there is the opportunity to extend some Sheffield/ Nottingham services to improve the frequency of trains to Leeds and to provide locations such as Barnsley with an inter-city type service. By routing some services via the Erewash valley this also improves connectivity from the growth towns on this corridor and also gives a direct interchange with HS2 at East Midlands Hub (Toton). However, the opportunity to provide fast services from cities north of Nottingham/Sheffield will need to be balanced against the opportunity to call at additional locations south of Leicester.

The LTPP Market Study conditional outputs seek improvements in the frequency of services on the east-west corridor between Leicester-Birmingham and Derby/Nottingham - Peterborough/Cambridge. This will be constrained at Leicester and on the Helpston – Syston – Leicester – Nuneaton corridor as a result of intermodal freight growth. As there is no significant released capacity on these corridors as a result of HS2 (with the exception of Birmingham New Street), any improvements to the future passenger service offer will need to be developed alongside likely freight growth through Leicester.

### ***Serving East Midlands Hub (Toton) and Sheffield (Meadowhall)***

As a result of the transfer of some long distance demand to HS2, there are opportunities for long distance trains on the existing network to call at East Midlands Hub (Toton) and Sheffield (Meadowhall). However, this opportunity will need to be carefully assessed as it could potentially increase the journey time of other users. MML stakeholders have expressed a strong preference against the option of diverting existing services if this would adversely impact journey times.

### ***5.2.3 East Coast Main Line (ECML)***

Whilst East Coast Main Line services are largely unaffected by HS2 Phase One, there are services that may be potentially replicated when Phase Two comes into operation especially London to Leeds. As with WCML, it should be noted that north of Leeds and York (to Newcastle), HS2 classic compatible trains will need to be planned in the light of the network constraints on these routes in the same way as other passenger and freight services.

A few examples of possible options are described below with a more complete list of options provided in Appendix 1.

### ***Liverpool to Newcastle and Newcastle to Edinburgh (via Hartlepool and Sunderland)***

The London to Edinburgh and London to Newcastle services on HS2 Phase Two will duplicate the conventional service on the existing ECML route. Whilst some such services will need to be retained to maintain connectivity, there is an opportunity to reduce the quantum of long distance services. The released capacity could be used to increase capacity and journey opportunities between Manchester and Newcastle, for example an inter-urban (semi-fast) service diverted via the Durham Coast. This is in line with conditional outputs from the Market Studies.

There is a further potential to deliver a service which enhances connectivity between Newcastle / Morpeth / Alnmouth / Berwick / Dunbar / Drem / Edinburgh and would support economic growth in the area.

### Doncaster to the North (freight)

The London to Leeds services on HS2 Phase Two will duplicate the service currently planned to run via Hambleton on the existing network. As such, an opportunity arises with this released capacity to increase freight capacity between Doncaster and Shaftholme / Hambleton / Temple Hirst.

### Findings

Several new journey opportunity options have been identified above for the WCML, MML and ECML routes (with a fuller, but not exhaustive list in Appendix 1), and in general all seek to increase commuter and inter-urban services, whilst maintaining some degree of current long distance connectivity on the existing network.

## 5.3 Integrated Connectivity Approach:

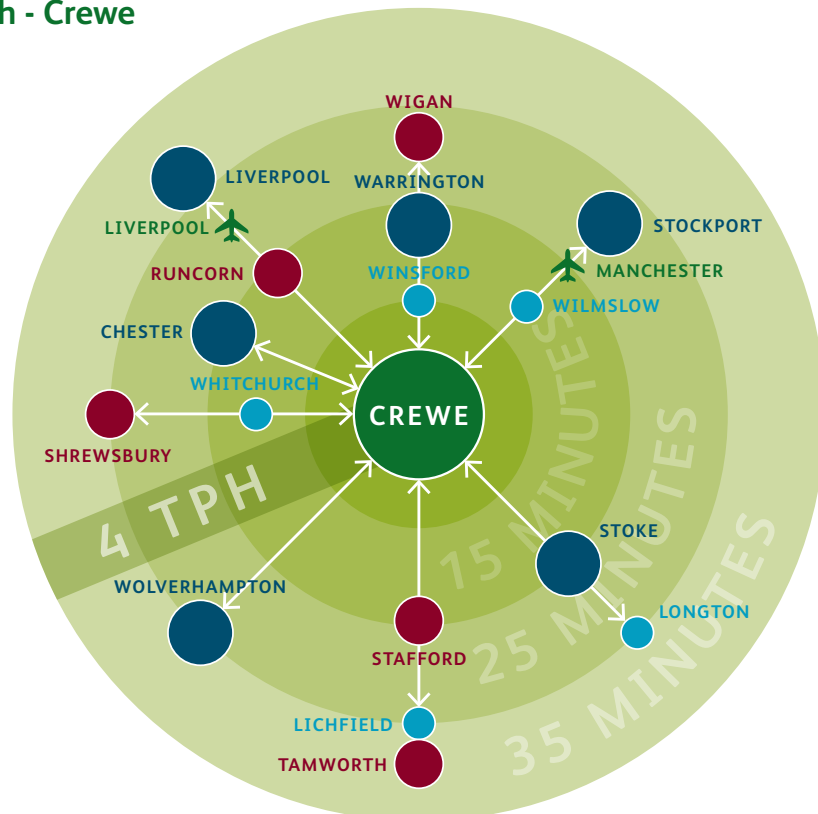
An integrated, holistic approach to the introduction of HS2 Phase Two would seek to plan the services on the existing network to work in conjunction with HS2. The aspiration is that where appropriate, long distance services would be provided by HS2, with services on the existing network set up in a feeder pattern to provide frequent and reliable connectivity

between surrounding areas and the HS2 station (hub). This would lead to a step change in how passengers would view using long distance services allowing additional opportunities to improve cross country services and offering new services and open up other markets that cannot be currently served due to capacity constraints.

### Considerations

- For this approach to work, the cost of travel on HS2 needs to be comparable with that of the existing network, thereby allowing an unconstrained transfer of passengers to take place from the existing network to HS2.
- Ease of interchange between HS2 and existing services is another key element in the viability of this approach. Interchanging must be made simple, quick and effortless to make this option attractive to passengers given the other benefits.
- The concept of the overall 'end to end' journey time has to be considered; the local (feeder) services need to be reliable and integrated transport planning is required. Further analysis of this potential option will be undertaken at a later date.

### Example of 'Hub and Spoke' approach - Crewe



## 5. Potential Approaches to Released Capacity

### *An Integrated (One Network) Approach*

The characteristics of the Integrated Connectivity Approach would be:

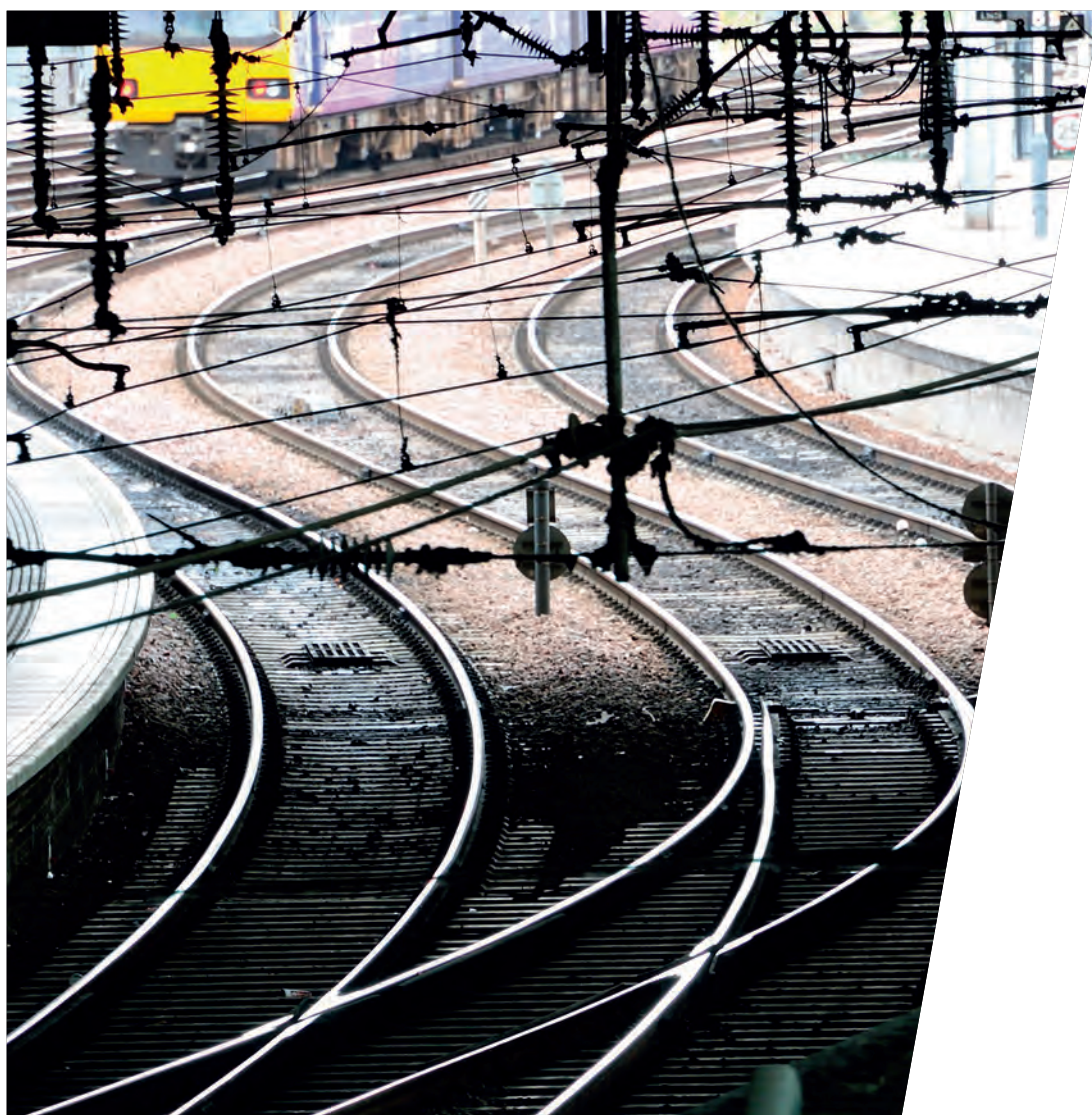
- a national network fully integrated with HS2.
- HS2 stations fed by the existing network wherever possible.
- long distance services principally delivered by the high speed lines.
- released capacity used to improve connectivity across the existing network.

The ideal is that where appropriate, HS2 is used as the primary means for long distance “hub to hub” services, and the existing network primarily for “hub and spoke” suburban, inter-urban and freight services (see example for Crewe).

### *Findings*

All stakeholders independently came to the conclusion that where possible, this “hub and spoke” style service was acceptable at appropriate locations could provide an alternative to how current services are run whilst also potentially creating new opportunities to improve inter-regional, commuter and freight services, whilst promoting a modal shift from road. This would be reliant on frequent feeder services, platform to platform interchanges and comparable costs.

Further work is required by all parties to determine how this approach could work in more detail, with HS2 and the existing network developed as a fully integrated transport system along with local highways, bus, shuttle and tram services.





# 6. Stakeholder engagement

## 6.1 Approach

In order to ensure that the report takes into account local aspirations for connectivity and journey opportunities, and that outputs align with regional growth plans, external stakeholders were invited to participate in workshops.

Local Authority Transport Officers and Chief Executives were identified and contacted for all County Councils, Borough Councils, District Councils and City Councils located directly along the Midland Main Line (MML), West Coast Main Line (WCML) and East Coast Main Line (ECML) routes as far as Leeds and Manchester. These councils were targeted as they would see the direct benefits of any released capacity.

Thirty one council representatives, participants from Passenger Transport Executives (PTEs) and Chambers of Commerce attended the workshops.

## 6.2 Workshops

### 6.2.1 Workshop structure

Three stakeholder workshops were held along the MML, WCML and ECML routes:

20th May 2013, Derby – focus on MML

21st May 2013, Manchester – focus on WCML

22nd May 2013, Leeds – focus on ECML

The objectives of the external consultation workshops were:

- For the stakeholders to independently identify any released capacity on the existing network as a result of HS2 Phase Two becoming operational.
- To capture and describe local aspirations for new rail journey opportunities to make best use of any released capacity on the existing network.

### 6.2.2 Key considerations and messages captured from external stakeholders

The stakeholders discussed a number of areas for consideration in order for HS2 to provide the most effective improvement to services for their respective areas. These broadly fell into the following areas:

- Services should not be worse than today.
- There is little released capacity on certain route sections to improve on current intermediate connectivity/journey times.
- HS2 and existing services require a similar fare structure for a full transfer of passengers to take place.
- Must have frequent and reliable connections for local services to connect with HS2 and existing inter-urban services.
- End to end journey times are key for interchanges to work effectively
- People prefer not to change trains to continue a journey however whole journey experience must be as seamless as possible with integrated transport ticketing.
- Integrated transport planning is needed to maximise overall benefits – this will require the integration of bus, tram, car and rail, particularly for longer distance journeys.

### 6.2.3 Possible journey opportunities identified by external stakeholders

A number of aspirational journey opportunities were identified on all routes at the external stakeholder workshops. Whilst Network Rail has not conducted any feasibility analysis at this stage, these journey opportunities options will be considered as part of the LTPP. A few examples are presented below (a full list is provided in Appendix 3)

#### **WCML**

- Aspiration to improve West Midlands-North West connectivity.
- Specific examples of local connectivity, such as Coventry-Leicester and Nottingham.
- Freight growth is important due to major expansion at Liverpool (Peel Ports).
- A new direct service from Liverpool to Glasgow/Edinburgh, Cardiff, Bristol and Milton Keynes.

#### **ECML**

- Improved London to Lincoln via Newark or Sleaford services.
- Increase freight paths and capacity to cater for additional domestic intermodal traffic.

- Direct service Grantham/Newark/Retford to Leeds to cater for commuter traffic heading north, and from/to London.
- Increased connectivity for London to Teeside/Scarborough/Skegness.

#### **MML**

- Re-establish Coventry - Leicester and Nottingham through services.
- Faster Nottingham and Leicester to Birmingham services.
- Provide new direct Lichfield to East Midlands services.
- Improve connectivity between Staffordshire and the East Midlands.

## 7. Looking ahead

Network Rail welcomes feedback on the approaches and associated options presented in this report. Responses can be submitted by e-mail to [highspeedrail@networkrail.co.uk](mailto:highspeedrail@networkrail.co.uk). Network Rail will be conducting a separate, more detailed analysis of the potential options which will be published in due course.

The outputs of this study will form an input to Network Rail's LTTP, which itself is subject to public consultation.





# Appendices

## Appendix 1 – Capacity released

It should be noted that not all journey opportunities may be delivered together. These offer different options for the potential use of capacity released.

<i>Route:</i>	<i>MML</i>			
HS2 Phase Two Service Releasing Capacity on Existing Service	Existing Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points) <sup>9</sup>
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Sheffield services	Extend services to Leeds	Long distance (fast and semi-fast)	Wakefield Westgate Doncaster Rotherham Central Sheffield Chesterfield Derby Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing Sheffield/ Nottingham - London St Pancras services	Additional calls south of Bedford all day (Bedford/Luton/LAP/ St Albans)	Long distance (fast and semi-fast)	Chesterfield Derby Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough Bedford Luton Luton Airport Parkway St Albans
London Euston - Leeds	On train peak capacity relief on existing Sheffield/ Nottingham - London St Pancras services	Additional calls south of Leicester all day (Kettering/ Wellingborough)	Long distance (fast and semi-fast)	Chesterfield Derby Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough

<sup>9</sup> Further work will be undertaken to consider the impacts of calling patterns on journey times and operations

Route:	MML			
HS2 Phase Two Service Releasing Capacity on Existing Service	Existing Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points) <sup>9</sup>
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Toton/Meadowhall HS2 stations (via Erewash)	Long distance (fast and semi-fast)	Dronfield Chesterfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham services	Extend services to Leeds	Long distance (fast and semi-fast)	Wakefield Westgate Sheffield Dronfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Extend services to Leeds via Barnsley	Long distance (fast and semi-fast)	Wakefield Kirkgate Barnsley Meadowhall Dronfield Chesterfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Bristol/Swindon/Oxford to Leicester/Nott/Sheffield (via East-West and splitting/joining at Leicester)	Inter-urban (semi-fast)	Bristol Swindon Oxford Bedford Leicester Loughborough Derby Chesterfield

9 Further work will be undertaken to consider the impacts of calling patterns on journey times and operations

## Appendix 1 – Capacity released

Route:	ECML			
HS2 Phase Two Service Releasing Capacity on Existing Service	Classic Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Cambridge to Leeds	Inter-urban	Leeds, Doncaster, Retford, Newark, Grantham, Peterborough, March, Ely, Cambridge (and then possibly to Stansted Airport or London Liverpool St)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Cambridge to Nottingham	Inter-urban	Nottingham, Grantham, Peterborough, March, Ely, Cambridge (and then possibly to Stansted Airport or London Liverpool St)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	London to Lincoln (via Spalding)	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Spalding, Lincoln
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	London to Peterborough	Suburban (fast)	London King's Cross, Finsbury Park, Stevenage, Huntingdon, Peterborough
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Leeds (and beyond) to York (and beyond) or Selby (and beyond)	Inter-urban or Suburban	n/a - could be all stations
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Freight between Doncaster and the north	Freight (intermodal)	n/a
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Hull (via Selby)...extended at least as far as Doncaster	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, Selby, Howden, Brough, Hull
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Middlesbrough or Sunderland... extended at least as far as York	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, York, Northallerton, then Hartlepool and Sunderland or Thornaby and Middlesbrough
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	Birmingham - Newcastle (via Hartlepool and Sunderland)	Inter-urban	Newcastle, Cramlington, Morpeth, Alnmouth, Berwick, Dunbar, Drem, Prestonpans, Edinburgh Waverley



Route:	ECML			
HS2 Phase Two Service Releasing Capacity on Existing Service	Classic Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	Liverpool - Newcastle (via Hartlepool and Sunderland)	Inter-urban	Birmingham New St, Tamworth, Burton, HS2 East Midlands, Chesterfield, Sheffield, HS2 South Yorkshire, Doncaster, York, Northallerton, Hartlepool, Sunderland, Newcastle
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Cleethorpes (via Lincoln or Scunthorpe) or Saltburn (via Yarm) or Sheffield (via Retford) or Scarborough or Skegness (via Grantham) or Nottingham (via Grantham) or Harrogate (via York) or Bradford etc	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Lincoln, Grimsby, Cleethorpes or London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, York, Northallerton, Thornaby, Middlesbrough, Redcar, Saltburn or London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Worksop, Sheffield etc.

## Appendix 1 – Capacity released

Route:	WCML			
HS2 Phase Two Service Releasing Capacity on Existing Service	Existing Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	South Coast - Manchester via EWR, WCML, Stoke	Cross Country (fast)	Southampton, Winchester, Reading, Oxford, Milton Keynes, Stoke, Macclesfield, Stockport
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	Birmingham - Walsall - Rugeley - Stoke - Manchester	Inter-urban (semi-fast)	Walsall, Cannock, Rugeley TV, Stoke, Macclesfield, Stockport
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	South East Midlands and Trent Valley to Manchester	Long distance (fast)	Milton Keynes, Nuneaton, Tamworth or Lichfield, Stafford, Crewe, Wilmslow
Euston - Liverpool	Euston to Crewe	Additional London to Crewe train per hour	Inter-urban (semi-fast)	Watford, Milton Keynes, Northampton, Rugby, Nuneaton, Lichfield, Stafford, Stoke
Euston - Glasgow	Euston to Wigan	Smaller stations served by half-hourly service	Inter-urban (semi-fast)	Watford, Milton Keynes, Rugby, Nuneaton, Tamworth, Lichfield TV, Rugeley TV, Stafford, Stone, Stoke, Kidsgrove
Birmingham-Scotland	Birmingham to Wigan	Birmingham-Wolverhampton-Crewe/Warrington semi-fast	Inter-urban (semi-fast)	Sandwell and Dudley, Wolverhampton, Penkridge, Stafford, Crewe, Hartford, Winsford, Warrington Bank Quay
Euston-Glasgow	Euston to Glasgow Central	Capacity on existing network is used for HS2 classic compatible train	Long distance (fast)	HS2 Phase Two service pattern stops at Carstairs.

## **Appendix 2– External stakeholder engagement attendees**

Bedford Borough Council  
Charnwood Borough Council  
Cheshire East Council  
Cheshire West and Chester Council  
City of York Council  
Coventry City Council  
Derbyshire County Council  
East Midlands Council  
Kettering Borough Council  
Leicester City Council  
Milton Keynes Council  
Newark and Sherwood District Council  
North East Lincolnshire Council  
North Yorkshire County Council  
Nottinghamshire County Council  
Liverpool Chamber Of Commerce  
Preston City Council  
Salford City Council  
Sandwell Metropolitan Borough Council  
South Yorkshire Passenger Transport Executive  
Stafford Borough Council  
Staffordshire County Council  
Stockport Metropolitan Borough Council  
Stoke-on-Trent City Council  
Transport for Greater Manchester  
Wakefield Metropolitan District Council  
Warrington Borough Council  
West Yorkshire Passenger Transport Executive  
Wyre Borough Council



### Appendix 3 – Journey opportunities identified by external stakeholders

Listed below are the aspirational journey opportunities and comments captured at the external stakeholder workshops. Whilst Network Rail has not conducted any feasibility analysis, these journey opportunities options will be considered as part of the LTPP.

#### WCML

- Capacity is released – from London to Manchester via Stoke and Crewe.
- Between Crewe and Liverpool, there is no released capacity.
- North of Golborne Jn there is little or no released capacity due to HS2 classic compatible trains running on the existing network.
- Aspiration for fast London connectivity.
- Fast, regular connectivity to regional cities (e.g. Birmingham, Liverpool, Manchester).
- Improved airport connectivity.
- Aspiration to improve West Midlands-North West connectivity.
- Development of cross-country flows.
- Specific examples of local connectivity, such as Coventry-Leicester and Nottingham.
- Freight growth is important due to major expansion at Liverpool (Peel Ports).
- A new direct service from Liverpool to Glasgow/Edinburgh, Cardiff, Bristol and Milton Keynes.
- Aspiration to retain current direct services between Carlisle, Cumbrian stations and London.
- Aspiration to connect south Manchester stations to HS2.
- Increase intermediate calling patterns.
- Rail connection from Stockport to Manchester Airport.
- Aspiration for increased level of connectivity at Bletchley between East-West Rail services and the WCML.

#### ECML

- Capacity is released between Leeds and London.
- Leeds to Cambridge, East Anglia, and Stansted Airport.
- Improved London to Lincoln via Newark or Sleaford services.
- Increase freight paths and capacity to cater for additional domestic intermodal traffic.
- Direct service Grantham/Newark/Retford to Leeds to cater for commuter traffic heading north, and from/to London.
- Increased connectivity for London to Teeside/Scarborough/Skegness.
- Improved services Peterborough to East Anglia.
- Improved service pattern and frequency London to Doncaster via Newark, potentially splitting to Lincoln and Hull (at Newark).
- Increased services London to Wakefield and Bradford.
- Increased connectivity at York.
- Finsbury Park to interchange to future Thameslink services.

## **MML**

- No released capacity south of Leicester, more capacity and timetable development opportunities.
- Improved East Midlands to North West services via Dore Curve.
- Re-establish Coventry - Leicester and Nottingham through services.
- Faster Nottingham and Leicester to Birmingham services.
- Provide new direct Lichfield to East Midlands services.
- Improve connectivity between Staffordshire and the East Midlands.
- Freight: intermodal growth on MML (new East Midlands terminal).
- Linking the existing MML network and its stations to HS2 at East Midlands Hub (Toton).
- Improved long distance services Nottingham to London, Derby to London, and Leicester to London.
- Improved frequency Bradford/Wakefield to Leeds utilising MML services.
- Aspiration for improved connectivity (potentially Derby and Nottingham heavy rail shuttle solution) at East Midlands Hub (Toton).
- Higher frequency and speed of services from London to Nottingham.
- Connecting south west Sheffield to Meadowhall.
- Better connections to/from Rotherham.
- Long distance Barnsley to London.
- More connections from Sheffield Meadowhall to the North East.
- More even spread of Loughborough/Leicester to London trains.
- Improved Nottingham to Kettering, Nottingham to Luton, Nottingham to Bedford services.
- Improved connectivity between Nottingham, Leicester & Northampton.
- Leicester south more stops at Bedford/Kettering
- Milton Keynes growth (size of Birmingham), Kettering, Wellingborough/Luton - additional services.
- Aspiration for a new Birmingham - Nottingham - Sheffield - Leeds service (cross country).
- Aspiration for increased capacity on Nottingham - Leeds and Nottingham to Liverpool services.
- Improved commuter services for Market Harborough to Leicester and London.





**Network Rail**

**Kings Place  
90 York Way  
London N1 9AG**

**Tel: 020 7557 8000**

**[www.networkrail.co.uk](http://www.networkrail.co.uk)**