Yorkshire and Humber

Route Utilisation Strategy
Draft for Consultation

Network Rail

Foreword

It is a pleasure to introduce the Route Utilisation Strategy (RUS) for Yorkshire and Humber. This RUS, like the previous ones, sets out the strategic vision for the future of a particular part of the rail network.

The network in Yorkshire and Humber is incredibly diverse, with heavily used services and fast-growing demand into the larger cities such as Leeds and Sheffield and across the Pennines to Manchester. There is a great deal of freight traffic, particularly to and from the ports. By contrast, some rural parts of the network are relatively lightly used.

A number of generic gaps have been identified. These include the need for additional capacity at peak hours for commuters into the cities and in the core Leeds to Manchester corridor; the need to improve inter-urban connectivity in certain places, including Bradford to Manchester; a requirement for greater freight capability in terms of capacity, loading gauge, route availability and diversionary routes; and a pressing need to address those parts of the infrastructure which can cause very significant delays.

This strategy recommends a number of options to be taken forward to address these gaps. Key to the strategy is addressing peak-hour passenger growth through train lengthening, supplemented by additional shuttle services at the times of heaviest demand and as new rolling stock becomes available, and to address the issues surrounding the presently limited freight capability.

The additional capacity provided at Leeds in the last five years has already been largely used up as a result of the growth in demand, and the RUS identifies the best solution for the next decade as being the introduction of more short distance cross-Leeds services in the peak. It proposes an additional service each hour between Leeds and Manchester, as well as some journey time improvements. Additionally, the proposal in the East Coast Main Line RUS to introduce a regular clock-face timetable should assist considerably in terms of both local and “east to west” services.

Further into the future we can expect to see further journey time improvements between Leeds and Manchester, between Leeds and Sheffield, between Sheffield and Manchester, and between Bradford and Manchester. A “standard hour” service of three fast trains per hour is proposed between Sheffield and Manchester. More freight paths will become available across the Yorkshire and Humber region to respond to the projected demand.

As with each of our Route Utilisation Strategies, this has been developed with the full input of the rest of the industry including train and freight operators. I thank them for their contribution to date. This is a draft for consultation so we are now seeking feedback and comments to support and inform our further analysis. Comments are invited before a deadline of 18 December 2008 and we are working towards publication of the final RUS for Yorkshire and Humber in Spring 2009.

Iain Coucher
Chief Executive

Executive summary

Introduction

This Yorkshire and Humber Route Utilisation Strategy (RUS) Draft for Consultation has followed the now well-established RUS process, with extensive stakeholder involvement. The RUS area is characterised by a diversity of both train service and stakeholders. On the one hand, there are heavily used inter-urban and urban services, and on the other, particularly in the eastern part of the area, relatively lightly used rural operations. Some parts of the network, such as Immingham, are very heavily used by freight traffic whilst others are solely passenger. Similarly, there is no one body responsible for transport planning such as Transport for London or Transport Scotland. Whilst the interests of the principal urban areas are represented by South Yorkshire Passenger Transport Executive (PTE) and West Yorkshire PTE (and to a lesser extent – in terms of geography rather than roles and responsibilities – Greater Manchester PTE), local authorities in the remainder of the area range from geographically very large shire counties such as North Yorkshire to quite compact unitary authorities. The National Park Authorities also have a role to play.

Scope and background

The Yorkshire and Humber RUS adjoins the infrastructure covered by the already-published East Coast Main Line, North West and Lancashire and Cumbria RUSs, and the East Midlands RUS currently in preparation. Several members of the rail industry Stakeholder Management Group (SMG) are common to some or all of these RUSs. There is a considerable interface with the North West RUS in the corridors from South and West Yorkshire to Greater Manchester.

The RUS covers broadly the area from Scarborough, Hull and Cleethorpes in the east to Newark, Chinley, Stalybridge, Rochdale and Skipton in the west, with the exception of the East Coast Main Line (ECML). It considers issues over an 11-year time period from 2008.

It has had issues passed to it from the North West RUS, the Lancashire and Cumbria RUS, the ECML RUS and the Freight RUS. The Network RUS currently under development will also address some issues such as electrification, which may impact on the RUS area.

Process

The RUS initially analyses the current capability and capacity of the railway in order to measure its ability to cater reliably for existing demand and thereby highlight any present-day “gaps”. Forecasts of predicted demand over the coming 11 years are then examined, and forecast future gaps identified. These forecasts take account of committed schemes which are known to be coming on stream in the next few years.

A set of options is then generated which could potentially bridge the known and predicted gaps. These options are then analysed in order to gain an understanding about which of them look to offer the most promising and value-for-money solutions.

At this stage, the RUS is put out to consultation in order for stakeholder responses to be sought and considered, and thereby for options to be refined. This consultation document has been prepared to support this part of the process. A finalised strategy will then be prepared and published in early 2009.

The Yorkshire and Humber RUS process is overseen and directed by the SMG, which

comprises representatives from the Train Operating Companies (TOCs), Freight Operating Companies (FOCs), the Department for Transport (DfT), Network Rail, Association of Train Operating Companies (ATOC), Passenger Focus, the PTEs and the Office of Rail Regulation (ORR) (as observers).

Gaps

This RUS identified six generic gaps:

Peak crowding and suppressed growth: Demand for rail commuting into Leeds, Sheffield and Manchester has been growing strongly in recent years with the result that many trains during the high peak are now close to or in a few cases beyond their nominal capacity. Significant overcrowding in peak hours is forecast if additional capacity is not provided.

Off-peak crowding and suppressed growth: Growth in demand for fast cross-Pennine services in the core Manchester – Leeds via Diggle corridor has been exceptionally strong in recent years and significant overcrowding is forecast such that demand management measures will be required if additional capacity is not provided. This prediction is based on growth predictions of an average of 3.6 percent per year and is dependent on a number of assumptions, in particular fares policy (RPI+1 percent is assumed, potentially conservative for unregulated fares) and external effects such as road congestion and motoring costs. There are only very limited opportunities to add services to meet this demand without restructuring the timetable.

Engineering access: On certain route sections, present methods of maintenance and renewal imply regular and lengthy possessions to keep the infrastructure fit for purpose. Increasingly, these do not fit comfortably with: demand for passenger services to operate later on weekday evenings and to start earlier on Sunday mornings; growing demand – especially on south Humberside – for 24-hour freight access; and a strong desire that passenger services in key corridors should as far as possible be free from bus substitution.

Regional links: There is a perception of poor connectivity in certain corridors. In particular, the service between Bradford and Manchester is slow by comparison with services between other major centres, as a result of numerous station stops combined with some low speed restrictions. The Sheffield – Manchester service is considered to be unattractive at two fast trains per hour when compared with the Leeds – Manchester frequency.

Freight capability: Parts of the RUS area have restrictive loading gauge clearance when compared with the Freight RUS aspirations for W9, W10 and W12. Such restrictions reduce the suitability of the lines affected for diversionary purposes, as well as hindering development of the intermodal container market. Identified key capacity pinch-points, such as the Hope Valley and Hare Park – South Kirkby, threaten to handicap future growth in the freight business. The absence of any loops of 775 metres within the RUS area limits the options for running the longest freight trains in line with FOC aspirations.

Reactionary delays: A number of key locations have been identified where very significant delays occur, notably Whitehall Junction, Sheffield station, Swinton junctions and Rochdale station. Congestion at these locations is related to the existence of rail infrastructure which has become increasingly inadequate and outdated as train services have grown in response to demand, whilst "quick win" solutions have almost invariably been taken up.

The immediate future: 2008 – 2009 (Control Period 3)

The most acute issue in the Yorkshire and Humber area is accommodating growth in peak-period passenger and freight traffic, although a number of performance issues are also apparent. With Control Period 3 (CP3) nearly at an end, the amount of work that can be undertaken within its remaining duration is very limited.

- Extension of the Leeds – Brighouse – Hebden Bridge stopping service to Rochdale to meet up with the Manchester stopping service in the December 2008 timetable will provide some additional capacity, as will the introduction of the new Nottingham – Leeds service
- The Hull Docks capacity enhancement scheme recently completed has provided significant additional capacity for freight traffic, as has the upgrade of the Barnetby – Gainsborough via Brigg line to a similar timescale
- An improved layout will be provided at Bradford Mill Lane, which will assist performance of the Calder Valley service. Higher-speed crossovers will be installed at Church Fenton allowing a small journey time and performance improvement for services in the York – Leeds corridor.

Short-term strategy 2009 – 2014 (Control Period 4)

Train services

The general approach will be that of progressive train lengthening and, on some corridors, providing additional peak shuttle services to relieve overcrowding, as additional rolling stock becomes available. At Leeds, the capacity provided by the recent remodelling has largely been used up already because of rapid growth. There is room to expand platform capacity on the north side of the station, which will suffice for Airedale, Wharfedale and Harrogate services, but expansion in the centre and south of the station would be very costly. The main solution proposed for the next decade is to introduce more short distance cross-Leeds services, using a new turnback facility to the east (near Micklefield). There will be some journey time improvements between Leeds and Manchester together with the introduction of an additional service each hour as part of a general recast of services on the Diggle route. Possible journey time improvements may be undertaken on other corridors.

Additional freight services will be accommodated in line with Freight RUS forecasts. Gauge enhancements in some key freight arteries will help intermodal growth. Introduction of a regular clock-face timetable on the ECML as proposed in the ECML RUS is also expected to assist considerably in terms of improving local and "east – west" services, but may require some infrastructure interventions to maximise the opportunities.

Infrastructure enhancements

The following schemes would be needed in order to deliver the changes to services detailed above:

- platform lengthening on a number of lines to accommodate increased train length [1]
- new and increased passenger train servicing and stabling facilities [1]
- new or improved turnback facilities at Horsforth, Keighley, Castleford, and in the Micklefield area
- some small-scale capacity enhancement in the Calder Valley
- at Leeds, additional bay platforms beside Platform 1 and Platform 17, subject to further development work
- various small-scale capacity enhancements between Leeds and Manchester, notably upgrading and lengthening of Diggle loop and upgrading of Marsden loop
- IEP infrastructure works [2]
- some W9/W10/W12 gauge enhancements, funded by Hutchison Ports (UK) Ltd (HPUK) and possibly others identified through the Strategic Freight Network mechanism
- remodelling of Shaftholme Junction [3]
- a fourth running line at York Holgate and associated enhancements [3]
- small-scale projects to enhance performance, provide marginal capacity improvements and/or journey time reductions.

Those schemes that are not funded specifically through the ORR Determination for Control Period 4 (CP4) or other funding sources will need to be deferred to Control Period 5 (CP5).

Medium-term strategy 2014 – 2019 (Control Period 5)

The following recommended changes to train services form the proposed strategy for CP5.

There would be continued train lengthening on local services, including additional shuttles introduced during CP4. A 43-minute journey time for Leeds – Manchester would become the norm for most fast services, with a further recast of services on the Diggle route to allow this to happen. A "standard hour" service of three fast trains per hour would be introduced between Sheffield and Manchester. Improved journey times would be introduced in the Leeds – Sheffield via Barnsley corridor, between Sheffield and Manchester and between Bradford and Manchester. Freight paths are expected to be further increased on those routes highlighted in the Freight RUS, plus routes where further growth is driven by gauge enhancement. Improved capacity, performance, linespeeds and engineering access will be provided between Immingham and Wrawby Junction and between Hessle Road Junction and Gilberdyke.

New rolling stock is expected to begin to bring benefits, such as:

- greater seating capacity on London – Yorkshire services as the result of Intercity Express Programme (IEP) introduction
- IEP dual fuel sub-fleet could provide potential for improved London links for towns/cities not on electrified routes
- new generation DMUs starting to replace Pacer/Sprinter fleet
- possible extension of electrification within the RUS area.

1 Scheme specifically shown as funded in ORR Draft Determination as part of a £60 million allowance to meet the HLOS on Strategic Route 10, and £10 million on Strategic Route 11 for platform extensions and stabling; these routes which encompass the Yorkshire and Humber area

2 Scheme specifically shown as funded in ORR Draft Determination

3 ECML scheme specifically shown as funded in ORR Draft Determination

It is envisaged that the following projects will be needed to deliver the aforementioned train service strategy:

- further platform lengthening
- capacity enhancements between Leeds and Manchester via Diggle
- any turnback facilities or other projects identified in the short-term strategy section that were not affordable in CP4
- an enhanced layout at Sheffield [4]
- doubling of the Dore & Totley station curve and new loops in the Hope Valley [4]
- additional crossover at Bradford Interchange and some bi-directional signalling [4]
- enhancements between Wrawby Junction and Brocklesby [4]
- enhancements between Ulceby and the Immingham dock complex
- possible extension of electrified network within the RUS area
- possible incremental improvements to capacity, performance and engineering access in the Doncaster station area prior to more significant enhancement on the back of signalling renewals in the longer term
- any further W9/W10/W12 loading gauge works identified through the Strategic Freight Network mechanism
- other schemes identified as representing value for money to reduce reactionary delay and/or improve the balance between engineering access and continuity of service operation.

Long-term context 2019 – 2039 (Control Period 6 and beyond)

The Government's 2007 White Paper suggests a general doubling of both passenger and freight traffic nationally over a 30-year period. However, it is recognised that there may be wide variations on individual routes or parts of routes according to local circumstances. In the event of very rapid growth there is little doubt the strategy for handling demand in the longer term must look first to make best use of the existing infrastructure in the RUS area and then to the opportunities offered by the wider rail network. These could include, for example, making use of any remaining capacity for growth on lines within the RUS area followed by use of the remaining capacity on lines outside the RUS area. There could also be options for reopening currently disused lines where feasible or construction of some completely new sections of railway. The latter could be unconstrained by traditional limitations on maximum speed, loading gauge and other output characteristics.

Consultation

We now seek stakeholders' views, particularly on the gaps, options and emerging conclusions presented, before finalising this strategy. **Chapter 7** provides contact details.

4 in association with renewal schemes


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Contents

1. Background

1.1 Introduction to Route Utilisation Strategies

1.1.1

Following the Rail Review in 2004 and the Railways Act 2005, The Office of Rail Regulation (ORR) modified Network Rail's network licence in June 2005 to require the establishment of Route Utilisation Strategies (RUSs) across the network. Simultaneously, the ORR published guidelines on RUSs. A RUS is defined in Condition 7 of the network licence as, in respect of the network or a part of the network[1], a strategy which will promote the route utilisation objective. The route utilisation objective is defined as:

> "the effective and efficient use and development of the capacity available, consistent with funding that is, or is reasonably likely to become, available during the period of the Route Utilisation Strategy and with the licence holder's performance of the duty."

Extract from ORR guidelines on Route Utilisation Strategies, June 2005

1.1.2

The "duty" referred to in the objective is Network Rail's general duty under Licence Condition 7 in relation to the operation, maintenance, renewal and development of the network. The ORR guidelines also identify two purposes of RUSs, and state that Network Rail should balance the need for predictability with the need to enable innovation. Such strategies should:

> a) "enable Network Rail and persons providing services relating to railways better to plan their businesses, and funders better to plan their activities; and
>
> b) set out feasible options for network capacity, timetable outputs and network capability, and funding implications of those options for persons providing services to railways and funders."

Extract from ORR guidelines on Route Utilisation Strategies, June 2005

1 The definition of "network" in Condition 7 of Network Rail's network licence includes where the licence holder has any estate or interest in, or right over a station or light maintenance depot, such station or light maintenance depot.

1.1.3
The guidelines also set out principles for RUS development and explain how Network Rail should consider the position of the railway funding authorities, the likely changes in demand and the potential for changes in supply. Network Rail has developed a RUS Manual, which consists of a consultation guide and a technical guide. These explain the processes used to comply with the licence condition and the guidelines. These and other documents relating to individual RUSs and the overall RUS programme are available on the Network Rail website (www.networkrail.co.uk).

1.1.4
The process is designed to be inclusive. Joint work is encouraged between industry parties, who share ownership of each RUS through its industry Stakeholder Management Group (SMG). There is also extensive informal consultation outside the rail industry by means of a Wider Stakeholder Group (WSG).

1.1.5
The ORR guidelines require options to be appraised. This is initially undertaken using the DfT's appraisal criteria and, in Scotland, the Scottish Executive's Scottish Transport Appraisal Guidance (STAG) appraisal criteria. To support this appraisal work RUSs seek to capture implications for all industry parties and wider societal implications, in order to understand which options maximise net industry and societal benefit rather than that of any individual organisation or affected group.

1.1.6
RUSs occupy a particular place in the planning activity for the rail industry. They utilise available input from processes such as the DfT's Regional Planning Assessments and, for the period to 2014, the 2007 High Level Output Specification (HLOS). The recommendations of a RUS, and the evidence of relationships and dependencies revealed in the work to reach them, in turn form an input to decisions made by industry funders and suppliers on issues such as franchise specifications, investment plans and the next High Level Output Specification.

1.1.7
Network Rail will take account of the recommendations from RUSs when carrying out its activities. In particular they will be used to help to inform the allocation of capacity on the network through application of the normal Network Code processes.

1.1.8
The ORR will take account of established RUSs when exercising its functions.

1.2 The RUS programme

The completed RUS programme will cover the entire rail network in Great Britain and commenced with the publication of the consultation document for the South West Main Line RUS in October 2005. There will be 19 RUSs in total, of which broadly 50 percent have been published and have become established under the terms of Licence Condition 7. The remainder are currently at varying stages of development. Full details of the programme can be found on the Network Rail website (www.networkrail.co.uk).

The responses from stakeholders to this consultation document will shape the final Yorkshire and Humber RUS, and Network Rail would accordingly welcome your feedback on it. The key dates and contact details for the consultation process are outlined in **Chapter 7**.

1.3 Document structure

Chapter 2 describes the geographic scope of the RUS, the time horizon and the planning context within which it is being developed.

Chapter 3 summarises the current capabilities and usage of the strategic routes within the RUS area, drawing on input from key industry stakeholders, and highlighting particular issues.

Chapter 4 discusses anticipated changes in supply and demand and the schemes planned to enhance or improve the routes and services covered by the study. This helps to identify the benefits which will flow from these improvements, as well as the potential for synergy between committed or expected schemes and those developed by the RUS.

A key step in the process is the sifting of the issues and analysis of the future year forecasts in order to identify gaps and develop options for addressing them. **Chapter 5** analyses these gaps and options.

Chapter 6 draws together the conclusions into an emerging strategy comprising recommendations for better use of resources and investment proposals for meeting growth. Recommendations are grouped chronologically using railway industry five-year control periods. The document shows how these interventions meet government targets for the 2009 – 2014 period and describes the industry's strategy for meeting predicted demand during Control Period 5 (2014 – 2019) in the context of likely longer-term developments. The document then looks ahead to the challenges posed to the RUS area in the longer 30-year term.

Chapter 7 covers the consultation process, including its purpose, how stakeholders can contribute and the deadline for responses.

Appendix 1 shows the freight terminals within the RUS area.

Appendix 2 lists the Department for Transport and Passenger Transport Executive aspirations for enhancement within the RUS area.

Appendix 3 (published on the Network Rail website) details the performance analysis undertaken for the RUS.

Appendix 4 (published on the Network Rail website) shows the economic appraisals for each of the options detailed in **Chapter 5**.

2. Context and scope

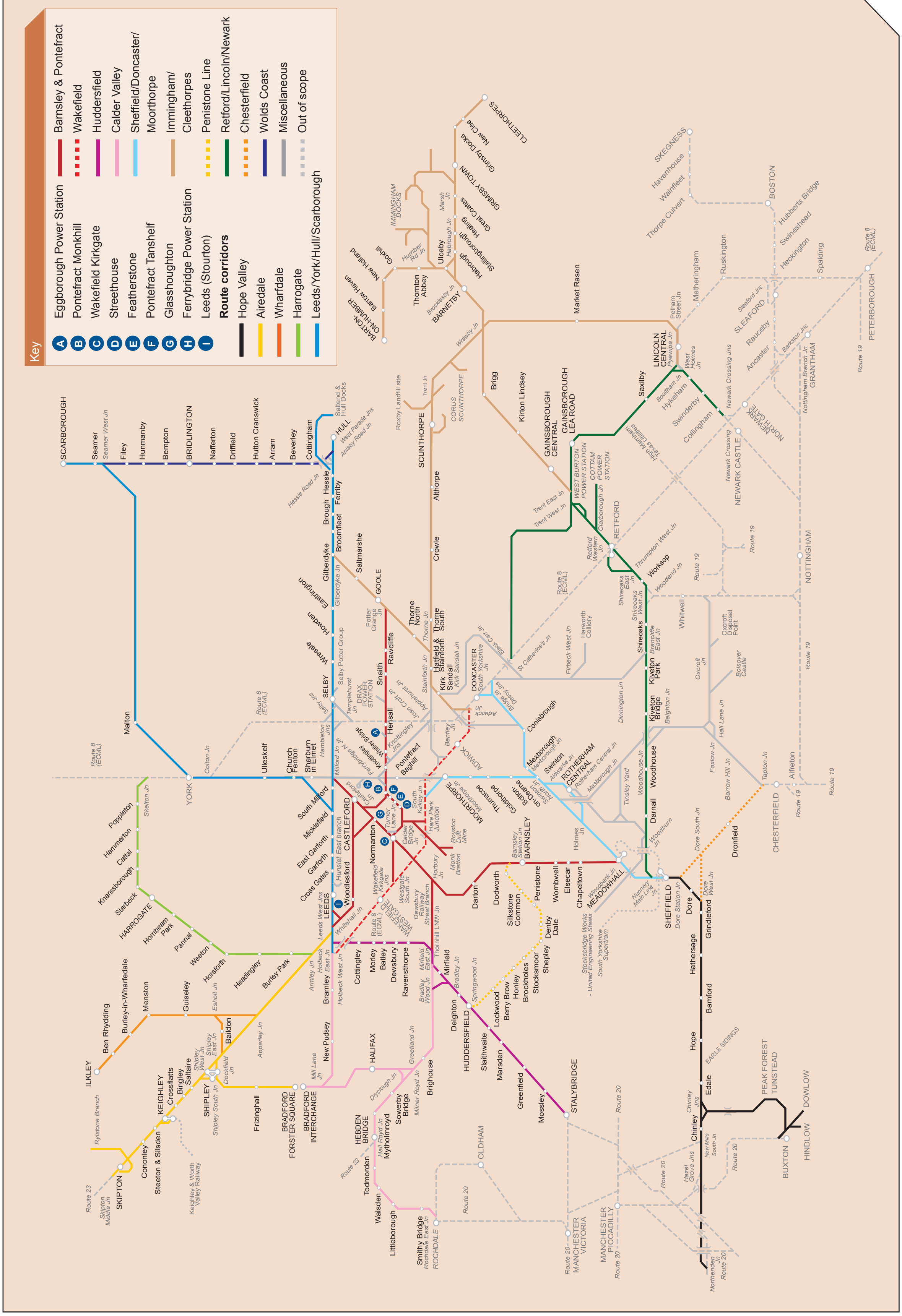
2.1 Geographic scope

The Yorkshire and Humber Route Utilisation Strategy covers broadly the network defined by Network Rail's Strategic Routes 10 and 11. This is depicted in geographical and schematic format in Figures 2.1 and 2.2 respectively. It includes all routes in the Yorkshire and Humber region with the exception of the East Coast Main Line north of Doncaster and the Middlesbrough to Whitby branch line, both of which are dealt with in the ECML RUS. Also included are a few routes in the East Midlands region, along with some areas to the west of the Pennines where the train services have been identified in other RUSs as being closely relevant to transport needs further east. Excluded are the lines from Skipton towards Carlisle and Lancaster dealt with in the Lancashire and Cumbria RUS.

The railway within the RUS area naturally falls into a number of discrete corridors which are shown shaded bold in Figure 2.1 and further defined by colour coding in Figure 2.2.

Figure 2.1 – Geographic scope

Figure 2.2 – Geographic scope and route corridors



2.2 Services considered

The RUS considers all services that use these routes for part or all of their journeys to the extent necessary to achieve the route utilisation objective – and includes appropriate analysis of those traffic generators outside the scope area which have a significant effect on the pattern of demand within it.

2.3 Linkage to other studies and workstreams

In April 2008, Network Rail submitted an update to its Strategic Business Plan (SBP) to the ORR as part of the regulatory review for the railway Control Period 4 (2009 – 2014). ORR delivered its draft determination for this control period in June 2008. The Yorkshire and Humber RUS Draft for Consultation is consistent with the draft determination in respect of CP4, and any changes in the final determination will be incorporated within the final RUS.

This RUS has interfaces with the following existing RUSs and those under development:

- East Coast Main Line RUS, principally at and between Doncaster and both Leeds and York
- Lancashire and Cumbria RUS, principally in respect of the Airedale and Calder Valley corridors
- East Midlands RUS, and the Strategic Rail Authority's Midland Main Line RUS at Chesterfield and in Lincolnshire
- Freight RUS, throughout the RUS area
- Network RUS, principally in relation to long-distance flows
- North West RUS, principally in respect to the Calder Valley, Hope Valley and Huddersfield corridors.

This RUS has drawn on a number of Regional Planning Assessments (RPAs). These strategies, published by the Department for Transport, provide a medium-to-long-term planning framework and are the result of extensive engagement between key planning and development bodies in their respective areas:

- East Midlands RPA (published in May 2007)
- Yorkshire and Humber RPA (published in June 2007)
- North West RPA (published in October 2006).

The following more detailed rail strategies for specific areas have been published covering parts of the RUS area:

- Greater Manchester Local Transport Plan (Greater Manchester PTE)
- South Yorkshire Rail Strategy (South Yorkshire PTE) – 2004 version, currently under review
- West Yorkshire Rail Plan 6 (West Yorkshire PTE).

The following have also provided valuable context for the RUS. Strategies addressing regeneration, inter-regional economic activity, sustainability and tourism issues were referred to during the planning process:

- The Draft Regional Spatial Strategy
- Regional Economic Strategy
- Joint Northern Regional Development Agencies' Northern Way
- Greater Manchester Transport Innovation Fund (TIF) submission.

2.4 Assumptions

During analysis, the following changes to services have been regarded as committed schemes, taking the December 2007 timetable as the base:

- the recently implemented timetable change to increase services between London and Leeds
- the introduction of an hourly Leeds – Nottingham service will take place from December 2008
- the Intercity Express Programme, to replace the HST fleet.

Further details are provided in **Chapter 4**.

2.5 Time horizon

The RUS primarily considers the period 2009 – 2019. It does, however, look further into the future in line with the 30-year timescale adopted in the Government's 2007 White Paper 'Delivering a Sustainable Railway' to identify factors which should influence development of the 10-year strategy.

3. Current capacity, demand and delivery

3.1 Train operators

At present, five franchised and two Open Access passenger train operators and five freight train operators run services over the lines covered by the RUS. These are:

3.1.1 CrossCountry

CrossCountry operates long distance services linking Scotland and the North East with the East and West Midlands, the South West and the South Coast. The franchise commenced in November 2007 and runs until April 2016. The final two years and four months of the franchise are subject to performance targets being met.

3.1.2 East Midlands Trains

East Midlands Trains operates regular long-distance high speed services from Sheffield and Chesterfield to London St Pancras International with a small number of trains extended to/from Barnsley or Leeds. It provides a service from Sheffield to the East Midlands, East Anglia, Manchester Piccadilly and Liverpool Lime Street. East Midlands Trains also operates a number of services in the Lincoln area. The franchise commenced in November 2007 and runs until April 2015. The final 18 months of the franchise are subject to performance targets being met.

3.1.3 National Express East Coast

National Express East Coast (NXEC) is the principal operator of long-distance high speed services from the RUS area to London King's Cross. In addition to the main East Coast Main Line (ECML) services from Leeds, NXEC provides links to London from Bradford, Harrogate, Hull and Skipton. The franchise commenced in December 2007 and runs until March 2015. The final 15 months of the franchise are subject to performance targets being met.

3.1.4 Northern Rail

Northern Rail operates the majority of the services and stations in this area, and is the only operator to run services in most of the corridors. The Northern Rail franchise was formed in December 2004 and runs until September 2013. The final two years of the franchise are subject to performance targets being met.

3.1.5 First TransPennine Express

First TransPennine Express (TPE) operates inter-urban services with limited stops, notably across the Pennines from most principal centres in the RUS area towards Manchester, as well as from Middlesbrough and Newcastle. The key hubs for TPE in the RUS area are Doncaster, Leeds, Sheffield and York. The current franchise was awarded in February 2004 and runs until December 2012 with an option for a further five-year extension dependent on performance.

3.1.6 Grand Central

Grand Central operates Open Access services between King's Cross and Sunderland via the ECML and Eaglescliffe.

3.1.7 Hull Trains

Hull Trains operates Open Access services between King's Cross and Hull via Doncaster and Selby.

3.1.8 English Welsh and Scottish Railway (EWS)

EWS is the largest freight operator in the UK operating services throughout Great Britain. It is organised into four market-based groups. These are Energy (which includes coal), Construction (which includes domestic waste), Industrial (which includes metals and petroleum) and Network (which includes international, automotive, intermodal, infrastructure and express parcels services).

3.1.9 Freightliner

Freightliner operates throughout Great Britain and has two divisions.

Freightliner Limited is the largest rail haulier of containerised traffic, predominantly from the deep sea market.

Freightliner Heavy Haul is a significant conveyor of bulk goods, predominantly coal, construction materials and petroleum, and operates infrastructure services.

3.1.10 First GBRf

First GBRf is an operator of container trains and infrastructure services. They also run a number of bulk market services, including coal, gypsum and Royal Mail trains.

3.1.11 Direct Rail Services (DRS)

DRS operates traffic for the nuclear industry. Over the past few years the company has expanded into the domestic and short sea intermodal markets, and some bulk traffic including coal.

3.1.12 Fastline Freight

Fastline Freight operates intermodal services to and from Doncaster Railport and is starting up coal operations.

3.2 Passenger market profile

3.2.1 Population, demographics and the rail passenger market

The area covered by the RUS has a population of just over five million, of which around 70 percent is located within the West Yorkshire and South Yorkshire metropolitan counties, with populations of 2.1 million and 1.3 million respectively. The majority of this population is concentrated in the Leeds and Sheffield conurbations.

The main urban centres in West Yorkshire have received significant commercial investment over the last two decades and Leeds in particular is now a nationally important location for a number of key tertiary industries such as retail, education, telecoms, legal and financial services. The economy has been largely buoyant as a consequence of this investment, and although some areas of deprivation still exist, they are less prevalent than in other parts of the RUS area.

South Yorkshire has experienced a significant programme of investment and redevelopment over the last 10 years and economic growth has been accelerating markedly. The legacy of the decline of the mining and steel industries means that a number of areas are relatively deprived; however, there is strong evidence that the economy of South Yorkshire is improving.

Outside the metropolitan counties the population is relatively sparsely spread, although there are some larger clusters of population, particularly in Hull and York. The demographics and economic performance of these areas vary significantly. York, for example, is particularly affluent with an economy that is highly dependent on tourism, whereas Hull is less well off and the economy is made up of more traditional secondary and tertiary economic activity.

The rail passenger market is reflective of the diverse demographic characteristics of the RUS area, and the recent economic success of the region.

The overall number of passenger trips has increased from around 39 million in 1998/99 to approximately 63 million in 2007/08, which is a sizable increase of over 60 percent. The largest increases have been in trips to and from Leeds and Sheffield, which have grown by around 78 percent and 66 percent respectively. A significant proportion of this

is through increased commuting. Figure 3.1 below details the split of all passenger trips made in the RUS area in 2007/08 and Figure 3.2 shows the 10 busiest station-to-station passenger flows. Rail usage in the RUS area is split between three main markets:

- **Local travel (commuting and leisure).** The majority of passenger trips (62 percent) were made entirely within the RUS area, of which nearly half were during peak periods for the purpose of commuting, and six of the ten busiest individual station-to-station passenger flows are short-distance trips.
- **Long distance business and leisure travel (cross-Pennine).** Around 11 percent of passenger trips were made between the RUS area and other stations on the TPE network, such as Manchester Piccadilly, Liverpool Lime Street and Newcastle. Furthermore, Leeds – Manchester is the eighth busiest passenger flow in the scope of the RUS.
- **Other long distance business and leisure travel.** Approximately 22 percent of passenger trips are made between the RUS area and other parts of the UK, predominantly London, the South East and the East Midlands.

Figure 3.1 – Summary of all passenger trips made (2007/08)

Area	Annual passenger trips (million)	Proportion of total
Within RUS area	38.9	62%
RUS area to/from cross-Pennine area	7.1	11%
RUS area to/from rest of UK	14.1	22%
Through RUS area*	3.2	5%
Total	63.3	

Source: March 2007/08 LENNON data with an uplift for travel using PTE products
*Based on RPA

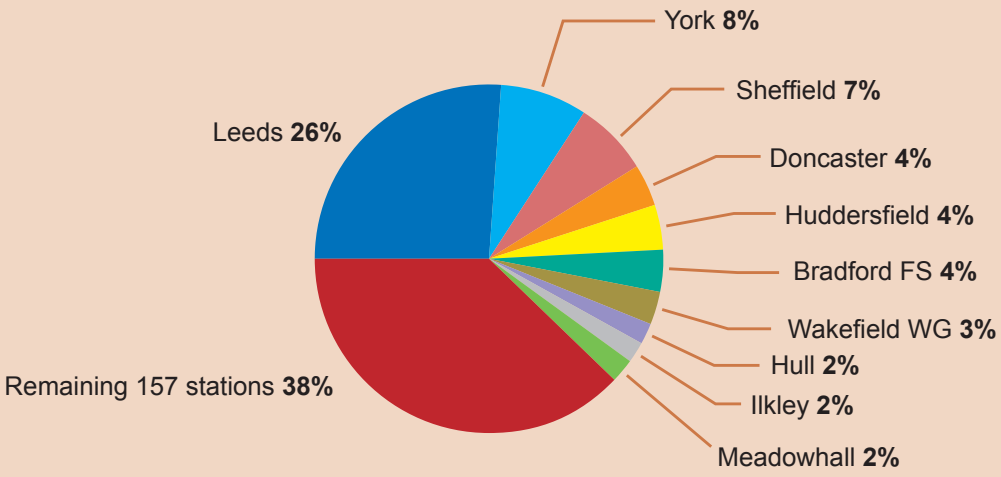
Figure 3.2 – 10 busiest station-to-station passenger flows (2007/08)

All trips		Within RUS area only	
Two way station – station flow	**Annual passenger journeys (000)**	**Two way station – station flow**	**Annual passenger journeys (000)**
Leeds – London termini	1,558	York – Leeds	1,120
York – Leeds	1,120	Huddersfield – Leeds	976
Huddersfield – Leeds	976	Horsforth – Leeds	695
York – London termini	883	Wakefield Westgate – Leeds	685
Sheffield – London termini	751	Guiseley – Leeds	598
Horsforth – Leeds	695	Shipley – Leeds	595
Wakefield W – Leeds	685	Bradford FS – Leeds*	558
Leeds – Manchester termini	681	Garforth – Leeds	557
Guiseley – Leeds	598	Ilkley – Leeds	539
Shipley – Leeds	595	Keighley – Leeds	514

Source: March 2007/08 LENNON data with uplift for travel using PTE products
* Split between Bradford Forster Square and Bradford Interchange estimated using RPA demand matrices

The size and characteristics of the three main passenger markets mean that the majority of passengers board, alight or interchange at one of the large urban stations. Figure 3.3 below illustrates this. Leeds is by far the busiest station with over 16 million trips per annum, which is around 26 percent of the total. York, Sheffield and Doncaster are the next busiest stations with 8 percent, 7 percent and 4 percent of the total respectively. Overall the 10 busiest stations account for nearly two thirds of passenger demand in the RUS area.

Figure 3.3 – Split of passenger demand by station – 10 busiest



Source: RPA Demand Matrices

3.2.2 Peak train loadings

The rapid growth in the commuter market has significantly increased the number of passengers travelling to and from the main urban centres in the RUS area during peak periods. As a result a number of services are operating at or beyond the seating capacity of the rolling stock, and in some cases the seating plus standing capacity. The most densely loaded trains are those which serve Leeds or Sheffield.

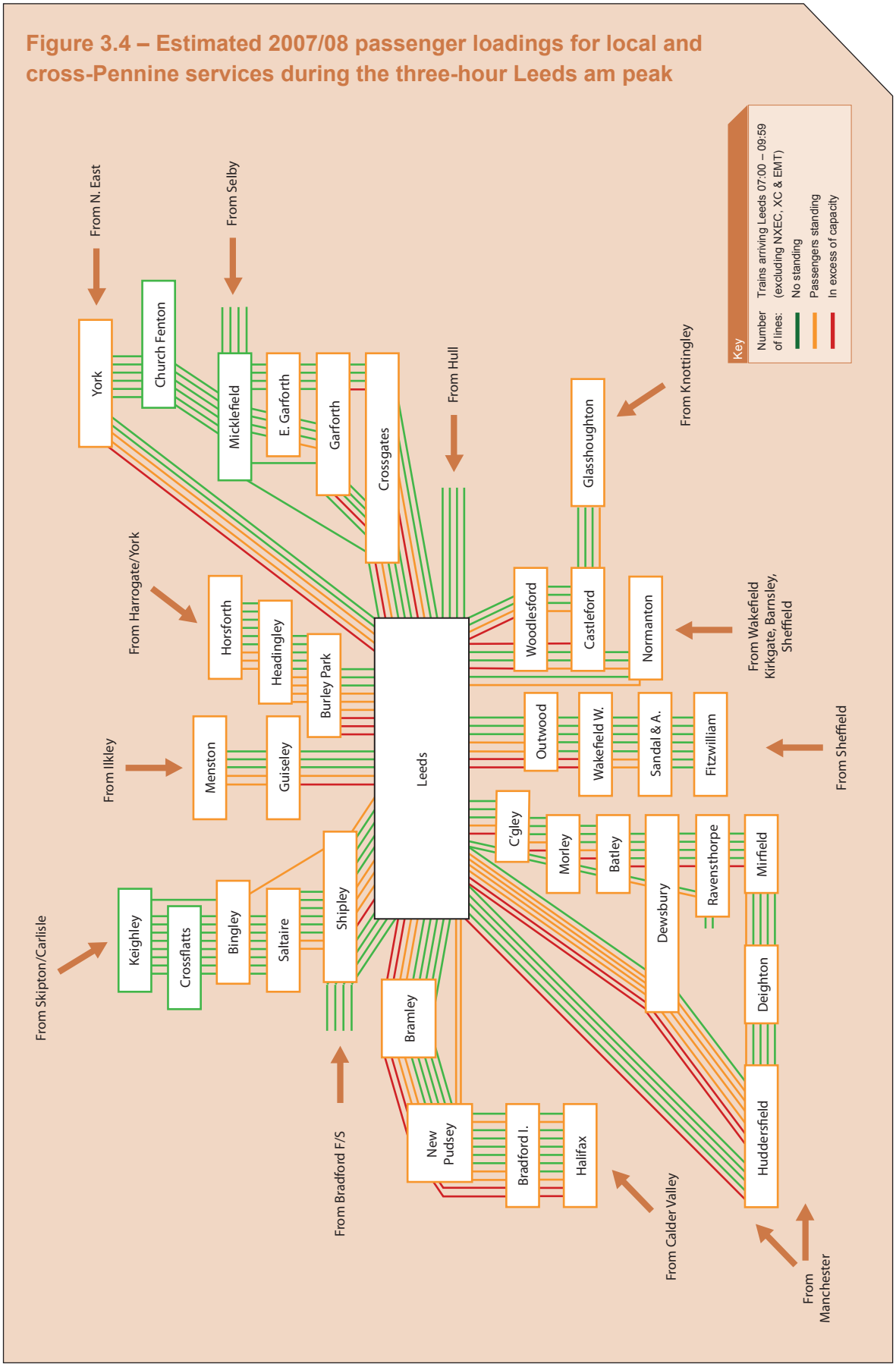
Figure 3.4 below shows the estimated train loading for each train service arriving at Leeds between 07:00 and 09:59 (the am peak).[1] Each coloured line represents one train in the timetable and are coloured green when seats are available, amber when the number of passengers exceeds the number of seats, and red when the number of passengers exceeds the seating and standing capacity for the rolling stock type. The information is based on historical TOC passenger counts and has been updated to 2007/08 using WYPTE alighting passenger counts at Leeds station. National Express East Coast, CrossCountry and East Midlands Trains services have not been included.[2]

Of the 92 train services that arrive in Leeds during the am peak in the 2007 timetable an estimated 45 have more passengers than seats available, and around 19 have more passengers than the theoretical seating and standing capacity of the rolling stock. This is equivalent to 49 percent and 21 percent of all train services respectively, and on most lines there are more passengers travelling than seats available for all Leeds arrivals between 08:00 and 08:59 (the high peak hour). On average, loads exceed the seating capacity when trains are a little over 20 minutes from Leeds. The Calder Valley line has standing for the longest amount of time with passengers standing from Halifax (39 minutes from Leeds) on four peak services, and the Harrogate line has the greatest proportion of trains with passengers standing (66 percent).

1 For simplicity the am peak has been taken as representative of the pm peak

2 The impact of committed services changes by these operators has been included in the development of options to reduce on train crowding

Figure 3.4 – Estimated 2007/08 passenger loadings for local and cross-Pennine services during the three-hour Leeds am peak



Source: TOC and WYPTE passenger counts

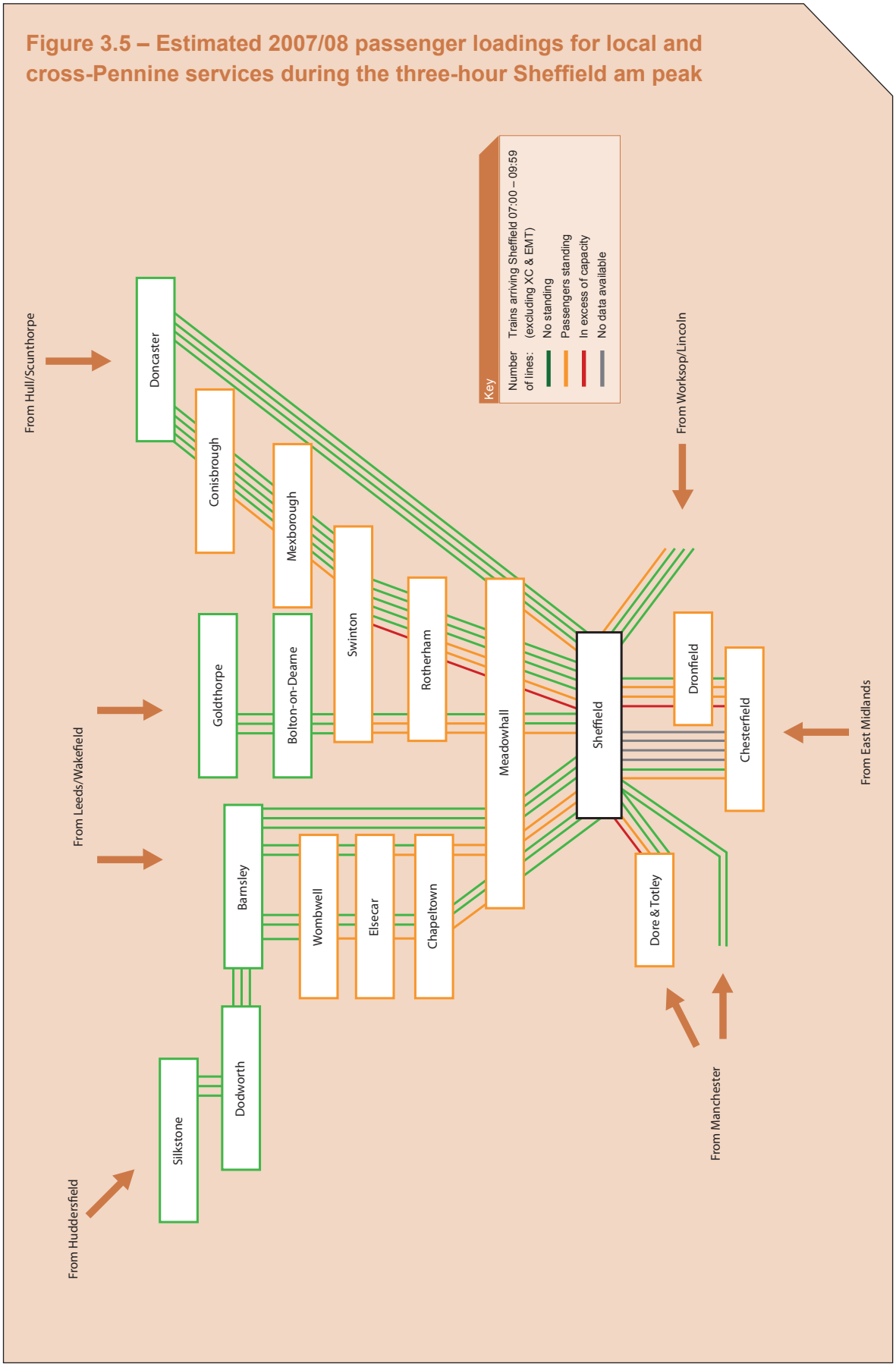
Figure 3.5 below shows the estimated train loading for each train service calling at Sheffield between 07:00 and 09:59 (the am peak). The information is based on TOC passenger counts, updated with SYPTE data when necessary. SYPTE believes that the pm peak may be slightly busier, so data for this time period has been used as a proxy where appropriate. The colour coding is the same as in Figure 3.4 and southbound CrossCountry services have not been included. [3]

Of the 41 services included in the analysis that arrive in Sheffield during the am peak approximately 16 have more passengers than the number of seats available. This is equivalent to 39 percent of the total, and the average travelling time from Sheffield at which services exceed the seating capacity is around 20 minutes.

On the Barnsley line there are more passengers travelling than seats available on all trains that arrive during the high peak hour.

3 The impact of committed services changes by these operators has been included in the development of options to reduce on train crowding

Figure 3.5 – Estimated 2007/08 passenger loadings for local and cross-Pennine services during the three-hour Sheffield am peak



Source: TOC and WYPTE passenger counts

3.2.3 Long distance travel – cross-Pennine and other regional links

The cross-Pennine (north and south) routes form the main east – west rail arteries in the north of England, linking the main city regions west of the Pennines, namely Liverpool and Manchester, with Leeds, Sheffield, Huddersfield, York, Hull, Cleethorpes and the North East. It is estimated that around 14.8 million passengers used these routes to travel to, from or within the Yorkshire and Humber region in 2007/08, which is 23 percent of all rail travel in the RUS area. The data from section 3.2.1 shows that 7.1 million of these trips were to or from the Yorkshire and Humber region.

Figure 3.6 below illustrates the cross-Pennine route, the other key inter-regional rail links in the north of England, and the approximate hourly train frequency for each.

The core section of the cross-Pennine north route between Leeds and Manchester has a frequency of four trains per hour and a typical journey time of around 50 minutes.

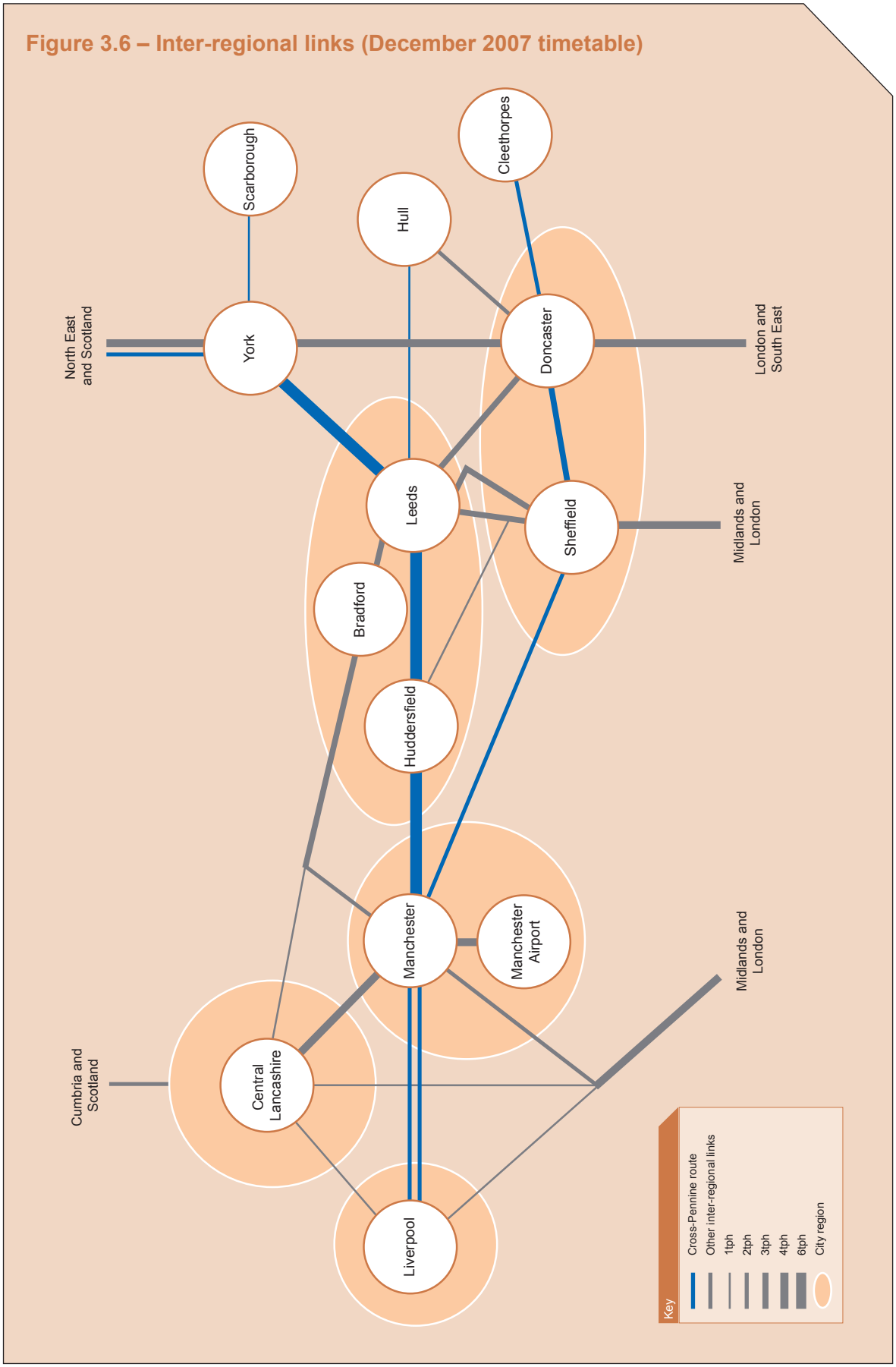
Stakeholders have recognised the strategic importance of this route, particularly the Leeds – Manchester flow. The recent Government White Paper [4] has targeted an improvement in this journey time as a priority for investment, and other industry stakeholders have advocated the need for additional services as there is evidence to suggest that some off-peak trains are loading at or beyond seating capacity.

The alternative route between Leeds and Manchester via the Calder Valley is generally viewed as inferior to the cross-Pennine north route, as the Leeds – Manchester journey times are typically around one hour and 35 minutes, and the frequency is only two trains per hour.

The cross-Pennine south route between Manchester and Sheffield is also a priority for stakeholders as the current frequency of around five trains every two hours is lower than for similarly sized conurbations elsewhere in the north of England.

4 Delivering a Sustainable Railway Department for Transport, July 2007

Figure 3.6 – Inter-regional links (December 2007 timetable)



3.3 Freight market profile

3.3.1 Overview

Within the UK, rail's market share has been growing year on year, up from 10 percent to 12 percent of total freight tonne kilometres (weight of freight multiplied by distance carried) in the 10 years following privatisation. Some of the busiest freight corridors in the UK are to be found within the Yorkshire and Humber area, particularly on the south bank of the Humber.

A strategy for accommodating the forecast freight traffic across the national network was set out in the Freight RUS, published in March 2007. The Freight RUS also highlighted a number of "gaps" specific to the Yorkshire and Humber RUS area, which are dealt with in **Chapter 5**.

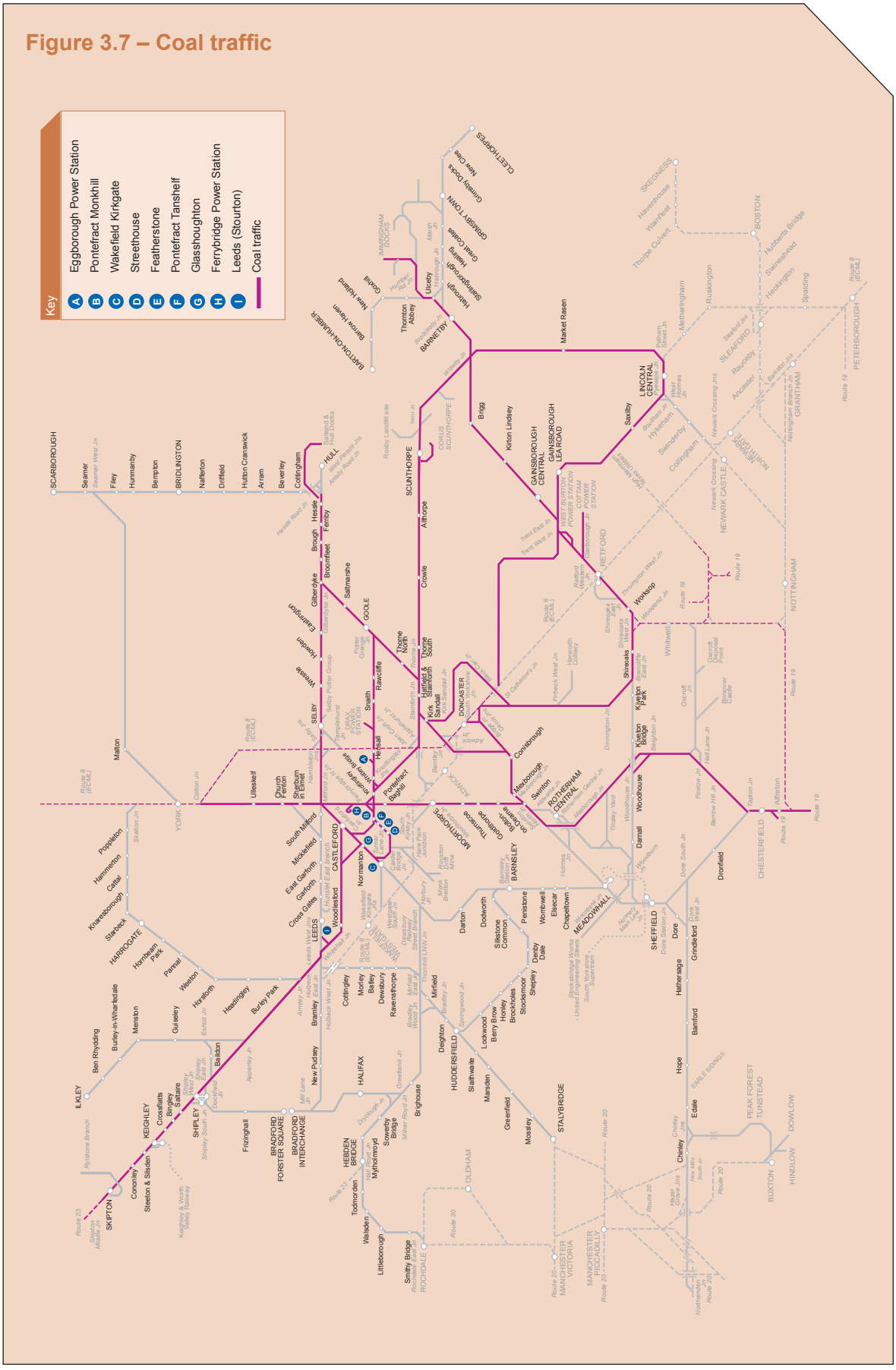
3.3.2 Freight markets

The main markets within the RUS area are described below.

Electricity Supply Industry (ESI) coal

Coal remains the dominant fuel used for generating electricity in the UK. With the continuing increase in gas and oil prices, and the time required to build nuclear power stations, it looks set to remain competitive for much of the RUS period. ESI coal flows constitute a significant proportion of the freight carried in the RUS area. The largest are from ports (especially Immingham and Hunterston) and from Scottish open cast sites (in Ayrshire and Fife) to the power stations at Drax, Eggborough and Ferrybridge in Yorkshire, and Cottam and West Burton in the lower Trent Valley. Coal also passes through the RUS area for Ratcliffe power station. The flows are shown in Figure 3.7

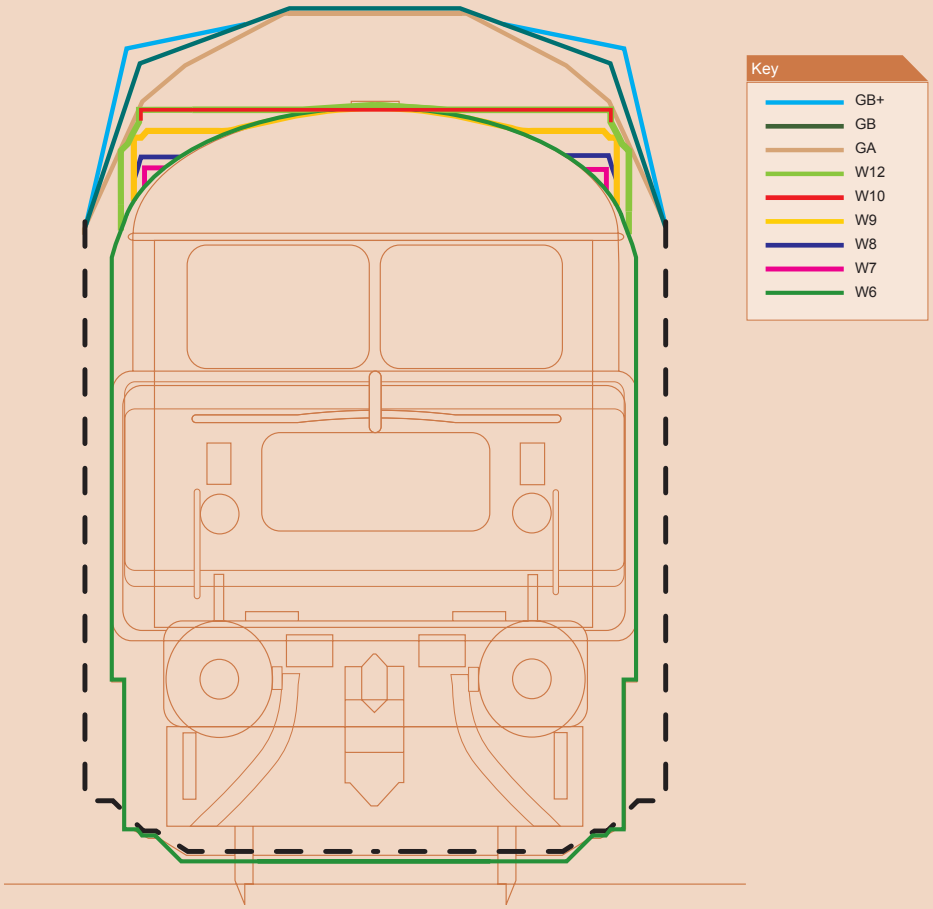
Figure 3.7 – Coal traffic



Intermodal

The total volume of container traffic in the UK is increasing and rail is increasing its modal share of this market. Deep sea containers are carried from Felixstowe, Southampton and Tilbury to terminals in Yorkshire. Deep sea containers are also conveyed through the RUS area from Southampton to Wilton (near Middlesborough). There is also a smaller number of services for European intermodal traffic, such as flows via the Channel Tunnel to Wakefield Europort. The type of containers that can be carried depends on the gauge of the overall end-to-end route. Some parts of the RUS area (together with the ECML) are currently W9 gauge cleared, allowing the European traffic described above to be carried. Many other routes within the RUS area are cleared to W8, allowing 8' 6" high containers to be carried on standard deck height wagons. 9' 6" high deep sea containers are increasingly favoured by shipping companies, with the percentage arriving in the UK growing significantly in recent years. Due to restricted loading gauge of less than W10, these larger containers can only be carried on special wagons, which can limit the weight of the containers, and either have small wheels and consequent high maintenance costs, or are much longer than the containers themselves, thereby using maximum train length inefficiently. The various gauge profiles are shown in Figure 3.8. The intermodal routes are shown in Figure 3.9.

Figure 3.8 – Loading gauge envelopes



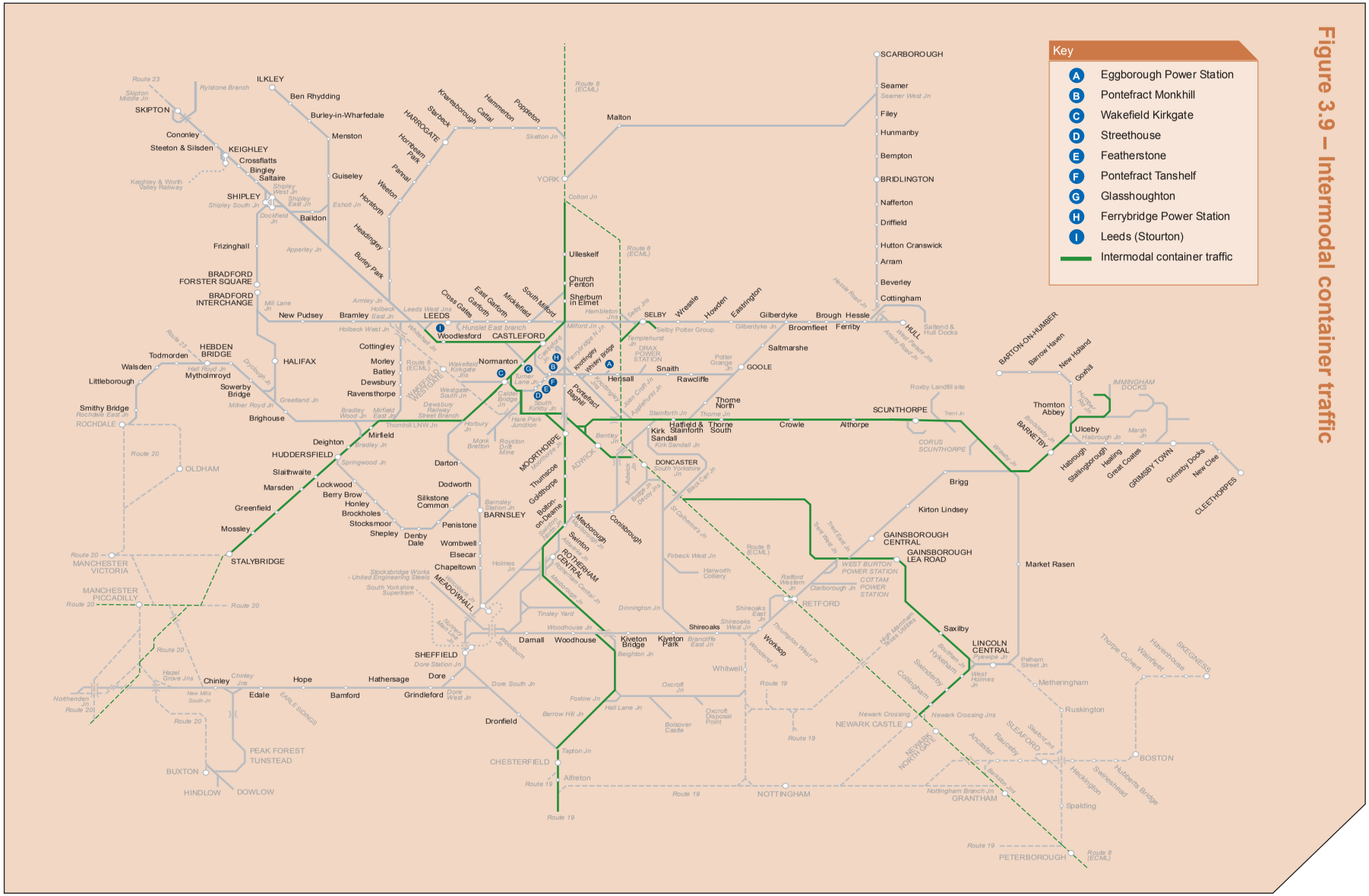


Figure 3.9 – Intermodal container traffic

Figure 3.10 – Construction and aggregates traffic

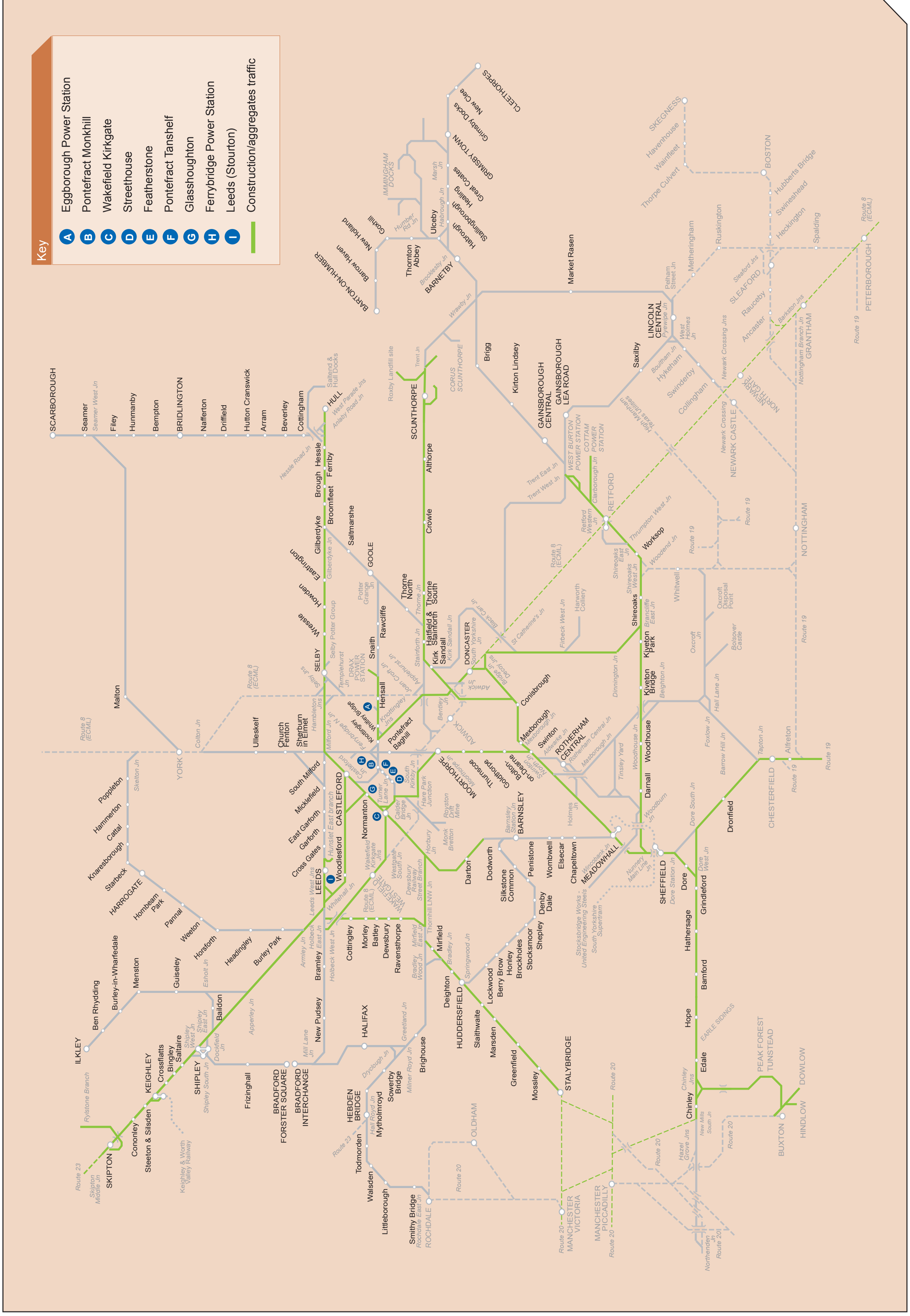
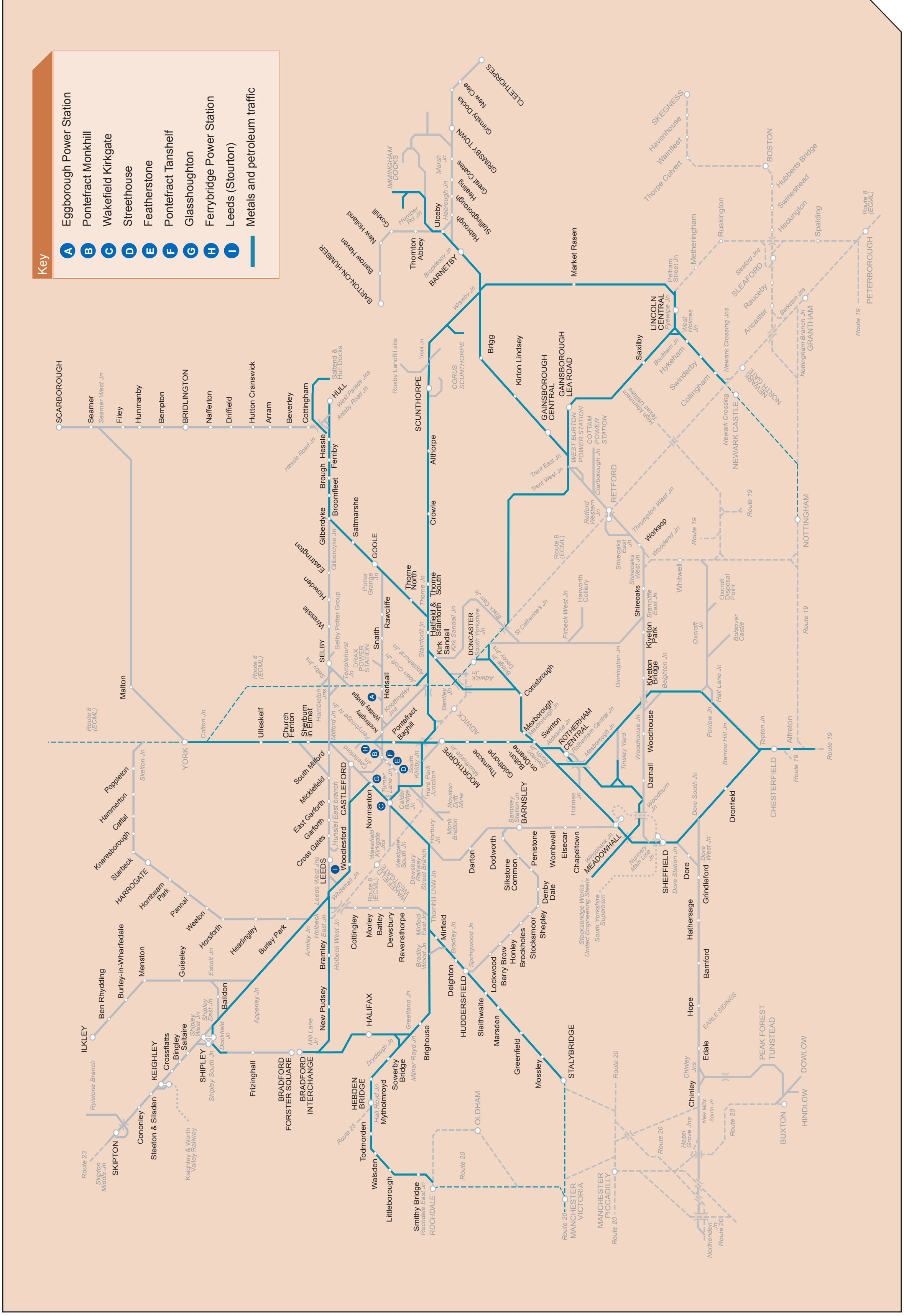


Figure 3.11 – Metals and petroleum traffic



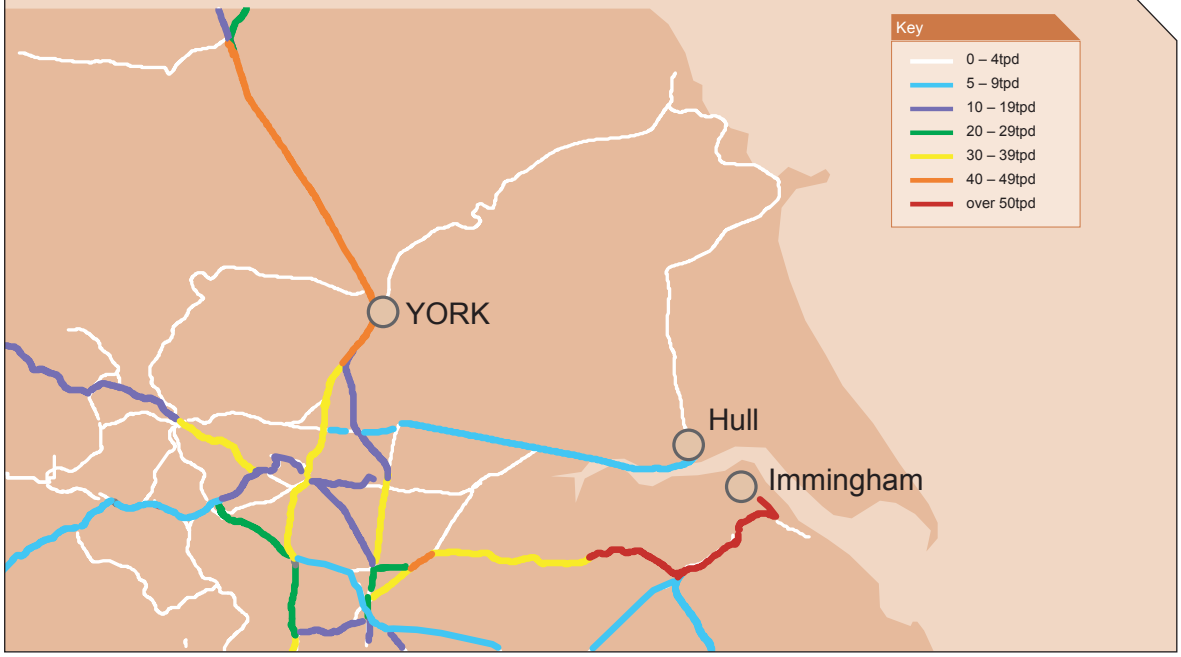
Construction

There are a number of aggregate services that spend at least part of their journey within the RUS area, including services from Tunstead, Peak Forest, Dowlow and Hindlow to a range of destinations – many of them in the North West, but also including Leeds and south-east England. There are also flows from Rylstone (near Skipton). Significant flows of sand traffic pass from Middleton Towers to Barnby Dun, Monk Bretton and Goole. Domestic waste is conveyed from Manchester to Roxby Gullet. The construction routes are shown in the map in Figure 3.10.

Metals and petroleum

Metals flows are significant in the area with both imported ore and finished steel traffic on south Humberside, further steel activity in South Yorkshire and through traffic to/from Teeside. Petroleum flows account for relatively lower volumes, with 10 – 12 loaded trains per day originating in the Humber area. There are also scrap metal flows in and through the area to and from a number of terminals. The metals and petroleum routes are shown in Figure 3.11.

Figure 3.12 – Current freight trains per day on sections of the network



Source: Network Rail Freight RUS. The data comes from ACTRAFF.

Other traffic

Automotive, network services (general merchandise wagonload), premium logistics and power station waste all generate smaller flows. Network Rail's own engineering trains also run along the routes in the RUS area to support infrastructure maintenance, renewal and enhancement activities.

3.3.3 Current freight demand in the Yorkshire and Humber RUS area

Figure 3.12 shows current freight usage of key sections of the route. The data covers the base year of the Freight RUS of 2004/05 and some updated data to reflect 2007 demand. All data is for trains per day in one direction. It can be seen that the heaviest freight flows are around Immingham, although there is a significant level of use over much of the RUS area.

Figure 3.13 – Freight terminals

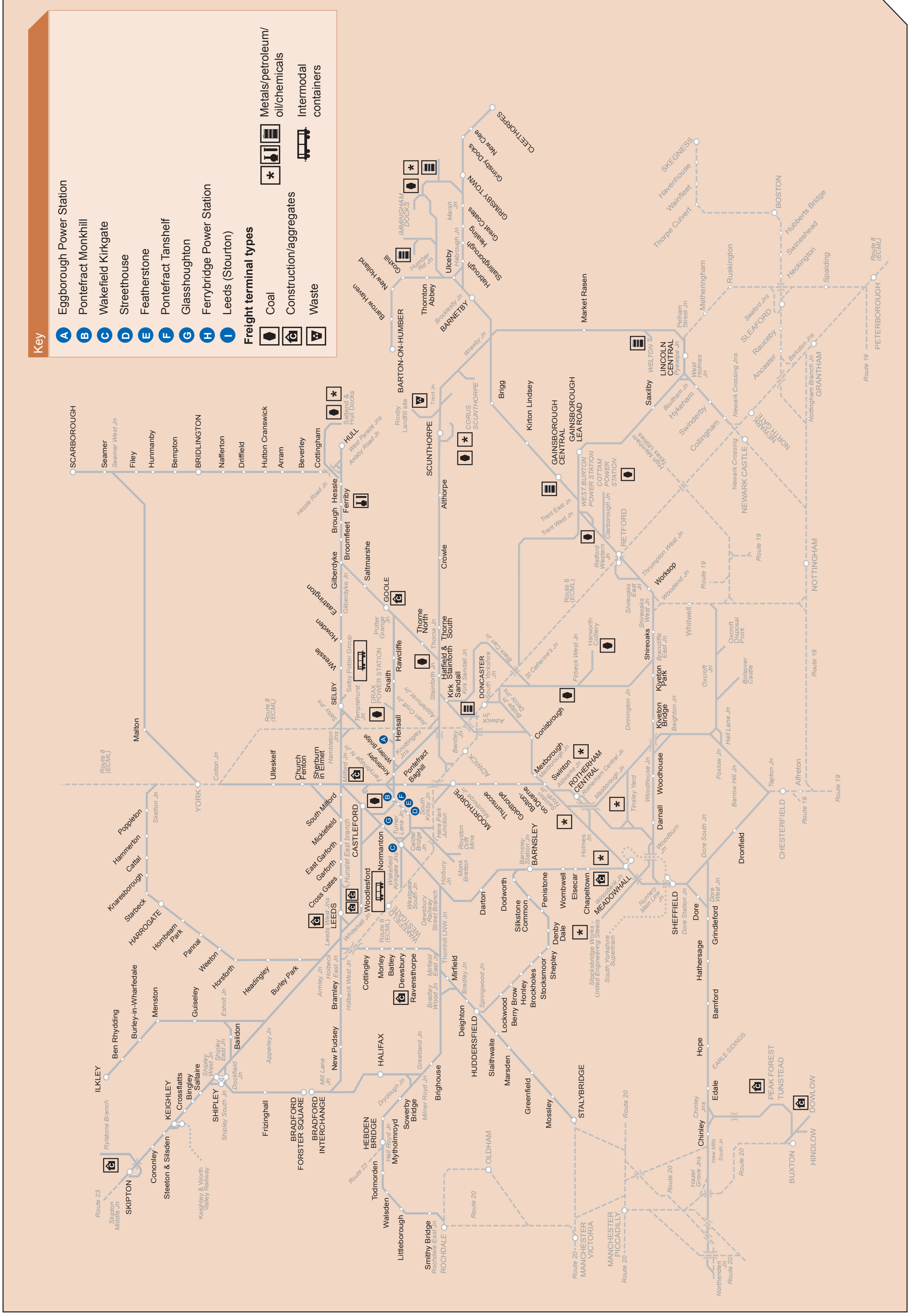


Figure 3.13 shows the active freight terminals in the area – these are detailed in **Appendix 1**.

Freight services require more reserved paths in the Working Timetable (WTT) than are actually used, to permit operational flexibility. Unlike passenger services, for most freight market sectors if there is little or no demand for a freight service it does not run. The Freight RUS contains a national analysis of path utilisation and an explanation of the key factors in each market sector.

The Freight Operated Companies (FOCs) are engaged in a number of initiatives to improve path take-up and efficiency of operations. EWS has developed the concept of the "Big Freight Railway", the purpose being to maximise use of each path on the network. The key focus is on running trains which are longer, heavier and potentially in some cases bigger (both in width and height).

3.4 Yorkshire and Humber rail network

The principal infrastructure and rolling stock characteristics that have been analysed to establish the current route capacity and capability are:

- planning headways
- linespeeds
- junction speeds
- electrification
- loop lengths
- rolling stock types
- platform lengths
- station facilities
- car parking
- integration with other public transport modes
- rolling stock depots and stabling
- loading gauge
- route availability.

3.4.1 Planning headways

The planning headway is a measure of how closely (in time) one train can be timetabled to follow another. Within the RUS area, headways vary from 2.5 minutes on the western approaches to Leeds station, to 8.5 minutes beyond Skipton, and even more on some single line sections. Most notable of the single lines are the section of the Wolds Coast between Bridlington and Seamer, the section between Grimsby Town and Cleethorpes, the Harrogate line between Poppleton and Knaresborough, the Penistone line between Barnsley and Huddersfield, the "freight only" South Yorkshire Joint Line (between St. Catherine's Junction and Dinnington Junction) and the section between Dore station junction and Dore west junction. Single lines restrict the number of services that can run and are generally a performance risk.

There are a number of lines where the headways vary along the route. In some cases, this suits the service pattern and rolling stock type. However, in others, it can limit capacity, reducing the ability to change the timetable, recover from perturbation, and use as a diversionary route. This is the case along the Calder Valley. Figure 3.14 shows the planning headways across the RUS area.

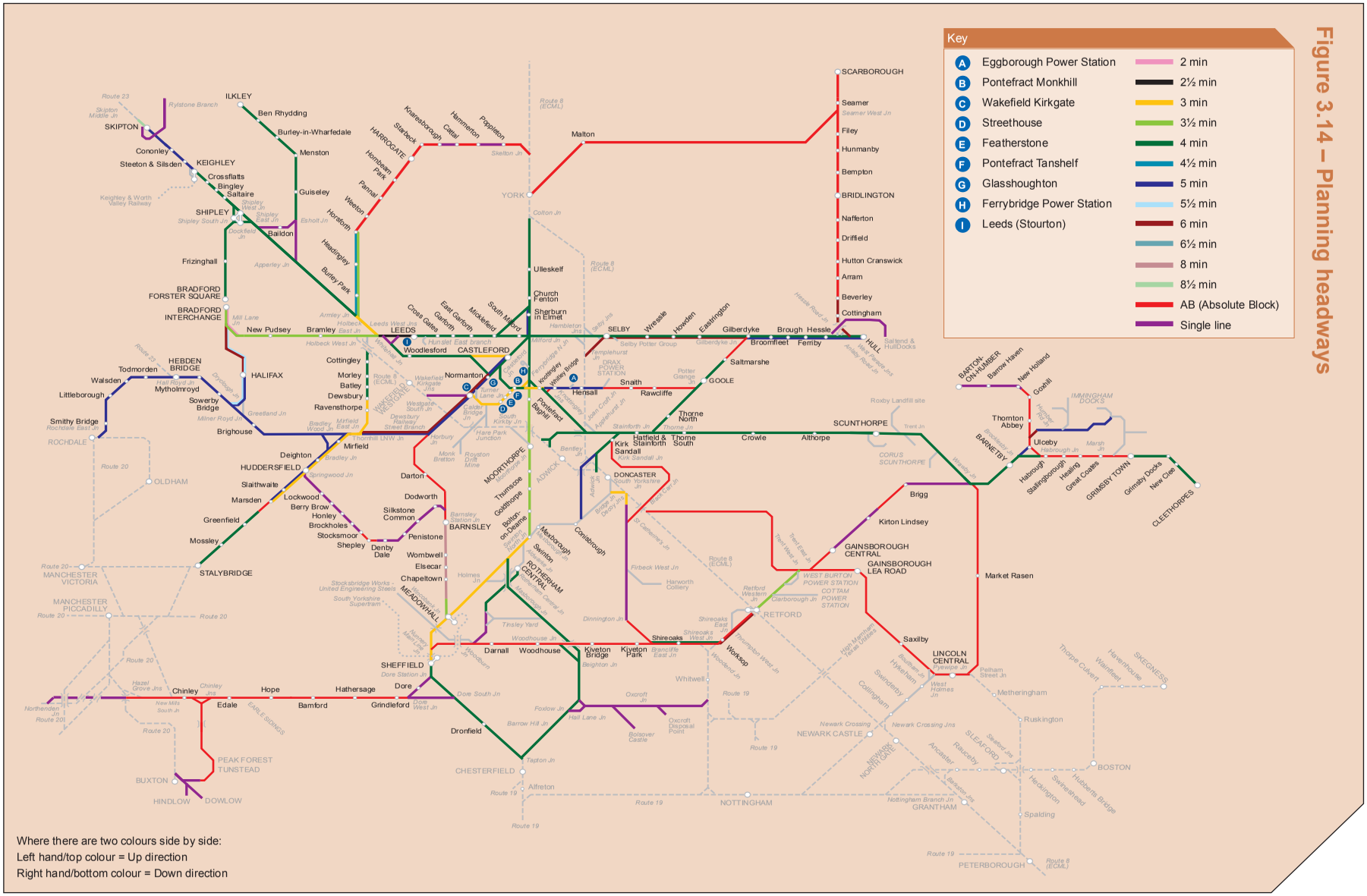


Figure 3.14 – Planning headways

The data was collated from Rules of the Plan and produced by Network Rail for the Yorkshire and Humber Route Utilisation Strategy

3.4.2 Linespeeds

The prevailing linespeed on most route sections is between 50mph and 75mph. All of the passenger rolling stock, however, is capable of at least 75mph, with the electric units and the interurban diesel units capable of 90mph and above. There are a number of routes along which the linespeed varies. This can be inefficient in terms of capacity and journey time, depending on unit types and stopping patterns. This is especially true for the interurban services, which do not stop as regularly as local services. Notable sections where higher linespeeds could result in significant journey time savings include the Calder Valley line and the route from Sheffield to Grimsby via Doncaster, although in the latter case the ability to achieve faster paths would be dependent on the overall traffic mix.

Freight traffic can be constrained by differential linespeeds throughout the RUS area. There are a number of route sections where freight trains have to operate at substantially lower speeds than their passenger counterparts. Equally, there are a number of specific structures in the RUS area which necessitate a specific reduction in speed for some or all freight traffic.

3.4.3 Junction turnouts

Many of the junction turnout speeds are 30mph and below. Deceleration from linespeed and subsequent acceleration back to linespeed after crossing a junction costs time and capacity. In some cases, the requirement for approach control signalling impacts journey time and decreases capacity further. Capacity is also constrained by “single lead junctions” (where parallel movements between trains on and off the diverging route are not possible), which also cause performance problems. For freight trains in particular, the time taken to decelerate and return to full speed can be significant, with attendant impact on line capacity as well as on fuel consumption.

3.4.4 Electrification

There is relatively limited electrification within the RUS area when compared with other conurbations such as Strathclyde or the West Midlands. Through the middle of the area runs the electrified East Coast Main Line, with the associated electrified route connecting Doncaster to Leeds. Additionally, the Airedale and Wharfedale routes from Leeds to Bradford Forster Square, Ilkley and Skipton provide a compact local electrified network. There are almost no electrified diversionary options available. The relatively small electrified route mileage means that there are currently few economies of scale for the electric train fleet.

3.4.5 Rolling stock types

Passenger services are operated by quite a wide variety of rolling stock types. The majority of fast cross-Pennine services are formed of high acceleration Class 185 units with Class 170s working the remainder. Most local and other regional services are operated by various types of Sprinter rolling stock (Classes 150, 153, 155, 156 and 158) and Pacers (142 and 144) whilst electric local services are operated by Class 333s and a few Class 321s. Long-distance services to/from London are operated by Class 91 electric locomotives and mark IV coaches, High Speed Trains (Class 43 diesels), and Class 222 and 180 diesel trains. Most services through the area connecting the North East and Scotland with the Midlands and South West are operated by Class 220 and 221s.

Most freight services are operated by Class 66 diesels though some of the heaviest trains use Class 60s.

3.4.6 Loop lengths

None of the loops in this area is long enough to take the longest 775-metre freight trains. Where there are substantial lengths of mixed-use double track, either without loops or with only loops of limited length, the inability for passenger trains to pass slower moving freight services (or vice versa) is both a constraint on capacity and adversely affects performance. This is most acute on the north and south cross-Pennine routes, where limited-stop interurban services share the route with substantial freight and, in some

places, stopping passenger operations. Other examples are Doncaster – Brocklesby, Doncaster – Hare Park, Gascoigne Wood – Hull and Rotherham – Doncaster/Moorthorpe.

A number of loops are sometimes used to allow faster trains to pass stopping services during perturbation. Often these are located as a result of historic traffic flows and hence may not be ideally suited to the requirements of today's service patterns. An example is at Diggle where the loop does not have the right signalling arrangements to make use of it by passenger trains.

3.4.7 Platform lengths

Apart from major stations such as Leeds and Sheffield, platforms across the RUS area are largely a mixture of two-, three-, and four-car lengths. In some cases platform lengths vary along a line of route, which means either the train length is constrained by the shortest platform, or stopping patterns have to vary according to train length. Often the shortest platforms are on the periphery of the RUS area (for example, some smaller stations on the Cleethorpes to Barton-on-Humber route cannot fully accommodate all types of modern two-car train).

A particular issue exists on some routes in South and West Yorkshire where increasing demand gives rise to a need for trains of at least four-car length but many stations are of a lesser size. The present rolling stock fleet does not generally provide for selective door opening, which can sometimes provide an alternative to platform lengthening at the more lightly used stations.

3.4.8 Station facilities

Large, busy stations such as Leeds and Sheffield have a comprehensive range of passenger amenities. Those at medium and small stations are more variable. For example, Wakefield Kirkgate is very limited in terms of passenger facilities, despite its city centre location. There are many small, relatively lightly used stations in suburban and rural areas which are entirely unstaffed and as a result offer only basic waiting and information facilities.

3.4.9 Car parking

Most stations within the RUS area provide at least a small number of car parking spaces with substantial provision at larger locations such as Sheffield. Generally, non-provision is restricted to small urban stations where realistically most passengers would arrive on foot, and without costly land purchase there is no space where parking could be created.

A significant number of stations within the Passenger Transport Executive areas offer free parking as an incentive to public transport use, but elsewhere charges are generally made. Whilst comprehensive survey information does not exist, there is a general perception that at stations with a frequent train service and good highway access, car parks fill early. As such, it is likely that demand for off-peak travel is currently constrained by limitations in car park capacity, although in some cases suitable alternative parking may be available beyond the immediate station area. The car parks at Chesterfield, Meadowhall and Swinton stations, for example, are known to be currently operating at capacity.

3.4.10 Integration with other public transport modes

There are a number of locations where the railway intersects or runs close to other modes of public transport. In the Sheffield area, interchange with the Supertram system is especially important, as this network gives easy access to multiple destinations in and around the city. There are two main locations where Supertram interacts most closely with the rail network, namely at Sheffield and at Meadowhall, where stops are located immediately adjacent to the main-line stations.

At Sheffield, Meadowhall, Barnsley and Doncaster, high-quality rail/bus interchanges are available, with comprehensive facilities provided by South Yorkshire PTE. Research in South Yorkshire indicates that 20 to 25 percent of rail users use the bus at one or both ends of their rail trip, even at local stations.

There is a similar West Yorkshire PTE interchange at Bradford Interchange.

Many more minor rail/bus interfaces exist around the RUS area, including that at Barton-on-Humber, allowing rail passengers from the south bank of the Humber to access buses to travel over the Humber Bridge into Hull.

3.4.11 Rolling stock depots and stabling

Northern Rail has rolling stock depots at Hull Botanic Gardens, Leeds (Holbeck), Leeds (Neville Hill), Sheffield and Skipton whilst TPE has depots at Cleethorpes and York. Additionally, there is overnight stabling of rolling stock in stations at Bridlington, Doncaster, Cleethorpes, Ilkley, Harrogate, Huddersfield, Hull, Leeds, Lincoln, Scarborough and York.

Neville Hill also has a depot operated by East Midlands Trains, which provides facilities for several long-distance high speed operators in the area.

Crofton Depot, operated by Bombardier Transportation, provides facilities for Hull Trains, TPE and CrossCountry and is currently at capacity.

There are other important depots outside the RUS area which are used by services operating within it, for example Ardwick (Manchester) and Central Rivers (Burton-on-Trent).

A strategic solution to the future provision of adequate depot and stabling facilities is a network-wide issue and will therefore be considered as part of the Network RUS. The major capability and capacity limitations within the existing facilities are described below:

- Rail access to and egress from Neville Hill depot is inflexible, which can cause performance delays on the main line if there are problems at the depot. Development work is progressing on a potential scheme to provide an additional access to the depot from the Leeds direction, an additional loop facility, and the electrification of further lines within the depot.
- Most Northern Rail depots and stabling points are either at or close to capacity, which raises a significant issue given that the DfT Rolling Stock Plan envisages the fleet will increase by 24 Electric Multiple Unit (EMU) vehicles and 158 Diesel Multiple Unit (DMU) vehicles by 2014. It appears that it will be essential to concentrate maintenance activity at Neville Hill and Newton Heath (Manchester), thereby increasing the need for stabling and servicing at other locations.
- Neville Hill is likely to be used in connection with trial running of the Intercity Express Programme fleet, which will place further pressure on the depot's capacity.

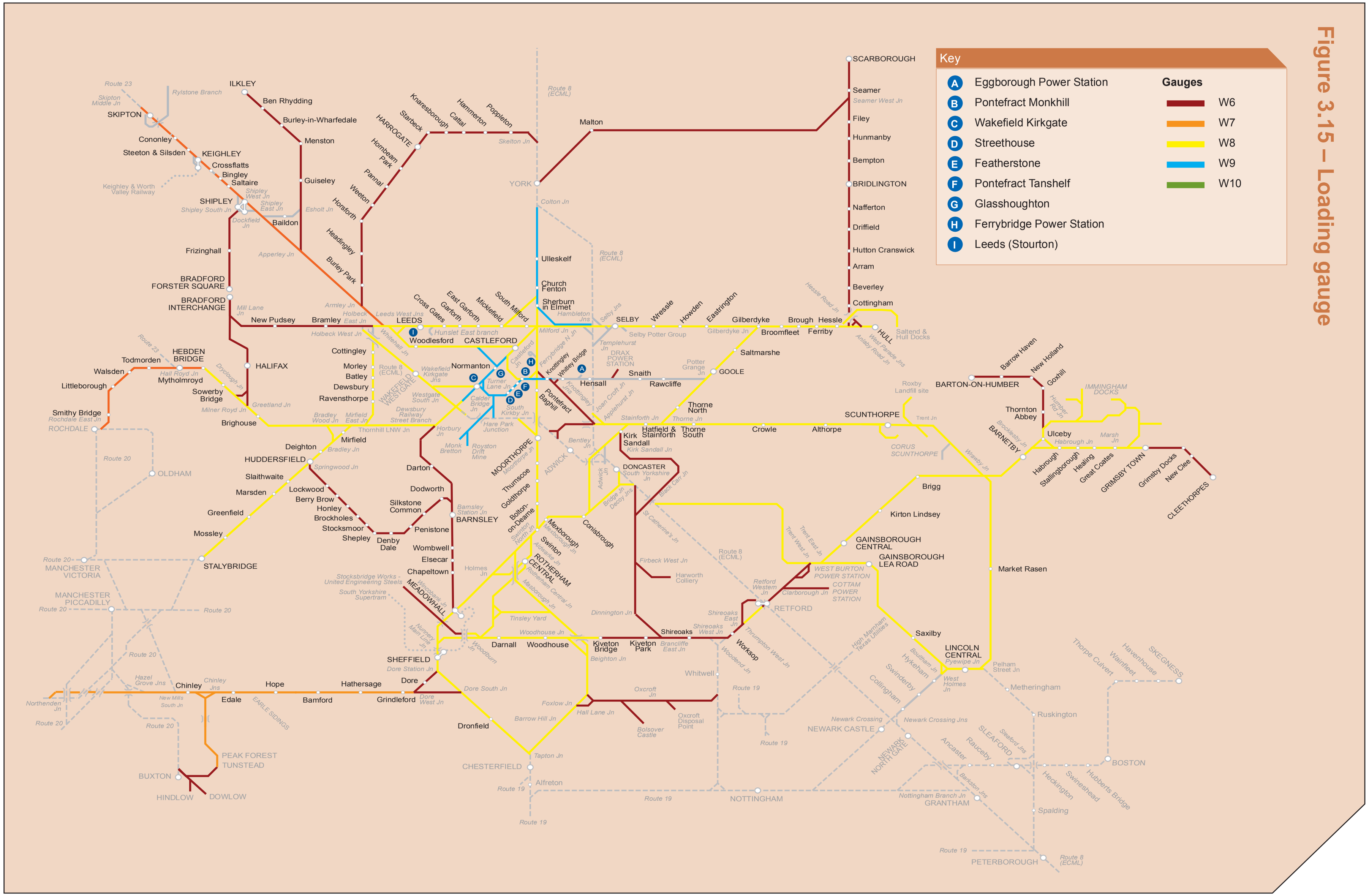
3.4.12 Loading gauge

Loading gauge is the profile for a particular route within which all vehicles or loads must remain such that sufficient clearance is available at all structures. In the UK, it typically ranges from W6 (the most restrictive) to W12 (the most generous). See Figure 3.8.

In the RUS area, gauge ranges from W6 to W9, but is predominantly W8 or below. As can be seen in Figure 3.15 in the small area where W9 is available, for the most part clearance exists on only one route. Consequently, if this route is unavailable, alternative options for W9 traffic are not readily available. The current pattern of gauge across the RUS area is a constraint on freight use. The absence of W10 gauge (which would allow 9' 6" containers to be conveyed on standard-height wagons) is a serious limitation on rail's attractiveness in the intermodal container market. Even the primary east – west route across the Pennines is restricted to W8 traffic.

The mixture of gauges means diversionary routes can often be long and circuitous, or trains have to be cancelled when the main route is unavailable. For example, whilst the route across the Pennines via Huddersfield and Stalybridge is cleared for W8 traffic, the other two routes (Calder Valley and Hope Valley) are only cleared for W7 traffic.

Figure 3.15 – Loading gauge



The data was collated from Rules of the Plan and produced by Network Rail for the Yorkshire and Humber Route Utilisation Strategy

3.4.13 Route Availability

The Route Availability (RA) of a specific route is determined by the carrying capability of both its structures and its track. Most of the RUS area is RA7 – RA9, although the Wolds Coast line between Hull and Seamer is of lower Route Availability. However, traffic up to RA10 operates over specified sections of the routes subject to certain speed restrictions. Each such train that exceeds the RA of the route requires special permission to run, and cannot be diverted from the specified path without additional authorisation, which reduces flexibility during perturbation.

3.5 Use of the network

3.5.1 Route utilisation and congestion

Route capacity is limited by a combination of a number of infrastructure features:

- plain line, where faster trains will catch up with slower trains
- junctions, where conflicting moves limit capacity
- station platforms, where the next train cannot arrive until the previous one has departed.

The rail industry has developed a measure of the level of congestion on the network, known as the Capacity Utilisation Index (CUI). The CUI is a measure of how much of the available capacity on a section of line is used by the train service. Although it cannot take account of every factor that impacts upon congestion at a local level, the CUI is based upon:

- route characteristics (eg. number of lines, etc)
- the number of trains in the timetable
- the order in which trains are timetabled and their mix of speeds
- planning headways.

Whilst CUI is a useful measure, it is of limited value as a planning tool since it does not include all the factors that need to be considered to make a timetable work and evaluation of specific options for changes to services or infrastructure requires modelling work to be carried out at a more detailed level. Key constraints are described in Section 3.5.3, whilst the detailed analysis appears in Appendix 3 on the Network Rail website.

3.5.2 Performance

Performance is known to correlate with capacity utilisation and also a number of key factors such as restrictive layouts, single lines and short turnarounds, the specifics of which are discussed in the next section in respect of each of the main corridors in the RUS area.

A major influence beyond the immediate RUS area is the “Manchester Hub”, which, due to its complex connectivity between routes, means that delays can have far-reaching and persistent effects over a wide area. Key hot-spots within the hub are Salford Crescent, Manchester Piccadilly and Manchester Victoria, due to the high capacity utilisation and the number of conflicting moves.

Similarly, Nottingham station has an influence on performance in the RUS area because of the impact on the Norwich – Liverpool service and (from December 2008) the Nottingham – Leeds service.

The Train Operating Companies, with support from Network Rail, continuously strive to optimise their performance within the constraints of the route. The (franchise-wide) Public Performance Measure (PPM) for TPE improved from 87.53 percent in 2005/06 to 89.37 percent in 2006/07. The equivalent figures for Northern Rail are 86.46 percent in 2005/06 and 87.30 percent in 2006/07.

From the start of Control Period 4, the FOCs will be the subject of a Freight Performance Measure (FPM) that will provide quantifiable data equivalent to the Public Performance Measure applicable to passenger operators.

Analysis has been undertaken to identify those locations that suffer performance problems caused by “RUS issues”, ie. those issues that can not easily be dealt with through established industry processes.

Reactionary delays were used as the main measure of performance. Reactionary delay gives an indication of the impact that a delayed train has on other services due to it not running in its timetabled path. This often leads to other trains also not running on time. Reactionary delays thus provide a measure of timetable and infrastructure resilience. In particular, reactionary figures indicate how accommodating the timetable and infrastructure are of any unplanned disruptive events, and how quickly the timetable can recover once the root cause of the individual disruptive event has been resolved. A more detailed methodology (Appendix 3) appears on the Network Rail website.

The geography of the railway in the Yorkshire and Humber RUS area is such that services from all over the area tend to head into or pass through the hubs around Leeds, Sheffield and Doncaster. Due to the congested nature of these hubs, services interact in such a way that a delayed train from one area can cause delays to trains going to other areas, and hence cause additional reactionary delay. This effect is accentuated by the surrounding busy flat junctions, which increase the likelihood of delay from one corridor impacting on services on other corridors. Notable among these junctions are Whitehall Junction (Leeds), Sheffield and Swinton. Also identified as a major source of reactionary delay is Rochdale, but this is centred on the fact that Oldham Loop trains are regarded as terminating there before starting their forward journey.

Sheffield station undoubtedly suffers from a track and signalling layout originally designed at a time when train operating patterns were significantly different and is handicapped by the fact that not all through platforms are fully bi-directional.

There are a number of single lines that can accentuate reactionary delay due to the difficulty in regulating trains on and around them. Notable among these is the section between Dore station junction and Dore west junction with very substantial reactionary delays recorded. At a somewhat lesser level is the line serving Rotherham Central, with its single track pinch-point between Holmes Junction and Rotherham Central Junction. At a number of locations on the route, short turnarounds at terminal destinations allow little time to recover from earlier delays. Particular examples of this are Rochdale, previously mentioned, and Huddersfield, although delays are significantly lower here.

3.5.3 Constraints by corridor

Harrogate corridor

Services on this route are currently limited by the lengthy signalling sections between Leeds and Harrogate and the presence of single-line sections on the Knaresborough – York section. In addition, train length is constrained by the four-car platform length at Knaresborough which cannot be lengthened.

Leeds – Scarborough/Hull corridor

Capacity to the east of Leeds is limited by the fact that much of the route is double track only and is required to handle a mixture of stopping and longer distance passenger trains as well as a variety of freight services. Whilst there is a small amount of four-tracking between Marsh Lane and Neville Hill depot, this is heavily used by trains proceeding to and from the depot.

Huddersfield corridor

Trains to and from Stalybridge bay platform and between Huddersfield and Manchester Victoria must cross the layout at Stalybridge at only 15mph. This reduces capacity, can affect performance and impacts on journey times. Between Stalybridge and Huddersfield, the mix of fast and slow passenger services with freight trains uses up significant capacity on this route. The lack of convenient turnback facilities for passenger trains inhibits the ability to operate short-distance local services which would economically increase frequency on the busiest sections and deal with peak overcrowding. The W8 loading gauge constrains the growth of intermodal freight, whilst the short loops at Marsden, Diggle and Stalybridge are a constraint to freight traffic in general.

Barnsley/Pontefract corridor

These lines have experienced growth in passenger and freight demand, but development has been restricted (in the case of stopping passenger services) by the need to reverse at Castleford, where there is only one usable platform. However, semi-fast Sheffield – Barnsley – Leeds services which avoid Castleford have been introduced, and further services (extending to/from Nottingham) will commence in December 2008. For freight, an increasing constraint is the fact that much of the infrastructure is limited to the W8 loading gauge.

Calder Valley corridor

The Calder Valley corridor serves Bradford and is used as an alternative route between Leeds and Manchester. However, journey times are significantly longer than on the route via Stalybridge, due to it being less direct, the linespeed being generally lower, and the need to reverse at Bradford Interchange. Additionally, capacity is limited by some long signalling headways, which restrict additional or diverted services. Meanwhile, the ability to run longer trains is limited by platform lengths at a number of stations.

The trains from Leeds that terminate at Manchester Victoria do so in the bay platforms. This necessitates crossing the whole layout, and can have a potentially serious impact on performance in times of perturbation.

The lack of W8 (or larger) loading gauge constrains freight and reduces usefulness as a freight diversionary route.

Wakefield corridor

This line is characterised by a wide variety of traffic, including local passenger trains, long distance high speed operations – serving a diverse range of origins and destinations – and various freight trains. The section between South Kirkby and Hare Park Junction was identified in the Freight RUS as a particular bottleneck. Meanwhile, the track layout at Wakefield Westgate constrains performance and has a significant adverse performance impact. The present loading gauge is a constraint for freight.

Airedale/Wharfedale corridor

This group of lines has experienced strong growth in recent years, but the ability to handle further expansion is limited by the existing track layout and signalling as well as limited platform lengths at a number of stations. In particular, the triangular layout at Shipley restricts scope for platform lengthening at reasonable cost. It is also likely that further expansion of electric operation would require a significant upgrade of traction power supply.

The Airedale corridor is also significant for freight, but growth is constrained by line capacity and loading gauge.

Hope Valley corridor

A characteristic of this route is increasing demand for both freight and passenger traffic. Particular constraints are currently the short section of single track through Dore & Totley station to Dore west junction, and the fact that the rest of the route is only double track (where capacity is constrained by the difference in running times between fast and slow trains). Loading gauge is a constraint for freight.

Sheffield – Doncaster/Moorthorpe corridor

Capacity is heavily in demand for both passenger and freight services on a route which is generally no more than double track and includes a large number of at-grade junctions in the short distance between Chesterfield, Sheffield and Moorthorpe/ Doncaster. A particular limitation for passenger development is the fact that trains serving Rotherham Central station must use the single track Holmes Chord. The value of the route for intermodal freight traffic is constrained by the present loading gauge of W8. Aldwarke Junction is a particular bottleneck for freight growth.

South Humber

This area is notable for the very intensive freight operation serving the port of Immingham and the Corus steelworks at Scunthorpe. The present loading gauge of W8 is a significant limitation to the development of intermodal traffic via Immingham, whilst the fact that the route between Doncaster

and Immingham is predominantly only double track places a limitation on capacity (though this has recently been eased by the reopening to regular freight traffic of the Brigg line between Wrawby Junction and Gainsborough). Turnaround times at Grimsby Town for some passenger trains are relatively short, with a potential impact on return workings when an incoming train is delayed.

Penistone line
This line is predominantly single track between Barnsley and Huddersfield, with passing loops only at Penistone Station and between Shepley and Stocksmoor. This constraint limits service expansion beyond the present operation. Since 2005, the line has been a Designated Line under the Department for Transport's Community Rail Development Strategy. The line is one of the seven routes chosen for the DfT's Community Rail Development pilot projects. The pilot projects were chosen to demonstrate how the Community Rail Development approach can increase revenue, manage down costs and encourage greater community involvement in the local railway. Meanwhile, the line has been chosen as the trial site for TramTrain operation between Sheffield and Huddersfield, with a target date of 2010 for implementation.

Worksop corridor
This line largely meets currently identified needs. The present predominant loading gauge of W6 would preclude its use for intermodal freight traffic, and could pose a constraint to development of new freight flows from the former Manton Colliery site.

Chesterfield corridor
Beyond the constraints identified in relation to Hope Valley services, the development of services in this corridor is largely determined by timetabling considerations associated with a heavily-used section of mainly double track and a wide range of origins and destinations.

Wolds Coast line
This passenger-only line largely meets currently identified needs. The single track sections north of Bridlington would limit major service expansion on that part of the route, whilst the need to reverse at Hull or Scarborough to serve off-line destinations to the west inevitably impacts on journey time. Turnaround times for some trains at Beverley, Bridlington or Scarborough are quite short, so that any delay to an incoming service can easily affect the return working with potential wider impact, especially given the constraints of single track operation at the north end of the line.

Other corridors
There are a number of other lines in the RUS area, with most of these being "freight only". Generally, there are no major issues with these, though some that are single line suffer from performance problems when trains are running out of course. The South Yorkshire Joint Line, which is a freight-only route between St. Catherine's Junction (Doncaster) and Brancliffe East Junction (Worksop) is largely single track, and is virtually at capacity.

The Barton-on-Humber branch carries a Community Rail Designated Service from Barton-on-Humber to Cleethorpes. Since February 2007, the section of this route between Barton-on-Humber and Ulceby North Junction has been a Designated Line under the Department for Transport's Community Rail Development Strategy.

3.5.4 Current engineering access
A cyclical engineering access strategy for key junctions on the network was jointly developed by Railtrack, its maintenance contractors, and its customers some years ago. This strategy identified a programme of regular extended possessions which sought to deliver value for money and minimise overall disruption to train services. This possession strategy was centred on a series of large (in both geographic coverage and time span), cyclical access opportunities. The aim of this strategy was to provide the opportunity to undertake

all major scheduled maintenance activity for the specific area on a regular, planned basis. This approach reduced the number of short, inefficient, but generally non-disruptive possessions. This pattern of possessions has been reviewed on an annual basis since then and the concept has gradually been extended.

A cross-industry review of the engineering access strategy is currently under way, together with evaluation of the 'Seven Day Railway' concept. This is being led by Network Rail, and is intended to be gradually implemented, where appropriate, by 2014. Within the RUS area, the recently completed upgrade of the Brigg line should help facilitate this by allowing diversion of trains away from the Scunthorpe line. As such, the South Humberside area is one of the first for examination as part of the Seven Day Railway initiative. The outcome of this work may result in changes to the current maintenance and renewals plans. Meanwhile, the current strategy has resulted in an evolving engineering access regime that tries to achieve a reasonable balance between engineering and train service requirements.

As mentioned above, there has been an identified need to improve access to the Scunthorpe line on midweek nights, to provide for cyclic maintenance between Wrawby Junction and Doncaster. A solution is in hand for this issue. Beyond this, there are a few locations where there is continued pressure on the access available, notably around some junctions, or on routes for empty stock movements associated with the first or last trains of the day. In these cases, engineering needs must be balanced with train diagramming demands and start-of-service performance. The normal service patterns allow, in most cases, for adequate maintenance and renewal access, with suitable shift lengths available at weekends and on midweek nights. On some routes this requires the diversion of the limited number of services operating at these times. For example, the core cross-Pennine route between York, Leeds and Manchester has a regular passenger service throughout the night. However, the area is quite well provided with diversionary routes, so that with careful planning, continuity of rail service can generally be achieved (albeit with some increase in journey time). Possessions between Thornhill LNW Junction (near Dewsbury) and Heaton Lodge Junctions (near Huddersfield) are a known problem for TPE, as the diversionary option via Bradford is substantially longer and maintaining train crew route knowledge over this route is not financially viable for TPE.

Freight diversions are constrained by capability requirements of gauge and weight, such as the very limited availability of W9 routes in West Yorkshire, or the constraints applying to RA10 aggregate trains from the Peak District. While diversion of traffic to road is not an option in the way it can sometimes be for passenger operators, some of the freight services have flexibility around the timing and duration of their journeys, and possessions that could affect them are targeted at times of little traffic. Inevitably, growth will increasingly require key routes to be available for more of the time.

4. Anticipated changes in supply and demand

4.1 Forecast passenger demand

4.1.1 Background

The Yorkshire and Humber Route Utilisation Strategy area has experienced a sustained period of substantial passenger growth, with 60 percent more journeys made by rail in 2007/08 than in 1998/99 when comparable records began. The key markets identified in **Chapter 3** have experienced the highest levels of growth, with the number of peak period trips between West Yorkshire and Leeds for example, increasing by 74 percent over this period.

The fastest demand increase has occurred in the more recent past, with growth in key markets since 2002/03 typically in excess of 6 percent per annum. The magnitude of this recent growth appears to be greater than can be explained by recovery from major shocks to the passenger market that occurred over the period, such as the Leeds First redevelopment programme and poor punctuality following the Hatfield accident.

Future rail passenger demand has been forecast for the period to 2017/18. The forecast was produced using a bespoke demand model based on the forecasting framework published in the Passenger Demand Forecasting Handbook (PDFH) 4.1. This is an industry standard framework for modelling underlying growth and includes global factors such as Gross Domestic Product (GDP), employment, population, fuel costs, and rail fares policy.

The model uses 2006/07 LENNON (rail) ticket sales data. This was the most recently available data when the forecasts were produced, and the forecasts have been sense-checked using the 2007/08 LENNON data published subsequently. Rail journeys entirely within West Yorkshire or entirely within South Yorkshire can be made using Passenger Transport Executive products which are not recorded in the LENNON sales data. Based on analysis for the Yorkshire and Humber Regional Planning Assessment it is estimated that 41 percent and 36 percent of passengers use PTE products to travel within West Yorkshire and South Yorkshire respectively.

Evidence from previous RUSs suggests that the PDFH framework can understate recent acceleration in passenger growth experienced in some urban and inter/urban rail markets outside of London. Network Rail has conducted an extensive validation exercise for the Yorkshire and Humber region and concluded that the PDFH would have underestimated passenger growth between 1998 and 2006.[1]

Econometric analysis was used to investigate the potential explanations for this under prediction and a statistical link was found between the rate of office and retail space occupation in central Leeds and Sheffield, and the shortfall between the PDFH forecast and peak period passenger growth. This explains the majority of the longer term discrepancy. On the basis of this evidence, Leeds and Sheffield city centre office and retail land take up was included as a new variable in the RUS forecasting model.

A further uplift was applied to the first three years of the forecast to account for the portion of short-term historical growth that could not be explained by the econometric analysis. This followed an approach developed during the North West RUS and was conducted in partnership with industry stakeholders.

1 By 2006 the rail passenger market had recovered from the impact of the Leeds First project and poor punctuality following the Hatfield accident

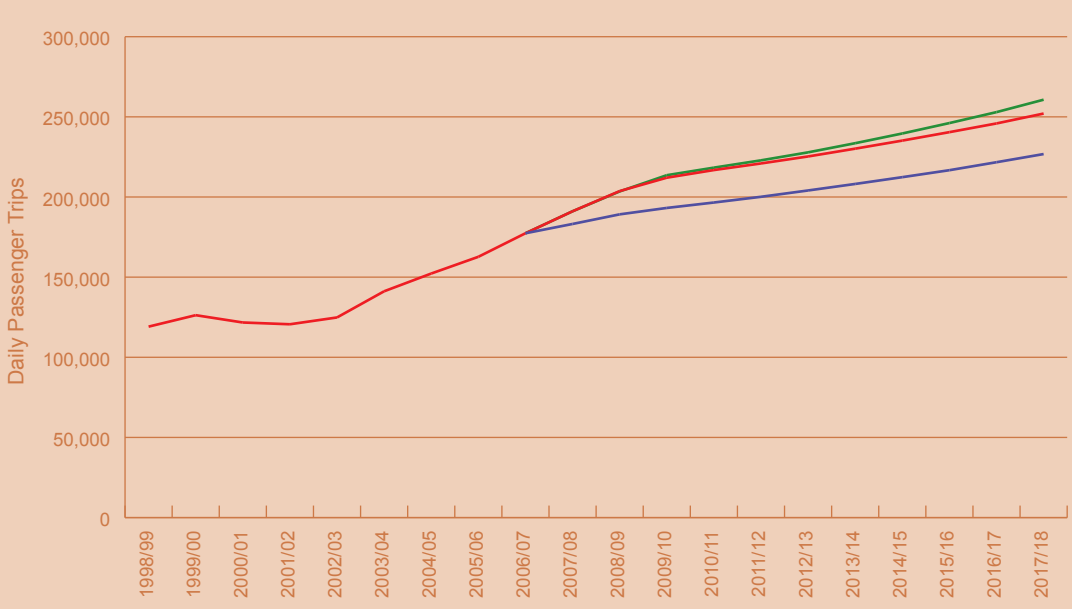
Three scenarios were developed using this approach. These are as follows:

- **Low Scenario**. PDFH-based forecast including the impact of office and retail take up in Leeds and Sheffield.
- **High Scenario**. PDFH-based forecast including the impact of office and retail take up in Leeds and Sheffield, as well as an uplift for the first three years to account for unexplained rapid short-term growth.
- **Central Scenario**. PDFH-based forecast including the impact of office and retail take up in Leeds and Sheffield, as well as an uplift to account for unexplained short-term growth which returns to the long-term trend more quickly than in the high scenario.

4.1.2 Overall growth forecasts

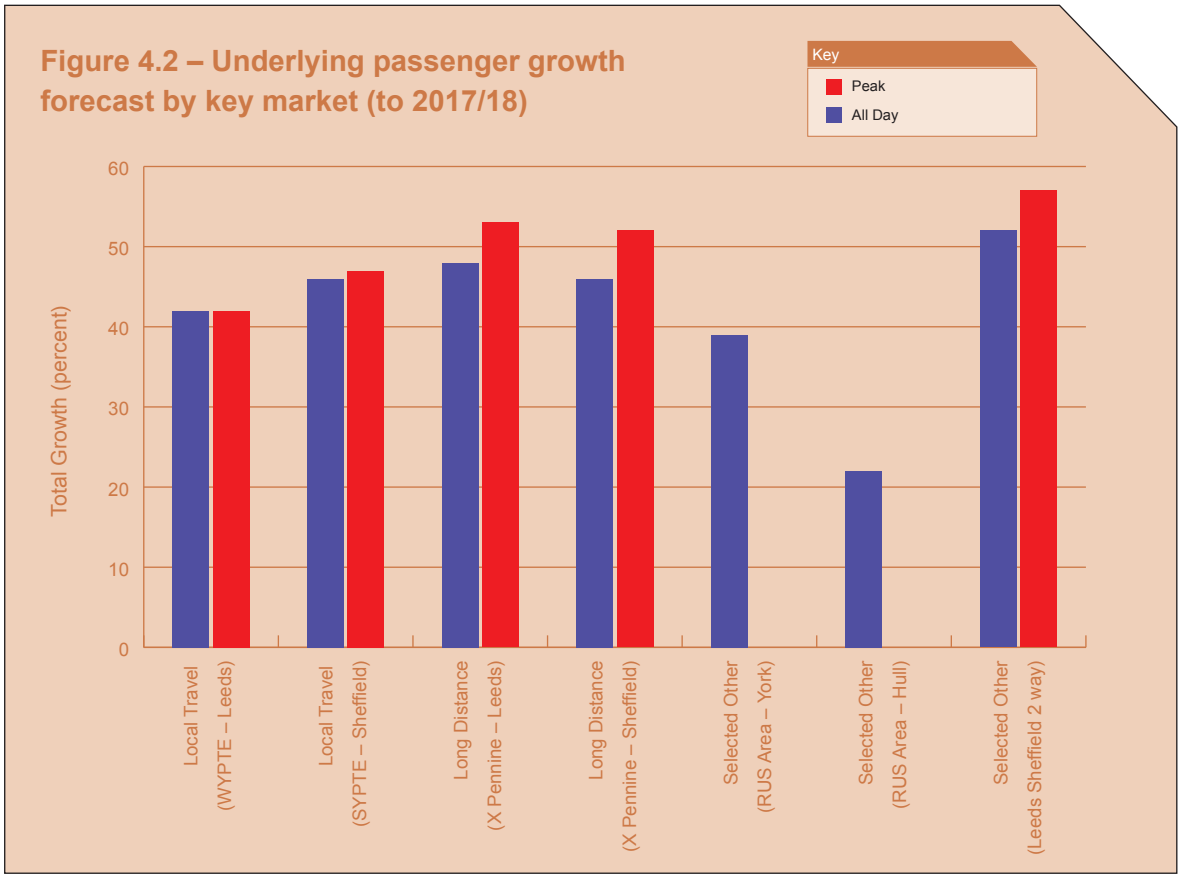
Figure 4.1 below details passenger numbers for the whole RUS area since 1998/99 and the projected passenger growth for the 11-year period to 2017/18. Over this period the total number of passenger trips is expected to grow by between 28 percent and 47 percent, which is equivalent to between 2.3 percent and 3.6 percent per annum. The central forecast is towards the upper end of this range with a total passenger growth of 42 percent (3.3 percent per annum) expected. This is purely an underlying forecast and takes no account of potential frequency or capacity improvements which may impact demand further. The demand impact of RUS schemes has been assessed during the work presented in **Chapter 5.**

Figure 4.1 – Underlying passenger growth forecast for the Yorkshire and Humber RUS area



Benchmarking is difficult as few comparable forecasts have been produced; however, the RUS projections are within the range of 25 to 56 percent over 10 years (2.1 to 4.5 percent per annum), published in the RPA for Yorkshire and Humber. The central forecast is of a similar magnitude to the North West RUS central forecast of 44 percent over 12 years (3.1 percent per annum). High Level Output Specification am peak demand projections which cover the period 2008/09 – 2013/14 forecast demand growth of around 4 percent per annum for Leeds and 2.5 percent per annum for other urban areas (including Sheffield). This is largely consistent with the shorter-term RUS demand forecasts for Leeds, which project peak growth to 2013/14 of 4.3 percent per annum, although the RUS prediction for Sheffield of 4.8 percent per annum is slightly higher than the figure implied in HLOS.

Figure 4.2 – Underlying passenger growth forecast by key market (to 2017/18)



4.1.3 Growth by key passenger market

Figure 4.2 illustrates the passenger growth forecast for the key markets identified in **Chapter 3**, as well as for a selection of other smaller markets.

The market for longer-distance travel on the cross-Pennine routes is forecast to grow at the fastest rate, with the number of trips to Leeds and Sheffield anticipated to increase by 48 percent and 46 percent respectively. It is anticipated that a greater than proportional share of this growth will occur during peak periods, with 53 percent and 52 percent more trips forecast during the busiest three hours in the mornings and evenings. Significant growth is also expected during the inter-peak (10:00 – 15:59), predominantly as a result of increased demand for business and leisure travel stimulated by the economic prosperity of the Leeds, Sheffield and Manchester City regions. The sizeable increase in demand for cross-Pennine services will have significant implications for the ability of the rolling stock and infrastructure to accommodate future passenger numbers, as will predicted growth in commuting demand into Leeds and Sheffield.

The market for local travel is expected to experience significant growth over the RUS period with the number of passengers travelling to Leeds and to Sheffield from their respective PTE areas forecast to increase by 42 percent and 46 percent respectively by 2017/18. This is equivalent to 3.8 percent and 3.9 percent per annum. Passenger growth is expected to be evenly spread across all time periods. Furthermore growth in the number of passengers travelling between Leeds and Sheffield is forecast to be particularly large with an increase of 52 percent expected by 2017/18. These projections are indicative of the strength of both the office and retail cores of Leeds and Sheffield.

Slightly lower levels of passenger growth are expected in markets outside the central PTE areas. The number of passengers travelling to York is predicted to increase by 39 percent (3.5 percent per annum) over the next 11 years, and the number of passengers travelling to Hull is expected to grow by 22 percent (1.9 percent per annum) over the same time period.

4.1.4 Passenger growth and future gaps

The continued increase in the demand for travel by rail is a key factor behind a number of the RUS 'gaps' that are detailed in the next chapter.

The local and cross-Pennines rolling stock and infrastructure are already congested during peak periods. Significant numbers of commuters stand on most routes into and out of Leeds during the high peaks and shoulder peaks, and passengers also stand into and out of Sheffield on some lines during the high peaks. On the basis of the passenger growth forecasts, this on-train crowding will become significantly worse. In the absence of any interventions, by the end of CP4 the daily number of morning peak trains in the RUS area with passengers standing would increase from approximately 61 to 79, and the number of trains with more passengers than the theoretical seating plus standing capacity would rise from 20 to 39.

Passenger growth during the inter-peak is likely to result in overcrowding at a time of day where historically there has been sufficient rolling stock capacity to accommodate demand. This issue will be most prevalent in the cross-Pennine market, where a number of individual services are already operating at or close to their seating capacity over some sections of the route. In the absence of any interventions, by the end of CP4 it is anticipated that up to 75 percent of all services operating between Manchester and Leeds (via Huddersfield) during the inter-peak will have some standing passengers. Similarly, there is increasing crowding between the peaks on Liverpool – Norwich services over the Manchester – Sheffield – Nottingham section.

Since the Leeds First Project and the 2004 TransPennine timetable recast, the number and timing of services between most destinations within and beyond the RUS area has been adequate for the key passenger markets. However, the significant and sustained passenger growth means that more frequent services and reduced journey times are increasingly required to meet the needs of these markets.

4.2 Forecast freight demand

The Freight RUS was published in March 2007 and subsequently established. This predicted a growth of 50 percent in gross tonne miles (GTM) by 2014/15. The forecasts described below are from this document. The Department for Transport's 2007 White Paper "Delivering a Sustainable Railway" anticipated a doubling of the rail freight market over the next 30 years.

4.2.1 Electricity Supply Industry (ESI) coal

The largest volume commodity in the RUS area is coal, which is predominantly used in the ESI. The Freight RUS contained two scenarios for the growth of coal. The Base Case was more coal through the ports of Immingham and Hull in the RUS area and the sensitivity was growth through the port of Hunterston on the west coast of Scotland. Over the past year the Base Case has been shown as the main source of growth.

The recently enhanced capacity on the Hull Docks branch and the recent enhancement of the Brigg line to allow regular use of this line will help to provide the additional capacity required. This is discussed further in **Chapter 5**.

The substantial increases in gas and oil prices over the past year have increased the attractiveness of coal for the ESI. The use of Flue-gas Desulphurisation (FGD) equipment at power stations requires limestone trains to support the FGD process and gypsum trains to remove the residue. The five power stations within the RUS area have or are fitting FGD, apart from one of the plants at Ferrybridge. The limestone is expected to originate in the Peak District and traverse the RUS area.

The future of the UK energy policy and carbon emission levels will affect the demand for coal beyond 2015. It is not currently clear how this will affect demand for coal. Bio fuel alternatives being considered have double the mass and any growth in this type of fuel at the expense of coal is likely to increase the demand for train paths rather than lead to a reduction.

4.2.2 Metals

The main flows of metals traffic are concentrated on the Corus plant at Scunthorpe, on the Doncaster to Immingham line. There will be some growth in raw materials from the port of Immingham and metal products between Scunthorpe and the Corus plants in South Wales.

4.2.3 Construction

The forecast 10-year growth in construction traffic from the quarries on the Hope Valley line in the Freight RUS has been exceeded in the first year with three additional trains in each direction. There is anticipated to be further growth in construction traffic to support the building market. Trains on the Hope Valley line serve areas as diverse as North Yorkshire and East Anglia.

Other more modest growth is also anticipated from Rylstone on the Skipton line and between Doncaster and Scunthorpe. As operators generally already maximise payloads, volume increases imply that additional trains will need to operate.

4.2.4 Petroleum

The oil refinery at Lindsey, close to Immingham, is a major source of petroleum products. The Freight RUS predicted an increase in trains between Lindsey and the West Midlands. There have been some changes in the supply industry following the Buncefield incident. These have given rise to unexpected growth in the number of trains to the South East, operation of which is likely to continue for the foreseeable future.

4.2.5 Intermodal growth

The Freight RUS predicted a large increase in intermodal traffic. There are three types of intermodal commodity, all of which are forecast to grow substantially – deep sea, domestic and Channel Tunnel. The deep sea market is growing at around 5 percent per year, mainly driven by the Far East. The domestic network is being supported by the planned increases in the loading gauge. The Channel Tunnel traffic now has a sound future with tolls issues resolved and competition in the railway industry in Europe.

The main terminals in the RUS area are located at Doncaster, Selby, Wakefield and Leeds. The Hutchison Ports UK (HPUK) funded W10 gauge enhancement from the south to the terminals will allow more containers to be conveyed per train. Currently the tallest 9 foot 6 inch containers must be conveyed in pocket or low loader wagons between the bogies which do not use the entire wagon length. It is expected that these containers will account for over 50 percent of the world intermodal container market within 10 years. The expansion of the ports in the South East such as Felixstowe and Tilbury will continue to increase the number of wagons forwarded.

4.3 Potential changes to services and infrastructure

This section identifies planned and proposed changes to supply within the railway system over the period of the RUS. Committed changes have been included (to the extent that they are defined) within the RUS baseline and other changes have been considered wherever they affect the RUS proposals. The changes can be to train services and/or to infrastructure. Major infrastructure schemes are usually accompanied by train service changes whereas minor ones can affect service outputs like journey time or performance. The first three subsections list planned significant investment in the railway network that is currently anticipated to be completed during the RUS period, firstly as part of planned track and signalling renewals and secondly through potential stand-alone enhancement schemes. Renewals often provide the most cost-effective opportunity to realise infrastructure enhancements as the incremental costs of progressing these in conjunction with planned works are generally significantly lower than progressing them as stand-alone projects. Section 4.3.4 describes significant planned train service changes. For reference, a combined list of aspirations from the key railway funders in the RUS area is provided in **Appendix 2**.

4.3.1 Planned major renewal schemes

A number of major switch and crossing renewal schemes are currently being developed. The formation of RUS options, as described in **Chapter 5**, has exploited the opportunities arising from these schemes where appropriate. These are highlighted in Table 4.1.

The industry will continue to consider ongoing switch and crossing, and signalling renewal proposals to identify and assess any future enhancement opportunities. Details of future renewals proposals covering all engineering disciplines are contained in the Route Plans that are published each year as part of Network Rail's Business Plan.

The following renewal schemes have been identified as having potential for some increased operational outputs subject to enhancement funding being available.

Table 4.1 – Planned switch and crossing and signalling renewal schemes with enhancement potential

Renewal project	Potential enhancement opportunity	Operational output	Notes
Horsforth signalling renewal	Provide turnback facility	Increased capacity to meet HLOS passenger growth and improved journey times	Enhancement scheme included in April 2008 Strategic Business Plan (SBP) Update to deliver HLOS
Rigton – Horsforth signalling renewals	Renewal of lineside equipment, additional signal sections and linespeed increase	Increased capacity to meet HLOS passenger growth, performance and improved journey times	Enhancement scheme included in April 2008 SBP Update to deliver HLOS
Hope Valley	Linespeed increase	Journey time improvements	
Calder Valley	Linespeed increase	Journey time improvements	
Wrawby Jn – Barnetby – Brocklesby signalling renewals	Potential reinstatement of fourth line and junction remodelling	Improved capacity	
Stalybridge signalling renewals	Speeding up of junctions and possible provision of north side bay	Improved performance and journey times, and increased capacity to meet HLOS passenger growth	Enhancement scheme included in April 2008 SBP Update to deliver HLOS
Rochdale interlocking works in conjunction with Metrolink	Opportunity to improve the linespeed	Reduction of journey time	
Ulceby and Immingham signalling renewals	Capacity improvements on the south bank of the Humber, including possible construction of a new railway to provide a circular route between Ulceby and Immingham Humber International Terminal (HIT)	Improved capacity and performance, and shorter running times for coal trains	
Ferriby – Gilberdyke signalling renewals	Capacity improvements on the north bank of the Humber may include loop extension or new loops between Gilberdyke and Selby, tied in with linespeed improvements	Improved capacity and performance, and shorter journey times	

Renewal project	Potential enhancement opportunity	Operational output	Notes
Dore & Totley East signalling renewals	Track doubling through Dore & Totley station	Increased capacity and improved performance	
Methley Jn Switches and Crossings (S&C) renewals	Track doubling on single lead junction	Increased capacity and improved performance	
Thorne Jn S&C renewals	Remodelling to eliminate single lead junction	Accommodate increased freight flows to/from port of Hull and provide performance and journey time improvements	
Sheffield Station S&C and signalling renewals	Revised layout in conjunction with renewal	Increased flexibility for improved capacity and performance	

4.3.2 Committed enhancement schemes

Table 4.2 – Committed enhancement schemes

Project	Main promoter	Operational output
Manchester Metrolink Phase 3a – conversion of Oldham Loop to Metrolink	Greater Manchester PTE	Transfer of the Oldham loop to Manchester Metrolink operation, altering the pattern of heavy rail services through Victoria, and with suitable alterations at Rochdale
W10 gauge clearance Felixstowe – Yorkshire terminals via Ely/ECML	Being developed for funding by HPUK Ltd	Ability to carry 9'6" containers on conventional wagons from Felixstowe to Selby, Wakefield Europort and Leeds Stourton
W10 gauge clearance Newark – Gainsborough – Doncaster	HPUK Ltd	Ability to carry 9'6" containers on conventional wagons on an alternative route avoiding the ECML between Newark and Doncaster
Manchester Transport Innovation Fund (TIF)	GMPTE	Series of enhancements to improve rail performance and connectivity in Greater Manchester area

4.3.3 Proposed enhancement schemes

The schemes highlighted in Table 4.3 are at various stages of development and are currently under discussion with project funders. The table identifies which of these schemes were included in the Network Rail SBP Update of April 2008. This updated plan was considered by the ORR in its Draft Determination on Network Rail funding for 2009 – 2014, published in June 2008, and some of the listed schemes were specifically identified by ORR for funding. In other cases, whilst ORR's Draft Determination did not explicitly provide a funding allowance for the listed schemes, it did provide a £60 million allowance to meet the HLOS on Strategic Route 10, which encompasses the Yorkshire and Humber RUS area (although Network Rail considers that this allowance is not sufficient to fund all the schemes). ORR will be publishing its Final Determination in October 2008 following consultation.

Network Rail will continue to liaise with the stakeholders of these projects and any new projects that arise.

Table 4.3 – Potential enhancement schemes

Project	Potential funding source(s)	Operational output
West Yorkshire platform extensions	Scheme included in April 2008 SBP Update to deliver HLOS	Handle four-, five-, or six-car trains to accommodate growth on most corridors into Leeds
Todmorden turnback facility	Scheme included in April 2008 SBP Update to deliver HLOS	Provide ability to turn around trains from Manchester to accommodate growth
Leeds Station – new southern entrance	Scheme included in April 2008 SBP Update to deliver HLOS. Also subject to a Regional Funding Allocation bid	Improved station facilities and access and additional footfall capacity to meet peak growth
Sheffield – Barnsley – Leeds	Funding not yet identified	Increased linespeeds leading to improved performance and journey times
East Leeds Parkway (Micklefield) including a turnback facility	Scheme included in April SBP Update to deliver HLOS. Also subject to a Regional Funding Allocation bid	New station adjacent to M1/A1 to provide new journey opportunities and increased capacity to meet peak growth
Greater Manchester Station improvement schemes	GMPTE – TIF funding	Provision of improved station facilities including Park & Ride
Station improvement schemes	Train Operating Companies	Provision of improved station facilities
Great Northern/Great Eastern (GN/GE) Joint Line Upgrade	Scheme included in April 2008 SBP Update to deliver HLOS and included specifically in the ORR Draft Determination	Increased passenger and freight capacity between Doncaster and London allowing opportunities for additional services between Yorkshire, the Lincoln area and London. Allows peak direction freight trains and changes approach to Doncaster

Project	Potential funding source(s)	Operational output
Depots (East and West Yorkshire)	Scheme included in April 2008 SBP Update to deliver HLOS	Provide servicing and stabling for increased Northern Rail fleet, to meet peak growth
Keighley turnback (platform or siding) facility	Scheme included in April 2008 SBP Update to deliver HLOS	Allow operation of Leeds – Keighley service to increase capacity and improve journey times in peaks in response to growth
Northern gauge improvements	TIF/third party/SFN funding	Provide greater range of routeing options for 9'6" containers on conventional wagons
Leeds – new bay platforms	Scheme included in April 2008 SBP Update to deliver HLOS	Accommodate peak growth and improve performance
Manchester Piccadilly Platform 0	Funding not yet identified	Increased capacity by conversion of stabling siding into an operational passenger platform
Huddersfield – new Platform 9	Scheme included in April 2008 SBP Update to deliver HLOS	Accommodate peak growth
W10 gauge clearance Gainsborough Trent Jn to Manton Wood	Third party	Ability to carry 9'6" containers on conventional wagons on Retford – Gainsborough route
Leeds – Manchester linespeed and capacity improvements	Scheme included in April 2008 SBP Update to deliver HLOS; linespeed improvements included specifically in the ORR Draft Determination	Increased capacity to accommodate growth, and improved performance and journey times
Depots (South Yorkshire)	Scheme included in April 2008 SBP Update to deliver HLOS	Provide servicing and stabling for increased Northern Rail fleet, to meet peak growth
South Yorkshire platform extensions	Scheme included in April 2008 SBP Update to deliver HLOS	Handle three- or four-car trains at various stations in South Yorkshire PTE area to accommodate peak growth
Cottam – new freight chord	Third party	Allows direct access from Immingham to Cottam power station improving operational efficiency, route performance and capacity
Grindleford loops	Funding not yet identified	Provide a new Up and Down loop in the Grindleford – Hope area to give improved regulation and performance
Dore capacity improvements	Funding not yet identified	Provide double track on Dore Station curve to improve capacity and performance

Project	Potential funding source(s)	Operational output
Castleford new platform	Funding not yet identified	Provide new platform to allow additional services to handle peak growth and improve accessibility to Pontefract area
Robin Hood Airport Doncaster Sheffield (Finningley)	Third party	Provide new station to provide rail link for airport passengers
Wakefield Westgate	WYPTE via Major Schemes Bid	Improve station and track layout to reduce congestion
Shaftholme Junction remodelling	Scheme included in April 2008 SBP Update to deliver HLOS and included specifically in the ORR Draft Determination	Provide shorter journey for freight from Immingham to Eggborough/Drax/ Ferrybridge power stations by running via Askern avoiding ECML (see Figures 4.3 and 4.4 below)

Figure 4.3 – Current freight route pre-Shaftholme Jn remodelling

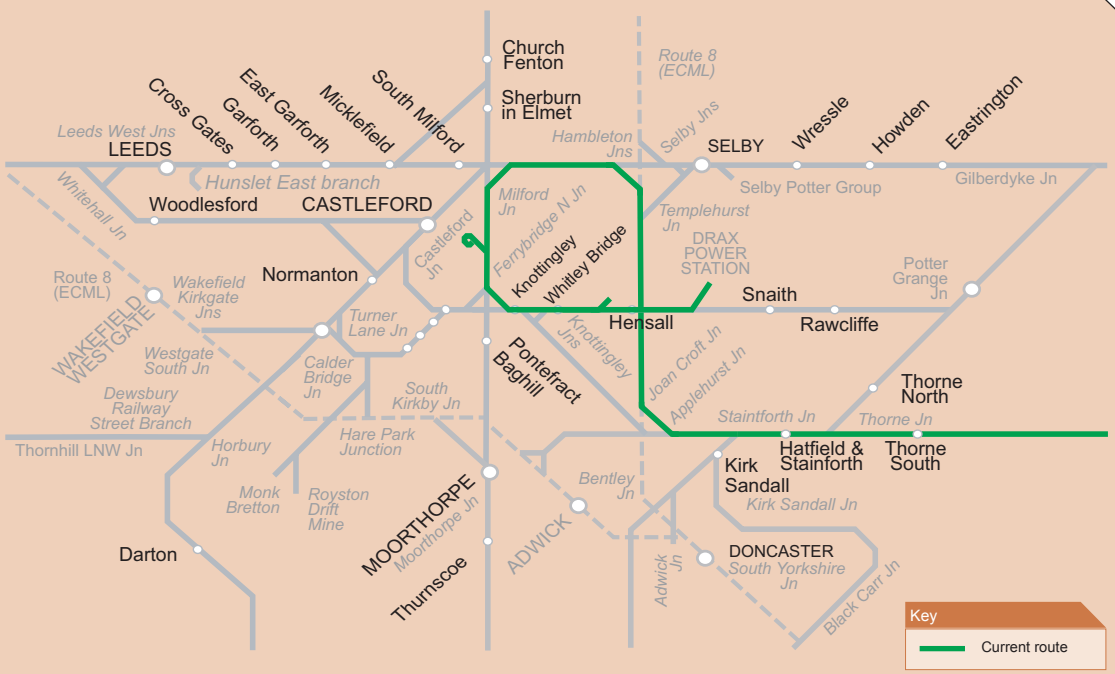
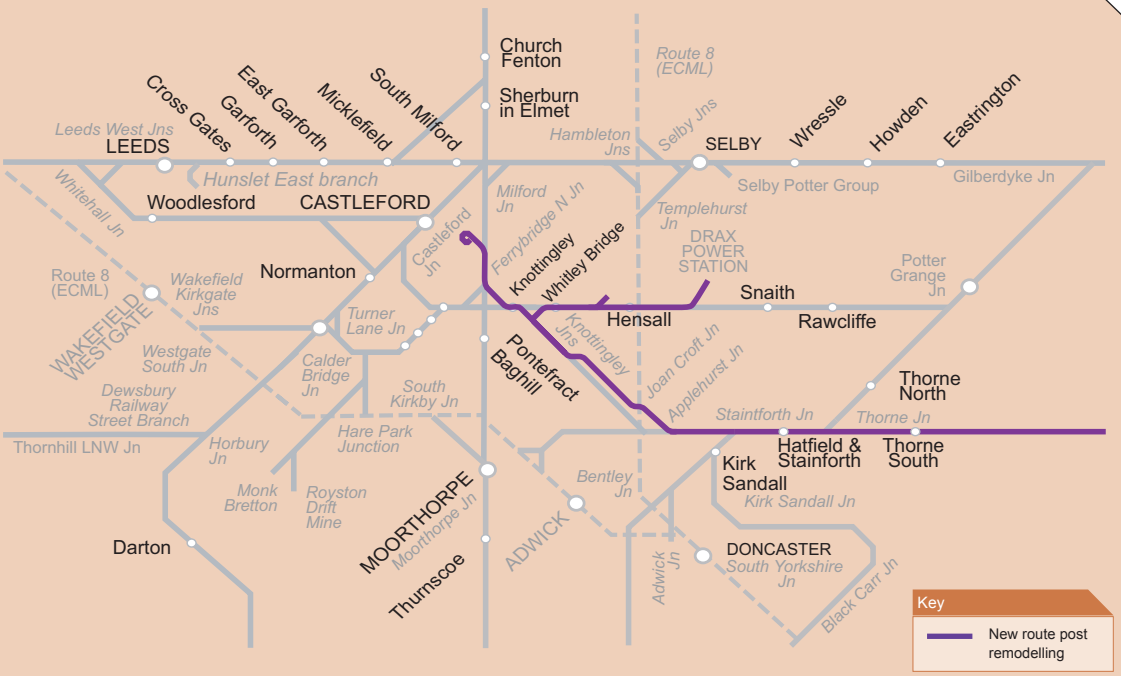


Figure 4.4 – New freight route post-Shaftholme Jn remodelling



4.3.4 Planned service change

A new Nottingham – Sheffield – Barnsley – Leeds semi-fast service operated by Northern Rail will be introduced in December 2008, which will relieve crowding in this corridor and open up new journey opportunities, in particular the ability to travel between Nottingham and Leeds without the need to change trains. At this time CrossCountry will be increasing the length of certain trains in the Sheffield – Wakefield – Leeds – York corridor, which may also provide some relief of overcrowding. From December 2008, most of East Midlands Trains' London – Sheffield services will be formed of Class 222 Meridians, though this has some limitations arising from the fact that not all through platforms at Sheffield are able to handle 10-car trains.

There are currently proposals from various operators for improved long-distance high speed services from various locations in Yorkshire and from Lincoln towards London, which are at present subject to other industry processes. At this stage, it is too early to say exactly what will eventually be provided both prior to and after the proposed upgrade of the GN/GE Joint Line between Peterborough and Doncaster via Spalding, Lincoln and Gainsborough.

East Midlands Trains is seeking to extend its London – Derby services to Sheffield in December 2009, giving two trains per hour between London and Sheffield. This would affect capacity in the key Chesterfield – Dore & Totley – Sheffield corridor.

5. Gaps and options

5.1 Introduction

Previous chapters have outlined the scope of the Yorkshire and Humber RUS by presenting the baseline assessment of the study area, and summarising the role of rail in the economic and social well-being of the Yorkshire and Humber region. This analysis has demonstrated that there are several instances where the current rail network is not able to meet existing and future requirements, which are termed “gaps”.

This chapter presents an analysis of the RUS gaps and the series of options that have been developed to address them. Full details of the option assessments are contained in **Appendix 4**, which can be found on the Network Rail website.

5.2 Generic gaps

For reference, Table 5.1 details the list of high-level gaps that were identified in the baseline assessment. These gaps are generic to the whole RUS area.

Table 5.1 – Generic RUS gaps (and short title)

Number	Gap
1	Peak overcrowding on key corridors, especially into Leeds and Sheffield (peak crowding)
2	Overcrowding and suppressed growth between the peaks (off-peak crowding)
3	Suppressed demand for travel in late evenings and weekends (engineering access)
4	Opportunities for enhancement of inter/intra regional links (regional links)
5	Inadequate freight capability of the network in terms of diversionary routes, route availability, loading gauge and capacity (freight capability)
6	Poor performance in some areas with high levels of reactionary delays (reactionary delays)

1. Peak crowding:
There are a number of areas where there is evidence of growing overcrowding. This applies particularly to a number of commuting routes into Leeds, Sheffield and Manchester during peak periods and also to CrossCountry services operating via Leeds. The situation is such that it is likely the full potential for rail in the relevant markets cannot be realised due to the inability within the present train service to accommodate any further growth. Key drivers are almost certainly the general increase in rail travel experienced in recent years, coupled with the continuing development of Leeds, particularly, as a major commercial centre within northern England.

2. Off-peak crowding:
There is evidence of increasing overcrowding on TransPennine Express and CrossCountry services operating via Leeds throughout the day. As with peak demand, this is believed to be partly driven by the general trend of increased demand for rail travel in recent years and the general expansion of Leeds as a centre. These services have also been improved in terms of frequency and regular interval timetables as well as new rolling stock, all of which will have been instrumental in attracting growing numbers of users.

3. Engineering access:
There is evidence of demand for passenger services over an increasing spread of hours, particularly later on weekday evenings and earlier on Sunday mornings. This has undoubtedly been encouraged by such developments as Sunday shopping, liberalisation of licensing laws and increased use of rail links to and from airports. Additionally, there is a demand to operate freight trains as far as possible on a “24/7” basis and a desire for weekend passenger services to be free from bus substitution at least for the major trunk flows.

4. Regional links:
Rail links between some of the larger conurbations both within the RUS area and to other sizeable destinations in the North East, North West and other regions are reaching capacity in their existing form. These have potential for frequency increases to bring service levels more in line with those on other key corridors in the UK rail network.

5. Freight capability:
On certain route sections regular and lengthy possessions for maintenance and renewals are required to keep the infrastructure fit for purpose. As well as being disruptive to passenger operations, this poses a particular problem for freight operators, because although a fairly comprehensive rail network exists in the RUS area, many of the routes have restrictive loading gauge clearance, reducing the suitability of these lines as diversionary routes. Equally, their attractiveness for future freight development as a result of these characteristics is quite limited.

In the context of the growing trend towards use of 9’6” intermodal containers and “seven days a week” freight transport, these limitations, if not addressed, will pose an increasing handicap for the rail freight market in the years ahead.

6. Reactionary delay:
This can be a result of outdated or inadequate rail infrastructure, or from timetables with historically tight turnarounds as a result of high rolling stock utilisation. Some reactionary delay is an inevitable consequence of the fact that many of the key stations in the RUS area, such

as Leeds and Sheffield, are operating close to capacity, coupled with the interaction of a range of long-distance trains serving a wide variety of markets with some highly intensive local services.

East Coast Main Line

The Yorkshire and Humber RUS area is bisected by the East Coast Main Line. The Yorkshire and Humber RUS looks primarily at its own gaps and consequent options, whilst East Coast gaps and consequent options have been dealt with in the ECML RUS. Clearly, however, both RUSs must be closely aligned. There are several areas where an integrated approach is essential and where, as the major drivers lie within the Yorkshire and Humber RUS area, the gaps and options are considered within this RUS rather than that already published for the ECML. These are:

- peak crowding into Leeds on services via Wakefield Westgate
- additional services Sheffield – Wakefield Westgate – Leeds
- capacity/pathing of services at Doncaster, including additional ECML trains, a possible new service to Robin Hood Airport Doncaster Sheffield (RHADS) and other stakeholder aspirations to serve this important node
- possible extension of Knottingley – Wakefield Kirkgate services to Wakefield Westgate and Leeds
- freight capacity Doncaster – South Kirkby – Hare Park
- possible use of Midland Main Line to relieve pressure on ECML (jointly with East Midlands RUS)
- depots and stabling for ECML-related vehicles
- current coal flows via Hambleton South.

North West and Lancashire and Cumbria

The Yorkshire and Humber RUS area is bordered in the west by the North West and the Lancashire and Cumbria RUS areas. With the various cross-Pennine rail routes in existence, gaps and options local to Yorkshire and Humber have a considerable synergy with gaps and options already considered on the west of the Pennines. The following have been identified as being most naturally addressed within the context of the Yorkshire and Humber RUS:

- services to the east of Manchester, and the need to consider the appropriate number and mix of services for both local and longer-distance travel
- fast regional links Manchester – Leeds and Manchester – Sheffield
- options for the Stalybridge corridor, including the Diggle loop
- stopping patterns and local services Manchester Victoria – Rochdale – Todmorden (and possibly Bradford) following transfer of the Oldham Loop to Metrolink
- journey times in the Calder Valley
- possibility of a fourth train each hour Manchester – Liverpool and operation of cross-Pennine trains on the Chat Moss line
- possible extension of the Leeds – Hebden Bridge service to Manchester Victoria
- Leeds – Skipton service levels
- Northern Rail rolling stock strategy.

Cross country services between Yorkshire, the Midlands and the South

From the start of the December 2008 timetable CrossCountry's services connecting eastern Scotland, the North East and Yorkshire with the Midlands and South West change noticeably. Although there will continue to be a regular pattern of two services per hour running alternately via Leeds and Doncaster, all trains via Leeds will serve the West Country and will call additionally at Chesterfield, Burton-on-Trent and Tamworth. Some of these services will be lengthened thereby, addressing certain crowding issues. The trains running via Doncaster will all run to Reading.

Clearly the impact of these changes in connectivity and journey times transcend more than just this RUS area and therefore they will be specifically examined in the trio of RUSs covering the East Midlands, West Midlands and Chiltern, and Great Western. The implications of any recommendations will need to be assessed on all affected RUS areas. A particular potential solution that affects the Yorkshire and Humber RUS area is the one previously considered by the Strategic Rail Authority which would route both trains per hour via Leeds. This would have both positive and negative effects on connectivity, crowding, journey time and capacity utilisation on a number of corridors. In the final RUS document consideration will be given to the implications of any options for CrossCountry services on the Yorkshire – Midlands – South axis that are being considered in other RUSs.

Freight

Some parts of the railway within the Yorkshire and Humber RUS area are very intensively used by freight trains and the following items first identified in the Freight RUS and the ECML RUS are examined further here:

- Capacity Wrawby Junction – Scunthorpe, Hull Hedon Road – Hull Hessle Road and Chinley East Junction – Dore West Junction (Freight RUS)
- Capacity South Kirkby Junction – Hare Park Junction (ECML RUS)
- W10 and W12 aspirations (Freight RUS).

5.3 Geographical split

The diverse demographic split and wide geographic spread of the RUS area means that the mix of gaps differs by individual sections of the route. Therefore the route sections have been considered individually. For convenience the geographical summary from the baseline assessment has been reproduced below in Table 5.2.

Some of the route sections are self-contained rail markets with a bespoke set of issues. However, others such as the Airedale line, the Calder Valley, the Chesterfield line, Doncaster – Immingham/Cleethorpes, the Hope Valley Line/the Huddersfield line and Sheffield Doncaster/Moorthorpe line form part of much wider markets variously involving an assortment of local stopping services, long-distance high speed services, commuter services for the major conurbations and a diversity of freight operations.

Table 5.2 – Geographical split

Serial	Route Section	Includes
AI	Airedale line	Leeds – Bradford FS – Skipton
WH	Wharfedale line	Leeds – Ilkley
HA	Harrogate line	Leeds – Harrogate – York
YS	Leeds – York/Hull/ Scarborough	Leeds – York – Scarborough Leeds – Selby – Hull Thorne Junction – Goole – Gilberdyke
BP	Barnsley and Pontefract lines	Leeds – Woodlesford – Castleford – Milford Castleford – Wakefield Kirkgate – Thornhill LNW Junction Horbury Junction – Barnsley – Sheffield Castleford/Wakefield – Pontefract Monkhill – Goole
WF	Wakefield line	Leeds – Wakefield Westgate – Doncaster/Moorthorpe
HF	Huddersfield line	Leeds – Huddersfield – Guide Bridge
CV	Calder Valley	Leeds – Bradford Interchange – Rochdale – (Manchester) Hall Royd Junction – Gannow Junction (Burnley) Milner Royd/Dryclough – Bradley/Heaton Lodge
HV	Hope Valley	Sheffield – New Mills/Hazel Grove – (Manchester)
SD	Sheffield – Doncaster/ Moorthorpe	Sheffield – Doncaster Swinton – Moorthorpe Rotherham Central Loop
IC	Immingham/Cleethorpes lines	Doncaster – Cleethorpes Wrawby Junction – Lincoln/Gainsborough Immingham Freight Lines Habrough – Barton-on-Humber Scunthorpe – Roxby Gullet
PN	Penistone line	Barnsley – Penistone – Huddersfield
LN	Retford/Lincoln line	Sheffield – Worksop – Retford – Lincoln Doncaster – Gainsborough
CH	Chesterfield line	Sheffield – Dore & Totley – Chesterfield
WD	Wolds Coast	Hull – Bridlington – Seamer

Serial	Route Section	Includes
MC	Miscellaneous	Moorthorpe – Church Fenton Adwick/Carcroft – Stainforth South Yorkshire Joint Line Woodburn – Stocksbridge Woodburn – Rotherham Central Monk Bretton Branch Tinsley Yard Skipton – Rylstone Chesterfield – Beighton – Rotherham Masborough
LD	Leeds station area	Neville Hill – Engine Shed/Whitehall/Wortley/Holbeck Junctions
SH	Sheffield station area	Sheffield – Nunnery Main Line Junction
DR	Doncaster station area	Loversall – Marshgate

5.4 Geographic gap analysis and options

For simplicity, all the options detailed in this chapter are presented on a stand-alone basis. In reality the strategy will comprise the implementation of a package of these interventions to make use of potential synergies in the economic benefits as well as economies of scale. Options have been subject to an economic appraisal consistent with the DfT's Transport Appraisal Guidance (WebTAG). Where appropriate, Benefit-Cost Ratios (BCRs) are reported for options which indicate the value for money of each. DfT funding criteria permits recommendation for funding through the RUS process if the BCR is at least 1.5. The figures presented in this chapter result from high-level feasibility work (equivalent to GRIP 1[1]), and represent the most likely value for money based on a range of key sensitivities. Value for money has not been quantified when an option is clearly inferior to another that is below the DfT funding threshold.

These generic RUS gaps that are relevant to the route sections are described together with the options that have been developed to solve them.

1 *Guide to Railway Investment Projects*, available at http://www.networkrail.co.uk/aspx/4171.aspx

- **Airedale line**

Peak crowding

Since electrification in the mid-1990s the route has experienced considerable passenger growth, and despite the line being served by high capacity rolling stock, there is significant overcrowding during peak periods. The busiest services are those that operate between Skipton and Leeds, which all have passengers standing during the high peak hour in the mornings and evenings.

Currently services on the route mainly operate in four-car formation, which is the maximum within the constraints of many platform lengths. Due to the track layout, lengthening all the platforms at Shipley to accommodate trains that are longer than six vehicles is prohibitively expensive and any scheme to do this would represent poor or low value for money. On this basis six-car operation is the maximum that can be achieved and it is not possible to provide sufficient additional capacity by lengthening current electric trains to six cars, without also increasing the frequency of services on the route.

Analysis therefore suggests that the most efficient way to alleviate overcrowding is to reorganise the peak timetable with a mixture of longer semi-fast and more frequent stopping inner services. On this basis it is recommended that the peak timetable is split to offer a two-tier service pattern. The current six electric services during the three-hour peak would be replaced by four services that start/terminate at Skipton, call at all stations between Skipton and Keighley, and operate semi-fast between Keighley and Leeds, calling only at Bingley. These trains would be lengthened to operate in six vehicle formations. Up to five further services would start/terminate at Keighley and call at all stations between Keighley and Leeds. Occasional through services to and from Lancashire and Cumbria would remain unaffected.

It is anticipated that this option will significantly reduce crowding during the peaks:

- all passengers to/from north of Keighley would use a semi-fast services, which when lengthened would have sufficient capacity to accommodate future growth
- passengers from Keighley and Bingley would have a choice of service types, however in reality most would be likely to use a semi-fast rather than a stopping train
- passengers from all other stations would use the stopping services, which would be significantly less crowded than currently in the absence of passengers from north of Keighley.

It is estimated that the effective level of capacity provision will increase by between 40 and 50 percent and an economic appraisal suggests that it will offer medium to high value for money, with a BCR of around 1.9. The alternative would be for all existing electric services to continue to start/terminate at Skipton and call at all stations on the route. These would be lengthened, thereby incurring sizeable additional platform lengthening costs, particularly at Shipley, but avoiding the cost of the Keighley turnback facility. This scheme has a lower value for money than the previous option and as such is not recommended. For simplicity, options have been assessed using a single set of unit rolling stock costs and an assumption that train formations are flexible, whereas in reality the exact operation will depend on the number of three- and four-car electric units allocated to Northern Rail in the fleet in CP4, which is dependant on the DfT Rolling Stock Plan.

Loadings of the present Leeds – Bradford Forster Square services are well within the capacity of the existing trains and therefore no action is required to accommodate forecast growth. On this basis these services may be the most suitable to serve potential new stations at Apperley Bridge and Kirkstall Forge, which are both aspirations of West Yorkshire PTE. There are also proposals currently subject to industry processes by NXEC for additional through services between Bradford Forster Square and London King's Cross

which, if implemented, would provide further capacity between Bradford and Leeds.

Engineering access

Apart from its commuter role, this corridor sees significant leisure passenger demand and freight activity. Leisure travel at weekends tends to be oriented towards the summer and the longer-distance services towards Morecambe and Carlisle. Apart from the Rylstone services, an alternative option for freight traffic generally exists via the ECML and Newcastle – Carlisle. For the immediate future, most non-commuting demand can be accommodated by careful possession planning. Following route modernisation in the mid-1990s, significant resignalling is unlikely for some years, but when it becomes due it will be appropriate to review the case for provision of bi-directional signalling.

Reactionary delays

Armley Junction is the key capacity constraint on the Leeds North West corridor as it is shared by services operating on the Wharfedale line and Harrogate line as well as the Airedale line. The combined preferred option for these lines has been developed so that the junction can accommodate all the additional services, and a detailed performance modelling exercise will be carried out during the development phase to identify whether any train performance mitigation measures are required. Any mitigation measures are expected to be relatively minor and the combined business case is sufficiently strong to accommodate these.

Table 5.3 – Airedale line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
AI1	Two-tier service from Skipton/Keighley during the three-hour am and pm peaks: • Four semi-fast Skipton – Leeds services, lengthened to six-car formation, with Crossflatts, Saltaire and Shipley calls removed • Five Keighley – Leeds four-car services calling at all stops	Peak crowding	Include in the strategy and develop requirements at Leeds Station and Armley Junction	1.9
AI2	Lengthen peak Skipton – Leeds services: • 16 additional vehicle arrivals/ departures spread across eight services in each peak • Platform lengthening	Peak crowding	Do not include in strategy as inferior to AI1	1.5

Wharfedale line

Peak crowding

The Wharfedale line was electrified in parallel with the Airedale line and has experienced a similarly high level of passenger growth in recent years. Currently, trains have passengers standing during the high peak hours in the morning and the evening, with the busiest services in each particularly overcrowded. Analysis suggests that train and platform lengthening would be relatively straightforward on this corridor, and therefore as train lengthening is normally the most efficient solution where crowding occurs over much of a route this is recommended. Eight additional peak vehicle arrivals are required to meet overcrowding and the best way to deliver this would be to lengthen the four busiest services to six-car formations. However, the precise deployment of vehicles will depend on the DfT Rolling Stock Plan and this could mean that further platform extensions would be necessary. The scheme offers high value for money, indicated by an estimated BCR of at least 2.0.

Reactionary delays

See Airedale line.

Table 5.4 – Wharfedale line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
WH1	Lengthen peak Ilkley – Leeds services: • Eight additional vehicle arrivals/ departures spread across peak services, increasing the maximum train length to six vehicles • Platform lengthening	Peak crowding	Include in the strategy and develop requirements at Leeds station	>2.0

Harrogate line

Peak crowding

Significant on-train crowding currently occurs on services during peak periods at the very southern end of the route within about 20 minutes journey time from Leeds. All trains during the high peak hour typically have passengers standing between Leeds and Horsforth, and most trains during the full three-hour peak have passengers standing between Leeds and Burley Park.

As the overcrowding is limited to a relatively short section of the route, the most efficient way to provide additional capacity is to operate additional peak shuttle services from Horsforth, rather than train lengthening or additional services throughout the length of the route. Train lengthening would be particularly problematic as Knaresborough station is directly adjacent to a Victorian viaduct at one end and a tunnel at the other.

It is therefore recommended that five peak-busting services calling at all stops between Horsforth and Leeds are added to the timetable in each peak period. These services would operate in four-vehicle formation and turn back via a new facility in the Horsforth area. Furthermore, it is recommended that up to two through services in each hour do not call at Headingley and/or Burley Park. Requiring local passengers to travel on the Horsforth terminating services will balance the loadings on the southern section of the route and avoid the need for major infrastructure work to make the timetable robust.

A number of proposals have been made for additional long-distance high speed trains to and from Harrogate. These are currently subject to industry processes and may provide some additional capacity at peak times to relieve overcrowding, depending on what paths eventually are taken up.

Engineering access

There are two main issues on this line, namely an aspiration for later trains from Leeds to Harrogate (and to a lesser extent from York) and the need to provide for the leisure and conference market at weekends. With the present signalling system, extension of the operating day not only entails reduction in the "no train period" for maintenance, it also implies significant additional signal operations costs. Thus it is likely that any such extension will need to await resignalling with more centralised control. Long distance travel to Harrogate can generally be accommodated by possession planning to provide access either via Leeds or via York from mid-morning Sunday onwards.

Reactionary delay

Long signal sections are a source of delay on the line. It is recommended that the length of these sections is reduced during the forthcoming signalling renewals between Rigton and Horsforth (also see Airedale line).

Table 5.5 – Harrogate line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
HA1	Horsforth – Leeds Peak shuttles: • 5 x four-car new services in each peak • Revised calling pattern for through trains • New turn back facility at Horsforth	Peak crowding	Include in strategy and develop requirements at Leeds station and Armley Junction	1.8
HA2	Train lengthening: • At least 10 additional vehicle arrivals/ departures spread across at least five services in each peak • Platform lengthening	Peak crowding	Do not include in strategy as business case inferior and unclear how longer trains could call at Knaresborough	<1.5
HA3	Additional Harrogate/Leeds services: • 5 x four-car new services in each peak	Peak crowding	Do not include in strategy as inferior to HA1. Whole life cost of additional rolling stock cost is greater than Horsforth turnback	n/a

Leeds – York – Scarborough and Leeds – Selby – Hull

Peak crowding

The majority of services have some overcrowding during the am and pm high peak hours. On local services passengers typically stand from as far out as East Garforth, and passengers often stand from York on fast and semi-fast services. It is likely that additional infrastructure will be required east of Leeds as an alternative to greater platform capacity at Leeds station, as the station cannot accommodate a significant increase in either train lengths or starting/terminating services and space for additional platform capacity is limited. Any major expansion in the centre and south of the station would be very costly. Options to alleviate peak crowding from the east of Leeds are also likely to benefit from this infrastructure enhancement east of Leeds. However, the scope of this infrastructure cannot be determined until the total number of additional vehicle arrivals in Leeds is known. For this reason options for infrastructure east of Leeds are discussed later in this chapter,

and schemes to alleviate peak crowding from the east are presented in isolation to the infrastructure purely to demonstrate that there is a business case to provide extra train capacity.

In the absence of any major infrastructure work east of Leeds the most sensible option to alleviate overcrowding would be to lengthen the busiest local and semi-fast services from York and the busiest services from Selby by two vehicles each. In practice this would require four vehicles spread over two York – Leeds local services, 12 vehicles spread over six York – Leeds semi-fast and fast services and six vehicles spread over three Selby – Leeds services. Although the practicalities of this option have not been developed, it is likely that it will offer a high value for money indicated by a BCR of greater than 2.0. Additional short distance services may offer better value for money than train lengthening; however, as stated previously, this will not be fully understood until infrastructure options east of Leeds have been developed.

Engineering access

At the Leeds end of the corridor, suitable diversionary routes do generally exist so that despite the need to provide for TransPennine Express services on a 24-hour basis it is normally possible to maintain rail access between main centres during engineering work, although given the nature of the diversionary routes road replacement services may be required to serve intermediate stations.

However, east of Gilberdyke there is no practical diversionary route for traffic between Hull, the ECML and places to the south and west. Therefore, when the signalling is renewed consideration should be given to provision of bi-directional signalling between Gilberdyke and Hull. The line from Temple Hirst on the ECML to Selby and Hull is normally closed during the night hours and therefore any expansion of services later at night (or earlier in the morning) would have cost implications for signal operations staffing until signalling control can be centralised into a route signalling centre.

Traffic on the line from York to Scarborough is now less seasonal than in the past, due to growing conference and “short break” trade within the town. There is no diversionary option other than a highly circuitous route via Hull and the Wolds Coast. Therefore the future engineering access strategy will have to recognise the need to maintain weekend train services as a minimum up to the early evening on Saturdays and from the early afternoon on Sundays (mid-morning during holiday periods). Potential options for this include single line working and the provision of bi-directional signalling when renewals become due.

Table 5.6 – Leeds – York/Hull/Scarborough options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
YS1	York – Leeds and Selby – Leeds train lengthening: • 22 additional vehicle arrivals/ departures spread across 11 services in each peak • Platform lengthening	Peak crowding	Develop in conjunction with infrastructure solutions east of Leeds, including the possibility of additional services as an alternative or complement to train lengthening	>2.0

Barnsley and Pontefract lines

Peak crowding

Currently services to and from Knottingley and Sheffield are overcrowded during the high peak hours with large numbers of passengers standing between Castleford, Woodlesford and Leeds. It is recommended that the frequency of Knottingley – Leeds services is increased during the peak from hourly to half-hourly. The new service would be operated by units in three-car formation, thereby providing an additional 12 vehicle arrivals/departures over three hours. Infrastructure work will be required at Castleford to accommodate the additional traffic.

Despite having an inferior business case this option is preferred to an additional Castleford – Leeds service, as some overcrowding occurs east of Castleford and it is not thought that train lengthening within the constraints of existing platform lengths will provide sufficient capacity in the high peak. Furthermore, the additional service from Knottingley will partially alleviate the regional links gap described below. Overall the scheme has a medium value for money indicated by a BCR of 1.5.

WYPTE believe there may be merit in operating a Leeds – Pontefract Monkhill peak service and this will be subject to further evaluation during the consultation period.

In the Barnsley – Sheffield corridor, most trains are overcrowded during the high peak hours with standing occurring from as far as Wombwell. Approximately four additional vehicles are required to alleviate this and accommodate future growth; however, some standing occurs on trains which start or terminate at Huddersfield (the Penistone line). It is not clear how the impending TramTrain trial will impact this and it is therefore recommended that initially two peak Barnsley – Sheffield services are strengthened by one vehicle each. If the TramTrain rolling stock is not retained following the trial the required number of additional vehicles will increase from two to four. The option for two vehicles offers medium value for money indicated by a BCR of 1.6.

Engineering access

The largest centre within this corridor is Barnsley. For travel to Leeds, options exist via both Wakefield and Huddersfield, so that even if one route is blocked generally a throughout journey by rail is possible. Similarly, Manchester can be reached via Huddersfield or via Sheffield. However, in the case of Barnsley – Sheffield (giving access to Doncaster, the East Midlands and London), there is only one route available via Elsecar and Meadowhall. To provide consistent seven-day access consideration will need to be given to provision of bi-directional signalling when renewal becomes due.

Regional links

The currently hourly passenger service to Knottingley is infrequent relative to the size of conurbation, and local stakeholders believe that more frequent services are required to support regeneration in the area. Analysis suggests that increasing the frequency of the Knottingley – Leeds service to run two per hour for most of the day will have a low value for money business case and as a result it is not recommended at this stage. Further work will be undertaken following the consultation period to understand whether regeneration activity in the area will strengthen the business case for the option.

Freight capability

The absence of a suitable route to allow intermodal container traffic to pass on standard wagons from Wakefield Europort northwards has been identified as a handicap to development of this traffic as indeed is the lack of diversionary routes for use during engineering works or perturbation on the ECML. The Wakefield Europort to Colton Junction section of the route is therefore included for development work in the Northern Gauging Project.

Table 5.7 – Barnsley and Pontefract lines options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
BP1	Knottingley – Leeds peak shuttles: • 4 x three-car new Knottingley – Leeds services in each peak • New track infrastructure at Castleford	Peak crowding, regional links	Develop further to improve value for money if possible	1.5
BP2	Castleford – Leeds peak shuttles: • 4 x three-car new Castleford – Leeds services in each peak • New track infrastructure at Castleford	Peak crowding, regional links	Develop further in conjunction with BP1 to address crowding east of Castleford and/or improve regional links	2.7
BP3	Operate BP1 all day	Regional links	Do not include in strategy. Investigate further during consultation period	1.4
BP4	Barnsley – Sheffield train lengthening • Two additional vehicles spread across two peak arrivals/departures	Peak crowding	Include in strategy with possible inclusion of two more vehicles	1.6
BP5	Loading gauge for intermodal freight traffic	Freight capability	Wakefield Europort to Colton Junction is included in development work for the Northern Gauging Project	

Wakefield line

Peak crowding

Considerable growth in peak demand has occurred in recent years and a number of trains in the high peak and shoulder peaks have some standing into and out of Leeds. Overcrowding predominantly occurs over a short distance on trains which call at Outwood and Sandal & Agbrigg, as these stations are not served by the longer National Express East Coast (NXEC) and CrossCountry services. Given the characteristics of this overcrowding it is recommended that a new half-hourly Wakefield – Leeds service is operated during the busiest peak hour in the morning and the evening, and that one additional peak stopping service is operated between Doncaster and Leeds in each peak period. It is also recommended that during the rolling stock cascade to deliver HLOS capacity requirements the current Class 321 rolling stock is replaced with higher capacity vehicles. The scheme offers high value for money, indicated by a BCR of 3.4, and is dependant on proposed infrastructure work at Wakefield Westgate. If this work does not go ahead it is recommended that the additional capacity provided through the Wakefield shuttles is replaced by adding five vehicles to the fleet such that services from Sheffield via Moorthorpe can operate in up to five-car formation. Alternatively this capacity could be provided by operating a second additional (shoulder peak) service between Doncaster and Leeds. These options still meet the minimum value for money criteria.

Freight capability

The Freight RUS identified a gap in terms of lack of adequate freight paths over the South Kirkby – Hare Park section. At the present time, further work is required to assess the ability to deliver improvement by means of timetabling solutions and the extent to which an infrastructure enhancement approach may

be required, such as by four-tracking, grade separation or provision of overtaking facilities. Consideration will also be given to the possibility of alternative routeing for freight traffic, which may reduce the pressure on this section.

Reactionary delays

South Kirkby and Hare Park Junctions have been identified as significant locations for reactionary delay, arising from the fact that the section of line between them is already very close to capacity and therefore any service perturbation will have a significant impact, particularly given the diversity of origins and destinations of the trains. Proposals for improvement will be developed based on the work mentioned above to assess future solutions.

Table 5.8 – Wakefield line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
WF1	Wakefield – Leeds and Doncaster – Leeds peak shuttles: • 2 x three-car Wakefield Westgate – Leeds services in each high peak hour • 1 x four-car new Doncaster – Leeds service in each peak • Change Doncaster – Leeds rolling stock to higher capacity vehicles	Peak crowding	Include in strategy providing Wakefield scheme is implemented	3.4
WF2	Sheffield – Leeds via Moorthorpe train lengthening or a further Doncaster – Leeds Peak shuttle • 1 x four-car new Doncaster – Leeds service in each peak • Five additional vehicles spread across five services in each peak • Change Doncaster – Leeds rolling stock to higher capacity vehicles • Platform lengthening	Peak crowding	Only include in strategy if WF1 is not implemented	2.1
WF3	Timetabling work to examine provision of extra freight paths	Freight capability (capacity)	The Shaftholme Junction Remodelling scheme would allow a number of services to be re-routed away from the Doncaster – Hare Park corridor thereby freeing up some freight capacity	n/a

Huddersfield line

Peak crowding

The number of commuters using the line has been increasing steadily for several years. During the high peak in particular overcrowding occurs between Huddersfield and Leeds, and between Huddersfield and Manchester on both Northern Rail and TransPennine Express services (whilst the North-West RUS included a strategy for alleviating crowding on Northern Rail services between Huddersfield and Manchester, it was in the context of the Yorkshire and Humber RUS examining the route as a whole).

The mixed rolling stock type and varied calling pattern of services mean that it is not possible to increase the frequency of the local services operated by Northern Rail. It is therefore recommended that Northern Rail services are lengthened to alleviate overcrowding between Leeds and stations which are only served by these trains. It is anticipated that around nine additional vehicles are required, with the longest trains increasing to operate in five-car formation.[1] This option has a medium value for money case, indicated by a BCR of 2.0.

It is also recommended that the frequency of TransPennine express services between Manchester and Leeds is increased from four to five trains per hour. The additional service would start/terminate at York if possible, with an aspiration for a clock-face quarter-hourly Manchester – Leeds – York frequency, and an hourly Manchester – Leeds – Selby frequency. This scheme would provide significant additional capacity between York, Leeds, Huddersfield and Manchester, and represents an efficient use of rolling stock as each additional set of rolling stock will provide more than one additional peak arrival/departure in Leeds or Manchester.

TransPennine Express has produced a high-level analysis of train punctuality and concluded that the majority of any adverse impact from operating an additional service can be mitigated. During the consultation period a detailed analysis of the impact on train punctuality will be completed however, it is anticipated that enhanced freight loops are required at Marsden and at Diggle. A cost of £6 million has been included in the appraisal for this. As well as ensuring that the timetable is robust, this infrastructure work would also reduce Manchester – Leeds journey times, and as such contributes towards the DfT's published aspiration for a 43-minute Manchester – Leeds journey time. Funding provision for journey time improvements was included in ORR's recently published Draft Determination for CP4. Other means of improving capacity on the route may exist such as operating faster and better accelerating rolling stock on local services. However, the work to date does show that five trains per hour can be timetabled on the route at the cost of some unevenness of departure times at Manchester and Leeds, as well as some pathing time in other services, though the affect on performance is not yet quantified.

It also is anticipated that new infrastructure will be required east of Leeds with the facility for both overtaking and turnback manoeuvres. This will allow operation of the additional TransPennine Express services through Leeds, as well as additional Northern Rail services from the Calder Valley (see also Calder Valley section).

This option is preferred to train lengthening as the cost of operating longer rolling stock throughout the route is significantly greater.

Off-peak crowding

The number of passengers travelling during the weekday inter-peak (10:00 – 15:59) has increased significantly over the last few years, and passenger counts indicate that several TransPennine Express services are operating at or beyond seating capacity between Leeds and Manchester. By 2014 it is anticipated that without additional rolling stock, three out of four services will have passengers standing between Leeds and Manchester.

It is recommended that the additional peak TransPennine Express service is also operated during the inter-peak as this is an extremely

1 In practice this would be four 23-metre long vehicles or five shorter 'pacer' vehicles

efficient way to accommodate demand growth between Manchester and Leeds. When combined with the peak option, the scheme offers a high value for money indicated by a BCR of greater than 5.

Engineering access

This section of route is one of the most critical in terms of "24/7" access, given the existence not only of various freight operations but also of TransPennine Express passenger services throughout the night to maintain a link with Manchester Airport. The need can generally be accommodated by the fact that a number of alternative routes exist so that in most cases rail access between the principal centres can be maintained. The primary solution will therefore continue to be based around careful possession planning, coupled with progression of schemes to improve the loading gauge profile of diversionary routes for freight traffic. Heaton Lodge Junction to Thornhill LNW Junction is a key section for TransPennine Express services as it is not economic to maintain TransPennine Express train crew route knowledge via Bradford Interchange for diversionary purposes and the increase in journey time in any case is significant. Consideration will need to be given to bi-directional signalling and a flexible layout over this section when renewals become necessary.

Regional links

Stakeholders believe that the current journey times and frequency of services between Manchester and Leeds are inadequate to meet the requirements of steadily increasing numbers of passengers.

Operation of the fifth TransPennine Express service between Manchester and Leeds, along with the potential associated infrastructure works will provide a significant improvement over the current situation.

Freight capability

The present loading gauge of W8 is not conducive to development of the intermodal container market, where the increasing requirement is to convey 9'6" containers on standard wagons. As a result, the Leeds – Huddersfield – Manchester route is included within the development work for the Northern Gauging Project.

Table 5.9 – Huddersfield line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
HD1	Huddersfield/Brighouse – Leeds lengthen stopping services: • Nine additional vehicles spread across approximately five services • New platform at Huddersfield • Platform lengthening at other stations	Peak crowding, off-peak crowding	Include in strategy	2.0
HD2	Manchester – Leeds additional all day hourly semi-fast service: • 1 x three-car additional hourly service in each direction • Enhanced freight loops at Marsden and at Diggle	Peak crowding, off-peak crowding	Include in strategy, and examine options to push additional service through to York	>5.0
HD3	Manchester – Leeds semi-fast train lengthening: • 12 additional vehicles spread across approximately six services • Platform lengthening	Peak crowding	Do not include in strategy as inferior to HD2	1.9
HD4	Restrictive loading gauge for freight trains	Freight capability	Included in development work for Northern Gauging Project	n/a

Calder Valley line

Peak crowding

During the high peak hours and parts of the shoulder peaks the eastern end of the route is one of the most overcrowded in the RUS area with passengers on some trains standing from as far as Halifax. It is recommended that five additional four-car Halifax – Leeds services are operated during each peak period. Despite requiring an additional crossover at Bradford Interchange, this option offers high value for money indicated by a BCR of 2.1. It is also more cost-effective than train lengthening, which would involve the operation of longer trains throughout the length of the route with low occupancy for much of the journey.

A similar option is recommended to meet the HLOS capacity metric into Manchester by making most efficient use of additional vehicles with up to six additional Todmorden and Rochdale – Manchester Victoria three-car services operating during each peak period, calling at all stations, rather than train lengthening on the longer distance services to/from Leeds. This would require a new turnback facility in the Todmorden area as the December 2008 timetable increases the number of services in this area and so turning around all trains on the main line is not possible. In addition this option would reduce Bradford – Manchester peak journey times as these services would no longer need to call at all intermediate stations.

Regional links

The journey time between West Yorkshire and Manchester via the Calder Valley is significantly greater than via Huddersfield, and local stakeholders believe this has a detrimental impact on the connectivity of places served by the Calder Valley line, particularly Bradford. One way to improve Bradford to Manchester journey times is to remove most intermediate calls. The option to meet peak-hour growth into Manchester helps towards this by removing peak-hour stops west of Todmorden, with the exception of Rochdale.

However, in order to improve all-day journey times other services would need to be provided. For example, extending the post-Metrolink Rochdale hourly service to Todmorden in the off peak, in addition to the peak recommendation, would allow about a six-minute journey time improvement in the slower post December 2008 Leeds – Bradford – Manchester service. Such an all-day option is likely to offer medium value for money indicated by a BCR of 1.5.[1]

The case for, and precise start/end of the additional service, is subject to further analysis; options for it to operate further east of Todmorden are being examined and new infrastructure at Todmorden or Hebden Bridge may be required instead of the Todmorden turnback. Furthermore, the Lancashire and Cumbria RUS identified that extending this service west via a new curve at Todmorden to Burnley and Accrington may be a viable option providing the infrastructure is required to solve the peak capacity problems on the line into Manchester.[2] The final Yorkshire and Humber RUS will need to include a definitive view on what infrastructure options meet the HLOS capacity metric at Manchester but also facilitate other aspirations.

The option as presented is likely to reduce the Bradford – Manchester journey time by around six minutes. Whilst acknowledging this is an improvement, stakeholders believe that a larger reduction in journey time could provide a step change in the level of use of the service, which may generate a large increase in the value for money of the scheme. On this basis additional work will be undertaken to understand whether the journey time can be reduced further whilst remaining within DfT funding criteria. One option for this may include bespoke linespeed improvements.

1 It is assumed that existing Leeds – Hebden Bridge service and one Rochdale/Todmorden – Manchester Victoria service have been merged to form a single through service as per the December 2008 timetable. It is also assumed that the Oldham loop has been taken over by Metrolink.

2 The Lancashire and Cumbria RUS also identified that if the infrastructure at Todmorden is not required to alleviate crowding on the line into Manchester, a fast Burnley/Accrington – Manchester Victoria service may be viable, providing rolling stock is available and that a non-DfT funding route can be identified.

Engineering access

The largest conurbation primarily dependent on this route is Bradford. The city benefits from the fact that it has two main stations and two separate routes to Leeds, so that in normal circumstances at least one route between Bradford and Leeds is always available and in turn Leeds connections are almost invariably available to key destinations such as Doncaster, York and London. For travel in a south-westerly direction towards Halifax and Manchester, the position is less favourable, since if the line between Bradford Interchange and Halifax is blocked the only alternative lies in a lengthy diversion via Leeds. When signalling renewals become due, it will therefore be appropriate to consider bi-directional facilities in this area.

Reactionary delays

Rochdale station has been identified as a very significant cause of reactionary delays, though this appears to be a technical anomaly due to the fact that Oldham loop services terminate and almost immediately restart as another service. Transfer of the Oldham loop to Manchester Metrolink may overcome the problem.

Table 5.10 – Calder Valley line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
CV1	Halifax – Leeds additional peak services: • 5 x four-car additional service in each direction • Additional crossover at Bradford Interchange (as part of planned scheme)	Peak crowding	Include in the strategy, subject to further work on option CV3	2.1
CV2	Manchester Victoria – Leeds train lengthening: • 20 additional vehicles spread across the majority of peak arrivals into Leeds • Platform lengthening	Peak crowding	Do not include in the strategy	1.3
CV3	West Yorkshire – Manchester Victoria improved journey times and additional services: • Leeds – Victoria (via Bradford) trains run fast between Todmorden and Manchester all day, calling only at Rochdale • Six Rochdale – Manchester three-car peak stopping services • Hourly additional all-day Todmorden (or beyond) – Manchester services, calling additionally at stops removed from Leeds services • Potential new infrastructure at Todmorden or Hebden Bridge	Peak crowding, regional links	Include in the strategy subject to further development	1.5

Hope Valley line

Peak crowding

There is an increasing problem of peak period crowding on all operators' services into Sheffield, which is anticipated to deteriorate over CP4 as a consequence of expected passenger growth on the route. The preferred option to alleviate this is an additional hourly peak-busting Manchester – Sheffield service during the three-hour am and pm peaks. This may be an extension of an existing Manchester – New Mills Central service. This option would require a redoubling scheme at Dore Junction at an estimated capital cost of £15 million. Including the cost and stand-alone benefits from redoubling Dore Junction, the BCR of the additional service is estimated at approximately 2.0, which is indicative of high value for money. During the consultation period further analysis is required to understand the detailed performance impact of redoubling Dore Junction, as the current analysis is based on work produced in 2004.

Lengthening some existing peak services from three-car to four-car operation has a similar value for money case; however, in contrast to the previous option it does not address the regional linkage gap discussed below. For this reason it is viewed as a fall-back option for delivering more peak capacity on the route.

In practical terms, it is recognised that to accommodate additional Hope Valley trains some recasting of local services in the Manchester area would be necessary, probably involving the Marple and New Mills services. There may be opportunities to meet some of the quantum required during CP4 without an adverse effect on performance.

Regional links

Stakeholders believe that the frequency of fast services between Sheffield and Manchester is insufficient relative to the size and proximity of these major UK cities. Analysis suggests that extending the previous option to operate an inter-peak hourly Manchester – Sheffield service is likely to offer at least medium value for money; however, it is anticipated that additional freight loops in the Hope Valley may be required as the demand for freight paths is greater than during the peak. Additional work is required to understand the potentially sizeable performance benefits from this infrastructure before a definitive recommendation on additional inter-peak services is possible. This may include East Midlands – Manchester services via the Dore South Curve, although initial analysis suggests the business case for this is inferior to the current recommended option.

Freight capability

Growing demand for stone, in particular, from the Buxton area suggests that in the near future it will not be possible to handle the volume of freight trains without significant adverse impact on the performance of existing trains in the area, assuming that paths could be found at all. It is therefore proposed to carry out further work to look in more detail at the benefits of providing a freight loop in each direction to enable freight trains to be overtaken by faster interurban passenger trains. Freight would also gain benefit from any redoubling scheme at Dore Junction.

Reactionary delays

Significant reactionary delays have been identified as occurring at Dore station junction and Totley Tunnel East, one cause being the short section of single track through Dore & Totley station. As mentioned above, it is intended during the RUS consultation period to carry out further performance analysis to assess the case for double-tracking.

Table 5.11 – Hope Valley line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
HV1	Additional peak Manchester – Sheffield services: • At least two-car additional hourly service via New Mills • Double tracking through Dore station	Peak crowding, regional links	Recommend in the strategy subject to performance modelling work	2.0
HV2	Manchester – Sheffield peak train lengthening: • At least four additional vehicles spread across four services • Platform lengthening	Peak crowding	Alternative to HV1, however do not include in strategy	2.0
HV3	Additional inter-peak Manchester – Sheffield services: • Two-car additional hourly service via New Mills • Additional freight loops in Hope/ Grindleford area • Double tracking through Dore station (completed with HV1)	Regional links, freight capability	Recommend in the strategy subject to performance modelling work and HV1 being implemented	Approx 2.0

Sheffield – Doncaster/Moorthorpe line

Peak crowding

A number of services are overcrowded during the high peak hour in the morning and particularly the evening, with standing typically occurring from as far as Conisbrough on the Doncaster line and from Bolton-on-Dearne on the Moorthorpe line. It is recommended that an additional six vehicles are spread across two peak Doncaster – Sheffield services and one peak Leeds – Sheffield via Moorthorpe service. The options for both lines have a high value for money case, indicated by BCRs of 3.1 and 2.5 respectively.

Regional links

Rotherham has a service frequency of three trains per hour, and a number of stakeholders believe this is insufficient given the size of the rail catchment and the proximity to Sheffield. A sizeable infrastructure enhancement would be required to achieve an increased service frequency and Network Rail and SYPTE are working together to understand the scope of this scheme and ascertain whether it is likely to meet the minimum DfT value for money criteria.

Engineering access

Diversionary opportunities exist for many purposes (although these are limited in terms of capacity and linespeed), but there are no suitable alternatives between Mexborough and Doncaster and as such this section should be considered for bi-directional signalling when signalling renewals become due. Rotherham Central station, being located on a loop, can be adversely affected by engineering work, but effectively mitigation could only be provided by reopening Rotherham Masborough station; however, with the various cost and other issues such an approach has not generally found favour.

Freight capability

The line forms an important component in the overall freight network and its current limited loading gauge if not improved would form an

increasing constraint to development of the growing intermodal container market. As a result this route is included within the development work for the Northern Gauging Project.

Reactionary delays

Swinton has been identified as a location at which very substantial reactionary delays occur in respect of both passenger and freight trains. It forms a hub at which several lines converge and the services passing through it originate and terminate over a very wide area and as such it is likely that as traffic continues to grow consideration will have to be given to capacity improvement, which could include additional tracks and grade separation.

Rotherham Central and Aldwarke Junction at a somewhat lower level are also significant reactionary delay locations. One cause is the single line section between Rotherham Central and Holmes Junction over which all passenger trains serving Rotherham must pass and which can readily become a source of congestion in the event of out-of-course running. The Holmes Chord doubling scheme, if implemented, would reduce the reactionary delays in this area.

Table 5.12 – Sheffield – Doncaster/Moorthorpe line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
SD1	Doncaster – Sheffield peak train lengthening: • Four additional vehicles spread across two services	Peak crowding	Include in strategy	3.1
SD2	Leeds – Sheffield via Moorthorpe peak train lengthening: • Two additional vehicles on one service	Peak crowding	Include in strategy	2.5
SD3	Increase train service frequency from three to five per hour via doubled Holmes Chord	Regional links	Business case being developed	n/a
SD4	Improve loading gauge for intermodal freight trains	Freight capability	Lines included in development work for Northern Gauging Project	n/a

Immingham/Cleethorpes line

Engineering access

The key flows in this corridor are freight traffic to and from Immingham and also for the Corus plant at Scunthorpe. The south Humber corridor forms part of the pilot Seven Day Railway workstream and as part of this exercise the issues and opportunities will be more fully examined. The recent upgrading of the Barnetby – Gainsborough via Brigg line offers improved diversionary opportunities, particularly for freight traffic. The most critical area remaining is the three-track section between Brocklesby and Barnetby, where no alternative route is available. When signalling renewals become due, it will be appropriate to consider bi-directional working and/or four-tracking of this section.

Regional links

Robin Hood Airport Doncaster Sheffield (RHADS) does not have any rail services, despite being adjacent to the line from Doncaster. Local stakeholders believe that the accessibility of the airport and the local area suffers as a result, and view provision of direct services to and from Doncaster as a solution to this. The airport owners have already committed to finance the cost of a new station at the airport.

The simplest way to serve the airport would be for current Lincoln – Doncaster services to call there. This would be extremely low cost and could be accommodated within the existing timetable. Unfortunately only five services per day are currently routed via the site of the proposed airport station and this would not be that attractive. It is estimated that up to 5,000 passengers per annum would use the service and it is unclear whether this would offset the dis-benefit through the slightly increased journey times caused by the addition of the airport call. It is recommended that the incumbent Train Operating Company should decide as to whether there is a commercial case for a service on this basis.

It is likely that if a new hourly or half-hourly service from Doncaster were introduced, sufficient passengers would be attracted to cover the cost of operation. An hourly or better service frequency cannot be operated however, without significant infrastructure work at Doncaster station. This infrastructure work may be required to deliver additional capacity on the ECML; however, it is not likely that this will be known by the end of the consultation period. Based on an analysis of the likely mode share that rail could capture, the total number of airport passengers would be required to grow approximately in line with the airport's official growth projection of around 16 percent per annum to 2016 to offer high value for money.[1]

A third party funder with an aspiration for hourly or better services would need to be satisfied that total scheme benefit is at least twice the estimated £9 million cost of the infrastructure work as well as the estimated operating cost of at least £700,000 per annum.

Freight capability

The lines in this corridor are heavily used by freight for which capability has recently been substantially improved by the upgrade of the Brigg line. Against this background, the restricted loading gauge would handicap development of the intermodal market.

Reactionary delays

Wrawby and Brocklesby Junctions are both significant sources of delay – for freight trains they are the highest source of reactionary delay within the RUS area. This is to some extent an inevitable consequence of the sheer volume of freight movements in the area, coupled with the number of conflicting moves and the diverse origins and destinations of the traffic causing delay to be imported from a wide area of the network. It is expected that the recently completed upgrade of the Brigg line will to some extent ease the position. Beyond this, it is likely that quadrupling of the track mentioned under engineering access would bring further benefit.

1 A BCR of at least 2.0 is typically required for public funding of a scheme with a high infrastructure cost

Table 5.13 – Immingham/Cleethorpes line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
IC1	Airport calls in existing services • Five trains per day in each direction • Airport station funded by private sector	Regional links	Commercial decision for Train Operating Company	n/a
IC2	New airport service • New hourly or half-hourly service • Requires Doncaster infrastructure scheme • Airport station funded by private sector	Regional links	Local stakeholders to develop further	n/a
IC3	Improved loading gauge for freight trains Doncaster – Immingham via Scunthorpe and via Brigg	Freight capability	Included in development work for Northern Gauging Project	n/a
IC4	Improved loading gauge for freight trains Gainsborough – Lincoln – Wrawby	Freight capability	As above	

Penistone line

The Barnsley – Penistone – Huddersfield line is a Community Rail route and is also proposed for the TramTrain trial project. It is expected that development of the route will be led by those initiatives. There is currently a small amount of peak crowding at the Huddersfield end, which will be further investigated by WYPTE during the consultation period. See also Barnsley and Pontefract line for options to alleviate crowding at the Sheffield end of the line. There will be a need for provision within the TramTrain trial to accommodate crowding and growth south of Barnsley and for similar provision on completion of the trial.

Retford/Lincoln line

Freight capability

This line has considerable potential for freight which, so far as intermodal traffic is concerned, is limited by restricted loading gauge.

Table 5.14 – Retford/Lincoln line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
LN1	Gainsborough – Lincoln – Wrawby Loading gauge for freight trains	Freight capability	Included in development work for Northern Gauging Project	n/a

Chesterfield line

Peak crowding

Growth in commuting demand in this corridor has led to overcrowding on a number of peak services where these are formed of two-car or three-car trains. Introduction of the new hourly Leeds – Sheffield – Nottingham service in December 2008 will provide some additional capacity to relieve overcrowding. Also, East Midlands Trains is seeking to extend its London – Derby services to/from Sheffield from December 2009 giving two trains an hour between London and Sheffield which, if implemented, will provide further additional capacity between Chesterfield and Sheffield.

Table 5.15 – Chesterfield line options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
CH1	Peak growth and crowding between Chesterfield, Dronfield and Sheffield is expected to be addressed by the new Nottingham – Leeds service starting in December 2008 and a possible increase in Sheffield – Chesterfield – London services in December 2009	Peak crowding, off peak crowding	n/a	n/a

Wolds Coast line

No significant gaps have been identified in respect of this line, beyond the fact that overcrowding can occur during the high summer. It is expected that additional rolling stock acquired for the Monday to Friday urban peaks will provide the basis of improved capacity at weekends.

Miscellaneous

Engineering access

The Swinton – Church Fenton line forms a key artery for freight traffic and at its southern end for long-distance high speed and local passenger services. For many purposes, possession planning based around diversion via Doncaster and the ECML provides a practical alternative, but it would be unrealistic not to recognise that the potential may be limited by increasing pressure on the Swinton – Doncaster line and the ECML. As such development of these routes will need to take into account the ability to handle diverted traffic especially at weekends. Options may include the provision of bi-directional signalling when renewals become due.

Table 5.16 – Miscellaneous options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
MC1	Swinton – Church Fenton	Engineering access	Develop further	n/a

Leeds station area

Peak crowding

Services from the Airedale, Wharfedale and Harrogate lines almost exclusively use platforms 1 – 3 at the far north of Leeds station, and trains are often accommodated during the peak by double stacking at each platform. This practice means that the full length of these platforms is utilised at the busiest times and it is unlikely that there is sufficient peak capacity at these platforms for additional or longer trains. It is therefore recommended that one or two additional bay platforms with associated track and signalling work are constructed at the north of Leeds station to accommodate additional and longer peak trains. Detailed work is currently underway to understand the scope of the infrastructure requirements. However, the combined business case for the three lines is robust against the likely capital cost. It is estimated that the combined capacity options for the three lines will offer a high value for money case if the cost of Leeds station works were less than £5 million, and medium value for money if the cost remains below £25 million.

Similarly, the increasing length and quantum of trains at peak periods on other routes into Leeds will mean that the present platform space will become insufficient because, again, double stacking of trains in platforms will no longer be possible and some of the shorter bay platforms will be of limited practical use. Rapid growth to date has already absorbed most of the additional capacity created under the Leeds First initiative of a few years ago. Further expansion of platform capacity in the centre and south of the station would be very costly apart from the possible creation of one new bay platform on the south side, the feasibility of which requires more detailed investigation. The solution proposed is to reduce the number of trains terminating at Leeds, thus freeing up capacity within the station. This can be achieved by linking stopping services operating to the west of Leeds with those operating to the east to provide many more cross-Leeds services.

The existing track layout east of Leeds implies that all such services would need to continue to York or Selby (or possibly Church Fenton), none of which would be an efficient use of resources. It is therefore proposed to create a turnback facility in the Micklefield area which would enable a more intensive operation within the WYPTE area where the greatest demand exists and would also permit some degree of “bounce back” operation whereby (for example) an early morning peak train from the west of Leeds could proceed to the turnback facility in sufficient time to form a later peak train from Micklefield into Leeds. Thus it would become possible for one train set to contribute at least two peak journeys into Leeds in the morning and out in the evening, which could not otherwise be achieved.

Engineering access

As explained earlier in this chapter, for many of the major passenger and freight destinations suitable diversionary routes exist from Leeds or with some upgrading could be made available. However, with most rolling stock stabling and maintenance in the area centred on Neville Hill, the route between Leeds station and Neville Hill is of vital importance to passenger train operations. No practical alternative route exists and with ongoing growth in traffic its usage will continue to increase. It is therefore recommended that the Seven Day Railway workstream will need to examine as a priority means of maximising access on a “24/7” basis. Options for this include bi-directional signalling and single line working.

Reactionary delays

Analysis has shown that Whitehall Junction is the largest source of reactionary delay at any single location within the RUS area. This arises as a result of the very intensive operations in the area, coupled with congestion related to a rail infrastructure which, despite interventions in the relatively recent past, is becoming increasingly inadequate as train services continue to grow in response to demand. It is therefore recommended that as options are developed for further enhancing capacity at Leeds station performance implications are fully taken into account and mitigation measures proposed

Table 5.17 – Leeds station area options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
LD1	Combined Leeds north-west option with additional infrastructure at Leeds station: • Options AI1, WH1, HA1 • Leeds station north end bay platforms	Peak crowding	Include in strategy providing infrastructure cost below £25 million	1.5 – 2.0
LD2	Construct new platform to the south of Leeds station	Peak crowding	Include in strategy provided providing infrastructure cost acceptable	n/a
LD3	Construct new turnback facility in Micklefield area for trains from/to Leeds direction and develop options to make best use of the constrained infrastructure between Micklefield and Leeds	Peak crowding	Include in strategy providing infrastructure cost acceptable	n/a
LD4	24-hour access between Leeds station and Neville Hill depot for which no diversionary route exists	Engineering access	The Seven Day Railway workstream will need to examine the scope for bi-directional signalling on all tracks or other mitigation measures	n/a
LD5	Leeds Whitehall Junction has the highest level of reactionary delay within the RUS area	Reactionary delays	Development of measures to improve capacity at Leeds will need to take this into account	n/a

Sheffield station area

Reactionary delays

The Sheffield station area has one of the highest levels of reactionary delay within the RUS area. It arises in part from the very intensive train service operated, coupled with the fact that the station has seen no major resignalling or track remodelling for many years. As a result, the infrastructure has become increasingly inadequate and outdated as train services have grown and patterns have changed in response to demand, whilst "quick win" solutions where available have by now all been taken up.

The situation is not assisted by the fact that not all of the through platforms are signalled reversibly to allow arrivals and departures in both directions, whilst one of the three reversibly signalled platforms is typically occupied for approximately 40 minutes in each hour by the London service, placing a further limitation on flexibility. On the other hand, to achieve maximum utilisation, some Northern local services are scheduled very short turnaround times so that even quite small delays to the incoming service will react onto the next working. With planned train lengthening the situation will become still more difficult, because the opportunity for "double stacking" of trains in bay platforms will be reduced. From December 2008, most of the East Midlands Trains' London to Sheffield

services will be formed of Class 222 Meridian trains, despite some limitations arising from the fact that not all through platforms at Sheffield are able to handle 10-car trains.

It is therefore recommended that when resignalling is due, consideration is given to reversible working on all through platforms and to the role of the through lines in the station which are lightly used. Additionally, when a major train service change is contemplated a balance will need to be struck between the lengthy turnaround time allowed for long-distance high speed services and the very short turnaround applied to some local trains.

Engineering access

The section of line between Sheffield station and Nunnery Main Line Junction is critical to continuity of service between Sheffield and a large number of key destinations as no practical alternative route exists. At present it is a section of double track with conventional Up and Down line signalling. It is recommended that when resignalling is carried out bi-directional working is provided to facilitate engineering access and increase flexibility at times of service perturbation.

Table 5.18 – Sheffield station options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
SF1	Provide full reversible working on all through platform lines at Sheffield station	Reactionary delays	To be considered when resignalling takes place	N/A
SF2	Provide bi-directional working Sheffield – Nunnery Main Line Junction	Engineering access	To be considered when resignalling takes place	N/A
SF3	Capacity scheme to alleviate train lengthening of local and long-distance trains at Sheffield	Peak crowding	To be considered when resignalling takes place	N/A

Doncaster station

Reactionary delays

Doncaster station area has been identified as an area in which significant reactionary delays arise, essentially as a result of the fact that numerous north – south and east – west services cross there on flat junctions. Further work on this issue is dependent on the planned development of a new ECML timetable based around higher frequencies and an almost "standard hour" timetable. Once this timetable is more fully developed, it will be possible to consider in greater depth what timetabling or infrastructure solutions may be appropriate in relation to other services.

Regional links

There is a strong local aspiration for services to a new station at Robin Hood Airport Doncaster Sheffield at Finningley beyond what could be provided by an additional stop in the existing Doncaster – Lincoln service. As with performance, detailed development of proposals will follow creation of the new ECML timetable, which will determine the optimal form for such services and other stakeholder aspirations for this important node.

Table 5.19 – Doncaster station options

Option	Description	Gap(s) addressed	Recommendation in RUS?	BCR
DR1	Split Scunthorpe – Sheffield service at Doncaster and divert Lincoln services to Platform 2	Reactionary delays	Not appraised as option requires additional resources	N/A
DR2	Operate above Scunthorpe – Doncaster through to RHADS	Regional links	Not included in strategy in isolation as poor value for money	N/A
DR3	Identify overall infrastructure requirements for Doncaster station area in order to deliver increased ECML passenger and freight train paths, improved performance and facilitate other aspirations (eg. regular services to RHADS)	Regional links, freight capability, engineering access, and reactionary delays	Final RUS to set out high level requirements	N/A

6. Emerging strategy

6.1 Introduction

The study of the routes in the Yorkshire and Humber area has shown that generally the routes are very well used by both passenger and freight traffic. The most acute issues are accommodating the growth in commuter journeys and providing additional capacity for freight traffic. The strategy therefore primarily seeks to address the question of growth progressively over time.

The Route Utilisation Strategy process has considered the current and future freight and passenger markets and assessed the future growth in each. It has then sought to accommodate this growth effectively and efficiently, in accordance with the route utilisation objective specified in Licence Condition 7. The measures proposed range from lengthening services to provision of additional infrastructure.

The RUS has considered Regional Planning Assessment conclusions and has taken into account other potentially fundable stakeholder aspirations, particularly those of the Department for Transport, Passenger Transport Executives, local authorities and regional bodies. In the course of this investigation, options were developed, tested, sifted and modified until feasible solutions were identified with acceptable performance and meeting value for money criteria, which are consistent with anticipated funding and acceptable to all key stakeholders.

To align with the 2007 Government White Paper "Delivering a Sustainable Railway", the strategy also looks forward to interventions which will help deliver sustainable transport to support long-term freight and passenger growth.

A number of the key recommendations are reliant upon there being increased amounts of rolling stock available to the Train Operating Companies. Consequently, timescales and final capacity solutions will be dependent on the DfT's rolling stock strategy and subsequent acquisition, cascade and deployment of rolling stock across the network.

For Control Period 4 (April 2009 to March 2014) there is a parallel process that is seeking to meet the Government's High Level Output Specification (HLOS) requirements through the Network Rail Strategic Business Plan. This process aims to address peak crowding using the options proposed for recommendations in the RUS subject to the affordability of infrastructure solutions that allow the efficient use of the rolling stock that becomes available via the DfT's Rolling Stock Plan.

6.2 Principles

6.2.1 Dealing with growth

The general principle adopted throughout the RUS has been to consider simpler and lower cost interventions before turning to more complex and expensive solutions. In the first instance optimising use of existing infrastructure has been examined. Timetabling solutions have always been sought as preferable to infrastructure works, subject to there being no unacceptable performance impact. The next step has been to consider the progressive lengthening of trains where heavy demand exists to the maximum practical size and only then to look towards infrastructure enhancement. Again the range of options is considered in order, from simpler schemes such as platform extensions, through more far-reaching measures such as signalling and power supply upgrades, or capability works for longer freight trains, or increased gauge for intermodal traffic, to more

comprehensive investment in a particular line of route. In many cases, the provision of additional services may offer a solution to peak and inter-peak overcrowding, which offers passengers a better service than simple train lengthening, even taking into account infrastructure capacity improvements.

Looking to the medium term, account has been taken of the opportunity presented by the introduction of further new trains to assume improved capacity per train and to consider the part that increased use of electric traction might play.

Ultimately, continued and sustained passenger growth means that an increasing number of enhancement projects have the potential to deliver tangible economic benefits for the Yorkshire and Humber region and the UK as a whole.

6.2.2 Performance

As with many other parts of the country, issues affecting performance on the rail network in the Yorkshire and Humber area are complex, given its diversity of routes and the wide range of services operating over it, with many of the services originating from places well outside the RUS area. It is clear that major factors are the mix of services with varying speed and stopping patterns and the large number of complex junctions and crossings, nearly all on the level, with conflicting train movements. These factors become critical when trains are running out of sequence due to an incident and the strategy seeks to reduce the scale of these issues. The RUS focuses on these types of delay (reactionary delay) that are caused by trains previously delayed elsewhere on the network by primary delays then being delayed further as they have lost their timetable slot or cause delay to other trains.

Primary delays are those that arise due to a problem with the infrastructure or the train itself, eg. points failure, vandalism or shortage of train crew. There are other industry processes which focus on reducing these delays and the RUS has not addressed them.

6.2.3 Access to stations

Access to the network was also highlighted as a gap in the RUS. Some measures are proposed to improve access to the railway such as improved interchange and Park & Ride facilities at a number of stations, and there will be a continuing need to work with train operators, the Passenger Transport Executives, local authorities and other stakeholders to maximise access opportunities both within the Network Rail property portfolio and beyond it. During the consultation phase, Passenger Focus has offered to help with more analysis of car parking issues and opportunities for improved public transport interchange at some key locations.

6.2.4 Rolling stock

DfT published its Rolling Stock Plan on 30 January 2008. The Plan sets out how rolling stock will be used to deliver increased capacity and hence contribute to the capacity outputs required over the period covered by the 2007 HLOS (2009 – 2014) and beyond. The DfT and train operators have been involved in the Yorkshire and Humber RUS throughout its development, so it has been possible to see that the strategy set out in this chapter takes account of the key provisions of the Rolling Stock Plan. The Northern Rail and TransPennine Express fleet increases will contribute significantly to this strategy up to 2014.

However, the detail of the Rolling Stock Plan is still evolving. The infrastructure funding for CP4 aims to accommodate the rolling stock necessary to meet the HLOS. Should further rolling stock become available then joint work will be necessary to utilise that rolling stock in the most efficient manner. Joint work by the Train Operating Companies, DfT and Network Rail will continue during the consultation phase of this RUS and will be reflected in the final document.

Beyond 2014 a further injection of vehicles will be necessary both to meet further growth and replace the Sprinter/Pacer diesel fleet, and further infrastructure enhancements may be necessary to continue to make best use of this new rolling stock.

Further benefits might be achieved by introduction of a new generation of diesel trains, with better acceleration characteristics than the Sprinter fleet, which would minimise journey time differentials between stopping trains and faster services on a number of capacity-constrained corridors and thereby optimise the timetable. Similarly an increase in the electrified network in the RUS area with an associated increase in the electric multiple unit fleet could give an opportunity to procure rolling stock with characteristics that optimise between the needs for rapid acceleration/ deceleration, maximum carrying capacity and quick access/egress to reduce station dwell times. The TramTrain concept, which will be trialled on the Sheffield to Huddersfield route, may also provide opportunities to deal with some issues in the RUS area.

For long-distance high speed services operating into the RUS area, benefits in terms of capacity, fleet flexibility and destinations served can be expected from the introduction of Intercity Express Programme rolling stock.

6.2.5 Depots and stabling

A strategic solution to provision of adequate rolling stock facilities is a network-wide issue and will be considered as part of the Network RUS. However, so far as West and South Yorkshire commuter services are concerned the strategy to accommodate the additional vehicles required during CP4 is to concentrate the use of Neville Hill depot at Leeds and Newton Heath in Manchester on maintaining vehicles. In order to do this, provision of additional servicing and stabling facilities will be necessary at a number of locations around Yorkshire.

Until IEP roll-out commences for ECML services to/from London and for CrossCountry routes, it is considered that vehicles for long-distance services can largely be handled within existing facilities. The IEP Programme will consider in depth the depot facilities required to allow successful implementation and as the programme is still in its early stages, it is not possible as yet to indicate the likely implications.

6.2.6 Power supplies

Only a relatively small part of the network within the RUS area is electrified (all at 25kv). However, traction power supply is potentially critical to service developments such as the operation of more frequent and longer trains, especially in the Airedale and Wharfedale corridors.

Looking further to the future, any additional electrified routes will probably require enhancement of the existing power supply infrastructure but will be dependent on the exact timetable, train formations and classes of traction that will be used. A significant factor will be the power consumption characteristics of IEP vehicles and whether they will operate services in electric mode beyond Leeds, details of which will not become known until the programme has reached a more advanced stage. This issue will be investigated once detailed service patterns of all electric services are known.

By the end of 2008, it is expected that all electrified routes within the RUS area will have been made receptive to regenerative braking, allowing the environmental and financial benefits of regeneration to be exploited by future new build and re-engineered rolling stock.

6.2.7 Engineering access

Most of the RUS recommendations relating to additional services concern either the commuter peaks or the main part of the day, the latter on both weekdays and weekends. These are times when there is currently no maintenance access.

A number of routes in the RUS area are used by high passenger and freight tonnages and the increases in services on these will generally not be sufficient to raise the current maintenance category for the specification and scheduling of maintenance inspections and work. However, the RUS recommendations on some routes to run additional or lengthened services may drive the need for additional maintenance access but application of the Seven Day Railway principles will aim to minimise the effect of this on all passenger and freight flows.

Most of the key towns and cities in the Yorkshire and Humber region can be accessed by more than one route so when more major engineering work is necessary reasonable continuity of service can be provided, albeit with some extension of journey time. The same is largely true of the key freight arteries and inter-regional passenger links where in many cases there are reasonable diversionary routes. A key issue is that comparable capability is provided wherever possible on the relevant diversionary routes, particularly in relation to gauge clearance.

There are a few sections of route for which there is no reasonable diversionary route and so when renewals or other enhancements are proposed on these, opportunities should be examined to provide a more flexible track layout such as bi-directional signalling.

6.3 The immediate future 2008 – 2009 (Control Period 3)

The most acute issues in the Yorkshire and Humber area are accommodating growth in freight and peak period passenger traffic, although a number of performance issues are also apparent. With CP3 nearly at an end, the amount of new work that can be undertaken is very limited.

Extension of the Leeds – Hebden Bridge via Brighouse stopping service to Rochdale to meet up with the Manchester stopping service in the December 2008 timetable will provide some additional capacity, as will the introduction of the new Nottingham to Leeds service.

The Hull Docks Branch capacity enhancement scheme completed during the summer of 2008 has provided significant additional capacity for freight traffic on the line connecting the docks to the Hull – Leeds/Doncaster line to allow further growth in rail-borne traffic.

Another scheme completed in the same timescales is the upgrade of the Barnetby – Gainsborough via Brigg line which provides a further route for freight traffic between the Barnetby area and the southern parts of the RUS area. It will particularly benefit coal trains between Immingham and West Burton by reducing the mileage these trains operate over and will allow increased access for maintenance and renewal on the route via Scunthorpe.

An improved layout will be provided at Bradford Mill Lane, which will assist performance of the Calder Valley service. Higher-speed crossovers will be installed at Church Fenton allowing a small journey time improvement for services in the York – Leeds corridor and improved performance when Leeds services are diverted onto the “Normanton” lines north of Church Fenton. This scheme will allow Scarborough to Liverpool services to be timetabled over either the Leeds or Normanton lines without suffering any journey time detriment.

Remodelling of the junction at Guide Bridge will provide some journey time benefits for Leeds to Manchester services via Diggle and reduce junction occupation times, thereby giving a marginal capacity improvement.

6.4 Short-term strategy 2009 – 2014 (Control Period 4)

6.4.1 Background

In July 2007, the High Level Output Specification was published. The HLOS set out the improvements in the safety, reliability and capacity of the railway system which the Secretary of State for Transport wishes to secure during the period 2009 – 2014.

Network Rail's Strategic Business Plan identifies the schemes required to meet these outputs.

The strategy in the medium term consists of measures to increase capacity on peak passenger services into Leeds, Sheffield and Manchester, to increase and improve cross-Pennine passenger services throughout the day and to provide capacity for freight growth. In addition, work will commence on the development of measures expected to be required in later years.

The emerging strategy for Control Period 4 is set out as follows below, although some initiatives may need to be deferred until Control Period 5 if the associated infrastructure changes are not funded in CP4.

6.4.2 Train services

The following changes to train services currently form the recommended strategy for CP4:

- the most crowded local services will increasingly be lengthened as additional rolling stock becomes available
- subject to affordability of the provision of turnbacks, additional peak shuttles will be run (a) Leeds to/from Horsforth, Keighley, Halifax and Knottingley and (b) Manchester to/from Rochdale/Todmorden
- some peak services will be extended through Leeds to a turnback facility east of Leeds
- an additional all-day hourly service will be operated between Leeds or York and Manchester via Diggle with a timetable recast of all cross-Pennine services
- cross-Pennine services will be accelerated to move towards the target journey time of 43 minutes Leeds – Manchester via Diggle
- possible journey time improvements on other key corridors
- additional freight services as forecast in the Freight RUS will be accommodated, with re-routeing where appropriate to take advantage of new freight routes such as the recently upgraded Brigg line
- additional services from London King's Cross to or through Doncaster as recommended in the East Coast Main Line RUS
- existing Doncaster – Lincoln trains may include a stop at a new station at Robin Hood Airport Doncaster Sheffield
- performance improvement through reduction in Reactionary Delay.

During CP4 there would be the need to undertake development of options for delivery of the medium-term strategy set out in section 6.5.

6.4.3 Infrastructure

The following schemes would be needed in order to deliver the above strategy:

- platform lengthening on a number of lines to accommodate increased train length [1]
- new and increased passenger train servicing and stabling facilities [1]
- new or improved turnback facilities at Horsforth, Keighley, Castleford, and in the Micklefield area
- some small-scale capacity enhancement in the Calder Valley
- at Leeds, additional bay platforms beside Platform 1 and Platform 17, subject to further development work
- various small-scale capacity enhancements between Leeds and Manchester, notably upgrading and lengthening of Diggle loop and upgrading of Marsden loop

- IEP infrastructure works [1]
- some W9/W10/W12 gauge enhancements, funded by HPUK and possibly others identified through the Strategic Freight Network mechanism
- remodelling of Shaftholme Junction [2]
- a fourth running line at York Holgate and associated enhancements [2]
- small-scale projects to enhance performance, provide marginal capacity improvements and/or journey time improvements funded via the Network Rail Discretionary Fund. [1]

Those schemes that are not funded through the ORR Determination for CP4 or other funding source will need to be deferred to CP5.

6.5 Medium-term strategy 2014 – 2019 (Control Period 5)

6.5.1 Background

The general approach will be to continue and further develop initiatives commenced in CP4 in line with the predicted continuing growth in demand. In addition, by this time a number of existing rolling stock fleets will be reaching life-expiry and commencement of a replacement programme will create opportunities for improvements in capacity, performance, fuel efficiency and attractiveness to passengers.

6.5.2 Train services

The following recommended changes to train services form the proposed strategy for CP5:

- introduction of peak shuttles and associated infrastructure on lines where turnbacks and other infrastructure enhancements were not affordable in CP4
- continued progressive train lengthening of local services, including the shuttles introduced during CP4
- lengthening of London and possibly other LDHS services, mainly as a result of the IEP programme
- increased flexibility provided by the IEP dual fuel sub-fleet could allow improved services between places on the electrified network and towns/cities elsewhere
- 43 minutes journey time between Leeds and Manchester for most fast services via Diggle
- progressive introduction of new generation DMUs to replace Pacer/Sprinter vehicles
- a further recast of cross-Pennine services via Diggle to provide more capacity
- improved journey times between Leeds and Sheffield via Barnsley, Sheffield and Manchester, and Bradford and Manchester
- possible increased use of electric trains within the RUS area (extension of electric train operation is a specific area that the Network RUS is examining)
- three fast trains per hour between Sheffield and Manchester
- further increases in train paths on those routes highlighted in the Freight RUS plus routes where further growth is driven by gauge enhancement
- improved capacity, performance, linespeeds and engineering access between Immingham and Wrawby Junction
- improved capacity, performance, linespeeds and engineering access between Hessle Road Junction and Gilberdyke
- enhanced service to RHADS
- further improvements to train performance through reduction in reactionary delays.

As with CP4, during CP5 there would be the need to undertake development of options for continued delivery of the strategy beyond the control period.

1 Scheme specifically shown as funded in ORR Draft Determination. The Draft Determination also provided a £60 million allowance to meet the HLOS on Strategic Route 10, which encompasses the Yorkshire and Humber area.

2 ECML scheme specifically shown as funded in ORR Draft Determination

6.5.3 Infrastructure

It is envisaged that the following projects will be needed to deliver the above strategy:

- further platform lengthening
- capacity enhancements between Leeds and Manchester via Diggle
- any turnback facilities or other projects identified in 6.4.3 that were not affordable in CP4
- an enhanced layout at Sheffield [3]
- doubling of the Dore & Totley station curve and new loops in the Hope Valley [3]
- additional crossover at Bradford Interchange and some bi-directional signalling [3]
- enhancements between Wrawby Junction and Brocklesby in connection with signalling renewals
- enhancements between Ulceby and the Immingham dock complex
- possible extension of electrified network within the RUS area
- possible incremental improvements to capacity, performance and engineering access in the Doncaster station area prior to more significant enhancement on the back of signalling renewals in the longer term
- any further W9/W10/W12 loading gauge works identified through the Strategic Freight Network mechanism
- other schemes identified as representing value for money to reduce reactionary delay and/or improve the balance between engineering access and continuity of service operation.

Delivery of the strategy for the route during Control Periods 4 and 5 will require analysis of the value of the different inputs and outputs to understand better the relationships shown, and to produce a robust staged implementation plan. Some of the inputs might be redefined or eliminated after further development work, but this is considered unlikely because many of the key dependencies are already clear.

6.6 Contingent projects

6.6.1 Intercity Express Programme

The Intercity Express Programme sponsored by DfT has commenced development and whilst it is currently in its early stages it is clear that it will be a significant element in the long-term development of the railway in the RUS area, given that ECML services are firmly included in the IEP programme scope. Network Rail will support IEP with a range of infrastructure works to accommodate operation of the new trains, and National Express East Coast is committed to operation of the pre-series trains. The DfT has received bids for delivery of IEP vehicles, with a view to contract award in April 2009.

6.7 Long-term context (Control Period 6 and beyond)

The Government's 2007 White Paper "Delivering a Sustainable Railway" aspires to a doubling of both passenger and freight traffic nationally over a 30-year period; however it is recognised there may be wide variations on individual routes or parts of routes according to local circumstances. In the event of very rapid growth there is little doubt the strategy for handling demand in the longer term must look first to make best use of the existing infrastructure in the RUS area and then to the opportunities offered by the wider rail network. These could include, for example, making use of any remaining capacity for growth on lines outside the RUS area. There could also be options for reopening currently disused lines where feasible or construction of some completely new sections of railway. The latter could be unconstrained by traditional limitations on maximum speed, loading gauge and other output characteristics.

3 in association with renewal schemes

This section of the document examines what a doubling of passenger and freight traffic over the 30-year period 2007 to 2037 could mean for the RUS area. It is assumed that all passenger markets would double. However, for freight it is assumed that the majority contribution to a national doubling of freight traffic would be intermodal traffic. This would operate over the key freight arteries connecting the ports, the Channel Tunnel and regional distribution centres and would require typically an additional two or three paths per hour on those arteries.

The rate of increase in passenger demand over the last few years, particularly on cross-Pennine services, has been well above the national average. Projected forward (including the impact of the increased passenger trains proposed above) this could well mean that this route would see more than a doubling of passenger numbers and that would suggest that by Control Period 6 (CP6) when all practical options on longer and more frequent trains have been taken up, the cross-Pennine route via Diggle will be operating at capacity. At that stage, the only practical option would appear to centre on four-tracking much more of that corridor unless a section of completely new railway was constructed.

Four-tracking would almost certainly entail the renovation and reopening of the former Down and Up slow line tunnels at Standedge. Additionally, with the restrictions posed by Scout Tunnel and Stalybridge Old Tunnel one way forward might be to re-open some sections of the former railway on the opposite side of the valley and some new alignments. Between Huddersfield and Standedge generally sufficient space already exists to accommodate a four-track railway – this section having consisted of four tracks in the past – but there is a risk to linespeeds as the current two-track railway makes best use of the old four-track formation to maximise speeds. This risk could be ameliorated by the use of rolling stock with tilt technology. Equally electrification of this route would bring benefits in terms of faster acceleration from stations and would significantly improve the performance of services over the hilly sections of the route.

The Hope Valley route is another corridor where further increases to passenger service levels are a possibility given that it links the Sheffield and Manchester City regions as well as providing longer-distance links. This would entail significant four-tracking of the existing route, which has only ever been a two-track railway for most of its length although the provision of freight loops (as mentioned in 6.5.3) would allow some improvement to the number of services using the route. The alternative would be to reinstate the Buxton to Matlock route, which would allow much of the eastbound aggregates traffic from the Peak District to be taken off the Hope Valley line, thereby freeing up capacity for an improved passenger timetable offer between Sheffield and Manchester. This option could also provide improvements between the East Midlands and North West, which the East Midlands RUS will be examining.

An alternative option to relieve cross-Pennine capacity put forward by various stakeholders is the reopening of the former Woodhead route, involving reinstatement of a two-track railway between Deepcar, Penistone and Hadfield coupled with upgrading of the existing railway between Sheffield and Deepcar and in the Hadfield area. It is recognised that, unlike the four-tracking of the Diggle route, this offers an additional benefit in providing greatly improved connectivity for the Barnsley, Penistone and Hadfield areas however it would do little to relieve the key capacity shortage between Leeds and Manchester. In addition, there are several significant practical limitations. Most notably, without very major construction work access to the route from the present Sheffield station would require trains to reverse at or near Woodburn Junction and put further pressure on the heavily used two-track section immediately north of Sheffield station.

Furthermore, the considerable density of existing rail traffic over the proposed route at the Manchester end, particularly during the commuter peaks, would potentially limit the amount of additional traffic that could be handled. Almost none of the solum of the disused parts of the former Woodhead railway is currently in Network Rail ownership. The main benefits of this route would arise from dealing with congestion on the cross-Pennine road network rather than solving rail network issues, whilst the size of the project and the existence of less costly short-to-medium term solutions to cross-Pennine rail capacity imply any development would be well into CP6 or beyond.

In order to accommodate a doubling of commuter journeys on each rail corridor, the short-to-medium term strategy of either train lengthening or additional services gives the foundation for the longer term. Continued growth could be addressed largely through progressive train lengthening both of existing services and the “peak busting” additional shuttle services and some further service frequency increases.

Based on present trends in growth in demand, capacity at Leeds station and its surrounding area is expected to become increasingly critical even with the interventions proposed for CP4 and CP5. The obvious solution is a further major rebuild of the Leeds station area but there are significant engineering complexities associated with this and the potential for a long period of disruption should not be underestimated.

Alternatively, consideration will need to be given to the possibility of four-tracking all or part of the route between Leeds and Micklefield to maximise the number of trains from the west and south running through Leeds rather than terminating there. Electrification of this corridor, either in CP5 or the longer term, could bring wider benefits – especially if extending as far as York – by:

- allowing cross-Leeds local services to the proposed turnback facility at Micklefield to be operated by electric traction, releasing capacity by improving their acceleration from intermediate stations
- if Leeds – Manchester via Diggle were electrified, allowing cross-Pennine services to be operated by electric traction through to York
- allowing some London – Newcastle (or beyond) services to operate via Leeds, either for diversionary purposes or as a regular arrangement.

The operation of more London – Leeds services through to other destinations would free up some further through-platform capacity at Leeds.

The need to commence renewal of the existing Sprinter/Pacer fleet during CP5, into CP6 and perhaps beyond might offer particular opportunities to build a case for electrification, based around the premise that new designs of electric train could be lighter in weight with the numerous benefits that brings. Furthermore, electric traction is generally simpler to maintain than diesel giving potentially more intensive utilisation and lower maintenance costs.

Another opportunity to mitigate capacity issues at Leeds station could be by the deployment of TramTrain vehicles on certain local corridors. TramTrain vehicles would be able to leave the heavy rail network close to Leeds city centre and then use street running, both freeing up capacity in Leeds station and offering improved connectivity to city centre destinations.

Similar opportunities may also be identified at Sheffield, building on experience gained during the planned TramTrain trial between Sheffield, Penistone and Huddersfield.

More widely, steps might be taken to encourage staggering of working hours in Leeds and other major centres – perhaps incentivised by fares policy. This would do much to reduce the adverse effect of relatively short morning and evening peaks in terms of

rolling stock assets fully utilised for only a very short period of each day. Longer, less intense peaks would certainly contribute markedly to a reduction in crowding and more economic operation of the local passenger transport network. The development of new ticketing technology to introduce more flexible and sophisticated pricing in the high peak hour and peak shoulders should be accorded a high priority. This will build on the work already done at industry level to identify appropriate standards for the potential national application of future ticketing solutions and other demand management techniques. The lead time in developing and proving such solutions means that while the full benefits are unlikely to be realised in the short to medium term, some early impact may be made.

As far as freight growth is concerned, as described above, accommodating a significant increase in intermodal growth is necessary. This requires gauge enhancement to W9, W10 and W12, to allow train lengths up to 775 metres (to maximise use of train paths, locomotives and drivers) and to increase freight paths on the key freight arteries through the RUS area, including associated diversionary routes.

Those arteries where increased capacity would be the most challenging are:

- Rotherham – Swinton – Moorthorpe – Hare Park Junction
- Cross-Pennine
- Doncaster – Colton Junction.

The first of these will need four-tracking of significant sections, which would need to be considered in relation to eliminating some of the flat junctions in the Rotherham to Sheffield corridor as well, but this will have benefits for other types of freight traffic growth, increased passenger services, train performance improvement and moving towards a Seven Day Railway. The second is discussed earlier in this section. The third requires solutions to future routeing of passenger and freight traffic through the Doncaster station area and attention given to making most effective use of the lines via Hambleton and Askern.

The Doncaster station area needs to be examined not only in the context of the freight growth above but for the longer-term increase in passenger services from London King's Cross to the RUS area, the North-East and Scotland, and for other service improvement aspirations in the Yorkshire and Humber Region. This could lead to a major upgrade of the network in this area when signalling renewals become due.

6.8 Alternative growth scenarios

The demand forecasts used in this RUS represent the growth projections derived from the housing, population and employment forecasts contained in DfT's TEMPRO model, overlaid with information from Regional Planning Assessments and some bespoke overlays. Longer-term demand forecasts are very uncertain and extremely sensitive to economic conditions.

The RUS strategy is expected to cater adequately for forecast growth in passenger and freight demand in the next decade. In the event that growth in demand does not meet the RUS forecasts, then clearly it would be possible to delay or abandon interventions where appropriate, provided that decisions are made in time to avoid major expenditure commitments. Equally, if growth continues at its current high level and exceeds the forecast over the next decade, then some of the measures for the longer term may have to be accelerated.

7. Consultation

7.1 Introduction

7.1.1 Purpose

Consultation with stakeholders within and outside the rail industry is essential to the successful development of a Route Utilisation Strategy. Close involvement of stakeholders helps to provide that:

- the widest range of options is considered
- the best solutions are identified
- implementation of the strategy can be undertaken more quickly.

According to Network Rail's network licence:

> "…the licence holder shall develop a draft route utilisation strategy in consultation with:
>
> i) providers and potential providers of services relating to railways,
>
> ii) funders and potential funders of services relating to railways,
>
> iii) the Rail Passengers Council or such other public body or bodies as may be performing the Council's duties,
>
> iv) other representatives of persons using services for the carriage of passengers by railway, and representatives of persons using services for the carriage of goods by railway,
>
> v) the Secretary of State [for Transport] and, in relation to a route utilisation strategy that involves Scotland-only services, or cross-border services, the Scottish Ministers."

(Network Licence Condition 7 as modified 10 June 2005)

In order to deliver this obligation in an effective and consistent manner, two consultative groups have been established for the Yorkshire and Humber RUS.

7.1.2 Industry Stakeholder Management Group (SMG)

The SMG consists of representatives from passenger and freight train operators, the Association of Train Operating Companies, Department for Transport, Network Rail, relevant Passenger Transport Executives, Passenger Focus and the Office of Rail Regulation (the latter as an observer).

This group meets periodically acting as a steering group for the RUS. In addition, the SMG has formed sub-groups to direct and review detailed items of specialist work needed by the RUS.

7.1.3 Wider Stakeholder Group (WSG)

The WSG is a larger, and hence necessarily more formal, group than the SMG. Representatives are invited from:

- County Councils
- City Councils
- Metropolitan Borough Councils
- Association of Community Rail Partnerships
- Yorkshire Forward
- East Midlands Development Agency
- Highways Agency
- Railfuture
- Yorkshire and Humber Assembly
- East Midlands Regional Assembly
- Government Office for Yorkshire and Humber

- Government Office for the East Midlands
- Humberside International Airport
- Leeds Bradford Airport
- Robin Hood Airport Doncaster Sheffield
- Strategic Economic Zone (M18)
- Campaign for Better Transport
- Travelwatch East Midlands
- UCVR Getting About Group
- Community Rail Partnerships.

This group exists so that stakeholders beyond the rail industry have the opportunity to contribute to the RUS process, and that they are briefed and prepared to make best use of the formal consultation period. A number of meetings have been held to date and additional meetings will be arranged during the remainder of the RUS process.

7.2 How you can contribute

We welcome contributions to assist us in developing this RUS. Specific consultation questions have not been set as we would appreciate comments on the contents of the document as a whole. Responses should, however, make particular reference to the options that have been developed as solutions for the identified gaps.

7.3 Response date

This RUS will have a formal consultation period of 12 weeks. The deadline for receiving responses is therefore 18 December 2008. Earlier responses would be very much appreciated in order to maximise the time available to consider them for the final RUS document which is due to be published in the spring of 2009.

Consultation responses can be submitted either electronically or by post to the addresses below and these will be published on our website following the completion of the consultation process.

YorkshireandHumber.RUS@networkrail.co.uk

Yorkshire and Humber RUS Consultation Response
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Appendices

Appendix 1

Freight terminals

The following table highlights the freight terminals located in the RUS area and typical current usage:

Location	Commodities	Origin/Destinations	Volume
Aldwarke	Metals	Handsworth, Scunthorpe, Deepcar, Wolverhampton	24tpw
Attercliffe	Metals, Aggregates	Liverpool, Peak Forest	8tpw
Corus Scunthorpe	Coal, Metals	Immingham/Lackenby	150tpw
Dewsbury	Aggregates	Hope	6tpw
Dowlow	Aggregates	Various	20tpw
Ferriby	Industrial inorganic chemicals	N/A	Nil
Gainsborough	Oil	N/A	Nil
Gascoigne Wood	Gypsum	Drax	6tpw
Goole Dock	Metals	Aldwarke	10tpw
Goole Guardian Industries	Sand	Peterborough	6tpw
Grimsby Docks	N/A	N/A	Nil
Harworth Colliery	Coal	N/A	Nil
Hatfield Colliery	Coal	Drax/Ratcliffe	12tpw
Healey Mills	N/A	N/A	Nil
Hull Docks	Coal metal	Cottam/Drax	60tpw
Humber Refinery	Oil	Various	30tpw
Hunslet East	Aggregates	Rylstone, Tunstead	8tpw
Huntsman Tioxide	N/A	N/A	Nil
Immingham	Coal, ore	Various	300tpw
Immingham Railfreight Terminal	N/A	Nil	Nil
Laisterdyke	Metals	Liverpool	3tpw
Leeds Balm Road	Aggregates	Tunstead	6tpw
Leeds Stourton	Containers, aggregates	Felixstowe, Southampton, Tilbury, Thamesport	36tpw
Lindsey Refinery	Oil	Various	30tpw

Location	Commodities	Origin/Destinations	Volume
Maltby Colliery	Coal	Drax/Cottam	12tpw
Manton Colliery	N/A	N/A	Nil
Markham Main	N/A	N/A	Nil
Oxcroft Disposal Point	N/A	N/A	Nil
Peak Forest	Aggregates	Various	40tpw
Rotherham	Metals	N/A	Nil
Roxby Gullet	Waste	Brindle Heath/Bredbury	18tpw
Selby Potter Group	Containers	Felixstowe, Doncaster, Peterborough	12tpw
Skellow	Oil	N/A	Nil
Stocksbridge/Deepcar	Metals	Aldwarke	10tpw
Tinsley	Metals	Immingham	10tpw
Topley Pike	Aggregates	Various	15tpw
Wakefield Cobra	N/A	N/A	Nil
Wakefield Europort	Containers	Various	10tpw
Welton	Oil	N/A	Nil
Wintersett	Coal	N/A	Nil

Appendix 2

Summary of DfT/PTE aspirations

The funder aspirations identified below where appropriate to the development of the RUS have been discussed in the analysis and conclusions in Chapters 5 and 6.

Other elements (for example many of the proposals for new stations will be subject to normal industry processes and the final strategy) will be developed in a way that is consistent with these aspirations.

Location	Aspiration	Proposer	RUS Section
Airedale corridor	Link some services to other parts of Leeds City region	WYPTE	6.7
Apperley Bridge	New station	WYPTE	
Barnsley – Doncaster	Create new rail link	SYPTE	6.7
Barnsley growth corridor	Provide improved local community access by reinstatement of former railway Crofton Jn – Cawthorne – Swinton to provide service to Sheffield	SYPTE	
Bingley	Improved interchange	WYPTE	6.2.3
Bradford Interchange	Improved interchange facilities	WYPTE	6.2.3
Bradford/Skipton	Additional through trains to London	WYPTE	6.5.2/6.7
Calder Valley	Examine potential to reduce journey times between Bradford and Halifax to Leeds/ Manchester and to run faster services, exploring routeing options via Brighouse	DfT	6.4.2/6.5.2
Calder Valley corridor	Improved journey times between Bradford and Manchester	WYPTE / GMPTE	6.4.3
Calder Valley corridor	Extend Calder Valley trains to Salford Crescent; extend Victoria – Rochdale trains to Todmorden (or beyond); Speed up Manchester Victoria – Bradford – Leeds services; linespeed improvement between Victoria and Hebden Bridge	GMPTE	
Castleton	Station improvements	GMPTE	6.2.3
Dewsbury	Improved interchange with buses	WYPTE	6.2.3
Doncaster	Capacity improvements within station	SYPTE	6.5.3
Doncaster	Improve capacity on rail approaches to station	SYPTE	6.5.3
Doncaster	Freight movements through or avoiding Doncaster	SYPTE	Chapter 5
ECML	Introduction of improved long-distance service pattern in line with ECML RUS proposals	DfT	6.5.2
ECML	Introduction of IEP trains	DfT	6.5.2
Elsecar	Reinstate station stop	SYPTE	

General	Provide additional capacity to meet predicted growth, particularly for commuter flows	DfT	Chapter 5
General	Improve links between the northern city regions through train lengthening or additional peak services	DfT	Chapter 5
General	Make provision for continuing growth in freight traffic	DfT	Chapter 5
General	Examine potential for further gauge clearance to W10 or W12	DfT	6.4.3
General	Deliver improved service punctuality and reliability in line with declared targets	DfT	6.4.2
General	Provide improved opportunity for use of train services by car park enhancement especially on routes into Leeds	DfT	6.2.3
General	Examine opportunities for more efficient engineering access to allow improved evening and weekend services	DfT	6.2.7
General	Improve existing stations including car parking	SYPTE	6.2.3
General	High-speed line to South Yorkshire	SYPTE	
General	New station car parks or extensions to existing where Park & Ride trips can be generated, improved bus/rail integration	GMPTE	6.2.3
General	Additional rolling stock for train lengthening to reduce overcrowding	GMPTE	6.2.1
Greenfield	Station improvements	GMPTE	6.2.3
Guide Bridge	Park & Ride and higher line speeds at Guide Bridge West junction	GMPTE	6.2.3
Haxby	Examine potential for a new station	DfT	
Hope Valley	Examine potential for higher frequency Sheffield – Manchester service	DfT	6.5.2
Hope Valley	Freight capacity	SYPTE	Chapter 5
Horsforth Woodside	New station	WYPTE	
Huddersfield	Improved interchange with buses	WYPTE	6.2.3
Huddersfield corridor	Additional capacity on local services and service improvements Leeds – Manchester	WYPTE / GMPTE	Chapter 5
Huddersfield corridor	Additional capacity Manchester – Leeds through train lengthening or additional services	DfT	6.4.2
Huddersfield corridor	Examine potential for reducing journey times between Leeds and Manchester	DfT	6.4.2
Hull and Scunthorpe lines	Optimise the opportunities offered by the Humber ports as international gateways	DfT	6.5.3
Keighley	Improved interchange and additional parking	WYPTE	6.2.3
Kirkstall Forge	New station	WYPTE	

Leeds	Examine potential for a new southern entrance to station	DfT	6.2.3
Leeds – Wakefield Westgate – Sheffield	Additional fast trains	WYPTE	Chapter 5
Leeds Bradford Airport	New transport link	WYPTE	
Leeds eastwards	Additional parking at all PTE car parks	WYPTE	6.2.3
Leeds station approaches and Whitehall Jn	Improve capacity and performance	SYPTE	6.5.2
Leeds/York/Hull/ Scarborough corridor	Examine potential for journey time improvements to strengthen connection between Leeds/York and Hull	DfT	6.5.2
Low Moor	New station	WYPTE	
Manchester Piccadilly	Improved interchange	GMPTE	6.2.3
Manchester Victoria	Improved interchange	GMPTE	6.2.3
Marple corridor	Station improvements, bus/rail integration Longer-term possible Tram/Train operation	GMPTE	6.2.3
Micklefield	Examine potential for a parkway station east of Leeds	DfT	6.4.3
Mills Hill	Park & Ride, station improvements, bus/rail integration	GMPTE	6.2.3
New Mills Central	Enlarged car park	Derbys CC	6.2.3
Newark	Improve connections between Lincoln services and ECML London services	DfT	
Nottingham – Leeds	Journey time improvements	DfT	6.5.2
Nottingham – Lincoln	Journey time improvements (being addressed in East Midlands RUS)	DfT	
Nottingham – Manchester	Journey time improvements	DfT	6.5.2
Penistone line	TramTrain trial	DfT	Chapter 5
Penistone line	Linespeed improvements	SYPTE	
Pontefract area	Improved access	WYPTE	6.2.3
RHADS	Examine options to serve the proposed new station	DfT	6.4.2
RHADS	Provide new station at airport and associated train service	SYPTE	6.4.2
Rochdale	Park & Ride, station improvements, future Metrolink Interchange	GMPTE	6.2.3
Romiley	Park & Ride, station improvements, bus/rail integration	GMPTE	6.2.3
Rother Valley Park	New station	SYPTE	
Rotherham Central	Upgrade waiting facilities	SYPTE	6.2.3
Rotherham Central	Extend platforms	SYPTE	6.2.3
Rotherham Central	Double-tracking of Holmes Chord	SYPTE	Chapter 5

Rotherham Parkgate	New station on Rotherham Central line	SYPTE	
Sheffield	Capacity improvements within station	SYPTE	Chapter 5
Sheffield	Capacity improvements on northern approach to station	SYPTE	Chapter 5
Sheffield	Capacity improvements on southern approach and Dore Junction capacity	SYPTE	6.5.3
Sheffield – London	Improved journey time to under two hours and increased frequency	SYPTE	
Sheffield – Manchester	Improved speed and frequency through infrastructure measures as required, in the longer term reinstatement of the Wodhead route	SYPTE / GMPTE	6.5.2
Shipley	Improved interchange and accessibility	WYPTE	6.2.3
Smithy Bridge	Station improvements	GMPTE	6.2.3
Stalybridge	Park & Ride, increase junction speeds, create north side bay platform to improve punctuality/ reliability	GMPTE	
Stocksbridge	Provide new passenger service to Sheffield (support as heritage option in short term)	SYPTE	6.7
Swinton	Improve junction capacity	SYPTE	Chapter 5
Various stations	Additional Park & Ride facilities at a number of local stations – principally on the Airedale, Caldervale, Huddersfield, Wakefield, Barnsley and Pontefract lines	WYPTE	6.2.3
Various stations	General station improvements	WYPTE	6.2.3
Various, including Halifax	Electrification of core parts of the local network	WYPTE	6.5.2
Wakefield	Extend Knottingley – Wakefield Kirkgate trains to Wakefield Westgate	WYPTE	Chapter 5
Wakefield Westgate	Improve capacity and performance	WYPTE	6.4.2
Waverley/Orgreave	New station	SYPTE	

Glossary of terms

Term	Meaning
Absolute Block Signalling	A long established form of signalling mainly, but not necessarily, associated with semaphore signals and one signal box for each signalling section. Its purpose is to prevent more than one train being within a given section of line at a time.
AC	Alternating Current
ATOC	Association of Train Operating Companies
BCR	Benefit-Cost Ratio
Capacity	The number of trains that can be run over a given section of route or the number of passengers/volume of freight that a specific train type is designed to carry.
CUI	Capacity Utilisation Index
DfT	Department for Transport
Down	Where referred to as a direction ie. Down direction, Down peak, Down line, Down train, this generally but not always refers to the direction that leads away from London.
DRS	Direct Rail Services
Dwell time	The time a train is stationary at a station
ECML	East Coast Main Line
EMT	East Midlands Trains, a Train Operating Company
ERTMS	European Rail Traffic Management System
EWS	English Welsh and Scottish Railway, a Freight Operating Company
FOC	Freight Operating Company
FTA	Freight Transport Association
GBRf	GB Railfreight
GMPTE	Greater Manchester Passenger Transport Executive
GN/GE Joint Line	The line between Peterborough and Doncaster via Spalding and Lincoln, avoiding the ECML
GRIP	Guide to Railway Investment Projects
Headway	The minimum interval possible between trains on a particular section of track
HLOS	High Level Output Specification
HPUK	Hutchison Ports (UK) Limited, operators of the Port of Felixstowe, Harwich International Port and Thamesport
HST	High Speed Train
IEP	Intercity Express Programme, the name given to the project to replace the HST fleet
Intermodal trains	Freight trains which convey traffic which could be moved by road, rail or sea (eg. Container trains)
JPIP	Joint Performance Improvement Plans
Junction margin	The minimum interval possible between trains operating over the same junction in conflicting directions
LDHS	Long-Distance High Speed
LENNON	An industry database recording ticket sales

Load factor	The number of people on a train service expressed as a percentage of total seats (or seats plus a standing allowance) available
Metro	West Yorkshire Passenger Transport Executive
MML	Midland Main Line
MOIRA	A passenger demand forecasting model
Multiple Unit Trains (DMU and EMU)	Trains comprised of self-contained units, which can be coupled together so that they work in unison under the control of the driver at the front of the leading unit. Each unit is normally composed of two or more semi-permanently coupled vehicles and a driving compartment is provided at the end of each unit. There are diesel multiple units (DMU) and electric multiple units (EMU).
N/A	Not applicable
NPV	Net Present Value
NXEC	National Express East Coast, a Train Operating Company
OHLE	Overhead Line Equipment
ORR	Office of Rail Regulation
PDFH	Passenger Demand Forecasting Handbook. An industry document that summarises the effects of service quality, fares and external factors on rail demand.
PLANET	A demand forecasting model
Possession	Where part of the infrastructure is closed to services to carry out maintenance, renewal or enhancement works
PPM	Public Performance Measure
PSB	Power Signal Box
PTE	Passenger Transport Executive
PV	Present Value
Railsys	A computer model used for timetable modelling
RFG	Railfreight Group
RFOA	Railfreight Operators Association
Route Availability (RA)	The system which determines which types of locomotive and rolling stock can travel over any particular route. The main criteria for establishing RA usually concerns the strength of underline bridges in relation to axle loads and speed. A locomotive of RA8 is not permitted on a route of RA6, for example.
RPA	Regional Planning Assessment for the Railways, produced by the Department for Transport
RSS	Regional Spatial Strategy
ROTP	Rules Of The Plan
RUS	Route Utilisation Strategy
S&C	Switches and Crossings
SDO	Selective Door Opening, used where the whole of the train does not fit onto a station platform
Seated load factor	The amount of seats occupied on a train service expressed as a percentage of total seats available
SMG	Stakeholder Management Group
SYPTE	South Yorkshire Passenger Transport Executive

TEMPRO	DfT software containing UK-wide official planning data and projections split by region and local authority.
TEU	Twenty-foot Equivalent Unit
TOC	Train Operating Company
TPE	First Keolis TransPennine Express
tpd	trains per day
tph	trains per hour
tpw	trains per week
Train path	A slot in a timetable for running an individual train
Track Circuit Block Signalling (TCB)	A signalling system which requires the entire line to be track circuited. The presence or otherwise of trains is detected automatically by the track circuits. Consequently, many of the signals on TCB lines operate automatically as a result of the passage of trains. The associated equipment ensures that only one train is within a given section of line at a time.
Up	Where referred to as a direction ie. Up direction, Up peak, Up line, Up train, this generally but not always refers to the direction that leads towards London.
XC	CrossCountry, a Train Operating Company
W10	The loading gauge which enables 9’ 6” containers to be conveyed on conventional wagons
WCML	West Coast Main Line
WSG	Wider Stakeholder Group
WTT	Working Timetable

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