

Route Plans 2009
Route 11
South Cross-Pennine,
South Yorkshire
and Lincolnshire

Network Rail

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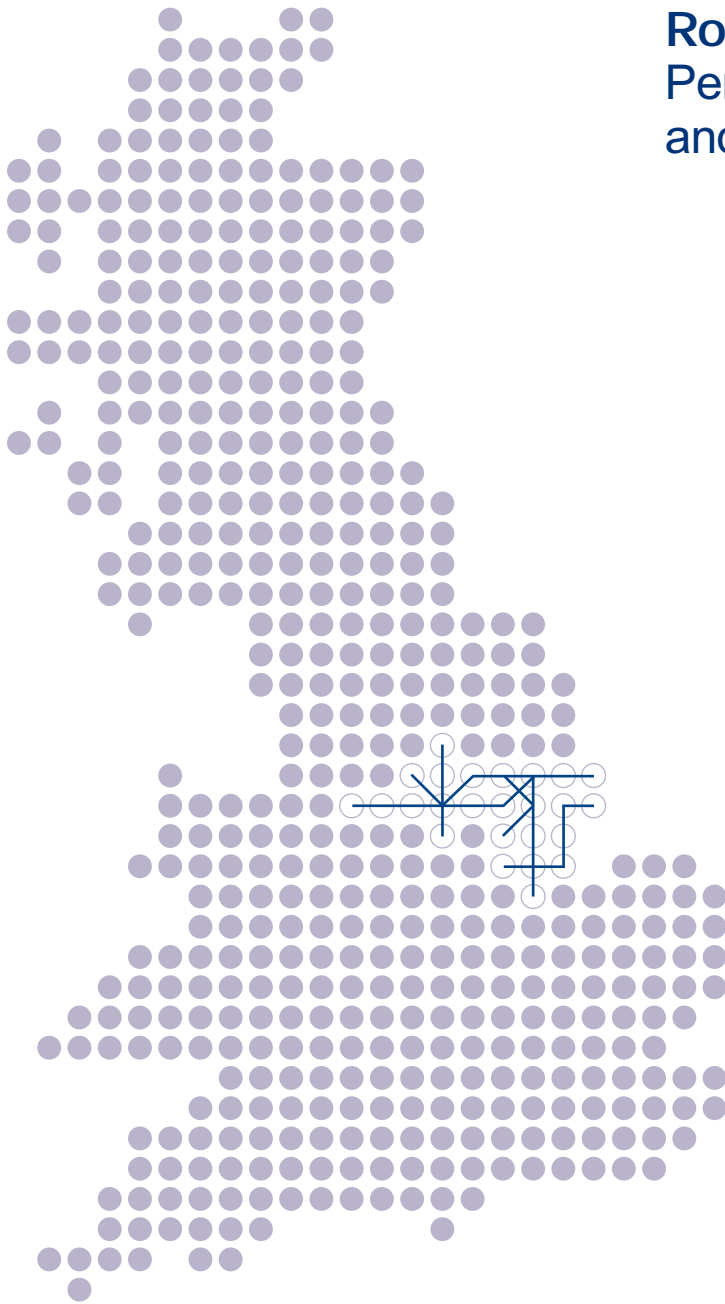
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Route 11 South Cross-Pennine, South Yorkshire and Lincolnshire

Section 1: Today's railway

Route context

This route traverses the Pennines through the Hope Valley, linking Manchester and Stockport to Sheffield, and extends through Doncaster to Scunthorpe, Grimsby and Cleethorpes. The route also provides links to the ports on the south bank of the Humber which generate significant volumes of rail freight. It provides links to the South Yorkshire conurbation and to the communities in Lincolnshire. It also carries a significant volume of freight traffic in connection with the steelworks at Scunthorpe and provides access to the lower Trent Valley power stations.

The route largely parallels a number of major cross Pennine roads and along the south bank of the Humber estuary.

The route is also used by CrossCountry providing a link between eastern Scotland, the North East, Yorkshire, the Midlands, Thames Valley and the South West.

Work is close to completion on the Yorkshire and Humber Route Utilisation Strategy (RUS), an industry study led by Network Rail covering this route and Route 10. The DfT has published its Regional Planning Assessment for the Yorkshire and Humber Region which feeds into the RUS.

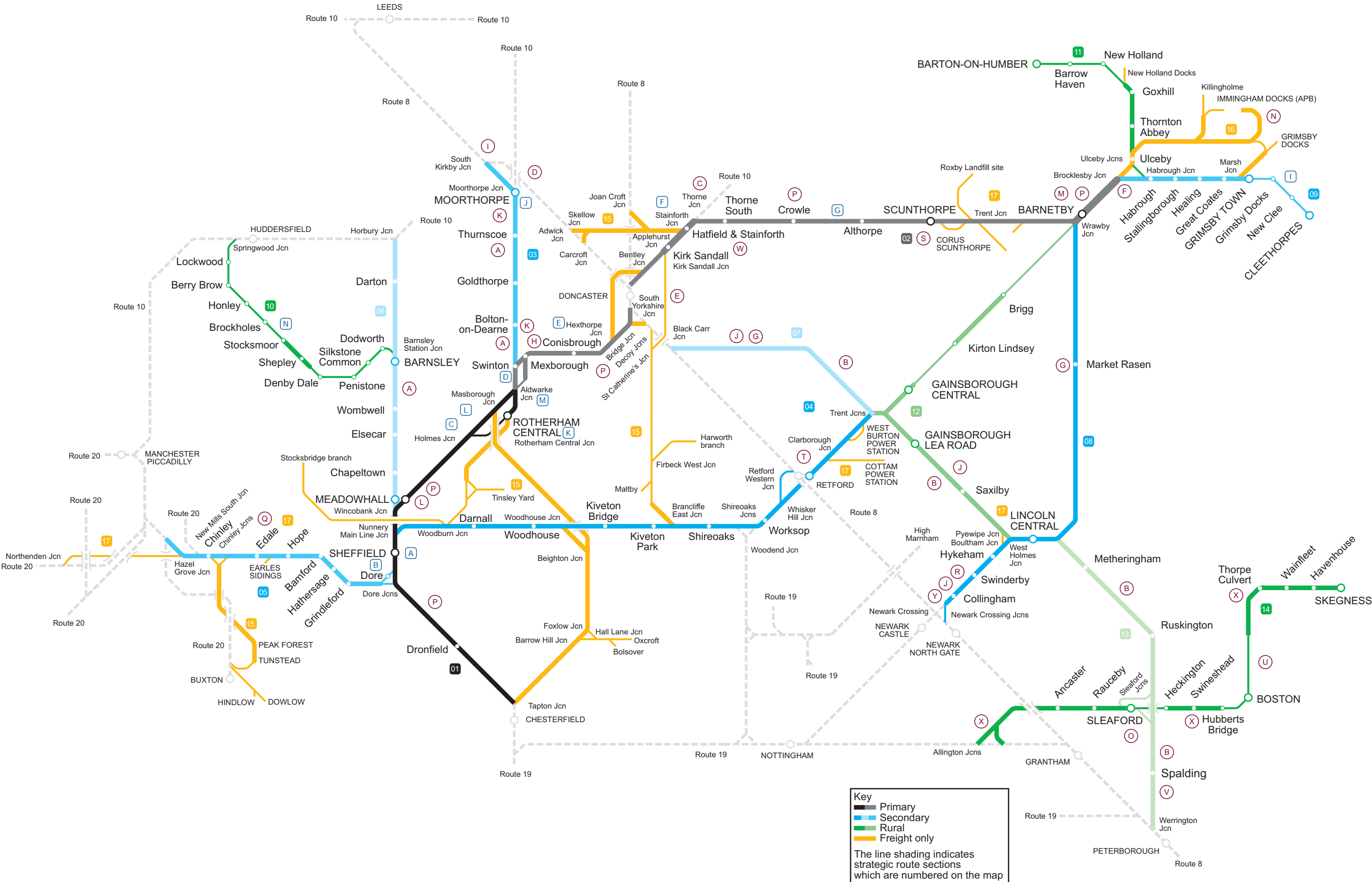
The Barnsley to Huddersfield line is a designated community railway led by a community rail partnership. The Grantham to Skegness line has a community rail partnership and services are designated as community rail services. A further community rail partnership covers the Barton on Humber and Wolds Coast (Route 10) routes.

Today's route

The principal components of this route are described below. The relevant Strategic Route Section is shown in brackets:

- the Hope Valley – the line between Stockport and Dore (11.05)
- South Yorkshire network – extends from Chesterfield to Doncaster, Moorthorpe, the Barnsley area and Kiveton. It includes some primarily freight through routes (11.01, part of 11.02, 11.03, 11.04, 11.06, 11.10 and parts of 11.15 and 11.17)
- South Humberside main line – from Doncaster to the east coast towns of Grimsby and Cleethorpes along with the ports on the south bank of the Humber (parts of 11.02, 11.09, 11.11, 11.16 and parts of 11.17)
- Lincolnshire and Nottinghamshire lines – including the Kiveton to Barnetby line via Worksop, Doncaster – Lincoln – Sleaford – Peterborough, Barnetby – Lincoln – Newark and the Grantham to Skegness line. (11.07, 11.08, 11.12, 11.13, 11.14 and parts of 11.15 and 11.17).

Route 11 South Cross-Pennine, South Yorkshire and Lincolnshire



Key

- Primary
- Secondary
- Rural
- Freight only

The line shading indicates strategic route sections which are numbered on the map

Current passenger and freight demand

Several distinct passenger markets are served by this route. The first is for cross country journeys linking eastern Scotland, the North East, Yorkshire, the Midlands, Thames Valley and the South West. The second is the interurban links provided by TransPennine Express (TPE) and East Midlands Trains services traversing the Pennines, linking Manchester and Stockport to Sheffield. TPE services extend through to Doncaster, Scunthorpe, Grimsby and Cleethorpes. East Midlands Trains services extend to Lincolnshire and East Anglia. The third is the initial portion of journeys between locations on the route and London either by direct services or by changing on to long distance services.

Another market is for local journeys within South Yorkshire, most of which are supported by South Yorkshire PTE. Finally, this route provides local journeys in rural areas to the east of the East Coast Main Line. These offer valuable links, for example schools' traffic, and access to resorts such as Skegness.

The route is heavily used by freight with some of the highest freight tonnage movements in the country operating on the south bank of the Humber between Immingham, Scunthorpe and Doncaster. In excess of sixty freight trains operate each way per day on the core section between Brocklesby and Wrawby Junction. The main traffics are:

- imported coal for power stations
- imported coking coal for the steelworks at Scunthorpe
- imported iron-ore for Scunthorpe steelworks
- steel products to/from Scunthorpe steelworks
- oil products from Lindsey and Conoco refineries to various distribution depots

Another section with significant freight flows is the Moorthorpe/Doncaster – Rotherham – Beighton – Chesterfield axis which sees considerable amounts of through freight traffic between the North East and the Yorkshire & Humber region, and the Midlands and South West.

The freight only South Yorkshire Joint Line from Doncaster to the Worksop area is also a key freight line which carries coal traffic from various locations in the Yorkshire and Humber region, the North East and Scotland to the lower Trent Valley power stations and in the opposite direction from the East Midlands coalfield to the Aire Valley power stations.

The Hope Valley line carries considerable aggregates traffic from the Peak District quarries and traffic connected with Hope cement works to the North East, London and the South East and Manchester. There are freight flows between Manchester and South Humberside and also metal flows to the Stocksbridge branch, Lincoln, Tinsley, Aldwarke and Rotherham Steel terminal. Aggregates also operate to Boston.

Figure 1 shows the current level of service to Sheffield from principal stations.

Figure 1 Sheffield – current train service level (trains per hour)

Originating station	tph to Sheffield
Chesterfield	3
Manchester (fast services)	2
Barnsley	3
Lincoln	1
Worksop	2 peak/1 off peak
Doncaster	6 peak/5 off peak

Current services

Passenger services are provided on this route by Northern Rail, First Keolis TransPennine Express (TPE), East Midlands Trains and CrossCountry. DB Schenker Rail (UK) Limited, Freightliner Limited, Freightliner Heavy Haul Limited and First GB Railfreight operate the freight trains.

Sheffield is a key interchange for long distance services. The majority of East Midlands Trains services from St. Pancras International terminate here.

Long distance high speed (LDHS) passenger trains are operated by CrossCountry providing links between West and South Yorkshire. On this route the pattern of their service is 2 trains per hour (tph) between Newcastle and Birmingham, with one of these running to/from Reading, and the other extending to Edinburgh and the South West. These operate via Doncaster or Moorthorpe, Sheffield and Chesterfield. Those via Moorthorpe form part of the Birmingham to Leeds corridor, which is one of the busiest on the CrossCountry network.

CrossCountry has increased capacity on its most crowded services, which generates some growth in capacity on certain peak hour flows to/from Sheffield, particularly on the Chesterfield line.

East Midlands Trains runs a long distance express service from Liverpool, via the Hope Valley and Sheffield, to East Anglia via Nottingham on an hourly basis. Furthermore, East Midlands Trains have extended some of their services from Nottingham to Lincoln from the start of this current timetable.

TPE also operates an hourly inter urban express service through the Hope Valley between Manchester Airport and Sheffield extending through to Doncaster and Cleethorpes. The TPE service runs on the opposite half hour to the East Midlands Trains service and together provides the express service link between the cities of Manchester and Sheffield.

There is a half hourly Sheffield – Barnsley – Leeds semi-fast service operated by Northern Rail. Alternate trains run to/from Nottingham and create new direct journey opportunities whilst helping to meet expected peak crowding on the Chesterfield – Sheffield – Barnsley corridor. The service from Nottingham provides a third fast train per hour between Sheffield and Leeds.

A number of PTE sponsored hourly stopping services, operated by Northern Rail; link Sheffield to Lincoln via Worksop, Leeds via Barnsley, Leeds via Moorthorpe, and Huddersfield via Barnsley.

A half hourly stopping service to Doncaster extends alternately to Scunthorpe and Adwick, and approximately every two hours there is a stopping service through the Hope Valley to Manchester. Hourly semi-fast services link Sheffield and Hull via Doncaster.

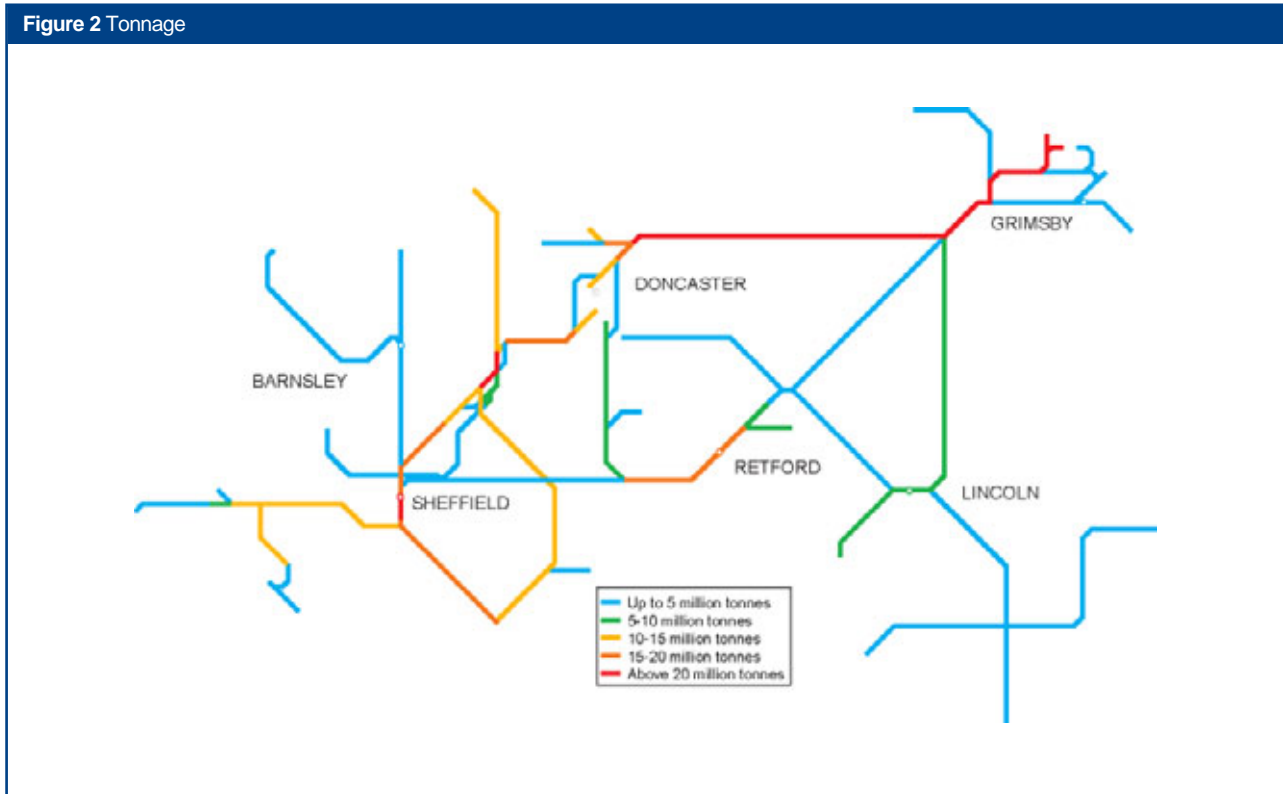
In Lincolnshire, East Midlands Trains operates hourly services from Leicester to Lincoln via Nottingham. East Midlands Trains also operate an hourly service between Nottingham and Skegness and approximately hourly service between Lincoln and Peterborough via Sleaford and Spalding. This latter service is split into two services, Lincoln to Sleaford and Spalding to Peterborough for part of the day due to limited route opening times.

An approximately two hourly service operates on the route from Grimsby to Lincoln with most services extended to Newark North Gate.

A limited service runs between Doncaster and Lincoln via Gainsborough (Lea Road) and a two hourly Northern Rail shuttle service operates between Cleethorpes and Barton-on-Humber.

Freight services are described in the previous section.

Figure 2 shows the total annual tonnage levels on the route.



Traffic volumes are summarised in Figure 3.

Figure 3 Current use

	Passenger	Freight	Total
Train km per year (millions)	12	5	17
Train tonne km per year (millions)	1,455	5,405	6,861

Current infrastructure capability

The following maps set out the capability of the current network.

Figure 4 Linespeed

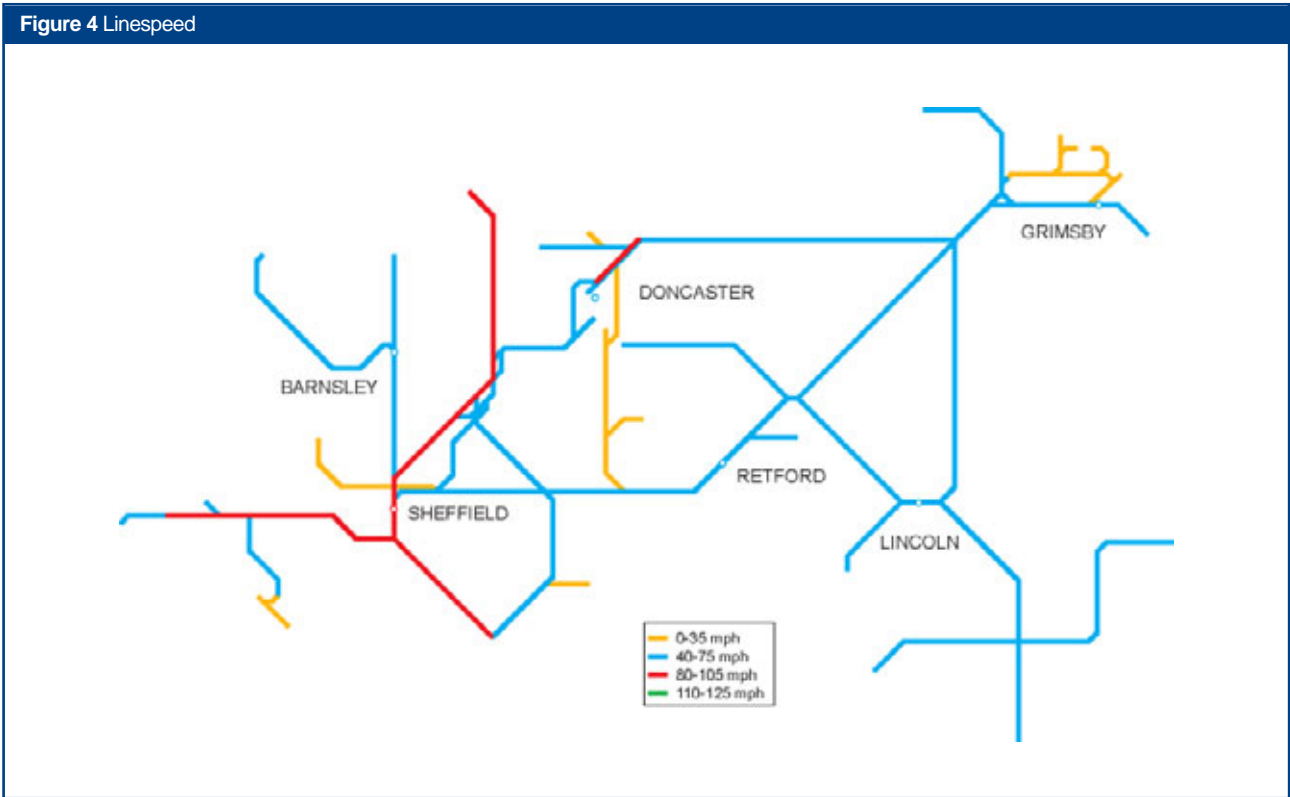


Figure 5 Electrification

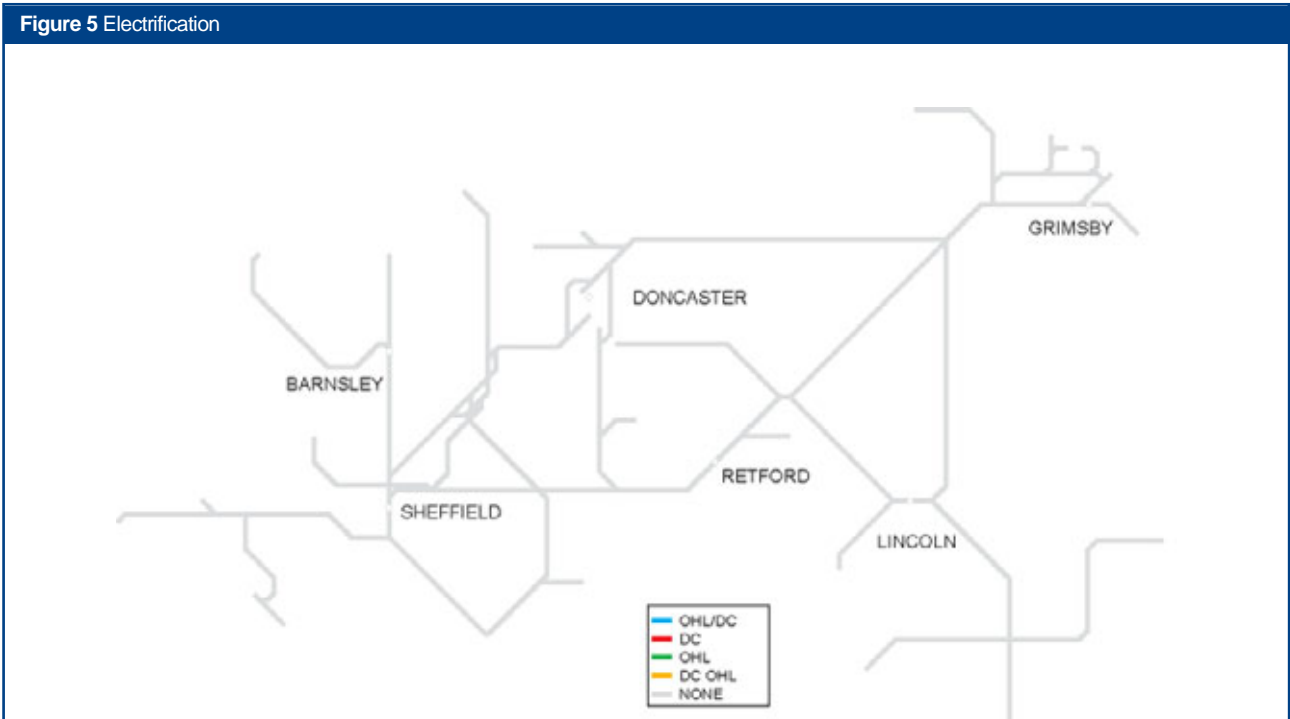


Figure 6 Route availability

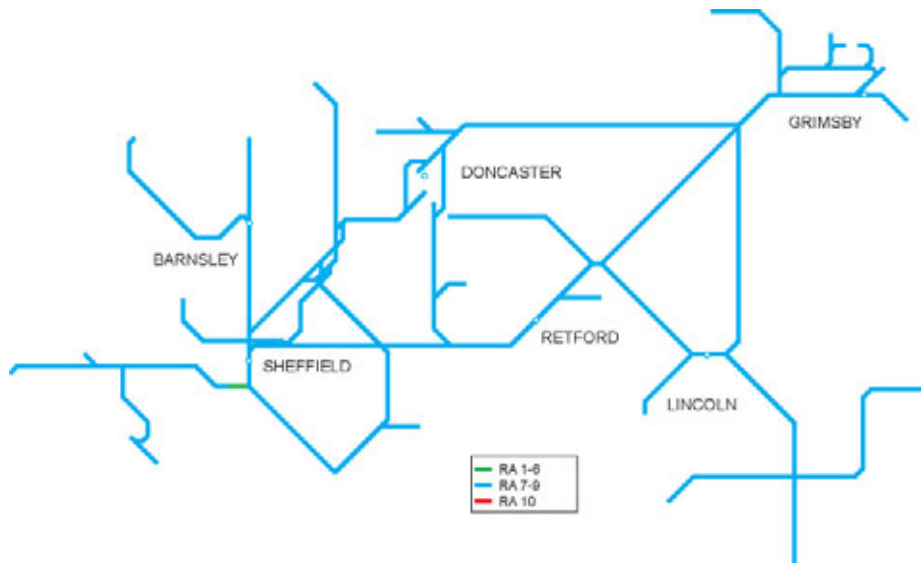
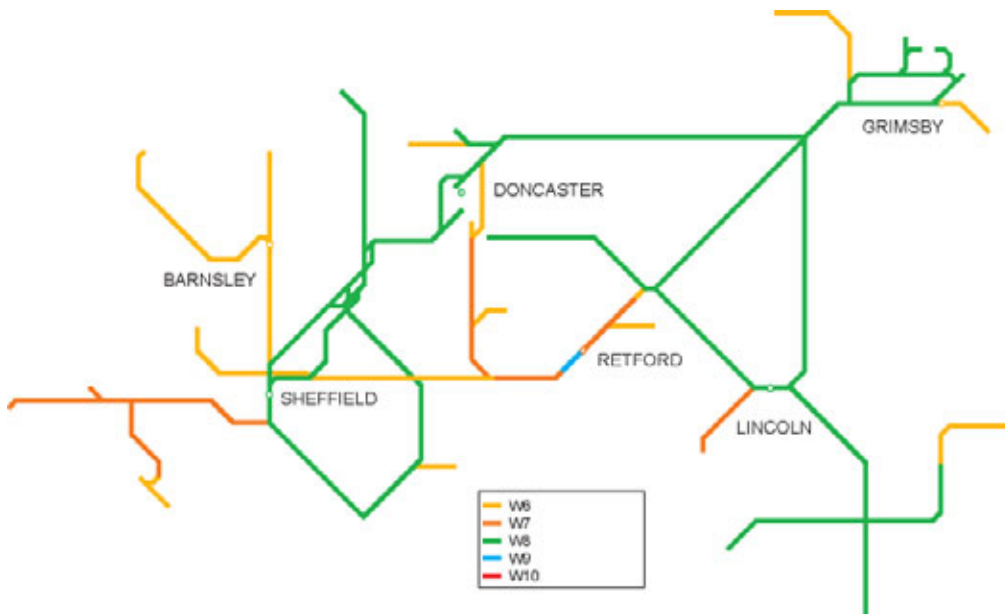


Figure 7 Gauge



Current capacity

The main section of the route with significantly high volumes of traffic and major capacity constraints is the Chesterfield – Sheffield – Moorthorpe/Doncaster corridor. It features eight flat junctions (excluding Sheffield station itself) within a 13 mile stretch between Dore South Jn and Swinton Jn. The infrastructure is at or near capacity on many hours and presents difficulties for the timetabling of services through the area, some of which run over considerable distances.

Other sections that are significantly capacity constrained and therefore also have an adverse affect on performance are as below:

- Immingham – Brocklesby – Wrawby Junction – Scunthorpe; primarily driven by large freight tonnages out of Immingham and other south Humber ports
- Doncaster – Maltby – Brancliffe East Junction; large volumes of local and through coal traffic operating through a low speed route with single line sections
- Hope Valley; mix of fast long distance and slower stopping passenger trains and freight services in connection with the Peak Forest quarries.

We have upgraded the Wrawby Junction to Brigg and Gainsborough rail route to enable the regular operation of freight services. Its use is targeted at coal trains from Immingham to the lower Trent Valley power stations. This in turn provides some additional capacity on the Market Rasen and Lincoln – Gainsborough routes.

In addition, this provides a suitable diversionary route for freight traffic and allows improved engineering access between Wrawby Junction and Doncaster via Scunthorpe.

A major remodelling scheme has recently been successfully completed at Lincoln, thus providing a more flexible operational layout and thereby improving capacity and performance in the station area.

Capacity has been improved on the Sheffield to Leeds via Barnsley route at Woolley to meet the demand for more frequency passenger train services between Sheffield and Leeds via Barnsley through the operation of the Nottingham – Leeds service.

Figure 8 shows the current train service level on key sections of the route.

Current performance

Figure 9 shows the forecast 2008/09 PPM for the main TOCs running along the route.

Northern Rail and SYPTe have undertaken some analysis work on minor performance improvement schemes.

The RUS has identified the Sheffield – Moorthorpe/Doncaster axis as key areas of reactionary delays due to the mix of fast and stopping passenger trains and freight services. The infrastructure operates at or near capacity and some of the services run over considerable distances.

Figure 8 Current train service level (peak trains per hour)

Route Section	Goods Line	Main Lines
Brocklesby Junction – Barnetby (westbound)	2	5
Brocklesby Junction – Barnetby (eastbound)		7
Marshgate Junction – Kirk Sandall Junction		6
Swinton – Aldwarke Junction		12
Sheffield – Meadowhall		9
Sheffield – Dore Station Junction		8

Figure 9 2008/09 PPM

TOC	Forecast MAA	As at period
East Midlands Trains	88.6%	10
CrossCountry	89.8%	10
Northern Rail	89.4%	10
TransPennine Express	90.2%	10

This means that in times of perturbation any lateness in longer distance trains is either exacerbated in the Sheffield area or other services are delayed.

The line from Immingham and Cleethorpes to Doncaster has a large number of temporary speed restrictions which have a significant effect on performance. Ongoing maintenance and track renewal activity should reduce the number of traffic restrictions and improve performance.

Various sections of the route are suffering from a considerable increase in cable theft which is having a major impact on train performance.

Section 2: Tomorrow's railway: requirements

HLOS output requirements

Figure 10 Total demand to be accommodated by Strategic Route

Route	Annual passenger km (millions) forecast in 2008/09	Additional passenger km (millions) to be accommodated by 2013/14
South Cross-Pennine, South Yorkshire and Lincolnshire	741	113

Figure 11 Peak hour arrivals to be accommodated by Strategic Route

Regional Hub	Peak three hours			High-peak hours		
	Forecast demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Forecast demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Sheffield#		13% increase on 2008/09	41		16% increase on 2008/09	46

Note #: included in aggregate target across a number of regional hubs

Future demand in Control Period 4 (CP4)

The number of urban and regional journeys into the major conurbations is expected to continue growing. In particular, demand growth on the Manchester – Sheffield – Cleethorpes corridor is being stimulated further following the introduction of Class 185 units, which offer improved passenger comfort and some improved journey times. These units offer an increase in the number of seats provided on this service.

Steady growth on the CrossCountry services linking West and South Yorkshire is leading to crowding issues on some trains. Through rolling stock internal reconfigurations, investment in more trains with more seats and service re-routing, CrossCountry have plans to increase passenger capacity. The aim of this is to improve connectivity between Leeds and Sheffield, reduce crowding over this section of the route and reinstate direct services between West Yorkshire and the Thames Valley.

The main pressure on local services will be on peak services to and from Sheffield as roads in South Yorkshire become more congested and economic growth continues.

Passenger growth in the Sheffield area is forecast to grow by up to 45 percent over the next 10 years.

The Freight RUS was published by Network Rail in March 2007 and established by the Office of Rail Regulation in May 2007. A key input to the strategy was a set of ten year demand forecasts that were developed and agreed by the industry through the RUS Stakeholder Management Group.

Substantial freight growth is expected to be associated mainly with further coal traffic growth at the port of Immingham to the power stations, and in the longer term intermodal flows passing through the Yorkshire area between the North East and the Midlands. There will also be further aggregates traffic out of the Peak District.

Future demand beyond CP4

Looking at the Network as a whole, the 2007 Government White Paper 'Delivering a Sustainable Railway' anticipated a doubling of both passenger and freight traffic over the next 30 years. On this route most passenger growth will be accommodated through further train lengthening. However, Manchester to Leeds and Manchester to Sheffield are likely to need additional services, necessitating the need for further major infrastructure changes mainly on existing rail corridors.

Freight trends are sometimes less easily predicted, an example being that long term patterns of supply of coal to the electricity industry do not follow readily-forecast trends. All the evidence, however, suggests that substantial growth can be expected, on routes highlighted in the Freight RUS particularly on coal traffic from the port of Immingham and in the longer term on intermodal flows driven by expansion of the east coast ports.

The Strategic Freight Network process and the Hutchison Ports (UK) Limited project, will continue with gauge enhancement work to W9, W10 and W12 and will take into account diversionary requirements.

Section 3: Tomorrow's railway: strategy

The table below summarises the key milestones during CP4 in delivering the proposed strategy for the route. Further explanation of the key service changes and infrastructure enhancements are set out in the following sections.

Figure 12 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2010-2011	Train lengthening for regional services serving Sheffield	Platform extensions and additional stabling facilities	Increased capacity for HLOS peak metrics at Sheffield and Leeds
2010-2014	Improved journey times between Sheffield and St Pancras International	Line speed improvements on Route 19	Reduced journey times
2010-14	GN&GE Route Upgrade (Peterborough – Doncaster via Spalding, Lincoln and Gainsborough Lea Road)	Gauge clearance, trackwork and line speed improvements, and level crossing improvements	Additional freight paths, growth in LDHS passenger traffic on the East Coast Main Line (ECML), improved engineering access.
2012-14	Improved journey times on the Hope Valley route	Line speed improvements	Reduced journey times
2013/14	W10 gauge enhancement from Newark to Doncaster via Swinderby and Gainsborough	Structures and trackworks	Capability to carry deep sea containers on standard deck height wagons. Provides additional capacity when East Coast Main Line cannot carry W10 traffic.
2014-2018	Improved journey times on the Sheffield – Leeds route via Barnsley	Line speed improvements	Reduced journey times, increased capacity and improved performance and engineering access

Figure 13 Capacity enhancements to meet HLOS peak capacity in CP4

Description	Additional vehicles involved	Station served	0700 – 0959 Capacity Impact	0800 – 0859 Capacity Impact
Northern Rail / TransPennine Express train lengthening and additional services	13	Sheffield	1,600	1,300

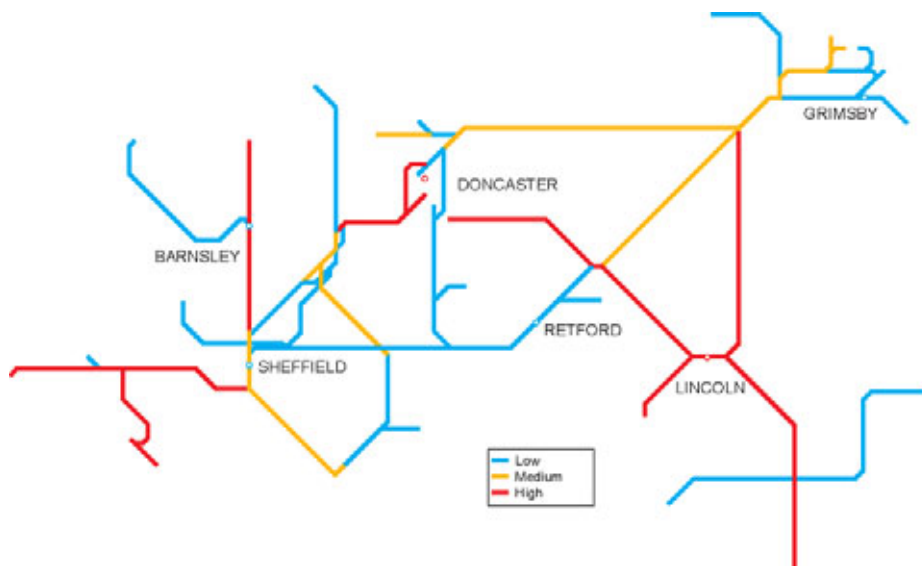
Figure 14 Impact on HLOS peak capacity metric

London Terminals and regional Hubs	Peak three hours				High peak hours			
	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4
Sheffield	31,300	15,500	17,000	40%	14,300	5,400	6,800	46%
Other urban areas		55,800	60,700			20,400	24,600	

The table above shows how the HLOS load factor targets for locations on the route are met by the proposed strategy.

The measures will also allow the total additional passenger km to be accommodated.

Figure 15 Tonnage growth



Strategic direction

Work on the Yorkshire and Humber RUS is nearing completion with final publication proposed in summer 2009.

This will provide a strategy for future development of the cross Pennine and Yorkshire routes. The main strategic challenge to be answered by the RUS is to cater for increasing peak demand.

In the short to medium term (2009-14) much of the peak growth will be met through train lengthening as it will be largely in other parts of the country. However, there are some routes where a revised service pattern may provide a better option for the use of the additional rolling stock than train lengthening.

Possible enhancement of the Sheffield – Leeds and Sheffield – Manchester services are further key areas being examined in the RUS.

Journey times between Sheffield and St Pancras International are proposed to be reduced both through line speed improvements on Route 19 and service enhancement through the new East Midlands Trains franchise. This will allow this route between the Sheffield city region and London to provide journey times which are more comparable with the East Coast Main Line.

Through the ongoing RUS programme, CrossCountry aspire to improve links and address capacity issues between York, Leeds and Sheffield.

Sheffield is an important passenger interchange and is therefore a key location to be considered when developing future transport strategies.

Improvements around Shaftholme and Joan Croft Junctions should help eliminate the use of the ECML by Immingham to Aire Valley coal trains and allow these to operate over a shorter route.

CrossCountry aspire to achieve journey time reductions along the Moorthorpe to Chesterfield corridor. This may be realised through opportunities to improve junction layouts in conjunction with renewal activities.

The Final ORR Determination includes upgrading the GN/GE route (Peterborough to Doncaster via Spalding, Lincoln and Gainsborough Lea Road). This will provide capacity for two freight trains per hour in each direction in addition to the existing passenger and freight services. This will facilitate future growth of freight and LDHS passenger services on the ECML. Parts of the GN/GE route may provide diversionary opportunities off the ECML during times of engineering work or perturbation, as part of the seven day railway concept.

Future train service proposals

Figure 15 indicates the forecast percentage change in tonnage to 2018.

Northern Rail

In the short to medium term (2009-14), much of the peak growth will be met through train lengthening. This applies to the rail corridors between Sheffield and Leeds both via Moorthorpe and Barnsley.

The two year tram-train trial in South Yorkshire from 2010 should help inform options for the future rail strategy for some urban services in the medium to long term.

In order to meet the peak hour growth targets in the HLOS, additional vehicles will be required at Sheffield. These will be provided by a mixture of additional capacity in agreed franchise changes and additional vehicles. The latter would be deployed by lengthening existing services thereby making best use of track capacity and train crews.

As the additional fleet requirements for the entire Yorkshire & Humber region are so large, there is a need to concentrate the workload of Northern Rail's depot at Neville Hill primarily on maintenance. In order to achieve this, and thereby avoid building another major fleet maintenance facility in the region, a number of new/enhanced stabling facilities are required.

Such facilities on this route would be in the Sheffield area. We continue to work with Northern Rail to identify suitable locations.

In conjunction with SYPTE we are looking at a passenger service to serve a new station at Robin Hood Airport Doncaster Sheffield.

First Keolis TransPennine Express

TPE have aspirations to improve journey times on the Hope Valley route between Manchester and Sheffield through line speed improvements for all trains. This may include the possible use of passenger and freight permissible speed differentials.

CrossCountry

Modifications to the Class 220/221 fleet of trains will enable CrossCountry to introduce additional seating in CP4. Further, CrossCountry have aspirations to improve links between York, Leeds and Sheffield. This would provide a regular half hourly pattern between these cities.

Grand Central / Grand Union

Grand Union has been developing new service groups since 2005 and has aspirations to introduce the following new services:

- Huddersfield – Kings Cross via Mirfield, Wakefield Kirkgate, Rotherham (or Barnsley), Meadowhall, Sheffield and Worksop
- Cleethorpes – Kings Cross via Grimsby, Habrough, Scunthorpe, Thorne South and Doncaster.

Hull Trains

Hull Trains aspire to operate a Lincoln to London service from December 2009 either via Newark or via Spalding.

National Express East Coast

National Express East Coast is planning to operate a two hourly service from Harrogate to London via Leeds and between Lincoln and Kings Cross from December 2009. This latter service may possibly be extended to Cleethorpes via Market Rasen at a later date.

East Midlands Trains

The other franchise with a significant service change is that operated by East Midlands Trains. The effect on capacity for commuter flows to/from Sheffield is still being examined. East Midlands Trains are proposing to double the frequency of off peak services between St. Pancras International and Sheffield from December 2009. This is likely to be achieved by the extension of the St. Pancras International to Derby services through to Sheffield.

The two flows where the current long trains provide high capacity for commuter journeys are on the Doncaster and Chesterfield lines.

Freight

The critical growth requirements for freight services on the route is likely to be coal imports (via the Port of Immingham) and in the longer term intermodal traffic driven by the expansion of the east coast ports.

Future capability

Platform lengthening is being sought on routes between Sheffield and Leeds (via both Moorthorpe and Barnsley). This will enable peak hour train lengthening of up to four vehicles to address peak growth and crowding in CP4 and beyond.

We are looking to continue with selective door operation (SDO) instead of platform lengthening on the Hope Valley route from Manchester to Sheffield as there is only one station at Hathersage that is not of sufficient length to accommodate longer trains in

the peak. Up to four car peak hour train formations in CP4 and beyond between Sheffield and Scunthorpe/Adwick and between Sheffield and Lincoln to address peak growth and crowding do not require platforms to be lengthened.

Train lengthening in South Yorkshire may give rise to platforming problems as the bay platforms at Sheffield and Doncaster are only short. Lengthening these platforms would require the station layout to be extensively remodelled.

With support from South Yorkshire PTE, Northern Rail and other stakeholders, we are working with Peel Holdings to address their planning commitment to provide a new station at Robin Hood Airport Doncaster Sheffield.

Improving line speed on the Sheffield – Barnsley – Leeds corridor, proposed for CP5, would help balance the journey times between Sheffield and Leeds on this route and via Moorthorpe. This will enable both to be used more effectively to provide a service between these key cities (including when the Moorthorpe route is blocked). The speed improvements may help South Yorkshire PTE's aspiration to reinstate off-peak calls at Elsecar.

Between Manchester and Sheffield, TPE aspire to provide further capacity on their busiest peak services as most of the additional capacity provided by their current 3 car length trains has now been utilised. RUS aspirations for additional fast services, particularly in the peaks, may be provided by TPE.

Nottinghamshire County Council is keen to improve the Nottingham to Lincoln route so that it competes better with the parallel A46 road and has asked us to undertake some development work on line speed increases. (Also see Route 19).

Provision of W10 gauge will permit the carriage of 9' 6" containers on the route between Newark, Gainsborough and Doncaster in connection with the port developments at Felixstowe and Bathside Bay. This will accommodate the carriage of deep sea container traffic as a second route to the ECML between Newark and Doncaster, and in addition will provide capacity and diversionary opportunities.

We are working with DfT and other stakeholders on development work for W9 and W10 gauge enhancement on a number of other routes that could provide a comprehensive network of core freight arteries in the northern half of the country that would be capable of taking deep sea containers on standard deck height wagons and swapbodies. Routes include Doncaster Marshgate Junction/Joan Croft Junction to Immingham.

Modest speed improvements on some rural routes would give longer turnrounds at one or both ends of a route which would improve performance as well as increase demand through faster journeys. Where renewals are planned we will seek ways to increase line speeds which may require some funding from the Network Rail Discretionary Fund (NRDF).

We are examining options to replace the station barrow level crossing with an overbridge at both Moorthorpe and Bolton-on-Deerne in order to improve the safe operation of the railway.

Some line speed increases are proposed under the Moorthorpe resignalling scheme planned for 2012/13.

In the Lincoln area we are planning to modernise the level crossings at Collingham and Swinderby Road and reduce the status of the level crossing at Cross Lane to a brideway level crossing in 2011/12.

With the support of South Yorkshire PTE we are examining options to improve the service frequency to Rotherham.

Future capacity

In the Barnetby to Wrawby Junction area, the proposed enhancement, following a number of asset renewals in the area, aims to allow higher line speeds including raising Wrawby Junction to 50 mph operation (currently 30mph). The first step has seen the installation of higher speed S&C at Wrawby Junction but current line speeds will need to apply until resignalling takes place, currently proposed for 2012/13, although this may be rephased to meet ERTMS timescales.

We are looking at options to provide additional capacity between Wrawby Junction and the Immingham area with a number of stakeholders.

Any infrastructure enhancements required in order to operate more services north of Sheffield continue to be examined.

Further traffic increases south of Sheffield, or the possible avoidance of pathing time in existing services that may require revised paths in the future, would require enhancements in the Dore area. There was a former scheme to double the junction here, but at the time its business case could only be built on performance benefits and it did not generate sufficient benefits. We are reviewing further options for this scheme to allow for an increase in passenger services between Manchester and Sheffield and additional freight

Figure 16 Forecast PPM MAA – CP4 plan

	2009/10	2010/11	2011/12	2012/13	2013/14
Northern Rail	90.1%	90.7%	91.2%	91.7%	91.8%
TransPennine Express	91.7%	92.2%	93.2%	93.8%	94.0%
CrossCountry	90.0%	90.2%	90.6%	90.9%	91.3%
East Midlands Trains	88.1%	88.7%	89.4%	89.9%	90.2%

services between the Peak Forest and Sheffield. Other realisable benefits include opportunities to link Dore Junction remodelling work with a resignalling scheme in this area proposed in 2014/15.

Freight traffic increases may require enhancements in the Grindleford and Peak Forest areas. This may help facilitate any increases in passenger services between Sheffield and Manchester by regulating freight and passenger trains thereby improving route capacity and performance.

The upgrade of the GN/GE route over the next five years will provide capacity for two freight trains per hour in each direction in addition to the existing passenger and freight services. This will facilitate future growth of freight and LDHS passenger services on the ECML as well as providing some diversionary opportunities off the ECML to support the Seven Day Railway initiative.

The implementation of an Integrated Train Planning System (ITPS) will be phased in during the next two years. The new system allows us to plan at a lower level of granularity, for example, it calculates sectional running times to the nearest second. We believe that using a system that has the ability to plan at this level of detail, may unlock additional capacity and modestly improve some journey times.

Future performance

Figure 16 sets out the planned PPM for each train operator.

Heavy maintenance, track renewals and bridge works over the next five years will target the removal of Temporary Speed Restrictions between Doncaster and Wrawby Junction.

Network Rail is managing a number of initiatives, involving considerable resources, to combat the huge rise in cable theft incidents and to reduce the risk of flooding. These plans aim to provide performance benefits and are consistent with the rail industry objectives to minimise the number of significantly late trains.

The capacity enhancement schemes above should help to improve performance.

Where significant track renewals take place, Network Rail will examine where line speeds can be raised without alteration to other assets, which will then provide some performance benefit.

The other operators on this route are CrossCountry and East Midlands Trains. The future performance section for these can be found in the plan for Route 19.

To meet ongoing freight growth and maintain and improve freight performance particularly from the Humber ports we have upgraded the Brigg line, and are looking at options to modify the track layout within the ports complex and remodelling junctions and improving capacity between Barnetby and Brocklesby Junctions.

Northern Rail

Northern Rail operates the local train networks both into the major conurbations and across the more rural areas in the North of England. Its performance is currently 89.4 percent PPM as at period 10 2008/09 and should reach 90.1 percent by the end of March 2010. The franchise is extremely complex with a focus on cost management so that resources are efficiently used with little spare capacity for growth or recovery from incidents. Northern Rail recognises that there is a potential balance between aiming towards a high average performance and targeting a lower, but more consistently achieved level of performance with better use of capacity for passengers.

To meet growth in West and South Yorkshire and in conjunction with Northern Rail we are proposing to operate longer passenger services and on some routes additional peak passenger services. To reduce the performance risk of operating additional vehicles we are proposing to lengthen platforms, provide a new stabling facility in order to operate, maintain and stable these additional vehicles.

The key performance issues and opportunities for this TOC have been identified as:

- the ability to maintain a highly performing service connecting multiple key transport nodes each with challenges for delivery in their own right and limited spare capacity for growth
- scope for growth in general and especially for services in the conurbations where there is incomplete scope for infrastructure enhancements and low spare resource to deliver increased capacity from existing supplies
- the challenge of improving service delivery during disruption from the available resource base, driving a preference for focus on incident avoidance
- taking ability to grow revenue across services, including community rail opportunities
- a consequential need to focus on detailed day to day delivery and good quality operating practice
- a complex mix of fleet some of which has an inherently low level of reliability. Opportunities to replace stock will be taken when they arise
- parallel scope for a significant improvement to the quality of the infrastructure over which Northern Rail operates services, including the need for these services to link into the more dense operation around conurbations. Some of the TOC's key revenue flows are also within its worst performing service groups
- specific need to improve track quality
- real ability to management the impact of weather and drive down cable theft
- getting the right balance between performance, journey time and capacity benefits from the enhancements planned on routes operated by Northern and driving delivery of smaller scale enhancements such as line speed improvements.

First Keolis TransPennine Express

First Keolis TransPennine Express currently operates the main cross-Pennine routes centred on the Leeds and Sheffield to Manchester corridors together with services from Manchester to the North (including Scotland since December 2007). The performance of TPE is currently 90.2 percent PPM as at period 10 2008/09 and this should reach 91.7 percent PPM by the end of March 2010. Recent performance improvements have been driven by fleet improvements and a well managed JPIP process.

The key performance issues and opportunities for TPE have been identified as:

- the ability to maintain a high performing service connecting multiple key transport nodes each

with a challenge for delivery in their own right and limited capacity for traffic growth

- a consequential need to focus on day to day delivery of good operational practice
- management of freight services
- real ability to manage the impact of the weather and drive down cable theft
- evaluation of line speed and route enhancements in the North West and across the Pennines.

TPE and Network Rail are currently developing a full 5 year performance plan around these issues. At present the forecast is that TPE will achieve a PPM of 94.0 percent by the end of 2013/14 although this is not signed up to by them as being deliverable.

The other operators on this route are East Midlands Trains, and CrossCountry. The future performance section for East Midlands Trains can be found in the plan for Route 19 and CrossCountry in the plans for Routes 8, 12, 13, 17, 18, 19 and 20.

Network availability

The South Humberside Main Line is one of eight national Seven Day Railway Routes. The overall vision for the route is to operate the customer working timetable on the route 7 days a week together with cyclic maintenance, renewal and enhancement requirements. When cyclic maintenance, renewals or enhancement works are proposed, options need to be considered to provide a more flexible operational layout through a greater level of maintenance, renewal and enhancement efficiency. This may include the introduction of quicker/simpler processes for taking and withdrawing possessions coupled with changes in working practices to facilitate Adjacent Line Open train operations and more efficient Single Line Working through infrastructure changes such as bi directional signalling. These are being examined as part of the Seven Day Railway initiative and will be taken account of for future timetable changes and in conjunction with any proposals for infrastructure changes. Such proposals will then be taken forward subject to a strong business case and funding priorities.

As part of the South Humberside Seven Day Railway initiative we are currently looking at the provision of additional crossovers in the Thorne and Crowle areas. These will be implemented subject to securing a strong business case and meeting funding priorities.

The route via Lincoln and the upgrade of the Brigg line should help improve engineering access on the Doncaster to Wrawby route, by allowing diversion of trains from the Scunthorpe line.

Renewal activity on the Wrawby to Brocklesby section of this route may provide some enhancement opportunities to improve capacity and diversionary capability on this section of the route.

We are keen to explore with our customers ways to improve access for maintenance between Dore, Chinley and Stockport on midweek nights from 5hr 30min to 7hrs, four nights per week every six weeks. However, operators would like to run more trains but are prevented from doing so by the existing possession arrangements.

Most of the key towns and cities in the Yorkshire and Humber region can be accessed by more than one route, so reasonable continuity of service can be provided during times of engineering work or perturbation, albeit with some journey time extensions. This largely applies to key freight arteries as described previously and inter-regional / cross country type links. Comparable capability needs to be provided on diversionary routes, particularly in relation to gauge clearance. This work continues to be developed.

It is important that users of short distance services are not disproportionately affected in order to give priority to long distance services as a result of any changes to the maintenance regime or infrastructure.

Further, on a number of routes signal box opening hours limit the hours of operation, so significant extra demand is required to cover additional TOC and our operational cost.

Long term opportunities and challenges

Upon completion, the Yorkshire and Humber RUS will provide a strategy for future development of the cross Pennine and Yorkshire routes. The main strategic challenge to be answered by the RUS in the longer term is to continue to cater for increasing peak demand.

Other particular longer term challenges on this route are:

- delivering capacity and performance increases on the Chesterfield – Sheffield – Moorthorpe/Doncaster corridor
- the single track section over Holmes Chord is a limiting factor in serving Rotherham. Doubling this section will enable more services to serve Rotherham. We are continuing to examine opportunities to improve capacity along this corridor
- enhancing interurban links between Leeds and Sheffield
- improving the interurban links between South Yorkshire and the North West whilst accommodating increased freight traffic from terminals in the Hope Valley
- Sheffield station remodelling including bi directional working to allow longer trains to operate and improve operational flexibility
- Improving capacity in the Thorne Jn. area and between Brocklesby and Wrawby.

The two year tram-train trial in South Yorkshire from 2010 should help inform options for the future rail strategy for some rural and urban services in the medium to long term.

The Strategic Freight Network process and the Hutchison Ports (UK) Limited project, will continue with gauge enhancement work to W9, W10 and W12, taking into account North Cross-Pennine route, South Humberside and diversionary requirements.

The Manchester Hub study may provide options to improve links between the regional centres of Manchester and Sheffield. Any scheme to emerge is likely to be implemented around a ten year timeframe.

In the longer term much of the peak growth can still be met through train lengthening as it will be in many other parts of the country. However, the current station layouts at Sheffield and Doncaster will be the constraining factors.

Infrastructure investment in CP4

Figure 17 Infrastructure Investment in CP4					
Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009/10	Ⓒ Thorne Jn S&C	Renewal of S&C to facilitate junction doubling when we resignal in CP5	Renewal and passive provision for capacity improvements	Network Rail & Network Rail Discretionary Funding	3
2009/10	Ⓓ Moorthorpe Signal Interlocking	Signalling renewal	Renewal and removal of differential PSR's.	Network Rail	6
2009-12	Ⓔ Boston – Skegness	Plain line track renewals	Renewal	Network Rail	4
2009-14	Ⓕ GN &GE Route	Route Upgrade	Gauge clearance, improved capacity and line speeds improvements.	Periodic Review 2008	3
2009-14	Ⓜ South Humberside Capacity Improvements	Track & Signalling renewal & Remodelling between Wrawby, Barnetby and Brocklesby.	Capacity Improvements	Network Rail, Network Rail Discretionary Funding & potential Third Party	3
2010/11	Ⓔ South Yorkshire Joint Line	Resignalling	Renewal	Renewal	4
2010/11	Ⓛ South Kirkby S&C	Renewal of S&C	Renewal	Network Rail	3
2010/11	Ⓝ Felixstowe – Yorkshire Terminals gauge clearance	Provision of W10 gauge via Ely and ECML plus some diversionary routes	Capability to carry deep sea containers on standard deck height wagons	Third party	4
2010/11	Ⓚ Bolton on Dearne and Moorthorpe	Level crossing closures	Improved safety and capacity	Network Rail	4
2010-12	Ⓢ Scunthorpe area	S&C renewal, Scunthorpe Eccles Yard, Trent Jn. North Lincs	Renewal	Network Rail	4
2011/12	Ⓝ Immingham East Signal Interlocking & Track Renewal	Signalling& Track renewal and rationalisation	Renewal and efficiency savings	Network Rail	4
2011/12	Ⓛ South Yorkshire Stabling	Stabling for increased Northern Rail fleet	Increased capacity through fleet enlargement	Periodic Review 2008	3
2011/12	Ⓐ Platform lengthening	Platform lengthening at various stations in South Yorkshire	Increased capacity	Periodic Review 2008	3
2011/12	Ⓥ Gosberton	Signal Interlocking Renewal	Renewal	Network Rail	3
2012-13	Ⓦ Hatfield & Stainforth S&C	S&C renewal	Renewal	Network Rail	1

Figure 17 Infrastructure Investment in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2012/13	Ⓜ Nottingham – Lincoln	Line speed increases	Improved performance and journey time improvements	Third Party	2
2012/13	Ⓜ Thrumpton Signal Renewal	Signal Interlocking renewal	Renewal	Network Rail	4
2013/14	Ⓜ Northern gauge improvements	Gauge clearance of the South Humberside route to the ECML, Midlands and North West	To accommodate the carriage of deep sea container traffic from the south bank Humber ports	Third Party	3
2013/14	Ⓜ Nottingham – Skegness	Line speed increases	Improved performance and journey time improvements	Third Party	2
2013/14	Ⓜ Lincoln – Newark North Gate level crossing closure/upgrade programme	Closure or risk mitigation measures at level crossings that will become high risk with an increase in train movements	Increased capacity, improved safety and performance	Periodic review 2008	1

NRDF candidate schemes in CP4.

Figure 18 Candidate NRDF schemes in CP4					
Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009/10	Ⓢ Grimsby – Barnetby	Linespeed increase	Improved journey times	Network Rail Discretionary Fund	1
2009/10	Ⓢ Market Rasen and Haxey	Linespeed increase	Improved journey times	Network Rail Discretionary Fund	1
2009/10	Ⓢ Conisbrough tunnel	Linespeed increase	Improved journey times	Network Rail Discretionary Fund	1
2009/10	Ⓢ Sleaford Signal Interlocking Renewal & Capacity Improvements	Signal Interlocking renewal and capacity improvements	Capacity and Performance Improvements	Network Rail & Network Rail Discretionary Fund	6
2010-2014	Ⓢ Hope Valley line speed increase.	Line speed increases for all trains (currently Sprinter differential)	Journey time improvements for non-sprinter services	Network Rail Discretionary Fund	1

Renewals activity

Figure 19 shows the estimated renewals costs and activity volumes.

The precise timing and scope of renewals will remain subject to review to enable us to meet our overall obligations as efficiently as possible consistent with the reasonable requirements of operators and other stakeholders.

It should be noted that in order to manage the deliverability of our civils, signalling and electrification plans we have included an element of over planning in our work banks. As a consequence the sum of our route plans exceeds our plan for the network as a whole. It is likely that a small proportion of the activities in these areas will slip to subsequent years.

Figure 19 Summary of estimated renewals costs and activity volumes

£m (2009/10 prices)	2009/10	2010/11	2011/12	2012/13	2013/14	CP4 total
Renewals						
Track	32	38	25	24	27	146
Signalling	17	17	22	14	17	86
Civils	24	14	14	14	13	80
Operational property	3	4	5	5	5	22
Electrification	0	0	0	0	0	0
Telecoms	2	4	2	1	2	12
Plant and machinery	1	1	1	1	2	6
Total	79	78	69	60	66	352
Renewals volumes						
Track						
Rail (km)	26					
Sleeper (km)	36					
Ballast (km)	40					
S&C (equivalent units)	14					
Signalling						
SEUs (conventional)	0	3	117	4	0	124
SEUs (ERTMS)	0	0	0	0	0	0
Level crossings (no.)	0	4	17	5	0	26

Appendix

Figure 20 Strategic route sections												
Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, RA is Route Availability												
SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
11.01	Chesterfield – Swinton (via Sheffield)	TJC1/2/3/HCD/WME	Primary	DfT	No	W8(9/6)	8 (10)	90 (15)	None	TCB	4	2
11.02	Swinton – Brocklesby Jn	SJM1/2/PED5/DOW/MAC3	Primary	DfT	No	W8	8	55 (40/30)	None	TCB(AB)	4	2(3/4)
11.03	South Kirkby Jn – Swinton	SMJ1/2/ SKM	Secondary	DfT	No	W8	RA8 (RA9)	80 (50/60)	None	TCB	4	2
11.04	Nunnery Main Line Jn – Trent Jns	MAC3/WHR /NUJ1/2	Secondary	DfT	No	W8 (W6)	RA8	60 (25)	None	TCB	5	2(1)
11.05	STP: Dore Jns – Hazel Grove Jn	MAS/NMC	Secondary	DfT	No	W7 (W6)	8	90 (50/30)	None	AB(TCB)	7	2
11.06	Wincobank Jn – Horbury Jn	CHS/BAH2/SHB	Secondary	DfT	No	W6	RA7	60 (70)	None	TCB(AB)	5	2
11.07	Black Carr Jn – Trent Jns	BCB/ SPD4/5	Secondary	DfT	No	W8	8	60 (70)	None	AB(TCB)	4	2
11.08	Newark – Wrawby Jn	NOB1/2/3	Secondary	DfT	No	W8	8	60 (75/30)	None	AB	6 (8)	2
11.09	Brocklesby Jn – Cleethorpes	MAC3	Secondary	DfT	No	W8 (W6)	RA8	60 (40/30)	None	AB(TCB)	4	2(1)
11.10	Penistone Line	PED1/2/ PEH	Rural	DfT	Yes	W6	8	50 (30)	None	OTW(AB)	19	1(2)
11.11	Barton-on-Humber Branch	BAR	Rural	DfT	Yes	W6	RA8	60 (40)	None	AB(TB)	Single line	2(1)

Figure 20 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, RA is Route Availability

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
11.12	Gainsborough Lines	MAC3/SPD3/BHP	Rural	DfT	No	W8	RA8	60 (25)	None	AB(TB)	Various	2(1)
11.13	Lincoln – Werrington Jn	WEB/SPD	Rural	DfT	Yes	W8 (W6)	RA8	60 (55)	None	AB	Various	2(1)
11.14	Skegness – Grantham	GRS1/2/3	Rural	DfT	Yes	W8 (W6)	RA8 (RA7)	60 (50/20)	None	AB(OTW)	10	2(1)
11.15	Freight Through Routes	Various	Freight	DfT	No	Various	Various	Various	None	Various	Various	2(1)
11.16	Immingham and Killingholme Docks	KIL1/ 2/INW	Freight	DfT	No	W8	8	25 (10)	None	Various	6	2(1)
11.17	Other Freight Branches	Various	Freight	DfT	No	Various	Various	Various	None	Various	Various	1(2)

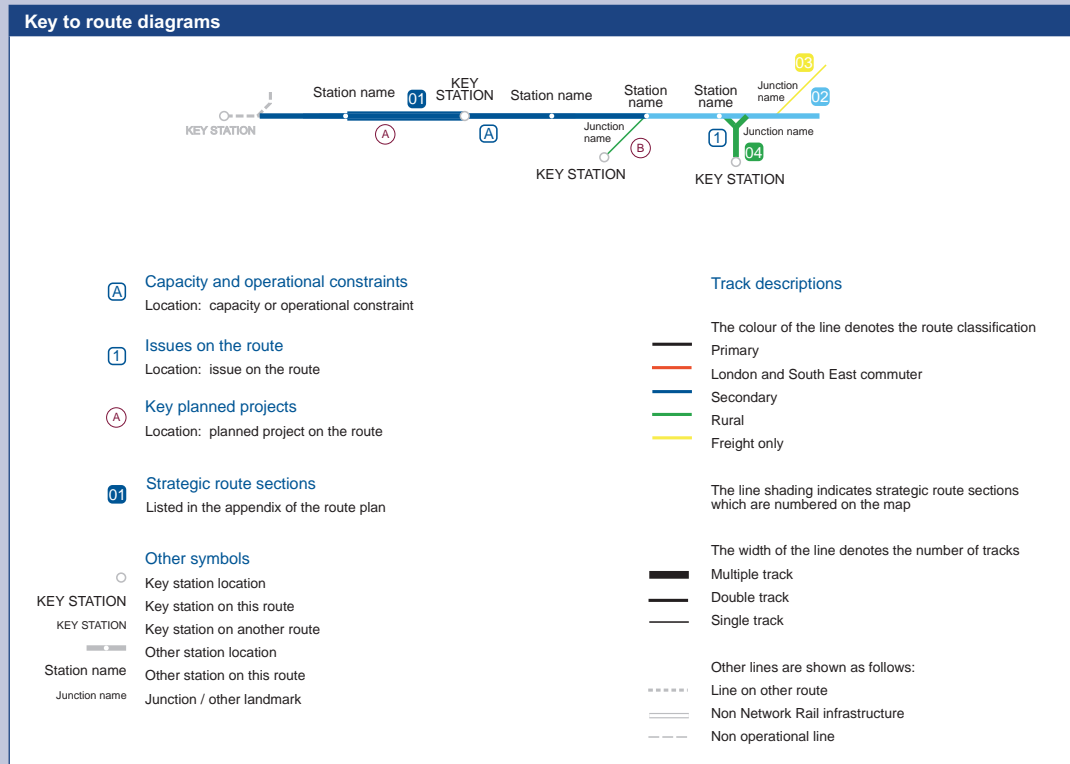
Capacity and operational constraints

- A Sheffield: S&C and curvature
- B Totley Tunnel East to Dore Station Junction: curvature and single line section
- C Holmes Junction to Masborough Station Junction: curvature and flat junctions
- D Swinton: curvature and S&C
- E Conisbrough: clearance through tunnel
- F Thorne Junction: flat junction
- G Keadby: low line speed over drawbridge
- H Grimsby Town to Cleethorpes: single line, level crossings and curvature
- J Moorthorpe Junction: curvature
- K Holmes Junction to Rotherham Central: curvature
- L Holmes Junction to Aldwarke Junction: track alignment
- M Aldwarke Junction: flat junction
- N Huddersfield to Bamsley: single line and curvature

Note

This Route Plan forms part of the Control Period 4 (CP4) Delivery Plan and supersedes the version published in April 2008.

Other documents in the Delivery Plan can be found on the Network Rail website www.networkrail.co.uk



GRIP stages

- 1 Output definition
- 2 Pre-feasibility
- 3 Option selection
- 4 Single option selection
- 5 Detailed design
- 6 Construction, test and commission
- 7 Scheme hand back
- 8 Project close out

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