

Route Plans 2008
Route 8
East Coast Main Line



**Delivering
for you**

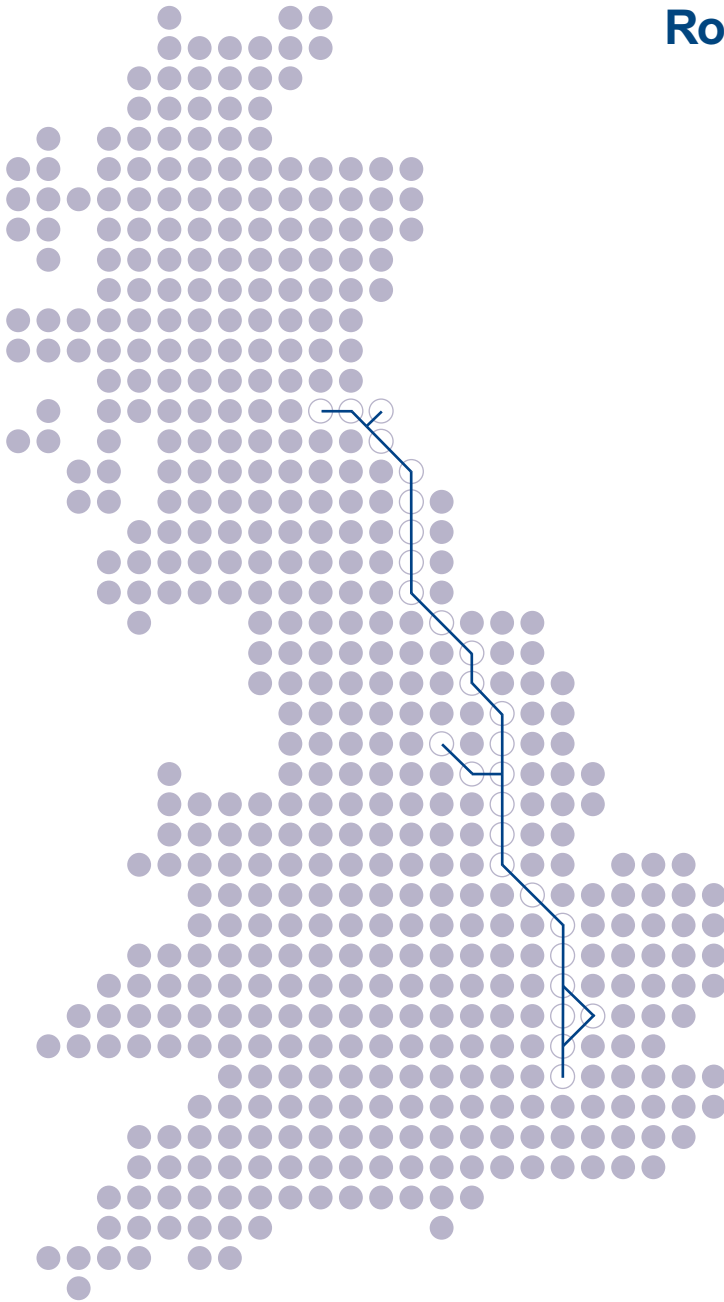


Network Rail helps bring the country together. We own, operate and maintain Britain's rail network, increasingly delivering improved standards of safety, reliability and efficiency. Our investment programme to enhance and modernise the network is the most ambitious it has ever been. Delivering a 21st century railway for our customers and society at large.

Every day. Everywhere.



Route 8 East Coast Main Line



Section 1: Today's railway

Route context

The East Coast Main Line (ECML) is the electrified high speed route linking London and the south east with the Yorkshire & Humber and North East Regions, and eastern Scotland. It provides the direct link between the English and Scottish capital cities, and is designated as being of Trans European Network (TEN) status. It carries key commuter flows to the north of London, as well as one of the UK's fastest growing long distance high speed flows between London and Leeds.

The route also handles cross country, regional commuter and local passenger services and carries heavy tonnages of freight traffic, particularly over the northern sections. It forms a key artery on the eastern side of the country and parallels the A1 trunk road. As such, it is of vital importance to the economic well-being of a significant area of Great Britain.

Network Rail led the development of the ECML Route Utilisation Strategy (RUS) on behalf of the industry, culminating in its publication on 29th February 2008.

The DfT has published four Regional Planning Assessments (RPA) which are relevant to the route, covering the North East, Yorkshire & Humber, East Midlands, and East of England. The Scottish Planning Assessment includes the route between the Scottish border and Edinburgh. All have informed the RUS.

Today's route

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

- the main line from King's Cross to Edinburgh and the line from Doncaster to Leeds which together form the core of the route (08.01, 08.04, 08.05, 08.06, 08.07, 08.08, 08.09 and 08.10);
- a loop via Hertford North which is mainly used by suburban services (08.03);
- a branch from Finsbury Park to Moorgate used only by inner suburban services Mondays to Fridays (08.02); and
- the North Berwick branch (08.11).

Route 8 East Coast Main Line



Key
 ■ Primary
 ■ Secondary
 ■ London & SE Commuter
 ■ Freight only
 The line shading indicates strategic route sections which are numbered on the map

Current passenger and freight demand

The route is seeing a continued increase in demand in the long distance high speed, commuter and regional passenger markets as well as in freight tonnages.

Long Distance High Speed (LDHS) services using London King's Cross regularly serve Leeds, Newcastle and Edinburgh with some services operating beyond these points. There are also eight trains per day each way between Hull and London (on weekdays) and a new service of three trains each way per day has recently started between Sunderland and London. Other long distance journeys on the route are provided by cross country services connecting eastern Scotland, the North East and Yorkshire with the North West, the Midlands and the South West.

The largest commuter market is that into London, with inner and outer suburban trains operating to/from King's Cross and Moorgate (inner suburban only) serving north London, central Hertfordshire, parts of Bedfordshire and Cambridgeshire. In addition, there is a significant long distance commuter market from further north, using stations such as Peterborough, Grantham and Newark. The route is also used for other commuting journeys, principally into Leeds, Newcastle and Edinburgh.

A number of regional express and rural passenger services interact with the route at various points between Peterborough and Doncaster, whilst PTE, regional express and various other local services interface with it at Doncaster, Leeds, York, Darlington, Newcastle and Edinburgh.

As there are few freight terminals on the route; most freight trains operating on the ECML are transiting between other areas of freight activity. The majority use the route to access the east coast ports, the Tees Valley and Scotland. A key use is for coal from north east England and Scottish opencast sites, and from east coast and Scottish ports, destined for the Aire and Trent Valley power stations. Container and other intermodal traffic from Felixstowe and the Thames estuary ports is a particular growth area.

Current services

The route's passenger services are provided by CrossCountry, East Midlands Trains, First Capital Connect (FCC), First Keolis TransPennine Express (TPE), First ScotRail, Grand Central, Hull Trains, National Express East Anglia, National Express East Coast (NEXC), Northern Rail and West Coast Railway Company. English Welsh & Scottish Railway (EWS), Freightliner Group, Direct Rail

Services (DRS) and First GBRf operate the freight trains.

The normal weekday level of operation of LDHS trains in and out of King's Cross comprises approximately 2 tph to/from the North East (with the majority extending to/from Edinburgh), 2 tph to/from Leeds, and a train broadly every two hours to/from Hull. This level of service increases to 5 or 6 tph at peak times, though the stopping pattern varies to align with demand. There are three trains per day each way to/from Sunderland. Some of the Leeds trains extend to/from Bradford, Skipton or Harrogate, whilst some of the Edinburgh trains extend to/from Glasgow Central, Inverness or Aberdeen. Most of the services are operated by NEXC, though Hull Trains provides all but one of the Hull services, and Grand Central operates the Sunderland trains.

There is an extensive FCC outer suburban service south of Peterborough, including trains joining/leaving the route at Hitchin serving Cambridge and King's Lynn via Royston. Inner suburban services operate from Moorgate to Welwyn Garden City, Hertford North and Letchworth. These services use King's Cross at weekends. The weekday service is increased in the morning and evening peaks.

Between Doncaster and Leeds, in addition to the London trains described above, there are three Northern Rail PTE-supported services per hour operating over various sections, an hourly CrossCountry service north of South Kirkby Junction, and the occasional East Midlands Trains service between Leeds and St. Pancras International.

In a typical hour, the section through York sees, in each direction, two NEXC London services, two CrossCountry services, three TPE trains between the North West and the North East or Scarborough, and three Northern Rail services (to Blackpool, Harrogate, and Selby/Hull).

CrossCountry operates a range of long distance services between Aberdeen and Penzance, Manchester and Bournemouth, Nottingham and Cardiff and Birmingham and Stansted. Its services are used by business travellers, leisure travellers and commuters. A high proportion of CrossCountry customers connect into and out of other services and TOCs.

The North Berwick branch is served by one First ScotRail train per hour to/from Edinburgh (two trains per hour in the peak hours and on Saturdays). An hourly Northern Rail local service

operates between Newcastle and Morpeth, which extends twice each way per day to Chathill.

In addition, the whole of the route (except the North Berwick and Moorgate branches) sees considerable use by freight traffic for which it forms a valuable north-south link.

There is typically one coal train per hour between the Port of Immingham and one of the Aire Valley power stations (Drax, Eggborough and Ferrybridge). These use the ECML between Joan Croft Junction and Hambleton Junction. Other coal services use the northern half of the route as far south as Doncaster. These originate from opencast sites in Fife and the North East, the port at Blyth, the Port of Tyne, and Redcar.

The steel industry is another major source of traffic, mainly associated with the steelworks at Scunthorpe and Lackenby (Teesside). Other bulk traffics include petro-chemicals from the Immingham area and Teesside, and aggregates on the southern half of the route.

The fastest growing traffic is intermodal, mainly with traffic through the deep sea container ports of Southampton, Felixstowe and Tilbury, and European traffic via the Channel Tunnel. The route provides access to several terminals in Yorkshire, and to Wilton container terminal on Teesside.

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

Figure 1 East Coast Main Lines – current train service level (trains per hour)		
Station	Moorgate	King's Cross
Welwyn Garden City	5 peak/3 off peak	4 peak/2 off peak
Hertford North	7 peak/3 off peak	Late evening/weekend only
Stevenage	1	7 peak/5 off peak
Peterborough	N/A	9 peak/5 off peak
Doncaster	N/A	3 on most hours
Leeds	N/A	2
York	N/A	2
Newcastle	N/A	2
Edinburgh	N/A	1-2

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

Traffic volumes are summarised in Figure 3.

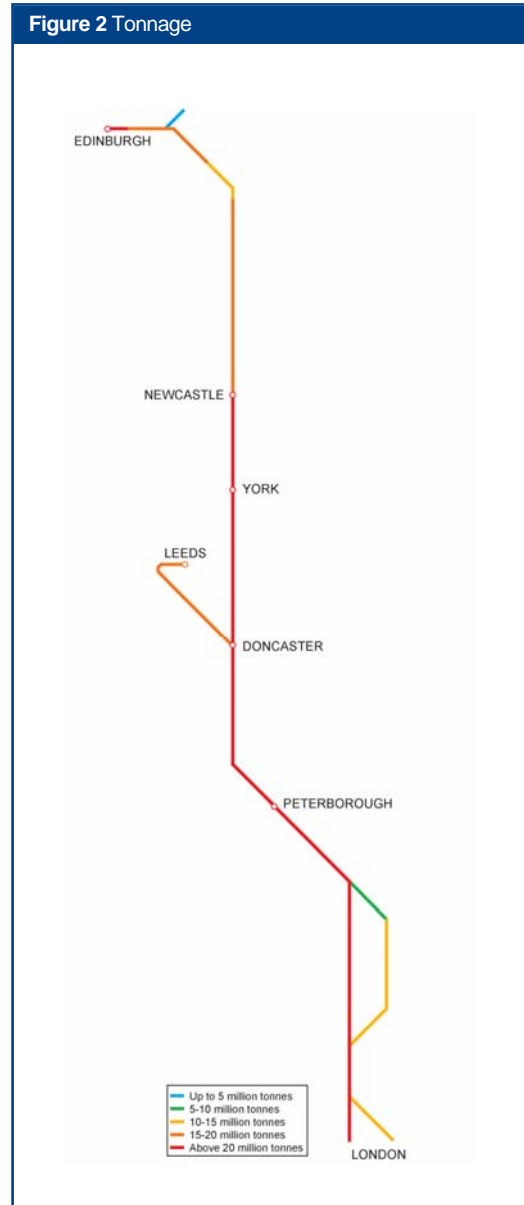
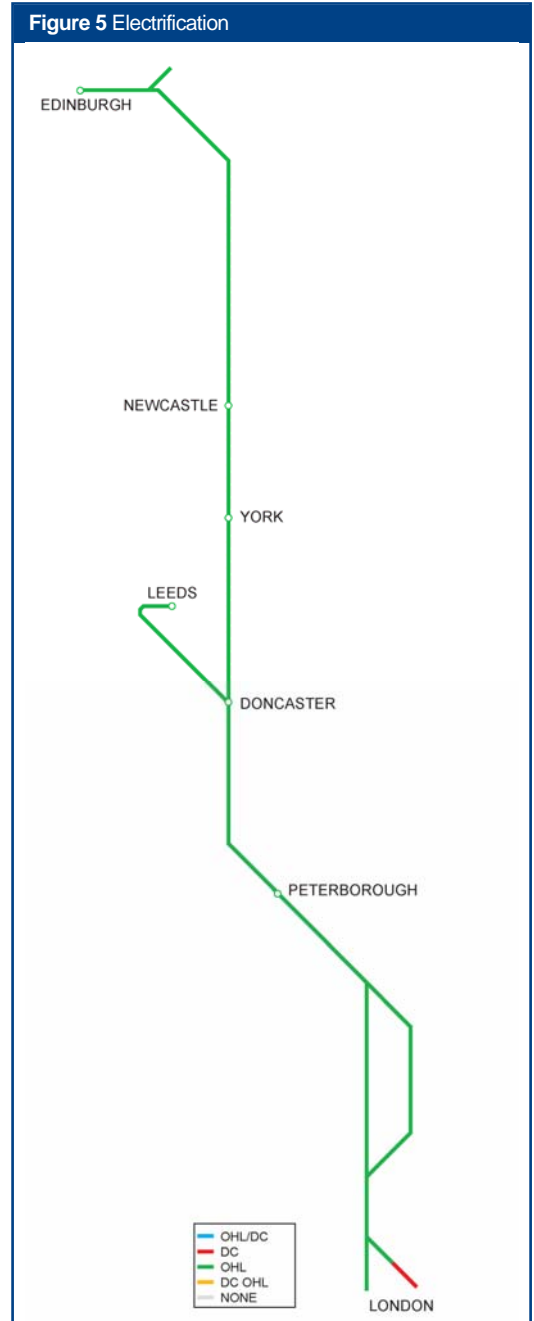
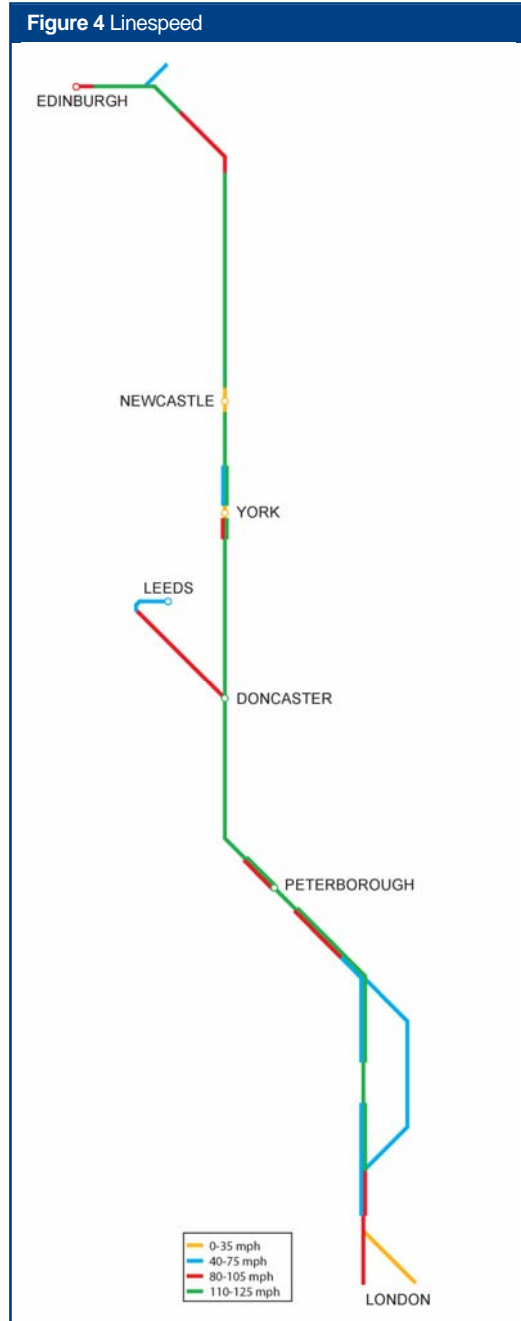


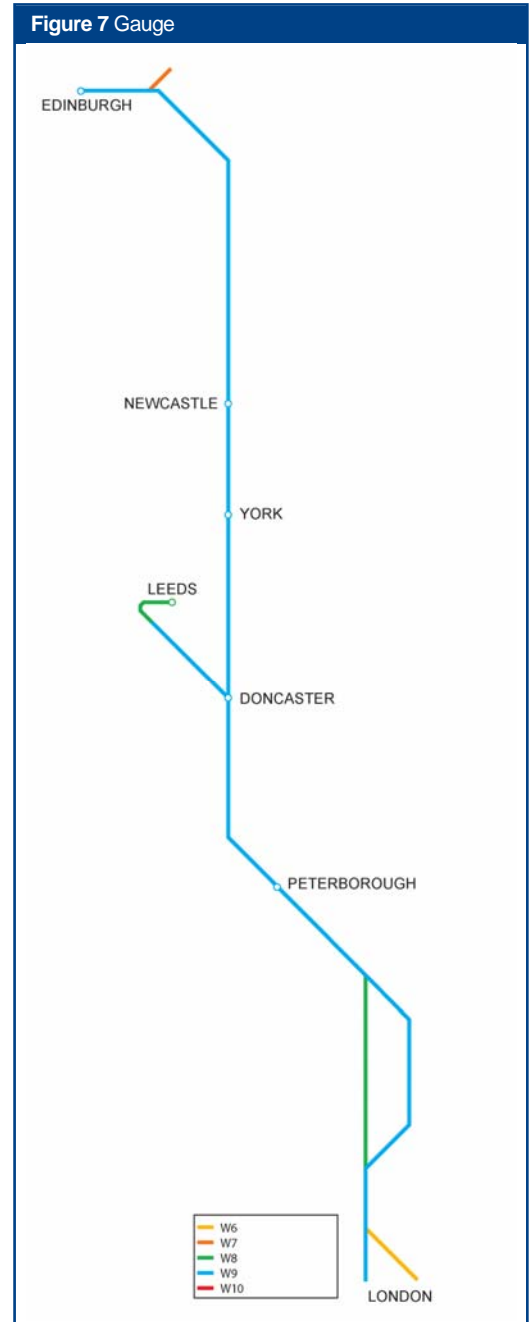
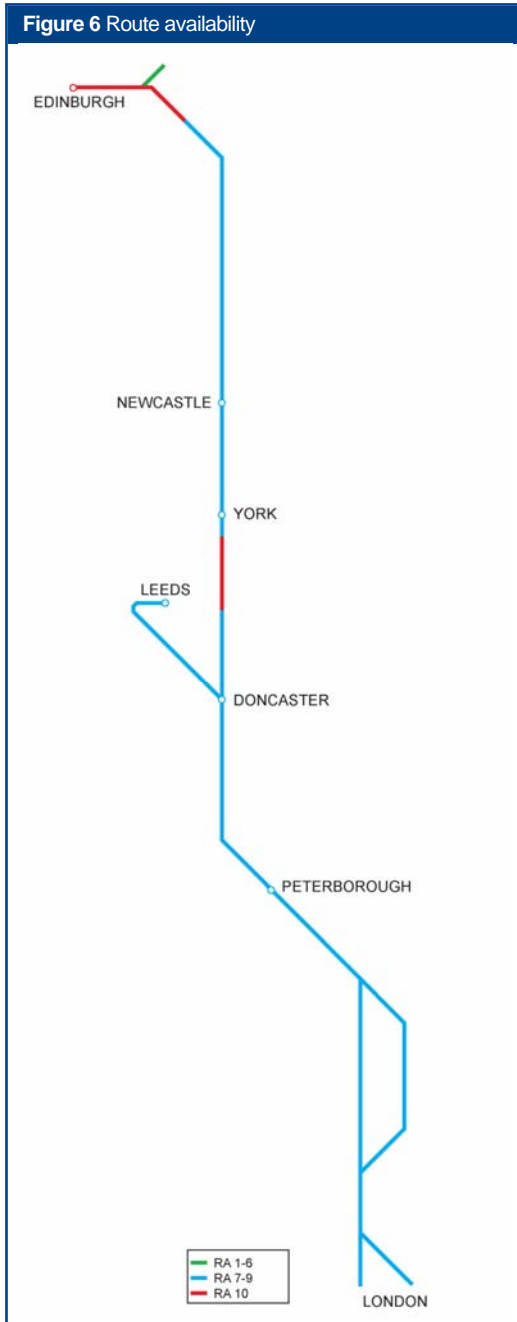
Figure 3 Current use

	Passenger	Freight	Total
Train km per year (millions)	37	6	43
Train tonne km per year (millions)	13,108	5,825	18,933

Current infrastructure capability

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





Current capacity

Much of the route currently operates at or just below capacity for much of the day, due to the service mix and stopping patterns. This is against a background of both passenger and freight growth. The route has capacity constraints at a number of key locations, including;

- King's Cross – the 11 platforms are extensively used at peak times and three are unable to accommodate more than eight car trains;
- Holloway to Alexandra Palace – the five tracks used by passenger trains are near to capacity in the peak;
- Digswell to Woolmer Green – two track section constrains capacity and exacerbates delays in perturbed running;
- Hitchin – at grade junction to/from Cambridge line creates capacity constraint and again exacerbates delays;
- Huntingdon to Peterborough – 16 miles of two and three track railway with high levels of trains;
- Peterborough – with only five platforms, routeing of trains can become constrained and operations can easily become perturbed;
- Grantham to Doncaster – two track section sees a mixture of fast and semi-fast passenger services interspersed with freight traffic and has some short loops;
- Doncaster – restricted layout of through platforms and large number of crossing movements;
- Doncaster to Leeds – on this two-track section capacity is constrained by the combination of fast and stopping passenger trains and freight services;
- York – four tracks reduce to three in the southern approaches to the station which, together with current signalling control arrangements, cause pathing and performance problems;

- Northallerton to Edinburgh – long two track section with limited looping facilities, being particularly constrained between Ferryhill and Newcastle;
- Dunbar – only one platform which requires northbound stopping services to cross onto the up (southbound) passenger loop;
- limited number of outer suburban platforms between King's Cross and Cambridge/ Peterborough with 12 car capacity;
- power supplies to the overhead electrification during busy periods are at capacity at the south end of the route and north of Newcastle; and
- Moorgate branch limited to six car trains and has five minute headways.

The lack of a regular pattern for long distance services to/from London constrains capacity together with the lack of larger gauge routes paralleling the ECML reducing the opportunity for freight services to be routed away from the capacity constrained sections.

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

Figure 8 Current train service level (peak trains per hour)	
Route Section	Number of trains
London King's Cross – Holloway	16
Finsbury Park – Alexandra Palace	28
Digswell – Woolmer Green	16
Woolmer Green – Hitchin	16
Peterborough – Helpston Junction	10
Doncaster – Leeds	8
Colton Junction – York	12
Durham – Newcastle	9
Drem – Edinburgh	6

Figure 9 Current PPM MAA (2007/08)

TOC	MAA	As at period
CrossCountry	86.9%	12
First Capital Connect	90.4%	12
First ScotRail	90.3%	12
National Express East Coast	82.5%	12
East Midlands Trains	87.1%	12
Northern Rail	88.4%	12
TransPennine Express	91.7%	12

Current performance

Figure 9 shows the current PPM for the main TOCs running along the Route.

The capacity constraints listed above cause performance problems when services are running out of course. The mix of high speed passenger trains, with varying stopping patterns, and slower passenger and freight services, also make it difficult to contain delays on the two track sections.

The two track sections are also a problem when an incident affects one or both lines as there are few viable diversionary routes, especially for electric trains. When one line is blocked, single line working can be instituted over the other track. On much of the route between Northallerton and Berwick upon Tweed, the signalling system allows this method of operation to be introduced relatively easily and so delays are normally contained. However, on other sections special signalling arrangements need to be employed, leading to delays mounting up very quickly and requiring the service to be thinned out significantly.

As with other routes with overhead electrification, failure of the equipment can cause major performance incidents from time to time. With the lack of suitable diversionary routes mentioned above the effects can be quite significant.

Section 2: Tomorrow's railway

HLOS output requirements

Figure 10 Total demand to be accommodated by Strategic Route

Route	Annual passenger km forecast in 2008/09 (millions)	Additional passenger km to be accommodated by 2013/14 (millions)
East Coast Main Line	6,375	975

Figure 11 Peak hour arrivals to be accommodated by Strategic Route

London Terminals and Regional Hubs	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 (%)
King's Cross	18,300	2,300	67	8,000	1,100	76
Moorgate	13,000	700	67	7,400	400	76
Newcastle#		13% increase on 2008/09	41		16% increase on 2008/09	46

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

In addition to the outputs above the HLOS for England and Wales includes implementation of Key Output 2 of the Thameslink Programme, though this will not be completed until early CP5, and infrastructure works to allow introduction of the Intercity Express Programme.

Improvement in Anglo-Scottish journey times and protection of service provision are key priorities of Transport Scotland.

Future demand

The HLOS specifies peak demand at the south end of the route heading into London rising by approximately two per cent per year. However, flows from some stations are expected to grow much more as a result of an increase in planned housing in their catchment areas. Growth on services on the Cambridge line is expected to be the highest. Peak growth will account for about one sixth of the passenger kilometre HLOS growth target for the route.

Continued economic growth is expected to increase demand for off peak travel in the inner and outer suburban areas, particularly for journeys to London where rail competes strongly with other modes.

Demand for longer distance travel is also expected to continue increasing, as economic growth encourages further business and leisure trips. Again, growth on London flows is expected to be the highest. The ECML RUS is predicting that this market will grow approximately three per cent per year.

It is anticipated that the majority of the HLOS target increase in passenger kilometres for the route will be generated by further long distance journeys to/from London.

Further growth is expected as a result of the transfer of Eurostar services to St Pancras International (adjacent to King's Cross) from 14th November 2007. These mainly operate to/from Paris, Brussels and Lille but offer interchange at these locations to services serving many other European destinations. In addition, Key Output 1 of the Thameslink programme will further increase demand with many new journey opportunities.

Growth on the Stansted – Nuneaton – Birmingham corridor is expected to increase considerably due to population growth in East Anglia and the continued expansion of Stansted Airport. This will increase the amount of interchange at Peterborough. Similar, or even greater, growth is anticipated on all other CrossCountry services as modal shift from road to rail accelerates over the coming years. A key feature of CrossCountry services is the opportunity to interchange and connect to services operating on the ECML, MML and WCML.

It is anticipated that the greatest growth areas for freight on the route will be in intermodal traffic and coal. Other commodities will remain as important traffic for the route with growth in most being expected. The completion of W10 gauge clearance from Felixstowe and Bathside Bay to four terminals in Yorkshire will drive a significant increase in

container traffic on the constrained section of the route between Peterborough and Doncaster, while the growth of Thames estuary ports will also provide an increase in traffic. Coal traffic to the Aire and Trent Valley power stations will also cause additional freight traffic on the route.

Construction of the Thameslink Programme will enable through running of suburban services on this route across London to destinations in south London and south east England, creating new direct journey opportunities, thereby stimulating further growth from 2016.

Section 3: Proposed strategy

Figure 12 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
2010-14	Progressive lengthening of outer suburban services	Platform lengthening at most outer suburban stations, power supply upgrade, additional stabling and additional platforms at Cambridge (Route 5) and Peterborough	Increased capacity on outer suburban commuter services
2010	Lengthening of regional commuter services	Platform extensions between Doncaster and Leeds	Increased capacity on Leeds and Newcastle commuter services
2011-14	Additional long distance high speed services to/from London and freight paths	A programme of infrastructure works between King's Cross and York to provide additional track capacity and improved performance	Increased passenger and freight capacity, improved performance and shorter journey times between London, Yorkshire, North East and Scotland
2012	Introduction of pre-series IEP trains	Track, station and depot works	Improved journey times and increased capacity for services operated by pre-series trains
2014	Additional inner suburban services	Additional passenger line between Alexandra Palace and Finsbury Park and enhanced signalling on the Moorgate branch	Increased capacity on inner suburban services and improved performance

Strategic direction

The ECML RUS was published on 29th February 2008. The key drivers for the development of the East Coast Main Line are:

- growth on long distance high speed services to/from London;
- reduced journey times between London, the Yorkshire and Humber and North East Regions, and Scotland;
- growth in commuter journeys to London from the outer London area, Hertfordshire, Cambridgeshire, Peterborough and parts of the East Midlands;
- growth in commuter journeys into Leeds and Newcastle;
- increased freight path requirements on certain key sections; and
- improved reliability of services.

The overarching strategy for the route proposed in the ECML RUS is;

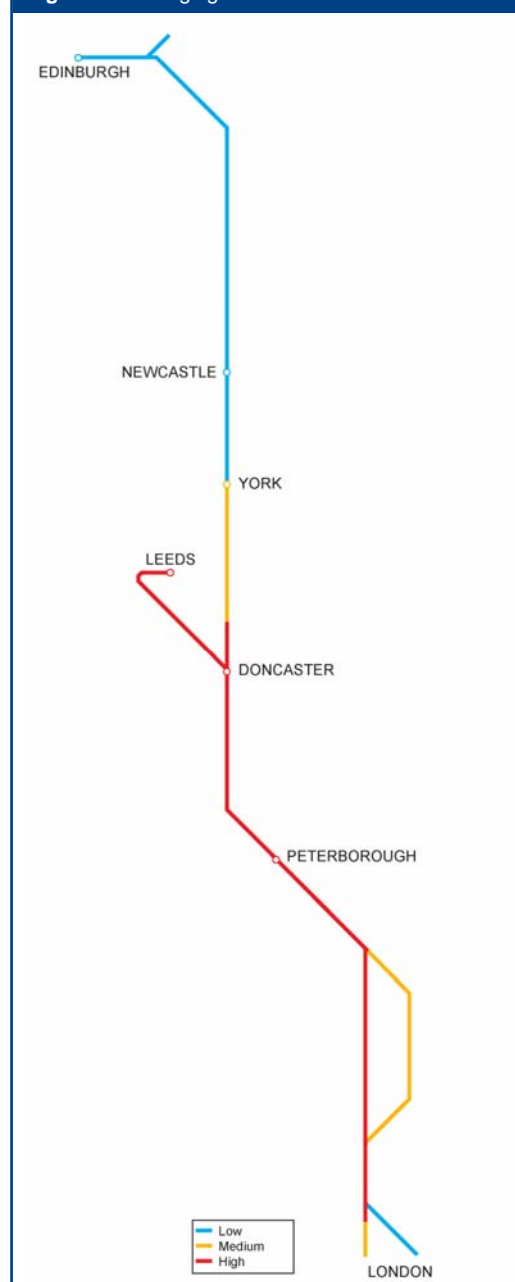
- progressive lengthening of London and Regional commuter services wherever possible to make best use of existing capacity;
- provision of additional long distance high speed services to/from London in the short to medium term to allow better segregation of flows and improve journey times on the longer journeys;
- increased train length and seating capacity on long distance high speed London services in the longer term, mainly as a result of the Intercity Express Programme (IEP);
- operation of a standard hour timetable to make best use of capacity for all passenger and freight operations and improve connectivity for passengers; and
- infrastructure improvements to reduce the number of bottlenecks thereby improving capacity and performance.

Future train service proposals

Figure 13 indicates the forecast change in tonnage to 2017.

Service levels for the long distance high speed market are already being increased. A 2 tph off peak service between King's Cross and Leeds commenced in May 2007 operated by GNER. NXEC took over operation of the InterCity East Coast franchise from GNER in December 2007, with service levels initially based on the December 2007 timetable. However, subject to the availability of rolling stock and the completion of any necessary infrastructure works, the pattern and level of service will increase in future years in line with the recommendations of the RUS.

Figure 13 Tonnage growth



Currently operating a three train service each way between King's Cross and Sunderland, Grand Central has an aspiration to increase its Sunderland service to four trains per day and to run six trains per day each way between Bradford and London via Halifax.

Hull Trains aspires to run an eighth train in each direction between King's Cross and Hull and three return services between King's Cross and Harrogate.

CrossCountry from December 2008 will operate a standard pattern timetable across its network. It has an option in its franchise agreement to extend the present Birmingham to Leicester service via

Peterborough to Cambridge and Stansted Airport each hour.

In the context of expected long distance growth to/from London, the RUS has explored the opportunities and issues associated with an increase in hourly paths each way to six in the off peak and eight in the peak and operating the off peak services in a standard hour (or two hourly) pattern.

This work is against a background of aiming for a standard pattern of service, improving longer distance journey times, and the need for more 60 and 75mph freight paths. The most critical section for the off peak services is between Peterborough and Doncaster where the Freight RUS has identified there is also a step change in freight path requirements.

It is proposed that the additional off-peak passenger path is used to serve the intermediate stations between Peterborough and Doncaster (ie. Grantham, Newark and Retford). This would provide a number of benefits:

- acceleration of Leeds, Newcastle and Scottish services by reducing the number of these intermediate calls;
- provide for growth on the longer distance flows by providing capacity on existing services that is currently used by passengers travelling between London and Grantham, Newark and Retford; and
- allowing growth and avoiding crowding for passengers from these intermediate stations by providing services that are more focussed on this medium distance market.

The standard pattern would standardise connectional opportunities and allow other services that interact with the route to maintain a 'clock face' pattern.

In the short term it is anticipated that much of the increase in outer suburban commuter demand will be met through the implementation of an enhanced outer peak timetable by FCC. This is likely to take effect from December 2008, subject to availability of rolling stock and completion of some small infrastructure upgrades.

Further growth in the outer suburban commuter market would be met through progressive train lengthening to 12 cars, building on the service levels in FCC's proposed timetable mentioned above.

Growth on inner suburban services will be addressed initially through operating all peak hour services as six car trains. The next stage will be to increase the number of peak services by up to three in each peak hour as train lengthening is not possible due to the platform lengths on the underground section between Drayton Park and Moorgate.

TfL aspires to an all-day frequency of at least four tph frequency on inner suburban services to both Hertford and Welwyn and are working with FCC and Network Rail towards delivering this.

The critical growth requirements for freight services on the route are listed below, including the number of additional daily paths identified in the Freight RUS:

- London – Peterborough: 10-15;
- Peterborough – Doncaster: more than 15;
- Doncaster – Hare Park Junction: more than 15; and
- Ferryhill – Tyne Yard: 10-15.

Based on RUS work and discussions with train operators the rolling stock implications of the above for CP4 are as follows:

- Inner suburban: initially three additional class 313 units for shoulder peak strengthening followed by 10 extra sets for increased services;
- Outer suburban: nine additional four car sets in addition to those required in CP3 for the enhanced Cambridge line service;
- London LDHS services: around five additional sets of eight or nine passenger vehicles though exact number will be influenced by set diagramming and destination of the additional services; these are assumed to be accounted for in the National Express East Coast franchise;
- Wakefield – Leeds corridor: using class 333 units released by additional four car electrics for the Leeds North West route (see Route 10) and additional diesel vehicles to strengthen Sheffield – Moorthorpe – Wakefield – Leeds services (included in the numbers shown for Route 10); and
- Darlington – Durham – Newcastle – Morpeth corridor: 11 additional diesel vehicles including those for Route 9 lines into Newcastle.

The main depot implications of the above are the need for additional stabling at Peterborough and Cambridge and additional stabling and maintenance facilities in the London area for outer suburban services and a suitable location for stabling the additional long distance sets.

The RUS also examined a number of options in the Newcastle – Edinburgh corridor but none could be recommended on value for money grounds in isolation. However, industry and wider stakeholders believe that an option involving a new Newcastle to Edinburgh or an enhanced North Berwick to Edinburgh local service could be viable and a full multi-model analysis has been suggested once full freight and long distance high speed passenger requirements have been finalised.

Together with SYPTE and Northern Rail, we are investigating the provision of rail services between Doncaster and a new station serving Robin Hood Airport (Doncaster Sheffield) at Finningley on the Doncaster to Lincoln line (Route 11).

Future capability

The major capability change is the proposed clearance of the Peterborough – Doncaster – Hare Park Junction/Temple Hirst Junction sections for W10 gauge to allow rail to capture a much larger portion of the increased container traffic generated by the Felixstowe and Bathside Bay developments. This is part of the project to provide gauge clearance from Felixstowe and Bathside Bay to four Yorkshire terminals.

Work to provide W9 and W10 gauge clearance between Peterborough and Nuneaton is now under way, funded via TIF. It will provide an alternative route for intermodal traffic from Felixstowe and Bathside Bay to the West Coast Main Line. Such W10 traffic can currently only operate via London.

We are working with a number of stakeholders developing options to provide gauge clearance on the northern half of the route as part of an extended core network of high gauge routes the implementation of at least some of which may also be the subject to a TIF submission.

Without significant infrastructure works there is little scope to increase line speeds on the slower sections of the route as most such opportunities were taken when the route was modernised either for the introduction of High Speed Train operation or subsequent electrification.

Platform lengthening will be required at many of the outer suburban stations to allow the progressive lengthening of services. About half of these are included in Key Output 2 of the Thameslink Programme but will be needed well before the completion of the project. The other stations form a separate project; selective door opening may be an option at some locations.

Some minor platform lengthening will be required to allow Class 333 operation between Doncaster and Leeds. This is detailed in the North Trans-Pennine, North and West Yorkshire Route Plan.

Power supplies to the overhead electrification in the London area will need upgrading to deal with the increased number of trains operating on London area suburban services and any additional electrically hauled long distance services in the commuter peaks. The necessary enhancements, including a new feeder station in the inner London area, fall within the Thameslink Programme scope but are required much earlier to accommodate peak hour growth on King's Cross and Moorgate commuter services.

An additional platform at Dunbar will be required as recommended in the RUS to improve operational flexibility.

We are currently reviewing the level crossings at Bathley Lane (between Newark Northgate and Retford) and Markle (between Dunbar and Drem). The aim is to improve operational safety and efficiency and at Markle the opportunity may also exist to increase the maximum permitted speed of trains.

Future capacity

The signalling headways are generally considered adequate except on the Hertford Loop, particularly when trains need to be diverted, and the Moorgate branch. Capacity is generally governed by the train occupation of junctions and whilst stopping at stations, and the mix of fast and slower speed services on the long two track sections rather than headways on plain line sections.

There are several major capacity and/or performance enhancements recommended in the RUS:

- an additional platform at King's Cross (known as Platform Y) which can be used by electrically hauled long distance services and 12 car outer suburban services;
- reduced headways on the Moorgate branch;
- third Up passenger line between Alexandra Palace and Finsbury Park including additional southbound platform at the latter;
- improvements to Down slow 2 line between Finsbury Park and Alexandra Palace;
- grade separation of the junction at Hitchin;
- an additional island platform at Peterborough which would allow the East Anglia passenger and freight services to operate independently of services from London. The proposal also

Figure 14 Forecast PPM MAA - CP4 plan

	2009/10	2010/11	2011/12	2012/13	2013/14
Northern Rail	90.5%	91.0%	91.5%	91.9%	92.2%
TransPennine Express	92.8%	93.3%	93.7%	94.0%	94.2%
National Express East Coast	86.8%	88.4%	89.5%	90.5%	91.1%
First Capital Connect	89.9%	90.4%	90.7%	91.1%	91.4%
First ScotRail	90.9%	91.3%	91.7%	91.9%	92.0%
CrossCountry	87.9%	88.7%	89.7%	90.4%	90.9%
East Midlands Trains	88.3%	89.1%	89.9%	90.4%	90.8%

Figure 15 Forecast PPM MAA - proposed local commitments

	2009/10	2010/11	2011/12	2012/13	2013/14
Northern Rail	89.9%	90.4%	90.9%	91.3%	91.6%
TransPennine Express	92.2%	92.6%	93.1%	93.4%	93.6%
National Express East Coast	85.2%	86.7%	87.9%	88.9%	89.5%
First Capital Connect	88.9%	89.4%	89.6%	90.0%	90.4%
First ScotRail	90.9%	91.3%	91.7%	91.9%	92.0%
CrossCountry	86.7%	87.4%	88.4%	89.1%	89.7%
East Midlands Trains	87.2%	88.0%	88.9%	89.4%	89.8%

includes improved looping facilities for freight trains;

- capacity enhancements between Peterborough and Doncaster to allow a significant increase in long distance passenger and freight services, by the enhancement of the GN/GE Joint Line via Spalding and Lincoln, to become a primary freight artery;
- improvements around Shaffholme and Joan Croft Junctions to eliminate the use of the ECML by Immingham to Aire Valley coal trains and allow them to operate over a shorter route;
- Holgate Junction to York station – additional line and other performance/capacity improvements; and
- level crossing closures/upgrades in order to allow additional services to operate and improve safety.

We are also developing a number of small schemes using the Network Rail Discretionary Fund that would provide small incremental capacity benefits as well as improving performance. These are as follows:

- Huntingdon North improved line speed through turnout from Up fast to Up slow;
- Fletton (south of Peterborough) Up slow to Up fast improved line speed;
- Doncaster area – improvements to signalling controls;
- York to Northallerton: line speed improvements on the slow lines

We are also proposing provision of bi-directional working on the Up east slow line between the Loversall Carr area and Doncaster and direct

access from the Down ECML route to the Up yards, mainly to provide increased flexibility for performance recovery and freight operations.

The scheme would also benefit the operation of a regular service to Robin Hood Airport (Doncaster Sheffield) at Finningley as it would minimise conflicts at Doncaster between these and other services.

Future performance

Figure 14 sets out the planned PPM for each train operator. Figure 15 sets out the trajectory we propose as local commitments with each operator. Other than for First Scotrail, these are lower than planned given the need for flexibility in achieving the HLOS targets and to reflect the greater uncertainty and risk associated with projecting performance at a disaggregated level. Reasonable requirements will finally be established for CP4 in our 2009 Business Plan. In some cases the services covered by the franchises will change; this means that the forecast PPM figures are not directly comparable with the current PPM figures.

Most of the enhancement schemes listed above will provide sizeable performance benefits.

The planned renewal of the overhead line equipment between King's Cross and Hitchin and in the Newark and Claypole areas should help reduce the number of equipment failures and thereby improve performance.

We are providing a banner repeater signal for the signal on the curve to the north of Grantham station

on the Down main line which will reduce delays where one train closely follows another service.

The Scotland RUS recommended doubling of the single lead junction at Portobello Junction (east of Edinburgh Waverley) to improve performance.

CrossCountry

As a long distance operator CrossCountry faces significant performance challenges. The franchise was re-mapped from 11 November 2007 bringing together parts of former Virgin Cross Country and former Central Trains routes. Additional capacity in the form of HSTs as well as additional seating on Class 220/221 and Class 170s will be introduced in the period between May 08 and Summer 09.

Performance Levels

PPM MAA for the remapped franchise at the end of period 12 2008 is 86.9 percent. The target contained in the 2008-09 JPIP is 87.3 percent.

Franchise plans developed during bidding based on TOC on Self improvements have a PPM figure of 88.7 percent at the end of the franchise. This was based on a given bid assumption of no improvement from Network Rail in CP4. It is therefore expected by CrossCountry that the further improvement sought in franchise and national PPM will come from Network Rail initiatives. The PPM figures shown for CP4 represent Network Rail's forecasts but while there have been some high level discussions, CrossCountry has not yet been able to agree formally a PPM figure for the end of CP4.

Significant lateness

Network Rail nationally is developing plans for a 25 percent reduction in trains over 30 minutes late over Control Period 4. These plans include continued work on flooding prevention and joint initiatives being developed between Network Rail and BTP to prevent theft and vandalism. These commitments are consistent with CrossCountry's desire to minimise the number of significantly late trains, a source of customer complaint, loss of business to rail and payments under the delay repay regime. Although plans are currently in their early stages, any actions under this heading are likely to benefit the performance of the CrossCountry services given the geographic extent and long distance nature of the business.

Extreme weather

Extreme weather is no longer confined to particular periods of the year. Flooding and high winds can strike at any time with an adverse effect on services. CrossCountry's geographic coverage means that a regional weather event can have a

national impact. Vulnerable pieces of infrastructure and land such as Dawlish Sea Wall and the Teignmouth cliffs will continue to pose a performance risk although specific Network Rail operational plans deal with such incidents. Of particular concern to CrossCountry are blanket emergency speed restrictions which can severely impact services which operate the length and breadth of the country as well as across Network Rail organisational boundaries

National Express East Coast

The performance of National Express East Coast is currently 82.5 percent PPM MAA and has suffered in this financial year due to a series of major disruptions from weather, OHL and cable theft problems. Both Network Rail and the franchisee are working together to improve the PPM performance and have developed additional plans to recover performance and aim towards achieving the J-PIP target PPM of 85.4 percent by April 2009.

The key performance issues and opportunities for this TOC have been identified as assisting the TOC reach its franchise commitments by:

- enhancing the network to remove points of conflict and increase flexibility in times of perturbed running, expected to include:
 - Hitchin grade separation;
 - Shaftholme Junction new layout;
 - Holgate junction (York) remodelling;
 - Additional platform at Kings Cross;
- improving the robustness of the overhead line and rectify sites of consistent failure;
- continued work to reduce the level of cable theft;
- reduction in the impact of trespass, vandalism and fatalities;
- faster repair of S&C;
- improved infrastructure reliability on the core two track sections between Huntingdon and Doncaster and north of York;
- regulation and timetable resilience work to keep trains closer to their booked path throughout their journey; and
- 7-Day Railway opportunities to reduce the impact of Sunday working.

The route plan is being developed around these key points and currently suggests that performance on NXEC by April 2014 will be around 91.1 percent PPM. This includes an allowance for passenger/traffic growth and an increase in engineering work. This figure has been discussed with the TOC and although challenging, both parties are firmly committed to work towards its delivery.

First Capital Connect

First Capital Connect operates the suburban train routes into London King's Cross and the cross London Thameslink route. The performance of the TOC is currently 90.4 percent and this is planned to rise to 90.7 percent by the end of March 2009 due as a result of the action included within the Joint Performance Plan. There is a significant level of change in service patterns driven by the Thameslink works throughout CP4 and the likelihood that some services will be jointly operated with South Eastern. This together with relatively major changes to fleet resources will result in some challenges to maintain performance.

The key performance issues and opportunities identified for this TOC include:

- minimising the operational impact of the Thameslink programme; to date modelling work has only been focussed on Key Output 0 and there is a degree of uncertainty around the full impact of the work programme;
- uncertainty over the impact of the ELL extension and planned rewrite of the South London and Brighton Mainline timetables;
- impact of passenger growth;
- the impact of enhancements on the East Coast – especially around King's Cross, Finsbury Park and Hitchin;
- specific concerns over seasonal variation and the likely benefits of Remote Condition Monitoring;
- maintenance of journey times; and
- the impact of fleet changes – and stabling arrangements.

The TOC is currently concerned by the lack of a detailed plan to deliver performance improvements on this route especially due to the large amount of uncertainty. We will work with the TOC to produce a long term performance plan during the Summer and the expectation is that this will result in a forecast level of performance of 91.4 percent by the end of 2013/14 (including the impact of the Thameslink works).

The other franchised passenger operators on this route are East Midlands Trains, First ScotRail, National Express East Anglia, Northern Rail and TPE. The future performance section for East Midlands Trains can be found in the plans for Route 19, First ScotRail in the plans for Routes 24, 25 and 26, National Express East Anglia in the plan for Route 7, Northern Rail in the plans for Routes 9, 10, 11, 20 and 23 and TPE in the plans for Routes 10 and 11.

Engineering access

As the number of trains increases to meet future growth there needs to be more access for maintenance, renewal and enhancement work on the route. Network Rail will seek to manage closures to a more regular pattern in order to improve both train and asset performance.

The sections having the most severe access constraints are those with only two tracks and limited diversionary opportunities. Another area where maintenance access is currently constrained is in the York station area. We will work with our customers to devise ways of improving access whilst allowing empty rolling stock and fuelling movements.

Maintenance access on the Scottish section of this route is particularly limited. Currently, access consists of two midweek nights every third week with only two high gauge trains operating during this period. In addition, extended access is available on Saturday and Sunday nights.

At times when traffic levels are reduced, the provision of bi-directional working or SIMBIDS on two track sections would make single line working during engineering work much easier. It would also assist when a performance incident affects one line as a higher level of reduced service could be operated.

We also recognise that both freight and passenger operators wish to operate trains for longer periods than allowed at present. The lack of suitable diversionary routes in terms of electrification, gauge clearance, axle weight and permitted train length, restrict the ability of our customers to accept diversions. The ECML is a pilot route for the 7-Day Railway concept and through working with our customers this workstream will try to balance these needs.

There is also a need to ensure integration with West Coast Main Line possessions so that at least one route is always available between London and Scotland.

The enhancements to capacity on the Hertford Loop, recommended in the RUS, will provide the ability to divert more trains when the main line via Welwyn is closed for engineering work. Against the background of continuing growth on outer suburban and long distance services an increased level of diverted services will be necessary to deal with passenger numbers. The scheme will also allow more trains to be diverted on an unplanned basis in times of disruption which will help bring performance benefit.

The identification of the GN/GE Joint Line as the preferred option in the RUS for capacity enhancement between Peterborough and Doncaster will give a much improved diversionary route for this section. As well as allowing reduced journey times for diverted passenger services it will allow growth of night time freight services which is currently constrained by the need for single line working in Rules of the Route to allow maintenance of the main line.

CrossCountry, like other operators, has aspirations for a 7-day railway. In the nature of CrossCountry, Sunday carries the second highest volume of passengers (with Friday peak having the greatest volume). Therefore, some weekend line closures, extended journey times and bus replacement services can impact on the revenue of the business. Possession overruns resulting in unplanned service changes are particularly damaging.

Long term opportunities and challenges

Train lengthening will continue to be the main mechanism to deal with growth on London and regional commuter services wherever possible. This approach can also be used for long distance high speed services with the introduction of the production series of Intercity Express Programme (IEP) trains.

IEP should allow some journey time improvements as the proposed superior acceleration will allow trains to pull away quicker from station calls and sections where speed restrictions are necessary, particularly north of Darlington.

The introduction of IEP could beneficially be complemented by the provision of a new inner suburban fleet (the Class 313 EMUs will be approaching 40 years old at that time and thus reaching life-expiry) with high acceleration characteristics, and all the outer suburban rolling stock having at least the characteristics of the class 365s. This should allow the existing capacity between King's Cross and Welwyn to be optimised through timetabling solutions that make best use of the fast and slow lines, especially south of Potters Bar. This should allow the eight tph peak level of London long distance high speed services to be delivered robustly on the current infrastructure.

It is likely that introduction of IEP will cause further growth which, in time, will mean that once all train lengthening options have been taken up it will be necessary to run further long distance services to/from London. The possible parallel introduction of European Rail Traffic Management System (ERTMS) providing in-cab signalling may help to provide some capacity increases. The introduction of large numbers of new vehicles, which could be delivered with ERTMS equipment – or at least 'ERTMS ready' - will help the business case for introduction of this technology on the southern end of the route and thereby deliver the associated benefits more efficiently.

ERTMS is also expected to allow increased operational flexibility, especially single line working, or when operation over only the two northbound or the two southbound lines on four track sections is possible due to planned engineering or disruption.

The second phase of the Thameslink Programme, due for completion in December 2015, will free up peak capacity at King's Cross by allowing operation of outer suburban trains formed of 12 cars via St Pancras International and Thameslink to destinations south of London.

The pointwork and signalling around King's Cross is due for renewal around this time and the opportunity needs to be taken to remodel the layout to best suit the development of long distance services and the operation of those suburban services that do not run via St. Pancras International and Thameslink.

Longer term freight growth on the route, especially once the full capacity of the Felixstowe and Bathside Bay port developments is utilised and when any further gauge enhancement take place, is likely to be significant. The section between Peterborough and Doncaster will be critical to this. The RUS solution for extra capacity on this section is compatible with these developments and further growth in long distance passenger paths, though further capacity enhancements on the GN/GE Joint Line could be replaced by upgrading the freight capacity and capability of the Midland Main Line (Route 19).

Stakeholders in the North East are keen to examine opportunities that the former Leamside route between Ferryhill and Pelaw via Washington may provide and have commissioned a study. This shows that there is not a business case for its reinstatement to cater only for additional local and regional services. However, longer term growth in LDHS and intermodal freight has been identified by the RUS as possible drivers for the project.

Enhancements to be completed by end of CP3

Figure 16 CP3 enhancements

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2008	ⓑ ECML power supply improvements - Hitchin-Cambridge line	Power supply booster transformers upgrade	Increased capacity and improved performance	OPF	4
2008/09	ⓒ Newcastle – Heaton	Overhead line additional isolation sections	Allows better engineering access	OPF	–
2008/09	ⓔ Wood Green, Hertford Loop	Power supply modifications	Improved capacity for electric trains	Network Rail Discretionary Fund	1
2008/09	ⓕ Thirsk	Platform extensions	Improved capacity for longer trains	Network Rail Discretionary Fund	4
2008/09	ⓖ York station	Overhead line additional isolation sections	Allows better engineering access	OPF	4
2008/09	ⓓ Grantham	Banner Repeater	Performance improvements	Network Rail Discretionary Fund	4

Proposed enhancements in CP4

Figure 17 Proposed enhancements in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009/10-2013/14 (Various stages)	Ⓛ King's Cross	Station development	Increased station capacity, new concourse, increased commercial opportunities and additional 12 car platform	Periodic Review 2008	6
Capacity relief 2011-2014	Ⓜ Capacity relief Peterborough to Doncaster	Enhancement of the GN/GE Joint Line via Spalding and Lincoln	Increased capacity and improved performance	Periodic Review 2008	–
2009-2014	ECML level crossing closure programme.	Closure of level crossings that would become high risks with an increase in train movements	Increased capacity and improved safety and performance	Periodic Review 2008	1
2010	Ⓜ FCC platform lengthening	Platform lengthening at Welwyn GC, Welwyn North, Knebworth, Letchworth, Baldock, and Ashwell (not in Thameslink scope)	Increased capacity through train lengthening	Periodic Review 2008	1
2010	Ⓝ Wakefield Westgate	Longer platform and provision of loops	Increased capacity and improved performance and passenger facilities	LTP Major Scheme Bid	4
2010	Ⓞ York Holgate Junction 4th line.	New line from Holgate Junction to Platform 11 at York station, and improvement of restrictive signalling arrangements	Increased capacity and improved performance	Periodic Review 2008	3
2010	ⓂⒺ W10 Gauge clearance	Gauge clearance on the route from Peterborough to various Yorkshire terminals in connection with the port developments at Felixstowe and Bathside bay	To accommodate the carriage of deep sea container traffic on the East Coast Main Line north of Peterborough	Third Party	4
2013	Ⓞ Redoubling Portobello Junction	Doubling the single lead junction onto the Newcraighall branch (including second platform at Brunstane), thereby providing parallel movements to/from the Newcraighall and Edinburgh Suburban routes	Improved performance and increased capacity	Transport Scotland	1
2012	Ⓜ Hertford loop (inc. Gordon Hill)	Capacity improvements	Increased capacity and improved performance and diversionary capability	Periodic Review 2008	–

Figure 17 Proposed enhancements in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2013	Ⓣ Peterborough station re-development and additional island platform	New platform on the western side of the station, additional southbound platform, enhanced freight loops and improvement to Nene Sidings	Increased capacity, improved performance and additional stabling for outer suburban services	Periodic Review 2008 / Third Party	1
2014	Ⓤ Shaftholme Junction re-modelling	Remodelling Shaftholme and Joan Croft junctions	Increased capacity and improves performance (also reduces coal train journey time)	Periodic Review 2008	4
2014	Ⓥ Alexandra Palace - Finsbury Park 3 rd Up line project	Additional southbound platform at Finsbury Park and conversion of goods line from Alexandra Palace to Finsbury Park to passenger status	Increased capacity, improved performance and increased interchange at Finsbury Park	Periodic Review 2008	3
2013/14	Ⓦ Hitchin grade separation	Revised layout at Hitchin Cambridge Junction taking the Down Cambridge line trains over the ECML	Increased capacity and improved journey times, safety and performance	Periodic Review 2008	4
2015	Ⓨ Thameslink Programme	Major works including revised track and signalling layouts and platform extensions between King's Cross and Peterborough, and Cambridge	Improved capacity and performance and new journey opportunities plus increase in 12 car operation of outer suburban services	Periodic Review 2008	3
2014	Ⓟ Finsbury Park – Alexandra Palace Down Slow 2 upgrade	Provide northbound platforms at Haringay and Hornsey together with associated layout alterations at Hornsey to allow more inner suburban services to call. Provide bi-directional signalling to allow southbound freight trains to access Barking – Gospel Oak line	Improved capacity, performance and operational flexibility for southbound freight trains to be diverted away from part of the North London Line	Periodic Review 2008	–
2012	Ⓢ Doncaster - Loversall Carr Junction revised operational layout	Additional signalled routes	Increased capacity reduced freight journey times and improved performance and engineering access	Periodic Review 2008	1
2012	Ⓜ Moorgate branch signalling improvements	Additional signals	Increased capacity	Periodic Review 2008	–
2013/14	ⓧ Northern Gauge Improvements	Gauge clearance of the route from Doncaster to Edinburgh	To accommodate the carriage of deep sea container traffic from East Coast Ports to NW England, Scotland and the Midlands	Subject to agreement	3

NRDF candidate schemes in CP4

Figure 18 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009/10	(K) Fletton	Linespeed increase	Performance improvements	Network Rail Discretionary Fund	4
2009/10	(L) York – Northallerton	Up and Down Slow lines speed increase	Journey time benefit and performance improvement	Network Rail Discretionary Fund	1
2010	(Z) Huntingdon North crossovers	Up fast - Up Slow turnout linespeed increase, Down Slow to Down Fast linespeed increase	Increased capacity and improves performance	Network Rail Discretionary Fund	5
2010	(AA) Bathley Lane level crossing	OHL enhanced protection	Improved performance	Network Rail Discretionary Fund	2
2011	(AB) Hemsworth Down loops	Increase turn in and out linespeed	Increased capacity and improves performance	Network Rail Discretionary Fund	–
2011	(AC) Doncaster area approach control signalling	Relaxation of restrictive signalling approach controls	Improved performance	Network Rail Discretionary Fund	1

Maintenance and renewals activity

Figure 19 shows the estimated maintenance and renewal 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 Civil Engineering, Signalling & 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 maintenance & renewals costs and activity volumes

£m (2006/07 prices)	2009/10	2010/11	2011/12	2012/13	2013/14	Control Period Totals			
						CP4	CP5	CP6	CP7
Maintenance expenditure									
Track	32	32	31	30	29	154	136	128	130
Signalling	7	7	7	6	6	33	30	29	29
Electrification	6	6	6	5	5	28	25	24	24
Telecoms	5	4	4	3	3	19	16	15	15
Plant and Machinery	1	1	1	1	1	6	5	5	5
Other (overheads / indirect)	21	20	20	19	19	98	88	85	85
Total	72	69	67	65	64	339	301	286	288
Renewals									
Track	48	44	49	48	46	235	294	225	186
Signalling	11	8	7	6	10	41	176	156	76
Civils	19	19	19	17	17	91	89	86	85
Operational Property	57	62	41	24	14	198	44	43	43
Electrification	11	10	9	8	6	44	17	43	36
Telecoms	15	16	8	10	3	51	25	20	27
Plant and Machinery	10	6	3	3	3	25	29	28	31
Total	171	164	136	116	99	685	674	602	484
Renewals Volumes									
Rail (KM)	80	79	80	78	79	396	534	244	142
Sleepers (KM)	31	31	31	31	31	153	322	301	238
Ballast (KM)	50	50	50	50	50	251	518	595	533
S&C Units	27	24	45	52	50	198	125	90	87
SEUs commissioned	50	0	0	4	0	54	667	839	328

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
08.01	King's Cross – Peterborough	ECM1	Primary	DfT	No	W9 (W6/8)	RA9	125	25kV	TCB	3 (4/5)	4(2/3/5/6)
08.02	Moorgate Branch	MEB	London & SE	DfT	No	W6	RA9	30	650V DC (25kV)	TCB	4.5	2
08.03	Hertford Loop	HDB	London & SE	DfT	No	W9	RA9	75	25kV	TCB	5 (3)	2
08.04	Peterborough – Doncaster	ECM1/ FWR1/ FWR2	Primary	DfT	No	W9	RA9	125	25kV	TCB	4 (5)	2(4/5)
08.05	Doncaster – Holbeck W Junction	DOL1/2	Primary	DfT	No	W9 (W8)	RA9	100	25kV	TCB	3.5 (3/4)	2
08.06	Doncaster – Colton Junction	ECM2/3	Primary	DfT	No	W9	RA10	125	25kV	TCB	4	2
08.07	Colton Junction – Northallerton	ECM4/5	Primary	DfT	No	W9	RA9	125	25kV	TCB	4 (3/5)	4
08.08	Northallerton – Newcastle	ECM5	Primary	DfT	No	W9	RA9	110	25kV	TCB	3 (4)	2

Capacity and operational constraints

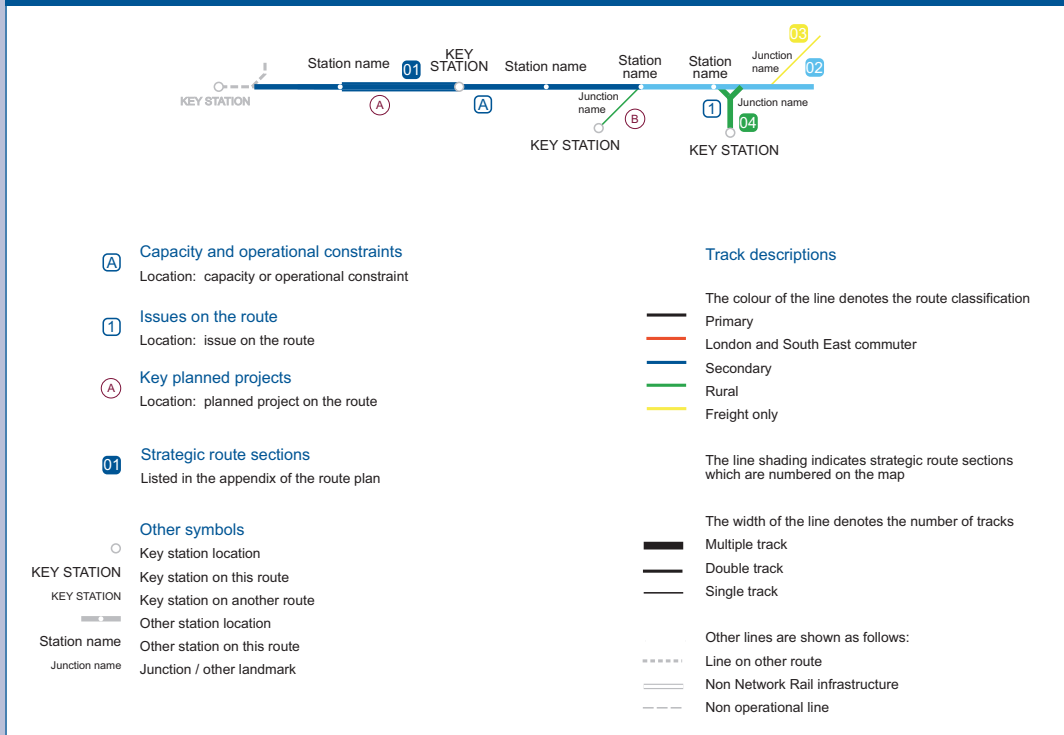
- | | |
|----------|---|
| A | Alexandra Palace to Welwyn: tunnel aerodynamics and curvature |
| B | Offord: curvature |
| C | Stilton Fen ground conditions |
| D | Peterborough: complex station layout |
| E | Stoke Tunnel: aerodynamics |
| F | Grantham: curvature |
| G | Peascliffe Tunnel: tunnel aerodynamics |
| H | Newark: flat crossing of Nottingham – Lincoln line |
| I | Gamston – Retford: curvature and location of S&C |
| J | Bawtry: curvature |
| K | Doncaster: complex station layout |
| L | Shaftholme Junction: location of S&C |
| M | York: curvature and complex station layout |
| N | Croft: curvature over Tees river bridge |
| O | Darlington – King Edward Bridge: curvature of track |
| P | Newcastle – Edinburgh: curvature of track and level crossings |

Note

This Route Plan forms part of the April 2008 update of Network Rail's Strategic Business Plan. The Route Plan supersedes the version published on 1 November 2007.

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

Key to route diagrams



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

**This Route Plan is part of a set.
To view or download the others
visit www.networkrail.co.uk**

Network Rail
40 Melton Street
London NW1 2EE
Tel: 020 7557 8000
www.networkrail.co.uk

CDS001/April 2008