

# Connecting local communities



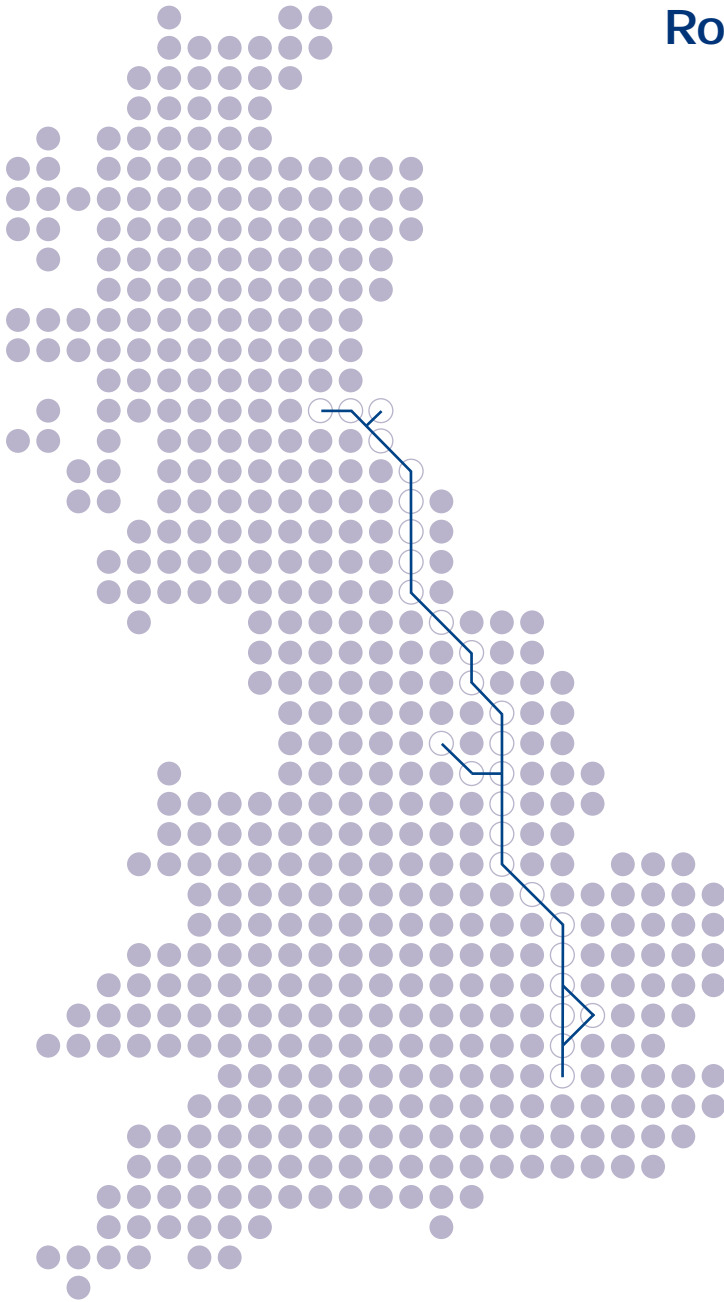
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## Route 8 East Coast Main Line



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### 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 some of the UK's fastest growing long distance high speed flows between London and Leeds and between Birmingham and Leeds. It forms a vital part of the cross country and cross Pennine long distance networks linking Scotland, the North East and

Yorkshire with Liverpool, Manchester, the West Midlands, the Thames Valley and the west of England.

The route also handles 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 29 February 2008.

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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)
- 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 service of three trains each way per day was recently introduced between Sunderland and London.

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, Cambridgeshire and west Norfolk. 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.

CrossCountry is one of the main providers of long distance high speed services outside London, and is geographically the most extensive of operator of passenger services in the UK, covering around 1,500 route miles and calling at over 100 stations. As CrossCountry's services traverse many of Network Rail's strategic routes, planning has to be considered across route boundaries in order to deliver maximum industry benefits.

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. TransPennine Express services operate over the East Coast Main Line (ECML) between York and Newcastle.

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, Yorkshire, 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 (NXEA), National Express East Coast (NEXC), Northern Rail and West Coast Railway Company. DB Schenker Rail (UK) Limited, Fastline Freight, Freightliner Limited, Freightliner Heavy Haul, 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 2tph to/from the North East (with the majority extending to/from Edinburgh), 2tph to/from Leeds, and a train broadly every two hours to/from Hull. This level of service increases to 5 or 6tph 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. Following the implementation of the December 2008 timetable, there are now hourly through services between Plymouth and Edinburgh (via Leeds), Reading and Newcastle (via Doncaster) and Birmingham and Stansted Airport. 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.

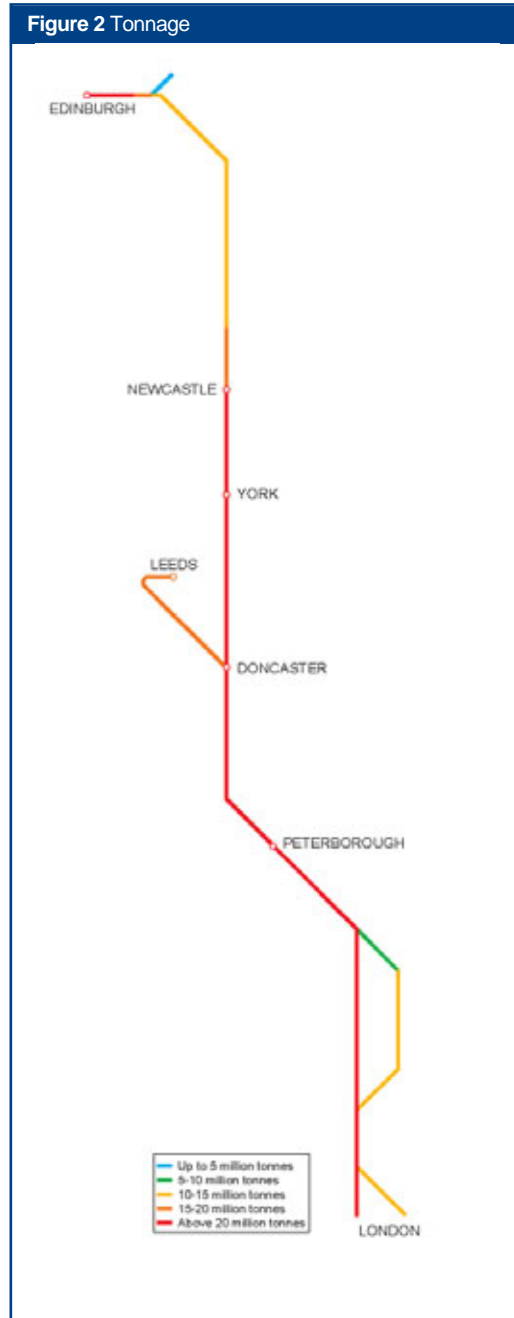
In addition, the whole of the route (except the North Berwick and Moorgate branches) sees considerable use by freight for which it forms a valuable north-south link.

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 2 shows the total annual tonnage levels on the route.



**Figure 1 East Coast Main Line – 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                       |

Traffic volumes are summarised in Figure 3.

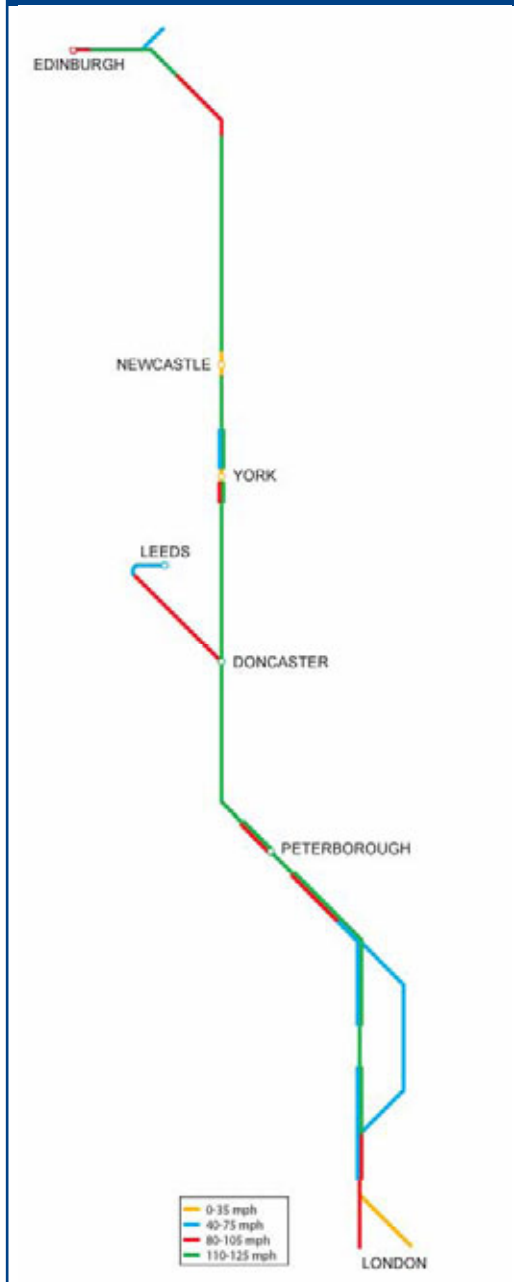
**Figure 3 Current use**

|                                    | 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.

**Figure 4 Linespeed**



**Figure 5 Electrification**

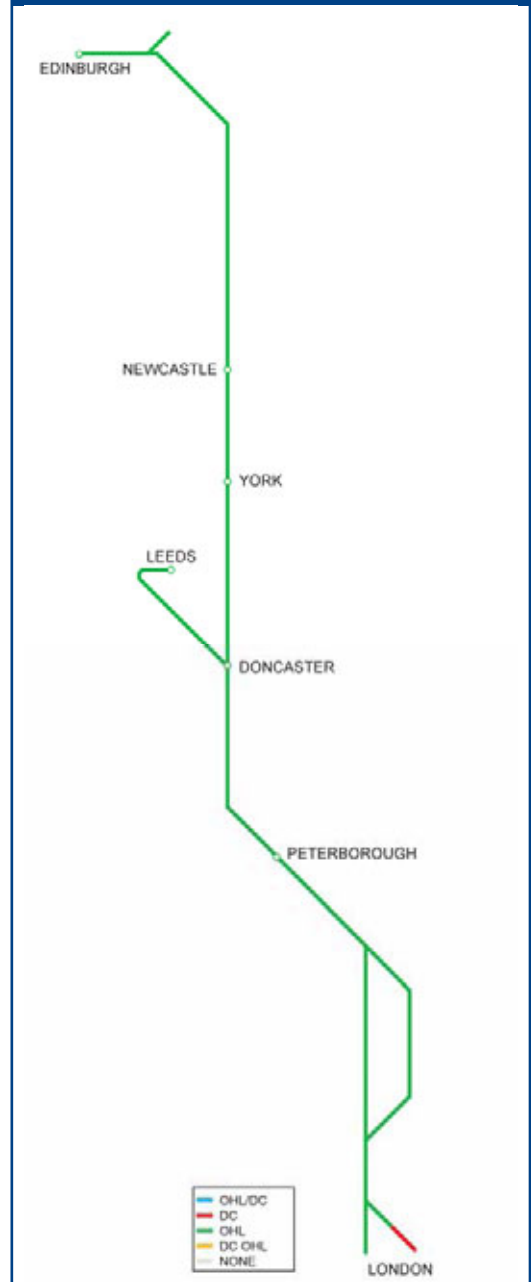


Figure 6 Route availability

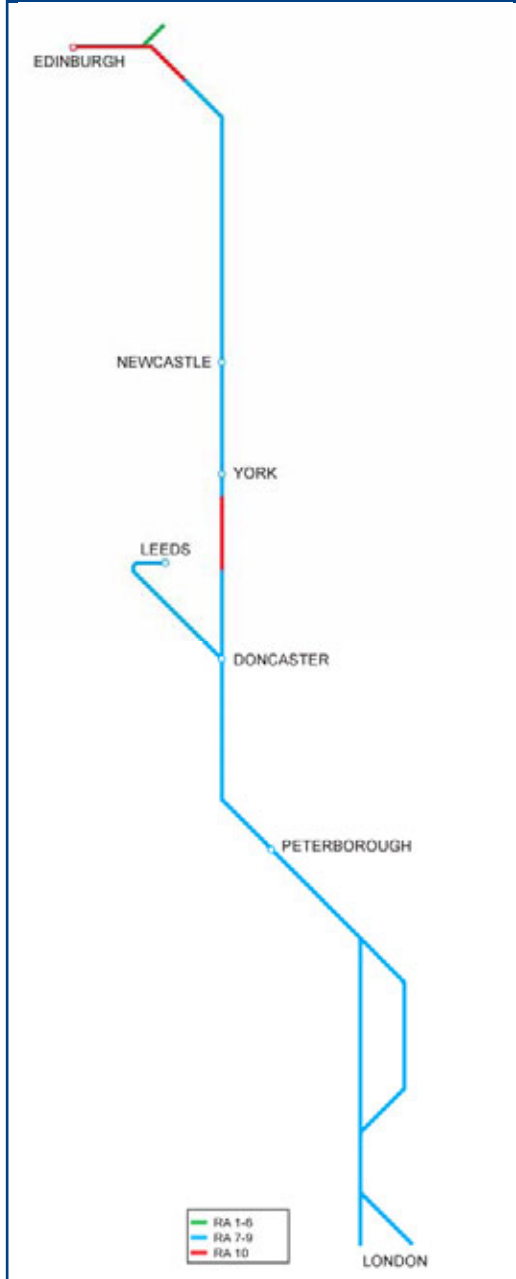
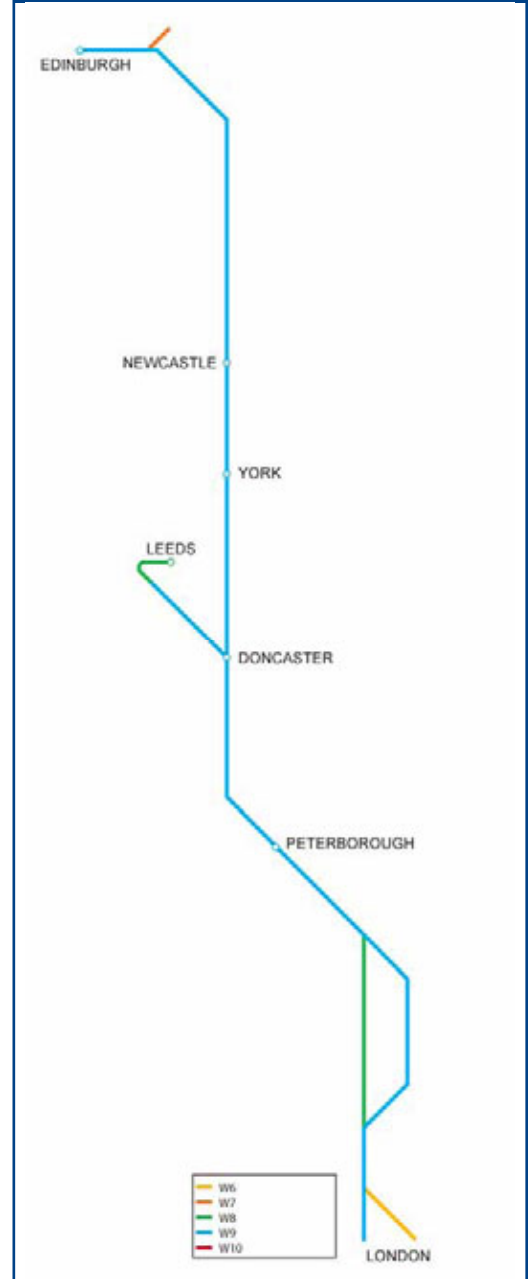


Figure 7 Gauge



## 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, routing 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
- 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 leads to a sub-optimal use of capacity. The lack of routes paralleling the ECML with adequate loading gauge, electrification and linespeed reduces the opportunity for freight services to be routed away from the capacity constrained sections. Use of the Hertford loop is limited by its existing signalling and by the track layout at Stevenage.

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 2008/09 PPM**

| TOC                         | Forecast MAA | As at period |
|-----------------------------|--------------|--------------|
| CrossCountry                | 89.8%        | 10           |
| First Capital Connect       | 92.1%        | 10           |
| First ScotRail              | 90.7%        | 10           |
| National Express East Coast | 86.5%        | 10           |
| East Midlands Trains        | 88.6%        | 10           |
| Northern Rail               | 89.4%        | 10           |
| TransPennine Express        | 90.2%        | 10           |

### Current performance

Figure 9 shows the forecast 2008/09 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: 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 |
|----------------------|--|--|
| 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

Figure 11 shows how the HLOS load factor targets for London stations are met by the proposed strategy. On ECML, although the measures contribute to the total additional passenger kilometres to be accommodated, on this route there is also the need significantly to increase the long distance passenger market through additional services.

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 in CP4

The HLOS specifies peak demand at the south end of the route heading into London rising by approximately two percent 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.

Demand for off peak travel in the inner and outer suburban areas is expected to continue to grow, particularly for journeys to London where rail competes strongly with other modes.

Demand for longer distance travel is also expected to continue increasing. Again, growth on London flows is expected to be the highest. The ECML RUS predicted that this market will grow approximately three percent 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 developing following the transfer of Eurostar services to St Pancras International (adjacent to King's Cross) in 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 – Peterborough – Nuneaton – Birmingham corridor is expected to increase considerably due to population growth in East Anglia and the continued expansion of Stansted Airport, which will increase the amount of interchange at Peterborough. Most recent counts on CrossCountry services indicated an overall growth rate of eight percent per year. Whilst CrossCountry is investing in more trains with more seats, resulting in an increase in capacity of 35 percent, the timetable structure means there is an imbalance between capacity and demand on some route. In particular, steady strong growth on the Edinburgh – Plymouth (via West Yorkshire) service is leading to significant crowding issues on a number of services while their Newcastle – Reading services (via Doncaster) remain relatively lightly loaded. A key feature of CrossCountry services is the opportunity to interchange and connect to services operating on the ECML, Midland Main Line (MML) and West Coast Main Line (WCML).

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.

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 at Doncaster, Leeds Stourton, Selby and Wakefield 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.

### Future demand beyond CP4

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. Equally, with substantial development proposed for Cambridge and its surrounding area it can be expected longer-distance commuting will continue to grow strongly.

CrossCountry aims to focus on the need to accommodate demand generated by the expansion of Stansted Airport, which is anticipated to continue beyond 2014.

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. However, LDHS operators have expressed a view based on trends of recent years that this will happen on the ECML considerably sooner, leading to the conclusion that continued attention will be required to improving the capability of the route.

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, particularly on intermodal flows driven by expansion of the east coast ports.

The concept of the Seven Day Railway is very important to both passenger and freight train operators. Key elements in achieving this capability involve increased sections of bi-directional signalling and the upgrading of key diversionary routes for additional and larger gauged traffic. The train operators and Network Rail will work together during CP4 with the aim of developing and implementing appropriate Seven Day Railway initiatives. These are likely to include improvements to the overhead line equipment (OHL) in the York area and traction power supply improvements in the north London and Leeds areas. Also under consideration is the provision of four additional crossovers between York and Newcastle and improved control arrangements for emergency/engineering works crossovers currently operated locally by ground frames.

## Section 3: Tomorrow's railway: 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.

The total additional passenger km will be accommodated in conjunction with improvements to the signalling on the Finsbury Park to Moorgate line, the planned upgrade to provide a third line in both up and down directions for passenger trains between Alexandra Palace and Finsbury Park.

| Figure 12 Summary of proposed strategy milestones |   |  |   |
|---|---|--|---|
| Implementation date                               | Service enhancement   | Infrastructure enhancement   | Expected output change  |
| 2009-14   | Progressive lengthening of London 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 London 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  |

**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 |
|---|------------------------------|----------------|-----------------------------|-----------------------------|
| Additional 1 LDHS tph King's Cross to York/Lincoln                      | 0                            | King's Cross   | 1,600                       | 500                         |
| Progressive lengthening of outer suburban services from 8-car to 12-car | 36                           | King's Cross   | 3,700                       | 2,100                       |
| TransPennine Express train lengthening                                  | 1                            | Newcastle      | 200                         | 100                         |

**Figure 14** Impact on HLOS peak capacity metric

| London Terminals and regional Hubs | Peak three hours |                    |                  |                  | Load factor end CP4 | High peak hours |                    |                  |                  |
|------------------------------------|------------------|--------------------|------------------|------------------|---------------------|-----------------|--------------------|------------------|------------------|
|                                    | Demand end CP4   | Capacity start CP4 | Capacity end CP4 | Capacity end CP4 |                     | Demand end CP4  | Capacity start CP4 | Capacity end CP4 | Capacity end CP4 |
| King's Cross                       | 20,600           | 34,200             | 39,500           |                  | 91,00               | 14,800          | 17,400             |                  |                  |
| Moorgate                           | 13,700           | 18,200             | 18,200           |                  | 78,00               | 7,800           | 7,800              |                  |                  |
| Other London termini               | 527,600          | 691,600            | 824,200          | 64%              | 265,400             | 301,400         | 356,400            | 74%              |                  |
| Newcastle*                         |                  | 9,800              | 11,100           |                  |                     | 3,800           | 5,000              |                  |                  |
| Other urban areas                  | 31,300           | 61,500             | 66,600           | 40%              | 14,300              | 22,000          | 26,500             | 46%              |                  |

### Strategic direction

The ECML RUS was published on 29 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, west Norfolk and parts of the East Midlands
- growth in commuter journeys into Leeds and Newcastle
- increased freight path requirements on certain key sections, particularly Peterborough - Doncaster
- 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
- infrastructure improvements to reduce the number of bottlenecks thereby improving capacity and performance.

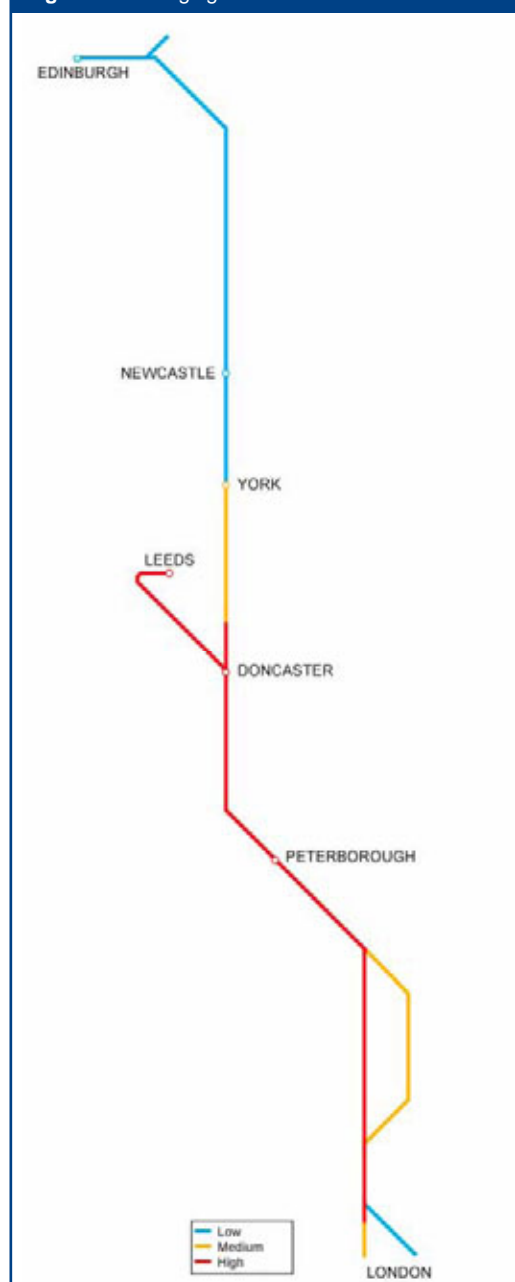
### Future train service proposals

Figure 15 indicates the forecast change in tonnage to 2018.

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 long distance high speed passenger 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

Figure 15 Tonnage growth



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

- 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.

### **CrossCountry**

CrossCountry since December 2008 has operated a generally half-hourly standard pattern timetable across most of its network. However, on the ECML there are off-pattern services and only an hourly service on the busiest flows via West Yorkshire. CrossCountry therefore proposes to standardise its service pattern and route both its trains from Edinburgh and Newcastle via Leeds, which is expected to bring a number of benefits.

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, which will be implemented progressively according to availability of paths and vehicles. An option to begin the process by extending Birmingham – Leicester trains every two hours to Cambridge is being pursued which will increase connectivity both north and south at Peterborough.

### **First Capital Connect**

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 will take effect from May 2009, subject to completion of some small infrastructure upgrades, with further enhancement in December 2009.

Further growth in the outer suburban commuter market will 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 4tph frequency on inner suburban services to both Hertford and Welwyn and are working with FCC and Network Rail towards delivering this.

### **First Keolis TransPennine Express**

TPE aspires to improved journey times on its northern route and to introduce an hourly through service between Newcastle and Liverpool.

### **Grand Central/Grand Union/Grand Northern**

Grand Central currently operates three daily return services between Sunderland and King's Cross, with plans for a fourth return service.

It aspires to operate an additional two daily return services between Middlesbrough and King's Cross (as part of Sunderland service group).

Grand Northern and Grand Union have been developing new service groups since 2005 and plan to introduce a new service Bradford Interchange – King's Cross via Halifax, Brighouse, Wakefield Kirkgate, Pontefract and Doncaster.

They have aspirations to introduce the following new services:

- Huddersfield – King's Cross via Mirfield, Wakefield Kirkgate, Rotherham (or Barnsley), Meadowhall, Sheffield and Worksop
- Cleethorpes – King's Cross via Grimsby, Habrough, Scunthorpe and Doncaster
- Scarborough to King's Cross via Malton and York

They also continue to evaluate other service proposals on the network.

### **Hull Trains**

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.

### **National Express East Coast**

Service levels for the long distance high speed market have been expanded in the recent past with the introduction of a 2tph off peak service between King's Cross and Leeds in May 2007. NXEC took over operation of the East Coast LDHS franchise from GNER in December 2007, with service levels initially based on the December 2007 timetable. The pattern and level of service is expected to increase in future as predicted in the RUS, including the planned introduction of additional services King's Cross – Lincoln and King's Cross – Harrogate via Leeds.

### **Northern Rail**

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).

### **Freight**

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
- Ferryhill – Tyne Yard: 10-15.

### **Rolling stock**

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 eight 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)
- 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 additional Class 313 units will be accommodated at Hornsey depot.

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.

### **Future capability**

The major capability change is the proposed clearance of the Peterborough – Doncaster – Hare Park Junction/Temple Hirst Junction (and diversionary route Newark – Gainsborough – Doncaster) 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 funded by HPUK to provide gauge clearance from Felixstowe and Bathside Bay to intermodal terminals at Doncaster, Leeds Stourton, Selby and Wakefield.

Work to provide W9 and W10 gauge clearance between Peterborough and Nuneaton is now under way, funded via TIF. It will provide an additional route for intermodal traffic from Felixstowe and Bathside Bay to the West Coast Main Line. Such W9 and W10 traffic can currently only operate via London. Gauge clearance to at least W9/W10 is envisaged also as part of the GN/GE Joint Line upgrade project planned for CP4 covering Peterborough – Spalding – Lincoln – Doncaster, giving an alternative route for freight avoiding an increasingly heavily-used section of the ECML.

We are working with a number of stakeholders developing options as part of the Strategic Freight Network initiative 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 a few locations.

Some minor platform lengthening will be required to allow Class 333 operation between Doncaster and Leeds. This is detailed in the North Cross 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 North Gate 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 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, with typical linespeed of 75mph for intermodal trains and 60mph for heavy freight
- improvements around Shaftholme 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
- 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 Farningley as it would minimise conflicts at Doncaster between these and other services.

The implementation of Integrated Train Planning System (ITPS) is planned to 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. It may also highlight instances where the existing plan is deficient.

**Figure 16** Forecast PPM MAA – CP4 plan

|                             | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 |
|-----------------------------|---------|---------|---------|---------|---------|
| CrossCountry                | 90.0%   | 90.2%   | 90.6%   | 90.9%   | 91.3%   |
| East Midlands Trains        | 88.1%   | 88.7%   | 89.4%   | 89.9%   | 90.2%   |
| First Capital Connect       | 91.7%   | 92.1%   | 92.4%   | 92.7%   | 92.9%   |
| First ScotRail              | 90.9%   | 91.3%   | 91.7%   | 91.9%   | 92.0%   |
| National Express East Coast | 86.6%   | 88.2%   | 89.5%   | 90.5%   | 91.1%   |
| Northern Rail               | 90.1%   | 90.7%   | 91.2%   | 91.7%   | 91.8%   |
| TransPennine Express        | 91.7%   | 92.2%   | 93.2%   | 93.8%   | 94.0%   |

### Future performance

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

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

The ECML OHL equipment performance improvement scheme planned for delivery during CP4 will reduce the number of equipment failures and thereby bring significant benefits.

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 is being introduced in the period between May 2008 and summer 2009.

Forecast PPM MAA for the remapped franchise for 2008/09 is 89.8 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.

Network Rail nationally is developing plans for a 25 percent reduction in trains over 30 minutes late over Control Period 4 (significant lateness). 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 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 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.

### First Capital Connect

First Capital Connect operates the suburban train routes into London King's Cross and the cross London Thameslink route. The forecast performance of the TOC for 2008/09 is 92.1 percent PPM MAA. There is a significant level of change in service patterns driven by the Thameslink works throughout CP4 and the intention that some services will be operated by FCC on behalf of Southeastern south of Blackfriars. 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 East London line 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
- 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 92.9 percent by the end of 2013/14 (including the impact of the Thameslink works).

### **National Express East Coast**

The 2008/09 forecast performance for NXEC is 86.5 percent PPM MAA.

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
- Seven Day Railway opportunities to reduce the impact of weekday night, Saturday and 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.

The other franchised passenger operators on this route are East Midlands Trains, First ScotRail, NXEA, 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, NXEA 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.

### **Network availability**

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. 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 Seven Day Railway concept and through working with our customers this workstream will try to balance these needs.

Engineering access forms part of the overall strategy for maintaining availability between England and Scotland, involving also the WCML, Settle & Carlisle, Newcastle – Carlisle and Glasgow & South Western (G&SW), so that at least one route is always available between London and Scotland.

Enhancements to capacity on the Hertford Loop, recommended in the RUS, would 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. This scheme would also allow more trains to be diverted on an unplanned basis in times of disruption with consequent performance benefit. It is currently the subject of discussion with stakeholders with a view to possible funding as part of the Seven Day Railway initiative.

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. In future it will become possible for either the ECML or the Joint Line to be open as a double track route during the night.

There is a general aspiration by long distance passenger operators for a seven day timetable. For example, it is in the nature of CrossCountry that Sunday carries the second highest volume of passengers (the Friday peak being the heaviest). 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 8tph 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 enhancements 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 an option may exist to upgrade the freight capacity and capability of the Midland Main Line (Route 19) as an alternative to making further capacity enhancements on the GN/GE Joint Line. It is likely that Peterborough, in particular, will become a capacity pinch-point and mitigation measures will become necessary.

In the event the proposed intermodal freight terminal at Alconbury, north of Huntingdon, were to proceed there would be a capacity constraint on this section of the ECML in handling the 20 trains envisaged in and out of the facility. The impact might be reduced by operating the majority of trains during the night hours when few passenger services run.

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.

## Infrastructure investment in CP4

Figure 17 Infrastructure Investment in CP4

| Implementation date       | Project  | Project description  | Output change  | Funding                           | GRIP stage |
|---------------------------|--|--|--|-----------------------------------|------------|
| 2009/10                   | Ⓒ York station   | Overhead line additional isolation sections  | Allows better engineering access   | OPF                               | 4          |
| 2009/10                   | Ⓒ Stenton (Dunbar)   | S&C Renewal in up and down ECML at Stenton Ground Switch Panel   | Renewal  | Renewal                           | 4          |
| 2009-2012                 | ECML Overhead Line Performance Improvement                           | Various improvements to OHL along line of route  | Better performance and engineering access  | Periodic Review 2008              | 2          |
| 2009-2013                 | Ⓓ King's Cross   | Station development  | Increased station capacity, new concourse, increased commercial opportunities and additional 12 car platform | Periodic Review 2008              | 6          |
| 2010/11                   | Ⓐ Abbeymount (Edinburgh)   | Bridge superstructure renewal  | Renewal to maintain Route Availability   | Renewal                           | 1          |
| 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              | 2          |
| 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          |
| 2010-2012                 | Ⓜ FCC platform lengthening   | Platform lengthening at Letchworth and Royston (down) (not in Thameslink scope)  | Increased capacity through train lengthening   | Periodic Review 2008              | 3          |
| 2012                      | Ⓝ Wakefield Westgate   | Longer platforms and provision of new bay platforms  | Increased capacity and improved performance and passenger facilities   | LTP Major Scheme Bid              | 4          |
| 2011                      | Ⓒ 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          |
| 2013                      | ⒶE 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                                      | At present unfunded               | –          |
| 2014                      | Ⓣ 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          |

Figure 17 Infrastructure Investment in CP4

| Implementation date | Project  | Project description   | Output change   | Funding              | GRIP stage |
|---------------------|--|---|---|----------------------|------------|
| 2014                | Ⓧ Alexandra Palace - Finsbury Park 3 <sup>rd</sup> 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                | Ⓜ 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          |
| 2010-2015           | Ⓧ 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 | 3          |
| 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          |
| 2009-2012           | Ⓜ Hitchin Interlocking renewal/resignalling                        | Renewal   | Maintain capability   | Renewal              | 5          |
| 2009-2011           | Ⓜ Peterborough signalling renewal                                  | Lineside equipment renewal  | Maintain functionality  | Renewal              | 5          |
| 2010-2012           | Ⓜ Doncaster – Leeds platform lengthening                           | Increased platform length at intermediate stations  | Increased capacity through train lengthening  | Periodic Review 2008 | 3          |
| 2009-2014           | IEP development/enabling works                                     | Infrastructure works to accommodate operation of IEP rolling stock  | Increased capacity  | Periodic Review 2008 | 2          |

## NRDF candidate schemes in CP4

Figure 18 Candidate NRDF schemes in CP4

| Implementation date | Project                                       | Project description   | Output change                                    | Funding                         | GRIP stage |
|---------------------|---|---|--|---------------------------------|------------|
| 2009/10             | Ⓚ Fletton                                     | Linespeed increase  | Performance improvements                         | Network Rail Discretionary Fund | 4          |
| 2009/10             | Ⓛ York – Northallerton                        | Up and Down Slow lines speed increase   | Journey time benefit and performance improvement | Network Rail Discretionary Fund | 1          |
| 2010                | Ⓩ 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                | ⓂⓂ Bathley Lane level crossing                | OHL enhanced protection   | Improved performance                             | Network Rail Discretionary Fund | 2          |
| 2011                | ⓂⓅ Hemsworth Down loops                       | Increase turn in and out linespeed  | Increased capacity and improves performance      | Network Rail Discretionary Fund | –          |
| 2011                | ⓂⓈ Doncaster area approach control signalling | Relaxation of restrictive signalling approach controls                                  | Improved performance                             | Network Rail Discretionary Fund | 1          |

## Renewals activity

Figure 19 shows the estimated renewals costs and activity volumes.

The precise timing and scope of renewal 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.

| <b>Figure 19</b> Summary of estimated renewals costs and activity volumes |                |                |                |                |                |                  |
|---|----------------|----------------|----------------|----------------|----------------|------------------|
| <b>£m (2009/10 prices)</b>  | <b>2009/10</b> | <b>2010/11</b> | <b>2011/12</b> | <b>2012/13</b> | <b>2013/14</b> | <b>CP4 total</b> |
| <b>Renewals</b>   |                |                |                |                |                |                  |
| Track   | 32             | 29             | 51             | 58             | 54             | 223              |
| Signalling  | 13             | 15             | 7              | 9              | 8              | 52               |
| Civils  | 14             | 18             | 16             | 16             | 15             | 78               |
| Operational property  | 46             | 45             | 30             | 12             | 16             | 149              |
| Electrification   | 6              | 8              | 7              | 8              | 8              | 37               |
| Telecoms  | 5              | 6              | 6              | 2              | 2              | 22               |
| Plant and machinery   | 4              | 3              | 2              | 4              | 5              | 17               |
| <b>Total</b>  | <b>118</b>     | <b>123</b>     | <b>120</b>     | <b>108</b>     | <b>108</b>     | <b>578</b>       |
| <b>Renewals volumes</b>   |                |                |                |                |                |                  |
| Track   |                |                |                |                |                |                  |
| Rail (km)   | 55             |                |                |                |                |                  |
| Sleeper (km)  | 20             |                |                |                |                |                  |
| Ballast (km)  | 37             |                |                |                |                |                  |
| S&C (equivalent units)  | 14             |                |                |                |                |                  |
| Signalling  |                |                |                |                |                |                  |
| SEUs (conventional)   | 1              | 45             | 6              | 0              | 5              | 57               |
| SEUs (ERTMS)  | 0              | 0              | 0              | 0              | 0              | 0                |
| Level crossings (no.)   | 1              | 2              | 6              | 0              | 7              | 14               |

## 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/<br>FWR1/<br>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            |

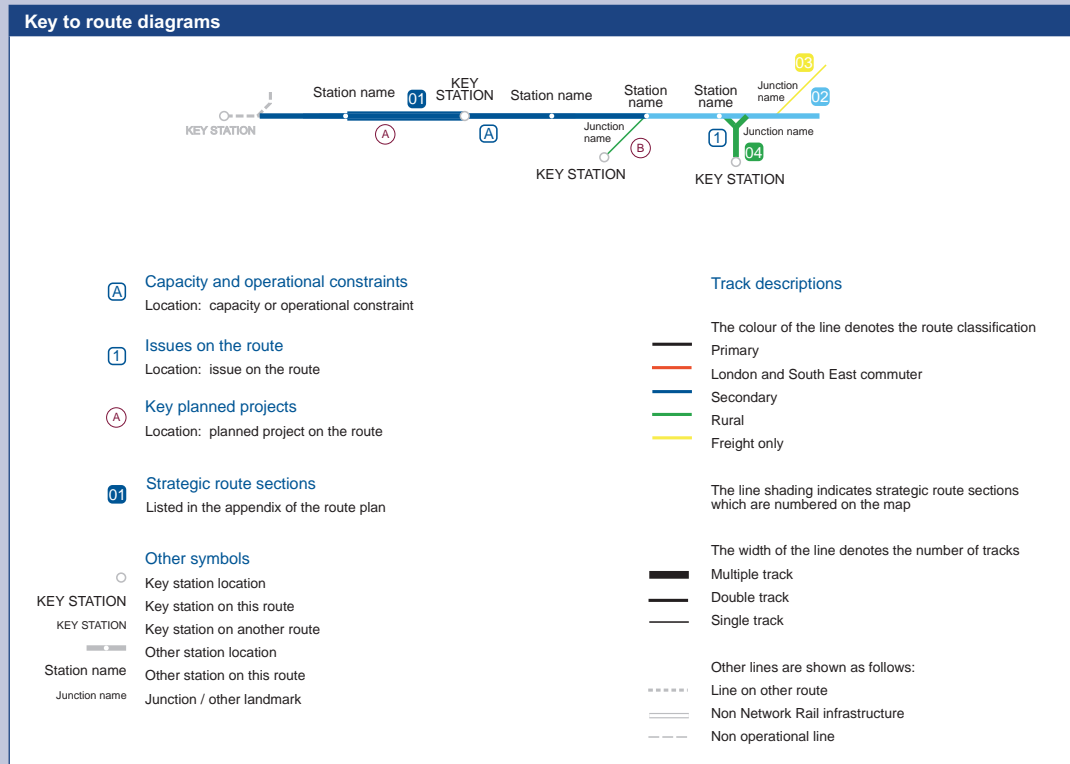
**Capacity and operational constraints**

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

## 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](http://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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