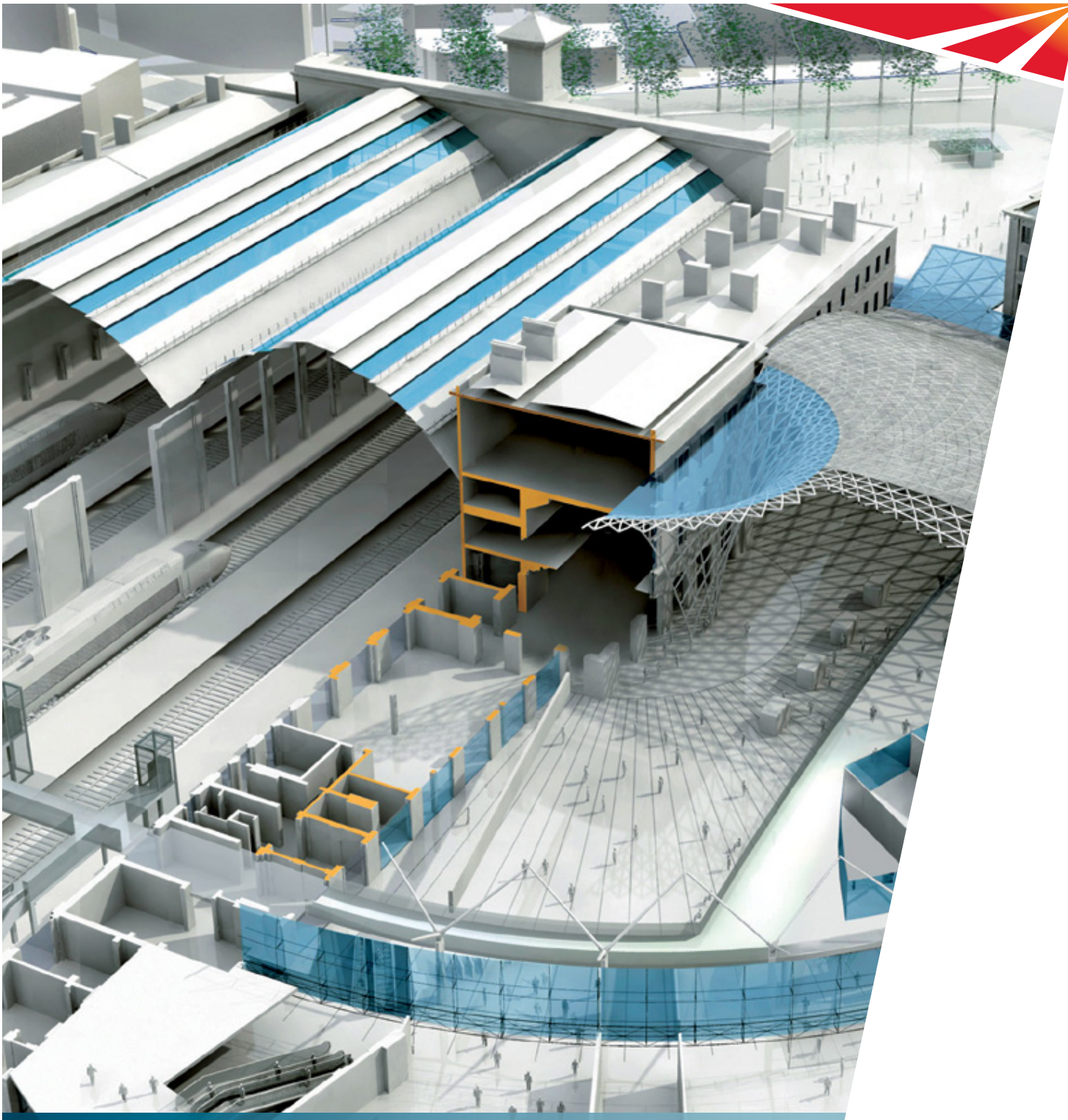
Moving ahead
Planning tomorrow's railways

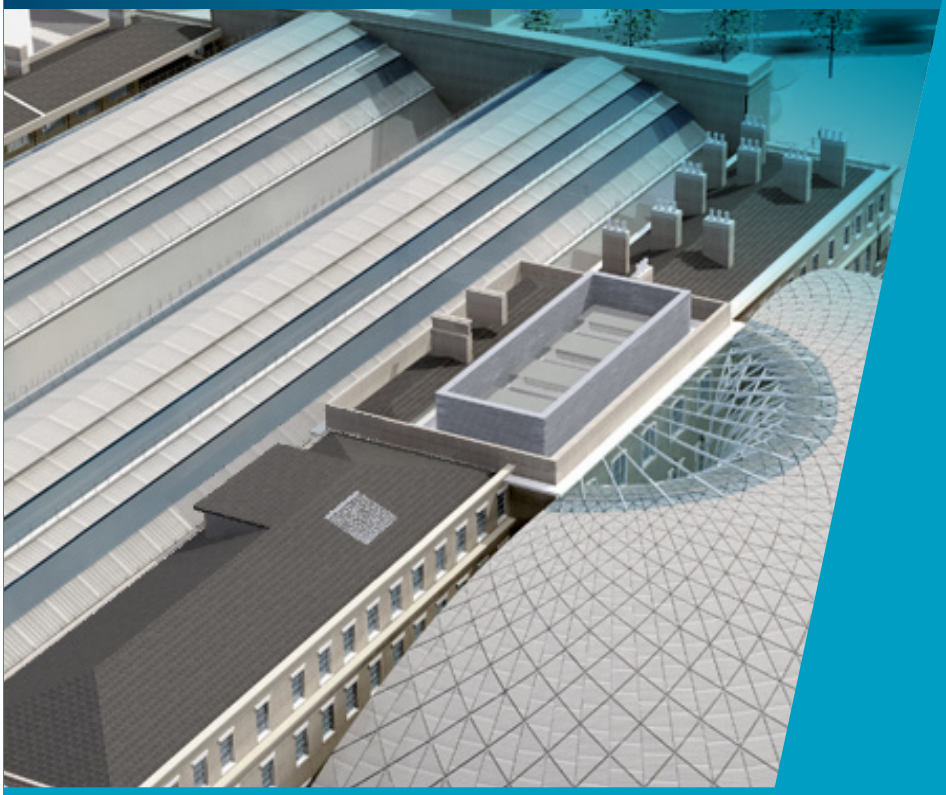
NetworkRail



Our railways play a vital role in building Britain's future

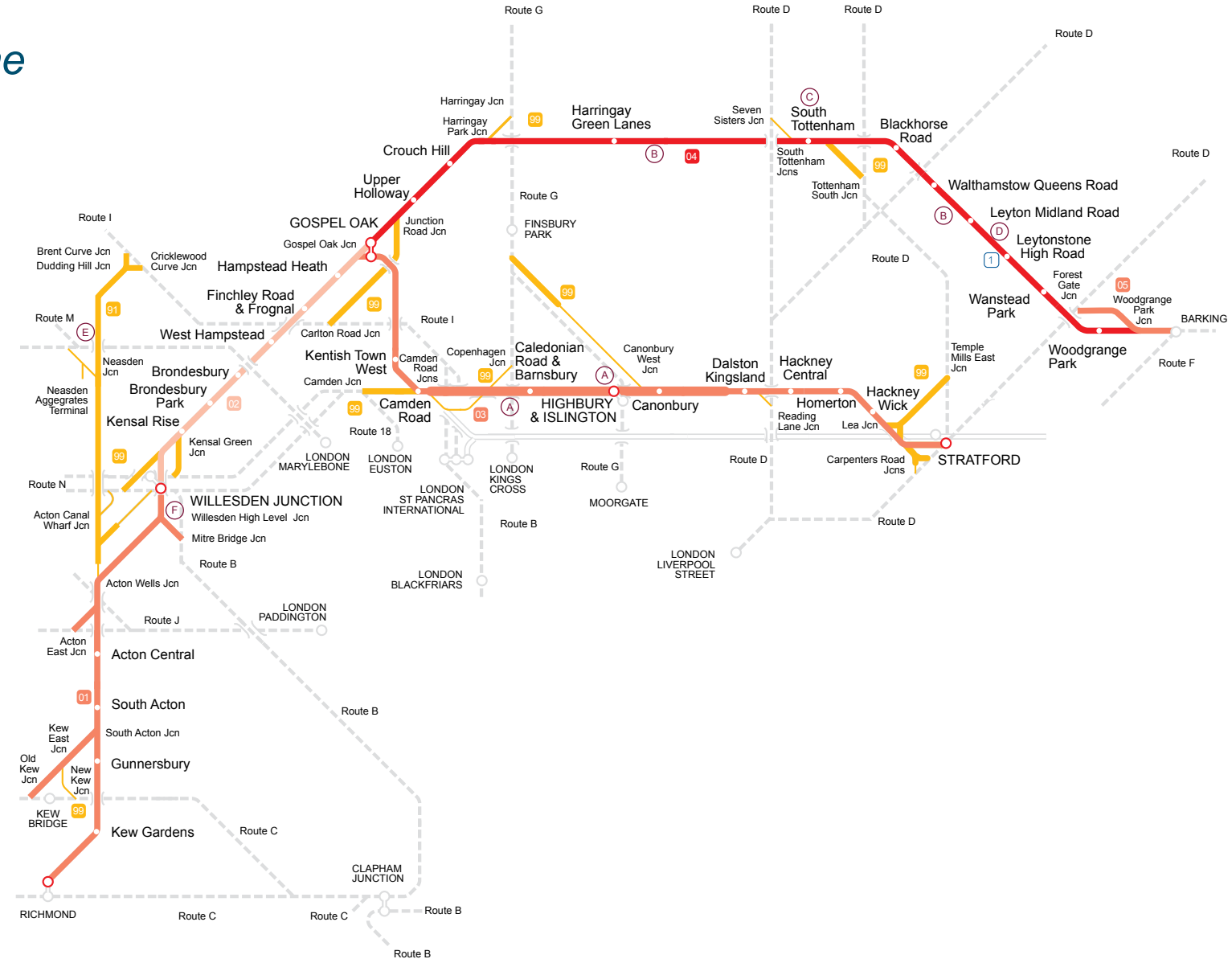
Planning tomorrow's railways

Our £500 million investment in King's Cross station will transform the experience of passengers using the station. We are delivering hundreds of projects across the network to build a bigger, better railway for passengers, freight and the whole of Britain.

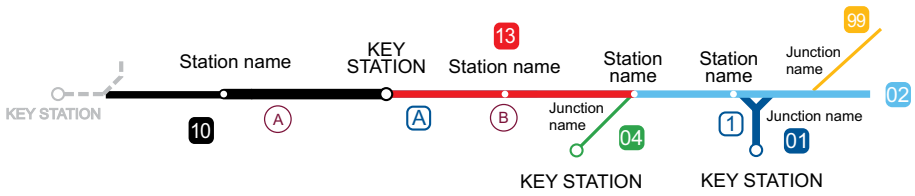


Route Plan E
North London Line

Route Plan E
North London Line



Key to route diagrams



Capacity and operational constraints

Location: capacity or operational constraint

Issues on the route

Location: issue on the route

Key planned projects

Location: planned project on the route

Strategic route sections

Listed in the appendix of the route plan

Other symbols

Key station location

KEY STATION — Key station on this route

KEY STATION — Key station on another route

Other station location

Station name — Other station on this route

Junction name — Junction / other landmark

Track descriptions

The colour of the line denotes the route classification

- Primary
- London and South East commuter
- Secondary
- Rural
- Freight only

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

The width of the line denotes the number of tracks

- Multiple track
- Double track
- Single track

Other lines are shown as follows:

- Line on other route
- Non Network Rail infrastructure
- Non operational line

Section 1: Today's railway

Route context

The North London Line (NLL) is a vital part of London's transport infrastructure and a major link between key arterial routes to and from the capital. It is a nationally important freight route and provides a key urban passenger service around London with connections to/from every arterial route north, east and west of London.

The main passenger markets are commuter and leisure journeys around London.

The Eastern Regional Planning Assessment (RPA), covering the period from 2011 to 2021, was published by the Department for Transport (DfT) in February 2006. The RPA sets out scenarios of continuing growth in commuting to the centre of London and Docklands. However parts of the current NLL route are already operating at or close to capacity in terms of train paths.

The NLL route is included in the Cross London Route Utilisation Strategy (CL RUS), which was published by Network Rail in August 2006 and established by the Office of Rail Regulation on in October 2006. The CL RUS proposed a range of measures for meeting growth on London's orbital routes up to 2016.

The CL RUS looked at options and recommendations for accommodating future growth, and options proposed by the CL RUS have been further developed for implementation under the North London Route Improvement Project (NLRIP).

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 10 year demand forecasts that were developed and agreed by the industry through the RUS Stakeholder Management Group.

Today's route

The principal elements of the NLL route are described below. The relevant Strategic Route Section is shown in brackets:

- the NLL which comprises the Richmond to Stratford route (E.01, E.02 and E.03)
- the Gospel Oak to Barking route (E.04 and E.05)
- the Dudding Hill lines (the freight route between Cricklewood, on the Midland Main Line (MML) and Acton Wells Jn - E.91)
- and associated connections to all of London's main radial routes.

Current passenger and freight demand

Passenger demand has been growing rapidly on the NLL. The North London Line serves local communities and provides both journey to work as well as all day business, leisure and shopping travel.

Some parts of the NLL compete with alternative modes of public transport such as bus and tube as well as car journeys on a congested road network, although in other sections rail has little competition in terms of journey time.

On the NLL demand is driven by increasing employment and population in Stratford, Docklands, north east and west London

There are several interchanges along the NLL route for onward travel. The main interchanges are at Stratford (LUL Jubilee and Central lines, West Anglia stopping service to Stansted Airport, DLR and the Great Eastern national rail route), Willesden Junction (LUL Bakerloo Line), Blackhorse Road (LUL Victoria Line), Highbury & Islington (LUL Victoria Line) and West Hampstead (LUL Jubilee Line and Thameslink/ Midland Main Line station is nearby).

Stratford is the gateway to the Docklands and employment in Docklands is expanding. Stratford itself is set to benefit from the new Stratford City development (currently under construction), and interchange with the High Speed 1 line to the Channel Tunnel.

Since the Freight Route Utilisation Strategy was published by Network Rail in March 2007 and established by the Office of Rail Regulation in May 2007, the demand forecasts have been revisited and further refined and agreed by the industry. Freight demand, especially in intermodal deep sea containers from the Port of Felixstowe is growing year on year by 4-5 percent. This demand could be further increased by the impending port developments at Felixstowe South (work commenced in 2008), and Bathside Bay, Harwich (approved March 2006) on the East Anglia route (Route D), as well as the development of the proposed deep sea London Gateway Port at Shell Haven on the Thames Haven branch (Thameside Route – Route F), which received approval in May 2007. These revised forecasts show that Felixstowe could generate around 26 additional trains per day (over and above the 2004/05 base year), but that this figure could fall to around 18 additional trains per day when the London Gateway Port is developed. London Gateway Port itself could generate up to as many as 30 trains a day by 2030.

Aggregates are the most significant bulk commodity crossing London. In terms of volume growth has been the most successful bulk rail business over the last 5 -10 years. Demand is set to see steady growth across the NLL due to major construction initiatives, including the growth of the City and Docklands, as well as continuing construction of the Olympic venues.

As a result there is increasing demand for train paths across the NLL, this is further explored in the capability and capacity sections.

Figure 1 Current train service level (Peak/Off-peak)

Station	tph
Richmond	3 Peak/4 off-peak
Stratford	up to 6 Peak/4 off-peak
South Tottenham	4 Peak/2 off-peak
Gospel Oak	3 Peak/2 off-peak

Current services

Passenger services on the NLL are run by London Overground (LOROL). DB Schenker, Freightliner Ltd, Freightliner Heavy Haul Ltd, Direct Rail Services (DRS) and First GBRf operate the main freight services.

The passenger service operated by LOROL on the core NLL offers 4 trains per hour (tph) between Richmond and Stratford. In the peaks the orbital service is supplemented by additional services between Stratford and Camden Road/Clapham Jn to relieve overcrowding. LOROL also operates 2tph on the Gospel Oak – Barking route.

New 3/4-car trains are currently being introduced on the Stratford to Richmond and Clapham Junction to Willesden Junction routes.

Figure 1 contains the tph frequencies on the NLL.

The NLL provides a vital cross London link for a number of long distance freight flows, from the ports of Felixstowe and Harwich and from Tilbury on Thameside. The whole route also sees significant volumes of freight to local terminals and yards in and around London including aggregates, sand and bulk commodities such as waste, automotive, petroleum, MOD and Olympics construction. There are also some LUL infrastructure services to Barking and Gunnersbury.

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

Figure 3 summarises the Traffic volumes.

Figure 2 Tonnage

Figure 3 Current use

	Passenger	Freight	Total
Train km per year (millions)	2	1	3
Train tonne km per year (millions)	485	427	913

Current infrastructure capability

The following maps provide an indication of the predominant capability on each section of the route.

As part of the Infrastructure Capability Programme a number of Network Changes to Route Availability and Gauge, which may affect some of the detail of these maps, have been issued for consultation. Details of the Network Changes being consulted can be found on the Network Rail website and details of Network Changes established can be found on the Network Rail website.

Current capability is shown in the Network Rail Sectional Appendix.

Figure 4 Linespeed

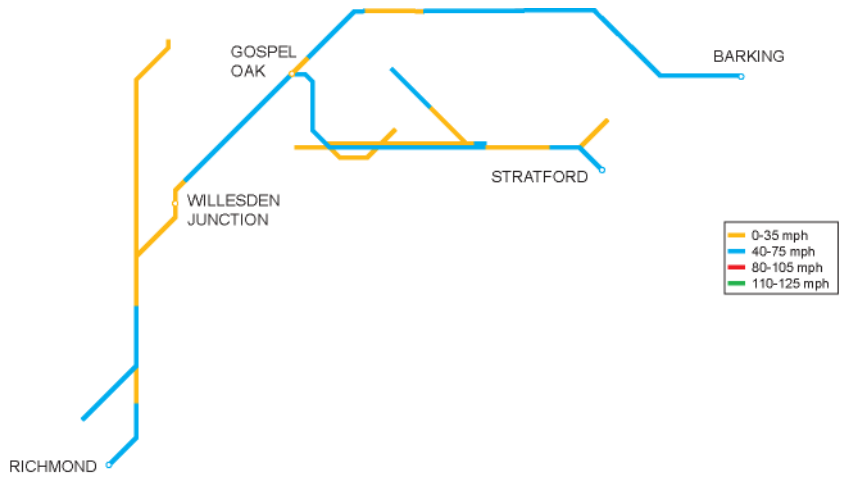


Figure 5 Electrification

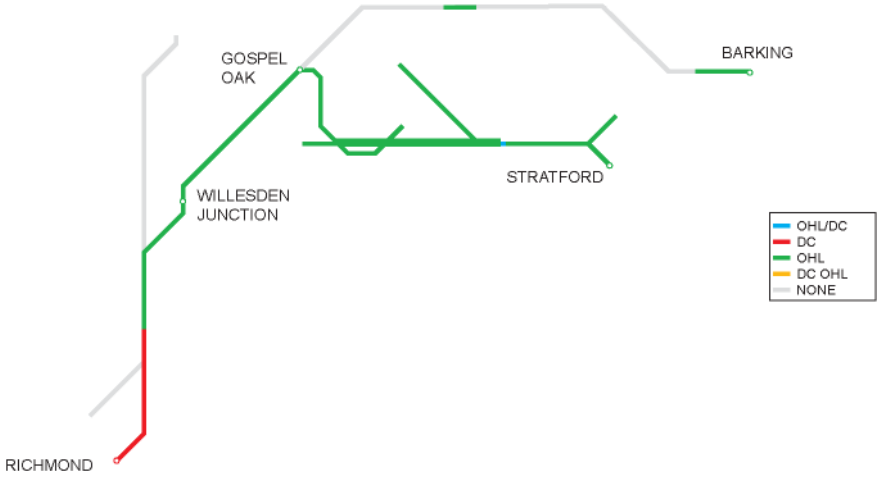


Figure 6 Route availability

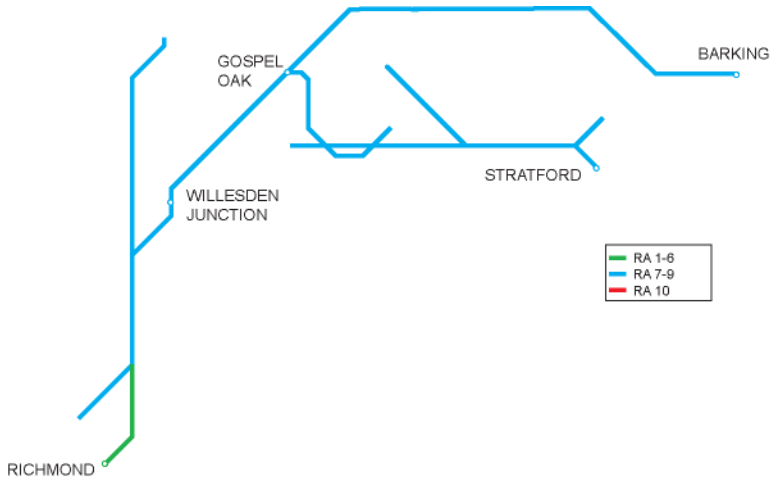
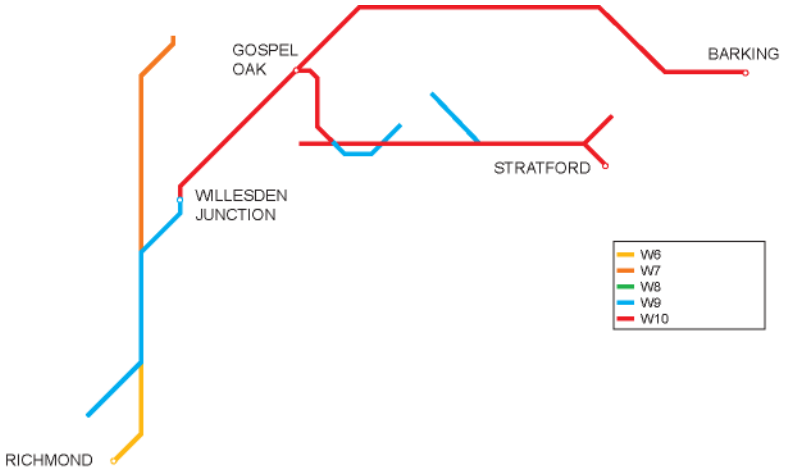


Figure 7 Gauge



Current capacity

The NLL capacity issues are documented in detail in the CL RUS and are therefore only mentioned briefly below. However, the whole of the NLL route is governed by the mixture of stopping passenger and through running freight services, complex junctions, and station occupancy. These issues are often interlinked and overall route capacity is constrained by a combination of these factors.

Key issues on the route are:

- current and future levels of both passenger and freight services on the NLL
- lack of alternative electrified route for freight traffic from Thameside away from the Great Eastern route between Forest Gate and Stratford
- long signalling headways and the large number of junctions
- weight restrictions for freight trains on the Gospel Oak – Barking line
- constraints on westbound services from Thameside across Gospel Oak Jn
- passenger overcrowding at a number of stations on the NLL including Blackhorse Road, Highbury & Islington, Dalston Kingsland and Homerton at peak times and high levels of transfers to/from the underground.

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

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

Route Section	
Stratford Low Level to Camden Road	6
Gospel Oak to Willesden Jn High Level	5
Willesden Jn High Level to Willesden HL Jn (inc. 3 Clapham Jn services)	7
Gunnersbury to Richmond (inc. LUL services)	12

Current performance

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

All passenger train services on the NLL, operated by LOROL, stop at all stations on the route and interact with through running freight trains. As a result the route is operating at close to track capacity for most of the day, which means that when a problem occurs there is a knock on effect on following services that can quickly cause large amounts of reactionary delay for what might be initially a small specific incident.

Analysis of recent performance shows the main problems on the NLL to be broken rails and track faults, points failures, track circuit failures, trespass and vegetation obstructing the infrastructure.

Figure 9 2009/10 PPM

TOC	Forecast MAA	As at period
London Overground	93.0%	11

Section 2: Tomorrow's railway: requirements

HLOS output requirements

Figure 10 below shows the HLOS output requirement for the total demand to be accommodated on the former strategic route which includes Route E: North London Line.

Figure 10 Total demand to be accommodated by Strategic Route

Routes	Annual passenger km in 2008/09	Additional passenger km to be accommodated by 2013/14
NLL/Thameside	1,047	118

Future demand in CP4

The Regional Spatial Strategy focuses housing development in the Thames Gateway and continued growth is expected into central London as well as Docklands where employment is expanding. London Plan predictions for increased housing and jobs in east, north east and west London will also fuel rising demand on the orbital services.

Passenger demand is predicted to increase by 1 to 1.5 percent a year during the morning peak across the North London route in our RUSs. On the morning peak services into Stratford, passenger numbers are predicted to increase twice as fast as those in the westbound direction.

Stratford is likely to see the most development. The new High Speed 1 interchange station is now open, with direct services from London St Pancras to Margate and Dover. The DLR has opened up an extension to London City Airport (and has now commenced construction of a new link to Stratford International station. There is also a direct rail service between Stratford and Stansted Airport.

The Freight RUS set the initial demand for freight services in CP4, which was reinforced in the GA RUS and has been expanded with revised long term forecasts agreed by the industry.

London is the host city for the 2012 Olympic Games and Paralympic Games (the Games) and Network Rail is now working with the Olympic Delivery Authority (ODA) on the development and ongoing construction of facilities to meet the needs of the Games taking account of the requirement for such schemes to have a legacy value by supporting the long term development of Stratford City and improved access to Docklands. This is fuelling additional demand for freight services to support construction of the Olympic venues. Network Rail is also working with the ODA to ensure that the increased demand for passenger travel to Stratford is met during the course of the Games.

Deep sea container traffic continues to grow and this will fuel a demand for freight paths from Felixstowe, Bathside Bay and London Gateway Port when it becomes operational. Aggregates will see steady growth around the NLL driven by major construction initiatives such as the Olympic venues/Lower Lea Valley Development, Thames Gateway and Crossrail.

The following factors are likely to influence the growing demand on the NLL:

- peak commuting is growing to central London, the Docklands and around the orbital route
- the Stratford City development
- developments in the Docklands
- Extension of the East London Line to Highbury & Islington
- expansion of the Port of Felixstowe, development of the ports of Bathside Bay and the deep sea London Gateway Port

The CL RUS explored these growing areas of demand and contains a number of capacity improvements which are now being developed by Network Rail and TfL (the Concessionaire for the London Overground services). These improvements are summarised in the capacity section below.

The London and South East RUS is currently being developed and will highlight new gaps and recommendations for meeting growth on the network.

Future demand beyond CP4

Increases in passenger demand will continue to be generated through CP5 by the Stratford City development and employment in Docklands and the City of London. There will also be a permanent increase following the redevelopment of the Olympic site after the Games.

Longer term forecast to 2030 of freight demand have been agreed with the industry; these show continued growth in freight beyond CP4.

The demand for freight paths is forecast to increase on the route as the ports of Felixstowe, Bathside Bay and London Gateway Port are developed and continue to grow. It is expected that aggregates volumes will continue to rise as the level of construction work for house building increases and Crossrail.

Section 3: Tomorrow's railway: strategy

Figure 11 summaries 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 11 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2011	NLL Route Improvements	Track remodelling, platform extensions, resignalling, closure of Signal boxes and OLE works to deliver reduced headways and freight loops	Longer and more frequent trains with additional peak and all day capacity
2011	Willesden High level Turnback	Motorised, signalled turnback	Increased capacity

Figure 12 shows how the HLOS load factor targets for locations on the route are met by the proposed strategy.

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

Figure 12 Impact on HLOS peak capacity metric

London Terminals and regional Hubs	Peak three hours				High peak hours			
	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4
Other London Termini*	533,400	707,100	839,400	64%	266,800	306,700	360,700	74%

* the load factor requirement in the HLOS applies as an average across 12 London stations.

Strategic direction

Network Rail believes that the solution to passenger growth and future capacity requirements can be potentially met by a combination of several generic initiatives:

- train lengthening, supported by platform lengthening and other rolling stock changes, which will require a complete review of the available traction power supply
- incremental introduction of additional services
- incremental enhancements delivered as improvements to planned track and signalling renewals together with stand alone enhancements. These will improve performance (necessary for growth), enable increases in train paths and facilitate timetable restructuring
- provision of additional passenger capacity at key stations.

Port developments at Felixstowe, Bathside Bay and London Gateway Port will bring significant demand for increased freight services across the route.

To accommodate the high levels of growth the current capacity and capability of the NLL will need to change, which will include headway improvements and remodelled tracks between Camden and Dalston. The completion of the extension of the East London Line from Dalston to Highbury & Islington will add additional journey opportunities.

More details on the infrastructure enhancements that are needed can be found in the capacity and gauge sections.

Figure 13 Tonnage growth

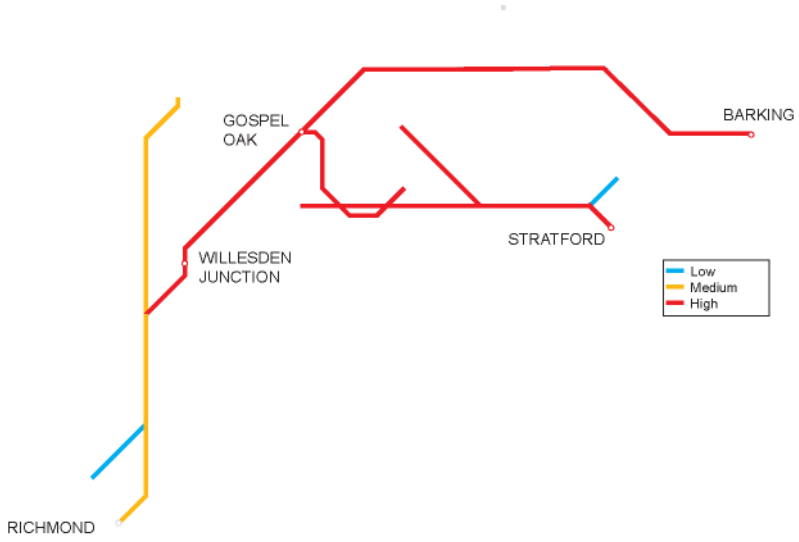


Figure 13 indicates the forecast percentage change in tonnage to 2019.

Future train service proposals

Network Rail has been working with LOROL, TfL and the DfT on developing plans for meeting growth in CP4.

London Overground

To meet peak demand on these services new 3/4-car Class 378 EMUs are being introduced onto the NLL route and LOROL has ordered new 2-car Class 172 DMUs for their Gospel Oak – Barking services (due to be introduced in 2010). These rolling stock introductions in conjunction with revised service patterns and remodelled infrastructure will provide a much improved service experience for NLL passengers.

In order to keep up with growing demand on the Stratford – Richmond, and Clapham Junction – Willesden Junction routes, services are planned to be increased in length from 3-car to 4-car in 2010.

LOROL plan to create a link between the Stratford to Richmond service and the West Croydon, Crystal Palace, New Cross Gate and Dalston Junction service by extending ELL services to Highbury & Islington in 2011.

The new trains are proposed to be berthed at existing locations as well as potentially berthing some trains at Orient Way (near Stratford).

Freight services

The following parts of the route are predicted to see higher freight flows due to expansion at the east coast ports and the development of London Gateway Port:

- Barking to Gospel Oak
- Stratford to WCML via Camden and Primrose Hill
- Gospel Oak to Acton.

More detail on future services has been incorporated into the capacity section.

Future capability

Gauge

Until 2008 the primary route for W9 and W10 gauge freight traffic in the region was along the Great Eastern route from the east coast ports of Felixstowe and Harwich to the WCML via Ipswich tunnel, Stratford and the NLL (via Primrose Hill).

The Gospel Oak – Barking route and the North London Line between Gospel Oak and Acton is now gauge cleared for W9 and W10 freight traffic and provides a necessary diversionary route for this increasing type of freight traffic from Thameside away from the GEML & core NLL via Forest Gate, Stratford and Camden. This was achieved by TIF programme funding and included gauging works through Hampstead Heath tunnel, which was a major obstacle on the route. Additional proposed works including strengthening, re-signalling and track remodelling at Camden will further help freight movements across London.

The West Anglia cross country route from Ipswich to the ECML via Bury St Edmunds, Ely, March and Peterborough has also been cleared for W9 and W10 gauge freight services during 2008 and further clearance works between Peterborough and

Nuneaton will be undertaken during CP4 to give a cleared route from the haven ports (Felixstowe and Harwich – Route D) through to the WCML. In conjunction with this, capacity works, such as improving signalling between Kennett and Bury St Edmunds, are being developed through the Strategic Freight Network that will allow additional freight services to operate. These works will absorb most of the freight growth from the proposed east coast port developments at Felixstowe and Bathside Bay and relieve the congested GEML and NLL routes. Freight management between Anglia and ECML and WCML is critical if freight is to flow smoothly across the NLL.

Line speed

Speed improvements on the Gospel Oak – Barking route are being assessed in conjunction with the structures work bank.

Tonnage

Increased demand for freight traffic to and from the east coast ports on the East Anglia route and London Gateway Port on the Thameside route will cause much higher tonnages to traverse the NLL, which will bring both capacity issues and the need for additional maintenance due to increased wear and tear on the assets. The following parts of the route are predicted to see the highest increases of freight tonnage carried:

- Stratford Central Jn to Camden Jn via Primrose Hill
- Barking to Acton via Gospel Oak and Willesden.

Platform lengths

It is generally accepted that the practical approach to continued passenger growth is the incremental lengthening of trains, especially as this solution is flexible, caters for the wide range of different growth scenarios and makes better use of scarce and high value paths.

On the NLL platforms are to be extended to allow the operation of longer trains.

Future capacity

The forecasts of significant further growth, as detailed in the future demand section above, pose significant problems and are driving a requirement for additional capacity.

Network Rail has been working with LOROL, TfL and the DfT on delivering capacity improvements in CP4 and is continuing to develop proposals for CP5 and beyond.

Network Rail has been working with TfL and LOROL on the North London Route Improvement Project (NLRIP), which will increase capacity on the NLL as well as developing a programme of upgrades to the Gospel Oak – Barking line and these are briefly detailed below:

- on the NLL in the short term, new high capacity rolling stock is being introduced, followed by the construction of the platform extensions mentioned previously (CP4)
- extensive route remodelling between Dalston and Camden to allow improved services (as described earlier) to be delivered, including the link to the East London Line, (CP4). This enhanced capacity also allows for freight growth across the route
- on the Gospel Oak – Barking line in the short term higher capacity diesel trains are to be introduced (CP4)
- In the medium term TfL are considering upgrades to both the route and train services
- The growth of London Gateway Port requires the upgrade of the route as discussed above.

Future performance

Both passenger and freight operators want a high level of performance from the network.

Figure 14 sets out the planned PPM for the operator. The PPM figure quoted represents the expected contribution of the TOC to the sector-level regulatory outputs in the CP4 delivery plan. This is 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. 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.

Figure 14 Forecast PPM MAA – CP4 plan

	2010/11	2011/12	2012/13	2013/14
London Overground	93.1%	94.0%	94.4%	94.6%

London Overground

The performance of the TOC is currently 93.0 percent PPM MAA and this should reach 93.4 percent by the end of March 2010. The TOC will undergo considerable change over the forthcoming years including a large increase in the number of services run, the introduction of a through service on the East London Line, and the investment in new rolling stock. The North London Route Improvement Project will provide much needed additional infrastructure and facilitate the increased level of train services.

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

- major uncertainty on the performance of the ELL service and how it will interact with Southern trains in South London
- risk of enhanced service on the Gospel Oak and North London lines
- freight growth – and the potential increased use of the North London Line
- better information on small delays through better data capture and analysis
- passenger growth, especially until the new rolling stock has bedded in
- new rolling stock and a predicted large decrease in the miles between trains breaking down
- increase in the speed of response and getting engineers to the site of a failure
- regulation and timetable resilience work
- introduction of GSM-R.

The route plan is being developed around these key points and currently suggests that performance on London Overground will be around 94.9 percent by April 2014. This includes an allowance for passenger/traffic growth and an increase in engineering work. The TOC and Network Rail are developing a more detailed 5 year plan as part of the JPIP.

Network availability

The high level of capacity utilisation on the route has meant that there has been difficulty in gaining access for maintenance and renewals work. As a result a pattern of cyclical possessions had been agreed for the NLL comprising five to six hour possessions each weeknight, for the maximum lengths of line that the overnight freight service will permit, on a twelve weekly cycle grouped into convenient lengths. However due to extensive remodelling works being undertaken to upgrade the route and accommodate the East London Line extension, the current cyclical arrangements will need to be reviewed with the train operators following completion of the works.

Although the introduction of cyclical access onto the NLL route is delivering improved maintenance and performance in most places, the need to run increasing services to cater for rising demand may require a revision of the current regimes. Options for improvement on the NLL are being developed as a result of the CL and GA RUSs and completion of gauge enhancements on the NLL, Gospel Oak – Barking and cross country routes will greatly enhance the ability to divert trains at nights/weekends to improve maintenance opportunities, which is bringing the route closer towards becoming a ‘Seven Day Railway’.

Long term opportunities and challenges

The work undertaken in the RUSs identifies key challenges that the rail industry will face in the long term, and through analysis and optioneering the most appropriate methods to resolve these issues will be determined. A key element of this work is to understand the issues that cross the RUS boundaries, and this work will then inform planning in CP5 and beyond.

Network Rail anticipates that accommodating growth in commuting to central London and the Docklands, together with developments around Stratford, will be a significant challenge. Similarly, on the parts of the core NLL and other sections of the route, enhancements will be required if additional services are to be operated on lines, which are already operating at, or very close to, capacity.

The suggested strategy for improving passenger and freight growth and future capacity requirements on the NLL are being developed through the NLRIP project. In addition Network Rail is working with TfL and LOROL on a number of enhancements to improve capacity both for the Games and to meet TfL’s longer term aspirations as part of its North

London Railway concession, which could potentially include future electrification of the Gospel Oak – Barking route. Electrification of this route would allow an electrified diversionary route across London for Thameside freight as well as providing capacity relief between Forest Gate Jn and Stratford on the East Anglia route (Route D).

The Strategic Freight Network vision includes making the cross London network fit for future expansion. The growth in the Ports of Felixstowe and the new Ports at Bathside Bay in Harwich and London Gateway on North Thameside will provide large growth in freight. The cross London network will need to cope with trains using the London radial routes and linking these with the local terminals and routes.

A further important area, which was covered in the CL RUS, is public access to the network. The following areas were considered:

- station capacity
- station facilities

Network Rail is working with LOROL and TfL in developing schemes to address station capacity issues and improve station facilities using a number of funding mechanisms including the National Station Improvement Programme (NSIP).

The Department for Transport published its formal consultation document Delivering a Sustainable Transport System (DaSTS) in November 2008. It sets out long term transport priorities for the period to 2019 and beyond and reflects conclusions from the Eddington Study and the Stern review.

The document sets out five clear transport goals for the network these are:

- To support national economic competitiveness and growth by delivering reliable and efficient transport networks
- To reduce transports emissions of carbon dioxide (CO2) and other greenhouse gasses, with the desired outcome of tackling climate change
- To contribute to better safety and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health
- To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society, and
- To improve quality of life for transport users and non transport users, and to promote a healthy natural environment.

Rail has potential to help meet these objectives and Network Rail will continue to engage with the Regions and Local Authorities at all levels of the process. There are four stages in the process. In stage one each Region was invited to propose a number of strategically relevant studies to take forward which they believe will meet the DaSTS objectives. The DfT then selected the studies that would progress into stage two to generate options for appropriate interventions. All studies are currently in stage two and need to produce a long list of options by the end of March 2010 for further review. Stage three will involve the sifting and packaging of options, while stage four will see the completion of an overall programme, with all studies complete by 2012.

As part of the DaSTS programme there are both National and Regional studies, the national studies are led by the DfT and the local studies are led by the Regions. There are a number of joint studies with the involvement of both the DfT and the Regions.

There is a national Freight Modal Choice study looking to confirm the economic, social and environmental benefits of current freight movements by non-road modes on national network corridors and to identify where changes in future modal choice, from road to rail or water, could address issues on the network and deliver against the five DaSTS goals. This includes consideration of the capacity and capability of the national infrastructure to accommodate these changes in modal choice.

On this route the studies that may affect long term opportunities and challenges are:

- Sustainable transport options to support housing and economic growth
- Role of transport options to support housing and economic growth
- Role of transport in addressing peripherality
- Transport options for London Arc and Thames Gateway
- Carbon plus study
- Enhancement of regional transport model
- Option generation, co-ordination and prioritisation
- London to Haven ports corridor study
- Freight from road to rail.

Links to RUS documents can be found on Network Rail's website www.networkrail.co.uk

Infrastructure investment in CP4

Figure 15 Proposed enhancements in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011	Ⓐ NLL capacity enhancements	Track remodelling, improved headways, platform extensions and loops	Capacity Enhancement	Periodic Review 2008/ Third Parties	6
2010/11	Ⓑ South Tottenham S&C renewal	S&C renewal	Renewal	Network Rail	3
2010	Ⓒ T&H bridge reconstructions	Bridge reconstructions at Skeltons Lane, Acacia Road, Lansdowne Road, Sansome Road, Harrow Road, Montague Road	Renewal	Network Rail	3
2010	Ⓓ Neasden S&C renewal	S&C partial renewal	Renewal	Network Rail	4

NRDF candidate schemes in CP4

Figure 16 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011	Ⓐ Willesden High Level Turnback	Turnback siding	Capacity Enhancement & Performance Improvement	Network Rail Discretionary Fund	5

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

Renewals activity

Figure 17 shows the estimated renewals costs and activity volumes.

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

It should be noted that in order to manage the deliverability of our Civils, Signalling & 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 17 Summary of estimated renewals costs and activity volumes

£m (2010/11 prices)	2010/11	2011/12	2012/13	2013/14
Renewals				
Track	9	3	9	8
Signalling	5	5	4	6
Civils	1	1	4	4
Operational property	3	3	1	1
Electrification	0	1	1	1
Telecoms	-	-	-	-
Total renewals	**18**	**12**	**19**	**19**
Renewals volumes				
Track				
Rail (km)	11	3	9	9
Sleepers (km)	2	0	2	2
Ballast (km)	2	0	2	2
S&C (equivalent units)	8	4	8	8
Signalling				
Conventional (SEU)	0	0	0	0
ERTMS (SEU)	0	0	0	0
Level crossings (no)	0	0	0	0

Appendix

Figure 18 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
E.01	NLL: Richmond/Old Kew Jn – Willesden Jn	various	London & SE	DfT	No	various	8 (6)	various	various	TCB	various	2
E.02	NLL: Willesden Jn – Gospel Oak	BOK2 (BOK3)	London & SE	DfT	No	W10 (W9)	8	45 (20)	25kv AC	TCB	various	2
E.03	NLL: Gospel Oak – Stratford	various	London & SE	DfT	No	W10 (W9)	8	various	25kv AC	TCB	Various	2
E.04	Gospel Oak – Woodgrange Park	TAH (GOJ)	London & SE	DfT	No	W10 (W9)	8	various	None (25kv AC)	TCB (AB)	various	2
E.05	Forest Gate Jn – Barking	various	London & SE	DfT	No	W10 (W6)	8	45 (25)	25kv AC	TCB	3	2
E.90	NLL: No1 Lines	various	Freight	DfT	No	W10 (W9)	8	20 (15)	25kv AC	TCB	various	2 (1)
E.91	Dudding Hill Line	CAW (BDH)	Freight	DfT	No	W7 (W9)	8	30	None	AB (TCB)	AB (5)	2
E.99	Other Freight Lines	various	Freight	DfT	No	various	various	< 40	various	TCB (OTW)	various	2 (1)

Other issues on the route
1 Route section would need an upgrade to allow a diversion of strategic freight flows (to release Forest Gate – Stratford capacity, see route D)

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March 2010