

Route Plans 2008
Route 6
North London Line
and Thameside



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Route 6 North London Line and Thameside



Section 1: Today's railway

Route context

The North London Line 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 Thameside route runs from London Fenchurch Street to Shoeburyness, with a loop line between Barking and Pitsea via Tilbury and a branch between Upminster and Grays, which carries a mixture of commuter and leisure traffic, and substantial freight movements to and from North Thameside.

The main markets are commuter and leisure journeys into and around London, in particular to the City, Docklands and north London from Essex and the Thames gateway (as well as the London boroughs).

The North London Line part of the route is included in the Cross London Route Utilisation Strategy (RUS). Following consultation the final document, which was published in August 2006, proposed a range of measures for meeting growth on London's orbital routes up to 2016. The Cross London (CL) RUS was established by the Office of Rail Regulation on 30 October 2006.

The Thameside part of the route is included in the Greater Anglia (GA) RUS, which was established by the Office of Rail Regulation

on 18 February 2008. The RUS looks forward to 2016 and 2021 and also contains a view on long term strategy.

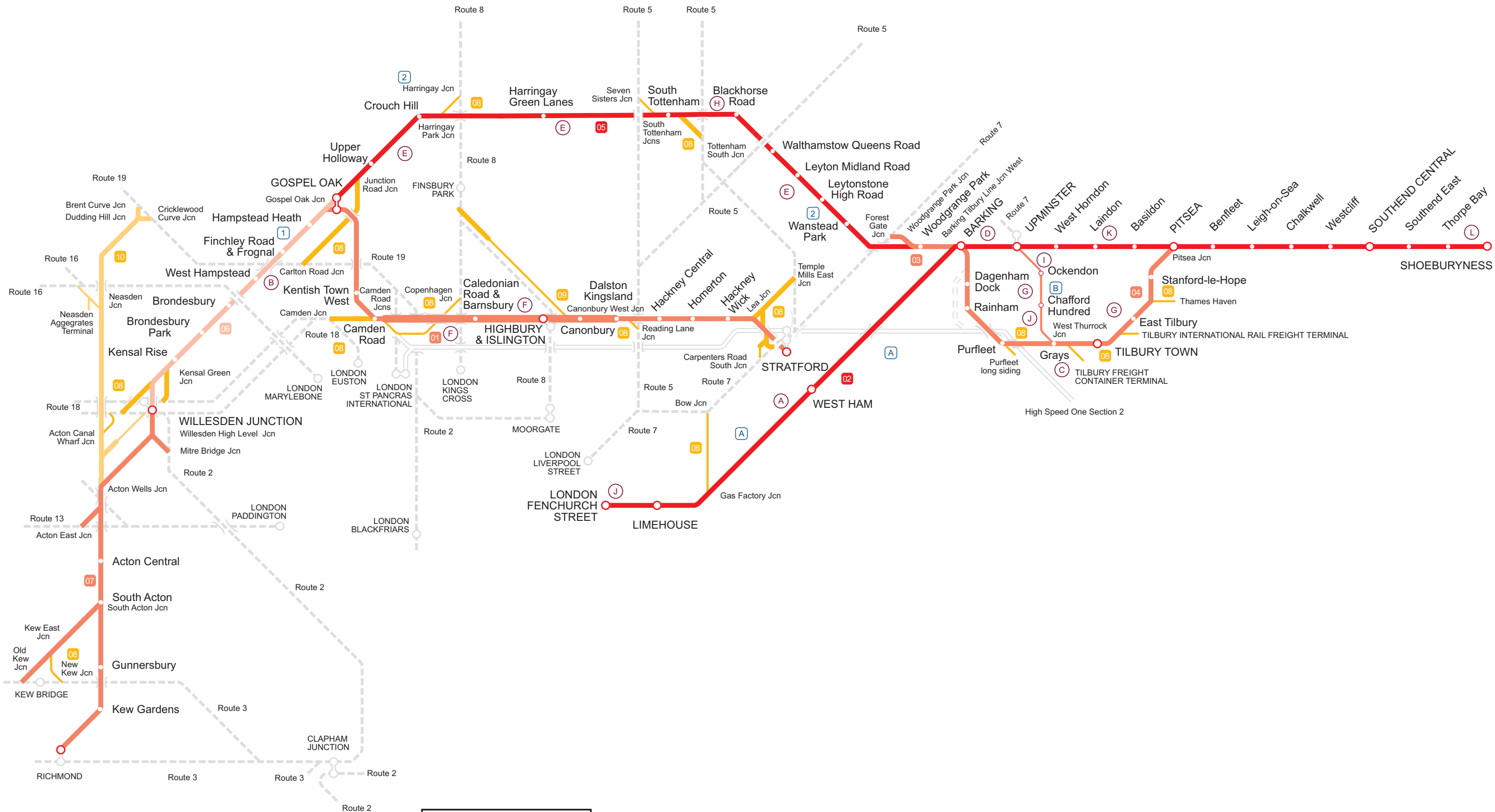
The Eastern Regional Planning Assessment (RPA), covering the period from 2011 to 2021, was published by the DfT on 16 February 2006. The RPA sets out scenarios of continuing growth in commuting to the centre of London and Docklands. However parts of the current NLL and Thameside route are already operating at or close to capacity in terms of train paths. As with the CL RUS, the GA RUS looked at options and recommendations for accommodating future growth, and options proposed by the CL RUS are being developed for implementation under TfL's North London upgrade project.

Today's route

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

- the North London Line (NLL) which comprises the Richmond to Stratford Low Level route (06.01, 06.06, 06.07 and 06.09) – the section between Stratford Low Level and North Woolwich (06.11) closed to traffic from Sunday 10 December 2006 – the Gospel Oak to Barking route (06.03 and 06.05), the Dudding Hill lines (the freight route between Cricklewood, on the Midland Main Line, and Acton Wells Junction – 06.10) and associated connections to all of London's main radial routes; and
- the Thameside route comprises the main line (06.02) and loop together with a line connecting Chafford Hundred station (close to the Lakeside shopping complex) with Upminster and Grays (06.04). There is also a freight only branch line to Thames Haven (part of 06.08).

Route 6 North London Line and Thameside



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

Current passenger and freight demand

Passenger demand has been growing rapidly on the North London line (peak loadings rose by 7.8 percent between 2005 and 2006). Capacity was increased on the Thameside route last year, when passenger numbers increased by around 10 percent on the previous year. The North London Line serves local communities and provides both journey to work as well as all day business, leisure and shopping travel. The Thameside route sees a large volume of commuter traffic into central London and the Docklands (more than 27,000 peak passengers a day were recorded in the autumn 2006 counts) as well as leisure traffic, especially to the major shopping development at Lakeside between Grays and Upminster.

Some parts of the North London Line 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. The Thameside route competes with the A127, A12 and A13 highways, which extend right through Docklands and into central London.

On the North London line demand is driven by increasing employment and population in Stratford, Docklands, north east and west London. On the Thameside route demand is driven by employment in the City and Docklands and future growth will be driven by the projected increases in housing stock in the Thames Gateway area.

Although the majority of the current demand from Thameside is into Fenchurch Street, a significant number of passengers interchange at West Ham with onwards journeys via the underground Jubilee Line and Docklands Light Railway.

There are several interchanges along the North London Line route for onward travel. The main interchanges are at Stratford (LUL Jubilee Line, DLR and the Great Eastern route), Blackhorse Road (LUL Victoria Line), Highbury & Islington (LUL Victoria Line) and West Hampstead (LUL Jubilee Line and Thameslink/ Midland Main Line stations are nearby). Stratford is the gateway to the Docklands from the North London Line and employment in Docklands is expanding. Stratford itself is set to benefit from new development, and demand is set to grow.

The Freight Route Utilisation Strategy 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. Freight demand, especially in intermodal deep sea containers from the port of Felixstowe is growing year on year by 4-5 percent. This demand will be further increased by the impending port developments at Felixstowe South (approved February 2006), and Bathside Bay, Harwich (approved March 2006) on the Great Eastern route (Route 7), as well as the development of a deep sea port on the Thameside route, London Gateway Port (Shell Haven), which has now also received approval. These forecasts in the Freight RUS 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 trains per day if London Gateway Port is developed. The Freight RUS predicts that London Gateway Port itself is forecast to generate around 8 trains per day.

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 North London Line and Tilbury Loop due to major construction initiatives, including the provision of additional housing in London and the East of England, the growth of the City and Docklands, as well as construction of the Olympic venues.

The High Speed 1 interchange sidings at Ripple Lane for freight services to/from Channel tunnel are now operational.

This will increase demand for train paths across the North London Line & Thameside route and is further explored in the capability and capacity sections below.

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

Station	tph
Richmond	4 Peak/4 Off Peak
Stratford	6 Peak/4 Off Peak
South Tottenham	3 Peak/2 Off Peak

Current services

Passenger services on the North London Line were operated by Silverlink up to November 2007 when Transport for London took over responsibility for the NLL concession rights. Train services are now run by London Overground. Passenger services on the Thameside route are operated by c2c. English Welsh and Scottish Railway (EWS), Freightliner, Direct Rail Services (DRS) and First GBRf operate freight services.

The passenger service structure on the core North London Line offers 4tph between Richmond and Stratford Low Level. In the peaks the orbital service is supplemented by two additional services between Stratford Low Level and Camden Road/Clapham Junction to relieve overcrowding.

Figure 1 contains the tph frequencies on the North London Lines (excluding additional peak services between Stratford Low Level and Camden Road/Clapham Junction).

On the Thameside route the passenger service structure is affected by the complexity of the network and the different stopping patterns. There are a variety of peak and off peak services:

- to Fenchurch Street via the main line from Laindon, Shoeburyness and Thorpe Bay;
- to Fenchurch Street via the Ockendon branch from Pitsea, Southend Central and Stanford-le-Hope; and
- to Fenchurch Street via the Tilbury Loop from Grays and Pitsea.

The North London Line provides a vital cross London link for several 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 (such as Purfleet and Dagenham).

Figure 2 contains the off peak tph frequencies into Fenchurch Street.

Figure 3 contains the morning peak arrivals at Fenchurch Street between 08:00 and 09:00.

Figure 2 Current train service level (Off Peak)

Station	tph
Basildon	4
Grays	4
Ockendon	2
Shoeburyness	4
Southend Central	6

Figure 3 Current train service level (Peak)

Station	No. of services
Basildon	4
Grays	8
Ockendon	4
Shoeburyness	6
Southend Central	8

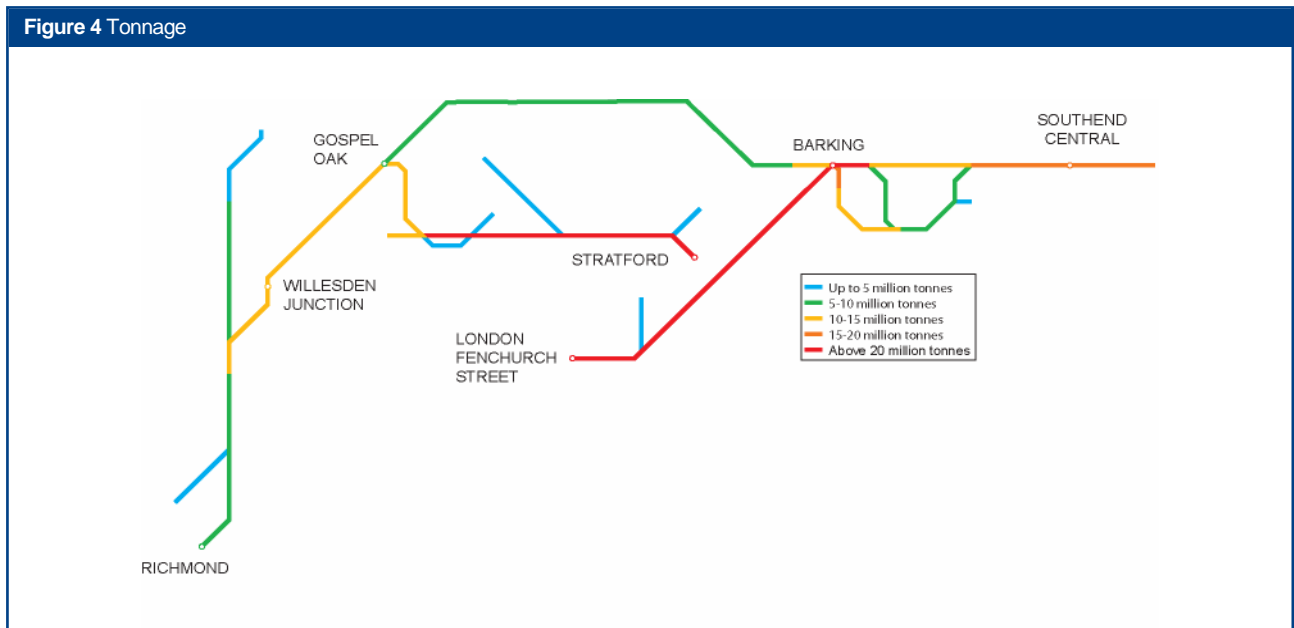


Figure 4 shows the total annual tonnage levels on the route.

Traffic volumes are summarised in Figure 5.

Figure 5 Current use

	Passenger	Freight	Total
Train km per year (millions)	8	1	9
Train tonne km per year (millions)	1,875	517	2,392

Current infrastructure capability

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

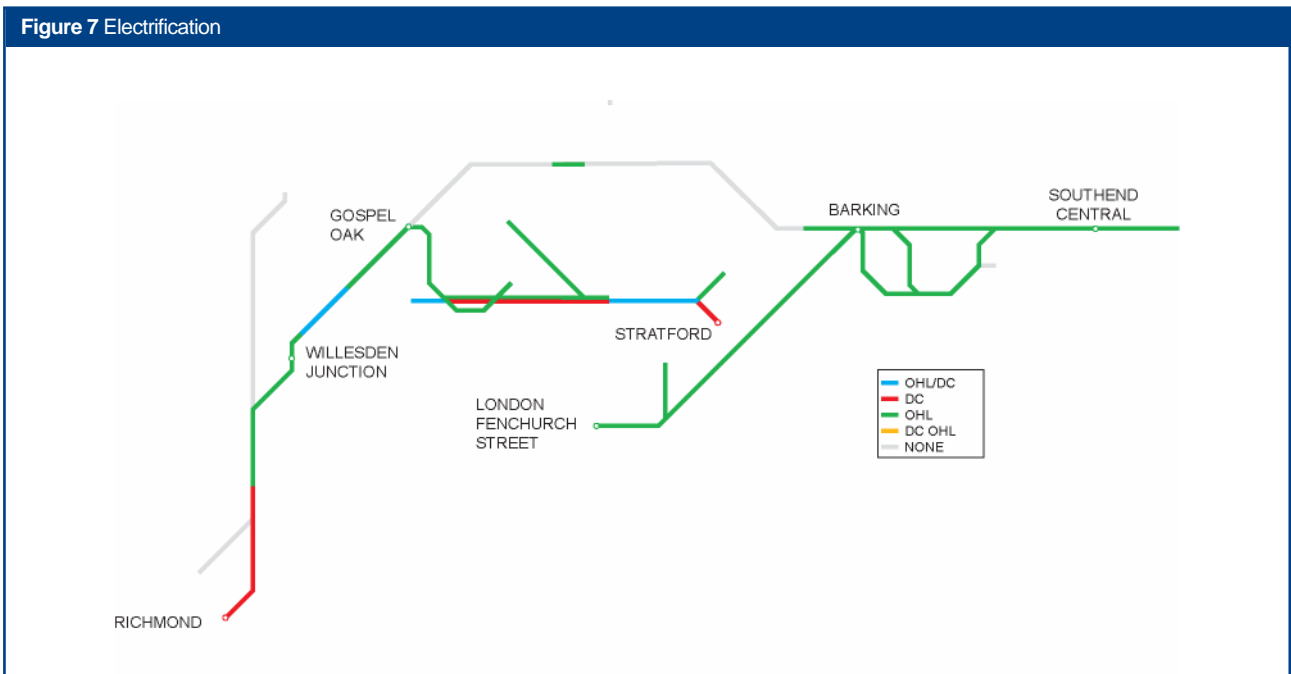
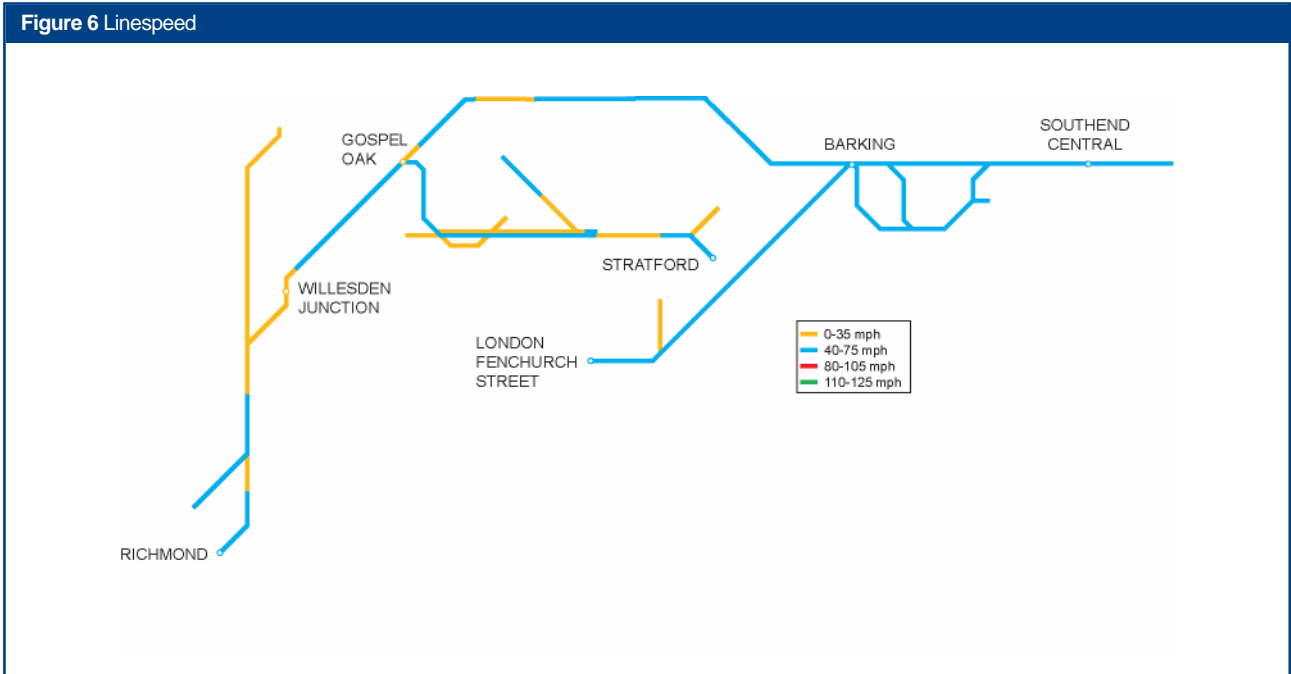


Figure 8 Route availability

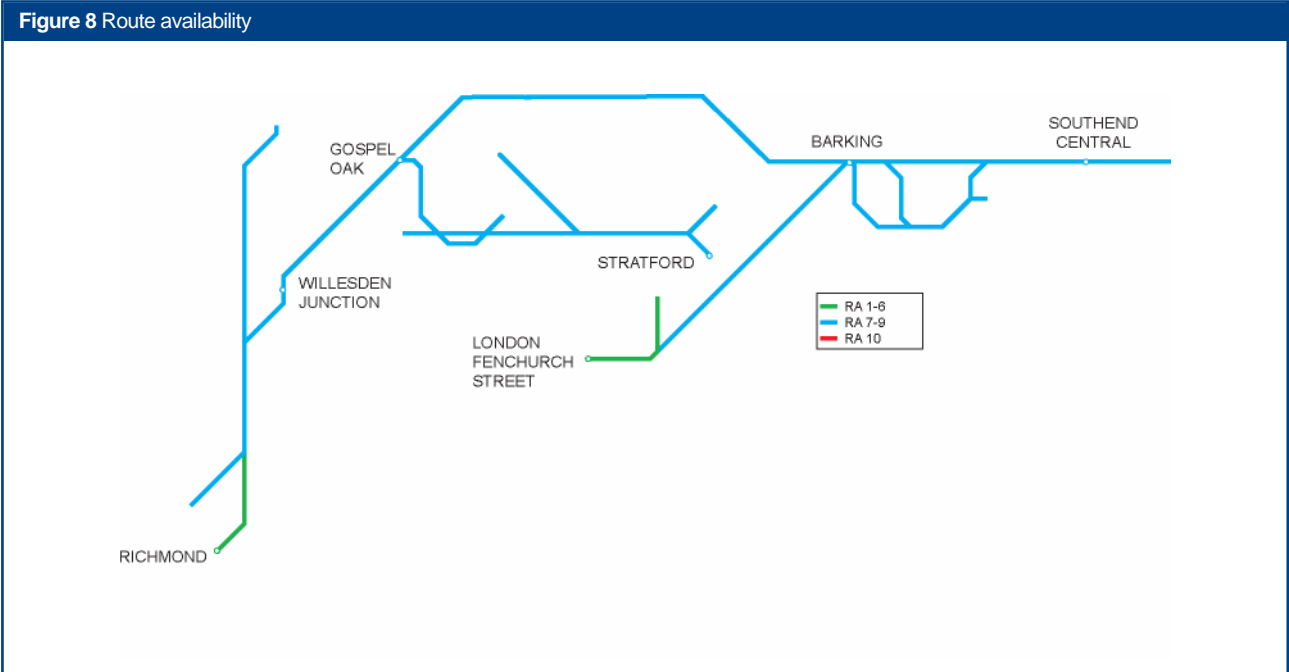
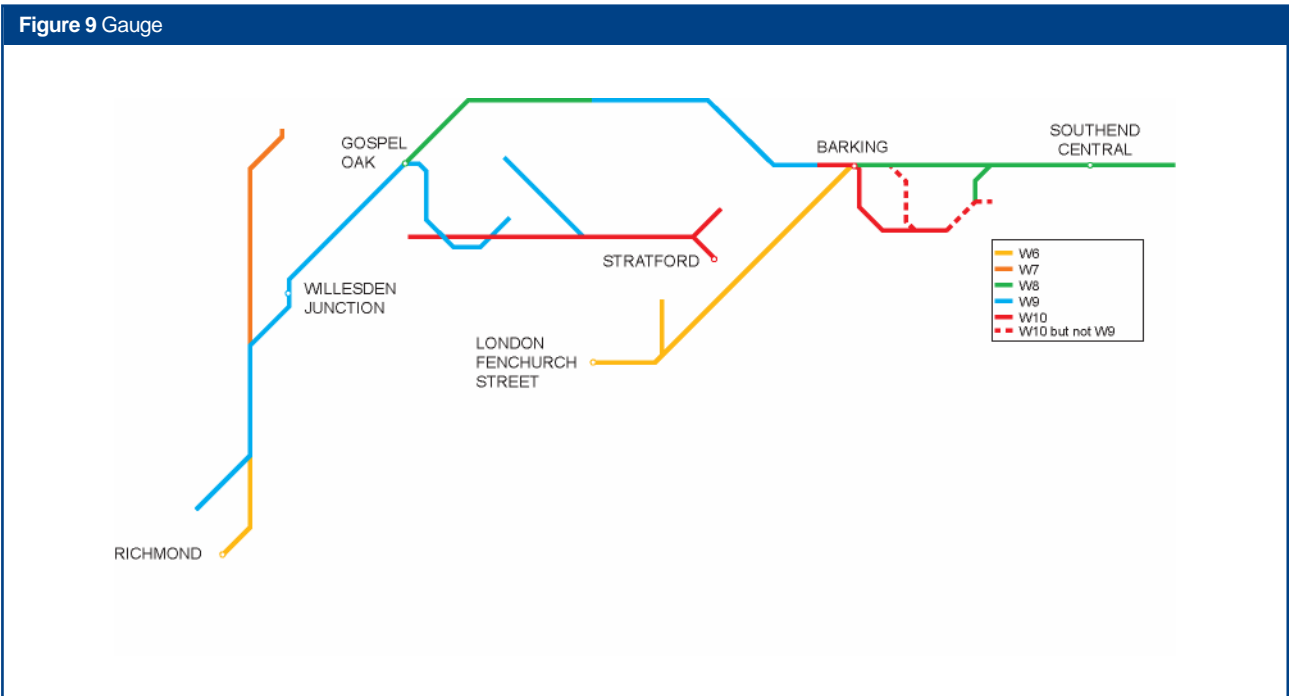


Figure 9 Gauge



Current capacity

The North London Line capacity issues are documented in detail in the Cross London RUS and are therefore only mentioned briefly below. However, the whole North London Line & Thameside route is governed by the mixture of services and stopping patterns, complex junctions, and station occupancy. These issues are often interlinked and overall route capacity is constrained by a combination of these factors. Additionally on the Thameside section the opening of West Ham station and introducing an extra stop on a fast section of line has restricted the track capacity into Fenchurch Street and makes it difficult to run additional trains.

Key issues on the route are:

- current and future levels of both passenger and freight services on the North London lines;
- lack of a W10 and W9 diversionary routes for container traffic;
- long signalling headways and the large number of junctions on the North London Line;
- weight restrictions for freight trains on the Gospel Oak-Barking line;
- limited signalling capacity to allow additional trains to stop at West Ham, which reduces the available capacity between Fenchurch Street and Barking;
- the single line track section between Upminster and Grays that has only one passing loop; and
- passenger overcrowding at a number of stations on the North London Line including Blackhorse Road, Highbury & Islington, Dalston Kingsland and Homerton at peak times and high levels of transfers to/from the underground. On the Thameside section passenger crowding is an issue at West Ham owing to interchange with the DLR and the underground as passenger numbers here have increased since the opening of the Jubilee Line.

Figure 10 shows the current train service level on key sections of the route.

Figure 10 Current train service level (peak trains per hour)

Route Section	
Stratford Low Level to Camden Road	6
Gospel Oak to Willesden Junction High Level	5
Willesden Jcn High Level to Willesden HL Jcn (inc. 3 Clapham Jcn services)	7
Gunnersbury to Richmond (inc. LUL services)	12
Shoeburyness to Thorpe Bay	6
Thorpe Bay to Laidon	8
Pitsea to Stanford-le-Hope	6
Stanford-le-Hope to Grays	7
Ockendon branch (Grays to Upminster)	4
Laidon to Upminster	12
Upminster to Barking	16
Grays to Barking	4
Barking to Fenchurch Street	20

Figure 11 Current PPM MAA (2007/08)

TOC	MAA	As at period
c2c	94.7%	12
London Overground	91.4%	12

Current performance

Figure 11 shows the current PPM for the main TOCs running along the route.

The metro passenger train services on the North London Line were operated by Silverlink up to November 2007. Silverlink's Public Performance Measure above also included their County services that they operated on the southern end of the West Coast Main Line (now part of the London Midland franchise). The passenger train services on Thameside are operated by c2c.

As a result of the route operating at close to track capacity for most of the day, there are difficult performance issues. The current mix of stopping passenger and freight services on the North London Line and intensity of the peak service on the Thameside route 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 North London lines to be broken rails and track faults, points failures, track circuit failures and vegetation obstructing the infrastructure.

On the Thameside lines analysis of recent performance shows the main problems to be track circuit failures and overhead line faults.

Services on both parts of the route have been affected by trespass incidents.

Section 2: Tomorrow's railway

HLOS output requirements

Figure 12 Total demand to be accommodated by Strategic Route

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

Figure 13 Peak Hour Arrivals to be accommodated by Strategic Route

London Terminals	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 (%)
Blackfriars	21,900	3,500	67	11,200	1,200	76
Euston	23,800	3,400		10,600	1,600	
Fenchurch Street	26,000	2,500		13,900	1,600	
Kings Cross	18,300	2,300		8,000	1,100	
Liverpool Street	74,300	10,600		36,700	4,900	
London Bridge	127,600	12,600		65,200	7,800	
Marylebone	9,100	1,000		4,600	600	
Moorgate	13,000	700		7,400	400	
Paddington	24,100	2,900		11,500	1,400	
St. Pancras	25,900	10,900		13,100	5,700	
Victoria	58,700	5,300		29,300	2,800	
Waterloo	74,300	9,200		36,800	4,900	

Future demand

The emerging 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 and Thameside routes in our RUSs. More recent government predictions for house building imply that passenger numbers would increase at about double that rate on the Thameside route. Unless capacity is increased, the level of on-train crowding will suppress demand growth by about 1/5. On the North London Line, 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 including a new interchange station with the High Speed One line. The DLR has recently opened up an extension to London City Airport (and has now commenced construction of a new link from Stratford to SE London). There is also a direct rail service between Stratford and Stansted Airport.

London has been chosen as the host city for the 2012 Olympic Games and Paralympic Games (the Games) and development work is underway. Network Rail is working with the Olympic Delivery Authority to ensure that the increased demand for 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 the east coast ports and London Gateway Port (Shell Haven). Aggregates will see steady growth around the North London Line driven by major construction initiatives such as the Olympic venues/Lower Lea Valley Development, Thames Gateway and Crossrail. At Ripple Lane there is also the opportunity for interchange with UIC (European) gauge traffic running from the Continent via the High Speed One line.

The following factors are likely to influence the growing demand on the North London Line & Thameside route:

- peak commuting is growing to central London, the Docklands and around the orbital route;
- the Stratford City development;
- developments in the Docklands;

- expansion of the east coast ports and development of the deep sea London Gateway Port; and
- the lack of diversionary routes for increasing W10 gauge intermodal freight services and W9 gauge freight traffic.

The RUSs are exploring these growing areas of demand. The Cross London RUS contains a number of capacity improvements which are now being developed by Network Rail with funding from TfL (the Concessionaire for the London Overground services). The Greater Anglia RUS covers demand on the Thameside route and recommends train lengthening. These improvements are summarised in the capacity section below.

Section 3: Proposed strategy

Figure 14 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 14 Summary of proposed strategy milestones			
Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2008/09	North London Line gauge clearance	Track and bridge gauging works on the NLL	Ability to move high cube containers on standard wagons and capacity to divert Thameside growth via the Gospel Oak–Barking route.
2008/09	Improved engineering access on North London Line	Track and bridge gauging works on the cross country route	Ability to move high cube containers on standard wagons and ability to divert growth traffic via the cross country route. This also allows freight to be diverted via the cross country route at night/ weekends to enable better engineering access and this also gives improved resilience in times of perturbation.
2011	North London Line capacity upgrade	Platform extensions, resignalling to deliver reduced headways and freight loops	Longer and more frequent trains with additional peak and all day capacity
2012	12-car trains on c2c main line	DOO equipment	Increase in peak capacity
2012	12-car trains on Tilbury Loop and Ockendon branch	Platform extensions and DOO equipment	Increase in peak capacity

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 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; and
- 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, which will make providing diversionary routes for W10 gauge freight traffic a high priority if overall capacity is not to be compromised.

To accommodate the high levels of growth the current capacity and capability of the North London Line will need to change, which is currently planned to include headway improvements, the construction of additional tracks between Camden and Dalston and upgraded capability on sections of the core North London and across the Gospel Oak to Barking route to allow the passage of W10 gauge freight trains. Construction of further phases of the East London Line via Dalston will add additional journey opportunities.

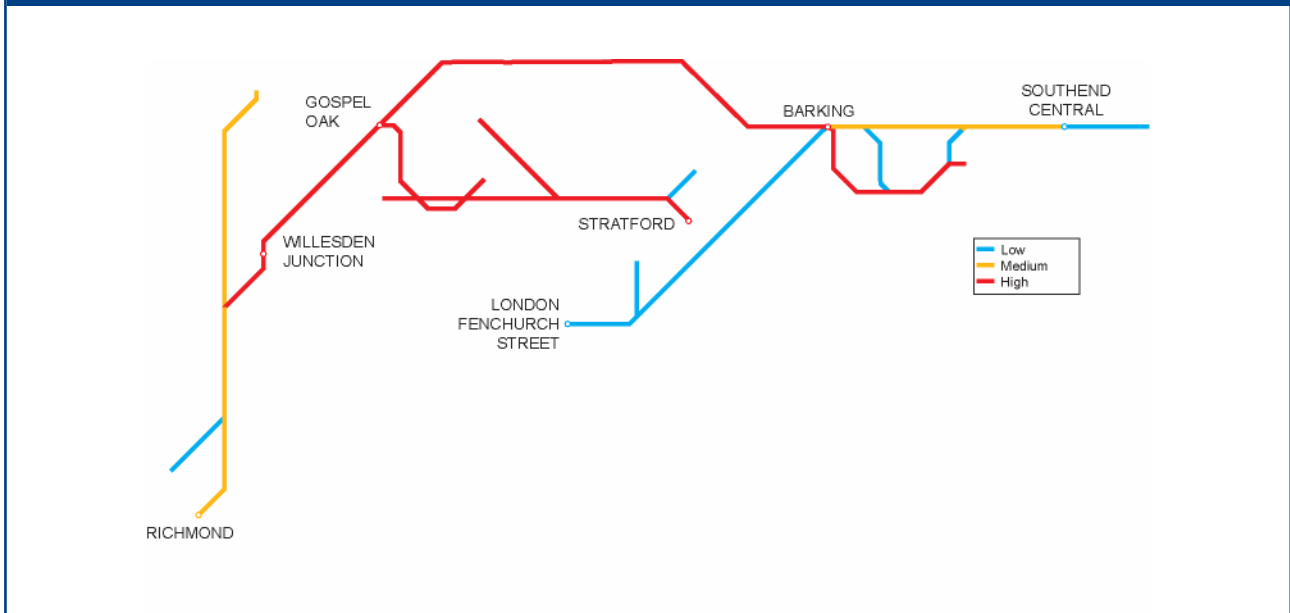
New rolling stock, covered by TfL's order for Class 378 EMUs and Class 172 DMUs, is due to be introduced on the North London Line. It is understood that these will be berthed at existing locations as well as potentially berthing some trains at Orient Way (near Stratford).

On Thameside train lengthening will meet forecast passenger growth and this will require platform lengthening on the Tilbury loop and Ockendon branch.

The DfT Rolling Stock Plan assumes that Class 321 EMUs will be cascaded from London Midland. The additional 4-car units could be berthed at the existing East Ham and Shoeburyness depots.

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

Figure 15 Tonnage growth



Future train service proposals

Figure 15 indicates the forecast percentage change in tonnage to 2017.

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

Future capability Gauge

Network Rail and the SRA carried out physical works to introduce W10 gauge freight traffic along the Great Eastern route from the east coast ports of Felixstowe and Harwich to the West Coast Main Line via Ipswich tunnel, Stratford and the North London Line (via Primrose Hill). These works, which were completed in September 2004, also opened up the route from Tilbury and North Thameside, via Forest Gate Junction and Stratford, to the W10 network.

The use of 9' 6" high containers is increasing and is predicted to account for the majority of current growth in the deep sea container market, however there is currently no alternative route for the current W10 gauge freight traffic from the east coast ports and further expansion is proposed at both Felixstowe and Bathside Bay (near Harwich), which would bring increased W10 gauge traffic to the North London Line. The West Anglia cross country route from Ipswich to the East Coast Main Line via Bury St Edmunds, Ely, March and Peterborough has therefore been identified as one of the highest priority routes for upgrading, which would divert some freight growth away from the congested North London Line. The upgrade between Felixstowe and Peterborough/Yorkshire will be funded through 'Section 106' planning commitments from the port developers, further

development of the route will be undertaken using funding secured under the Transport Innovation Fund (Productivity) programme.

There is no diversionary route from the Thameside route to the WCML and the London Gateway Port, will generate additional freight traffic. These services would need a diversionary route via Barking, Gospel Oak and Kensal Green in order to relieve the congested North London Line and Great Eastern route between Forest Gate Junction and Stratford. However Hampstead Heath tunnel is a major obstacle and a scheme to improve the gauge through this structure is being developed. Also the Barking to Gospel Oak route, which runs mainly on viaducts and embankments, may need to be moved to a higher track maintenance band due to increased tonnages if it is to carry freight in the long term. Freight routing issues (including those relating to diversionary routes) were considered as part of the Freight RUS and are likely to be funded through the TIF programme. So far the upgrading of the Gospel Oak–Barking route and the development work on the cross country line are being funded from this programme.

Line speed

An option to improve line speed on part of the Thameside route, which could contribute towards additional capacity or improved performance, is currently being considered. Speed improvements on the Gospel Oak–Barking route are also being assessed in conjunction with the structures work bank.

Tonnage

Increased demand for freight traffic to and from the east coast ports on the Great Eastern route and London Gateway Port will cause much higher tonnages to traverse the North London Line, 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 Junction to Camden Junction via Primrose Hill;
- London Gateway Port to Barking via Purfleet; and
- Barking to Forest Gate Junction via Woodgrange Park Junction.

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 North London Line platforms are to be extended to allow the operation of longer trains. On the Thameside route growing demand will require additional mainline trains to be extended to 12-car and on the Ockendon branch and Tilbury Loop, as the housing developments are built, platforms will need to be extended to permit the operation of 12-car 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.

The Cross London RUS contains the strategy for increasing capacity on the North London Line and these are briefly detailed below:

- on the North London Line in the short term new high capacity rolling stock is to be introduced, followed by the construction of the platform extensions mentioned above. In the medium term capacity is to be enhanced by resignalling and improving signalling headways to allow frequencies to be increased to at least 4 tph all day on all legs of the route (including the link to the East London Line extension). This enhanced capacity also allows for freight growth across the route; and
- on the Gospel Oak–Barking line in the short term higher capacity diesel trains are to be introduced. 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.

The Greater Anglia RUS examined the growth and capacity issues on the Thameside route and recommends running longer services on all routes. The strategy is also developing the case for infrastructure improvements to permit more trains to call at West Ham. In the longer term the single line Ockendon branch may have to be addressed if additional services are required via this route.

Figure 16 Forecast PPM MAA- CP4 plan

	2009/10	2010/11	2011/12	2012/13	2013/14
C2C	94.8%	95.1%	95.2%	95.3%	95.3%
London Overground	92.5%	93.4%	94.3%	94.7%	94.9%

Figure 17 Forecast PPM MAA - proposed local commitments

	2009/10	2010/11	2011/12	2012/13	2013/14
C2C	93.4%	93.7%	93.8%	93.9%	93.9%
London Overground	91.6%	92.5%	93.3%	93.7%	93.9%

Future performance

Figure 16 sets out the planned PPM for each train operator. Figure 17 sets out the trajectory we propose as local commitments with each operator. These are lower than planned given the need for flexibility in achieving the HLOS targets and to reflect the greater uncertainty and risk associated with projecting performance at a disaggregated level. Reasonable requirements will finally be established for CP4 in our 2009 Business Plan. In some cases the services covered by the franchises will change; this means that the forecast PPM figures are not directly comparable with the current PPM figures.

c2c

The performance of the c2c franchise is currently 94.7 percent PPM and this is forecast to continue at approximately this level through to April 2009 as an outcome of the 2008/09 Joint Performance Improvement Plan (J-PIP).

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

- accommodating more and longer freight trains associated with traffic growth from the port of Tilbury;
- Improving the condition of the overhead line through campaign changes of expired components;
- reduction in the impact of trespass, vandalism and fatalities;
- reduction in the impact of cable theft, focusing on protection of the return conductor;
- Initiation of a 'Right Time Railway' project focusing on sub-threshold delays, the second largest cause of PPM failure;.
- timetable review to cater for passenger growth, focusing on the Tilbury services and increasing seating capacity country side of Pitsea;
- faster repair of S&C;
- improved protection of the 650v signalling supply which is prone to rodent damage in urban areas.

The route plan is being developed around these key points and the desire to focus on maintaining

current level of performance through mitigation against major incidents. The plan therefore only shows a slight PPM improvement during CP4 to 95.3 percent PPM on c2c by April 2014. This includes an allowance for passenger/traffic growth. This figure has been discussed with the TOC and although c2c has no franchise commitment on PPM this figure is in line with their aspirations.

London Overground

The performance of the TOC is currently 91.4 percent PPM MAA and this should reach 91.7 percent by the end of March 2009. 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 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 casualties;
- increase in the speed of response and getting engineers to the site of a failure;
- regulation and timetable resilience work;
- reduction in the amount and impact of trespass, vandalism and fatality incidents
- Introduction of GSMR

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 keen to develop a more detailed 5 year plan as part of the upcoming J-PIP round.

Engineering access

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 has been agreed for the North London Line 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.

On the Thameside part of the route, twelve week cyclic maintenance is sustained on weeknights over the main line between Fenchurch St and Shoeburyness. On the Tilbury Loop maintenance is carried out in twelve 27-hour annual possessions over the whole line between Barking and Pitsea.

Although the introduction of cyclical access onto the North London Line & Thameside 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 Cross London RUS and include looking at the possibility of diverting trains onto the cross country route at nights/weekends to improve maintenance opportunities. On Thameside the use of the bi-directional signalling to allow services to operate during single line possessions is now being introduced.

Long term opportunities and challenges

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 North London Line 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 North London Line are discussed in detail in the Cross London RUS. In addition Network Rail is working with TfL 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 may include possible electrification of the Gospel Oak–Barking route.

For Thameside, different scenarios were explored in the Greater Anglia RUS with significant input from stakeholders.

The suggested strategy for provision of the capacity and performance improvement required from the North London Line & Thameside network are set out below and where not already committed are being assessed as continuing workstreams from the RUSs.

A further important area, which was covered in the Greater Anglia RUS, is access to the network. The following four areas were considered: station capacity, station facilities, car parking and new stations to serve developments.

Most stations with identified capacity issues already have schemes in development to address the problem, however, Fenchurch St and Chafford Hundred have been identified for separate study. Station facilities have been improved over the years and Network Rail and the operators will be working on station improvements using a number of funding mechanisms, including the National Station Improvement Programme.

Car park extensions are proposed at a number of stations including Benfleet, Leigh-on-Sea, Ockendon, Rainham, Upminster and West Horndon to improve access to the network. The Regional Spatial Strategy identified the Thames Gateway as a key growth area and new stations are being considered to serve new developments in the Grays–Barking corridor.

Links to both the Cross London and Greater Anglia RUS documents can be found on Network Rail's website www.networkrail.co.uk.

Enhancements to be completed by end of CP3

Figure 18 CP3 enhancements

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2008/09	(A) West Ham additional calls	Alterations to signalling headways and check on station capacity	Increased capacity and improved interchange with the DLR and District Line/JLE	Network Rail Discretionary Fund	2
2008/09	(B) West Hampstead station improvements	Station improvements and improved links between stations	Improved station capacity and interchange	Developer	–
2008/09	(C) Grays 8-car bay platform	Extend Grays bay platform to 8-cars	Relieves peak overcrowding and saves 2x8 car units. Reduces EC4T costs and improves performance	Network Rail Discretionary Fund	4
2008/09	(D) Barking–Upminster linespeeds	Improve speeds between Barking and Upminster	Linespeed increase to reduce journey time/ improve performance buffer	Network Rail Discretionary Fund	1
2008/09	(E) Gospel Oak–Barking upgrade	Improved gauge and capacity	Increased capacity and ability to divert W9 & W10 freight services.	Transport Innovation Fund/ Network Rail Discretionary Fund	5

Proposed enhancements in CP4

Figure 19 Proposed enhancements in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009-13	Power supply upgrade	Provide power supply to support longer trains and additional services	Increased capacity	Periodic Review 2008	1
2011	Ⓣ NLL capacity enhancements	Improved headways, four tracking, platform extensions and loops	Improved capacity	Periodic Review 2008/ TfL	4
2012	Ⓢ Platform extensions on the Tilbury Loop and Ockendon branch	12-car platform extensions	Improved capacity	Periodic Review 2008	2
2012	Ⓣ Fenchurch St and Chafford Hundred passenger circulation	Improve circulation	Capacity improvement	Periodic Review 2008	–

NRDF candidate schemes in CP4

Figure 20 Candidate NRDF schemes in CP4					
Implementation date	Project	Project description	Output change	Funding	GRIP stage
2009/10	Ⓜ Waterworks viaduct	Bridge strengthening/track alignment	Speed improvement	Network Rail Discretionary Fund	2
2012	Ⓛ Ockendon branch loop at Upminster	Provision of loop	Performance improvement	Network Rail Discretionary Fund	–
2010	Ⓚ Laindon improved access	Additional access	Capacity improvement	Network Rail Discretionary Fund	–
2012	DOO operation on c2c services	Equipment to facilitate DOO	Capacity and performance improvement	Network Rail Discretionary Fund	–
2010	Ⓛ Shore supply to Shoeburyness depot	Provide shore supply to depot when line is isolated	Improve performance	Network Rail Discretionary Fund	–

Maintenance and renewals activity

Figure 21 shows the estimated maintenance and renewal costs and activity volumes.

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

It should be noted that in order to manage the deliverability of our 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 21 Summary of estimated maintenance & renewal costs and activity volumes

£m (2006/07 prices)	2009/10	2010/11	2011/12	2012/13	2013/14	Control Period Totals			
						CP4	CP5	CP6	CP7
Maintenance expenditure									
Track	7	6	6	6	6	32	29	27	26
Signalling	3	3	3	3	3	13	12	11	11
Electrification	1	1	1	1	1	5	5	5	4
Telecoms	1	1	1	1	1	4	4	4	4
Plant and Machinery	0	0	0	0	0	1	1	1	1
Other (overheads / indirect)	5	5	5	5	5	25	22	21	21
Total	17	16	16	16	15	81	73	69	68
Renewals									
Track	12	10	10	12	10	54	42	40	32
Signalling	11	15	12	6	2	47	47	14	20
Civils	9	8	8	8	8	40	37	36	36
Operational Property	6	7	7	4	4	29	24	24	24
Electrification	4	4	4	2	2	16	8	15	5
Telecoms	6	3	2	2	2	14	4	7	5
Plant and Machinery	2	2	1	1	1	7	6	6	7
Total	50	49	44	34	29	207	168	142	129
Renewals Volumes									
Rail (KM)	13	13	14	14	13	67	59	29	34
Sleepers (KM)	10	10	10	10	10	48	29	64	47
Ballast (KM)	11	11	11	11	11	55	46	90	73
S&C Units	12	8	8	15	12	55	56	58	54
SEUs commissioned	0	0	169	0	20	189	228	24	62

Appendix

Figure 22 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
06.01	NLL: Gospel Oak – Stratford	various	London & SE	DfT	No	W10 (W9)	8	various	25kv AC (Third rail DC)	TCB	Various	2
06.02	Fenchurch Street – Shoeburyness	FSS2 (FSS1 & 3)	London & SE	DfT	No	W8 (various)	8 (3)	75 (various)	25kv AC	TCB	3 (2)	2
06.03	Forest Gate Jn – Barking	various	London & SE	DfT	No	W10 (W6)	8	45 (25)	25kv AC	TCB	3	2
06.04	Barking – Pitsea	TLL (UPG)	London & SE	DfT	No	W10 (W8)	8	70 (60)	25kv AC	TCB	3 (OTIS)	2 (1)
06.05	Gospel Oak – Woodgrange Park	TAH (GOJ)	London & SE	DfT	No	W8 (W9)	8	various	None (25kv AC)	TCB (AB)	various	2
06.06	NLL: Willesden Jn – Gospel Oak	BOK2 (BOK3)	London & SE	DfT	No	W9	8	45 (20)	25kv AC	TCB	various	2
06.07	NLL: Richmond/Old Kew Jn – Willesden Jn	various	London & SE	DfT	No	various	8 (6)	various	various	TCB	various	2
06.08	Other Freight Lines	various	Freight	DfT	No	various	various	< 40	various	TCB (OTW)	various	2 (1)
06.09	NLL: No1 Lines	various	Freight	DfT	No	W10 (W9)	8	20 (15)	25kv AC	TCB	various	2 (1)

Figure 22 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
06.10	Dudding Hill Line	CAW (BDH)	Freight	DfT	No	W7 (W9)	8	30	None	AB (TCB)	AB (5)	2

Capacity and operational constraints

- Ⓐ Fenchurch Street – Barking: Trains stopping at West Ham reduce available capacity
- Ⓑ Upminster – Grays: Single line track section with only one passing loop

Other issues on the route

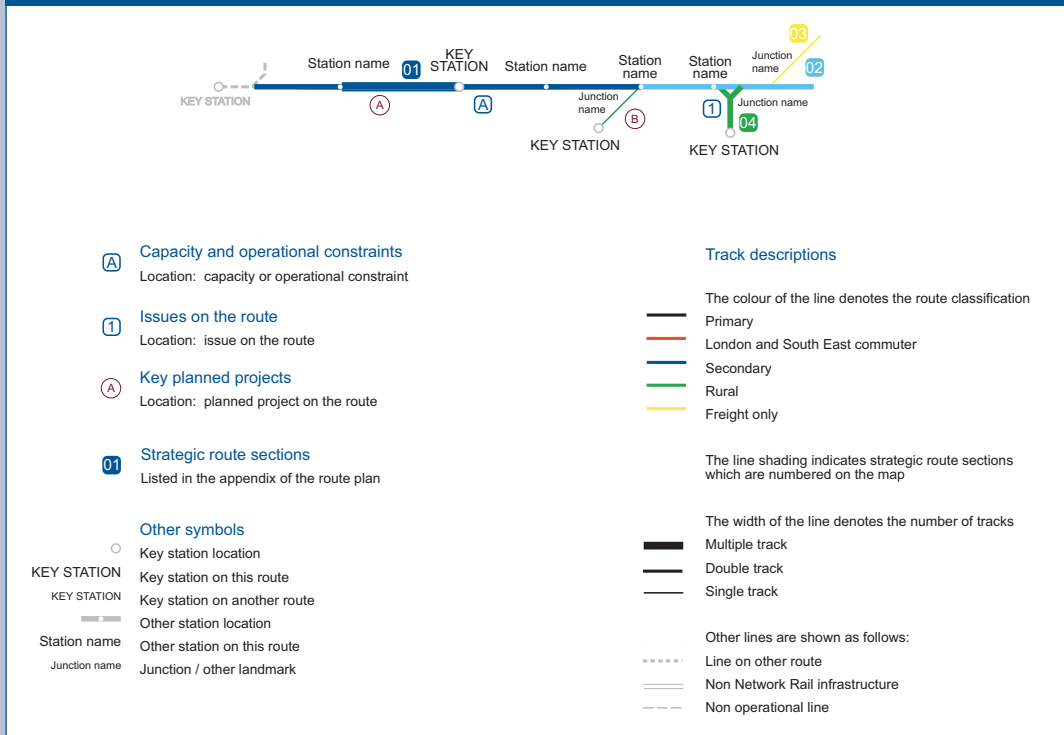
- ① Hampstead Heath tunnel Freight gauging issue prevents the use of 9' 6" containers on standard wagons
- ② Route section would need an upgrade to allow a diversion of strategic freight flows (to release Forest Gate – Stratford capacity, see route 7)

Note

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

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

Key to route diagrams



GRIP stages

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

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

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