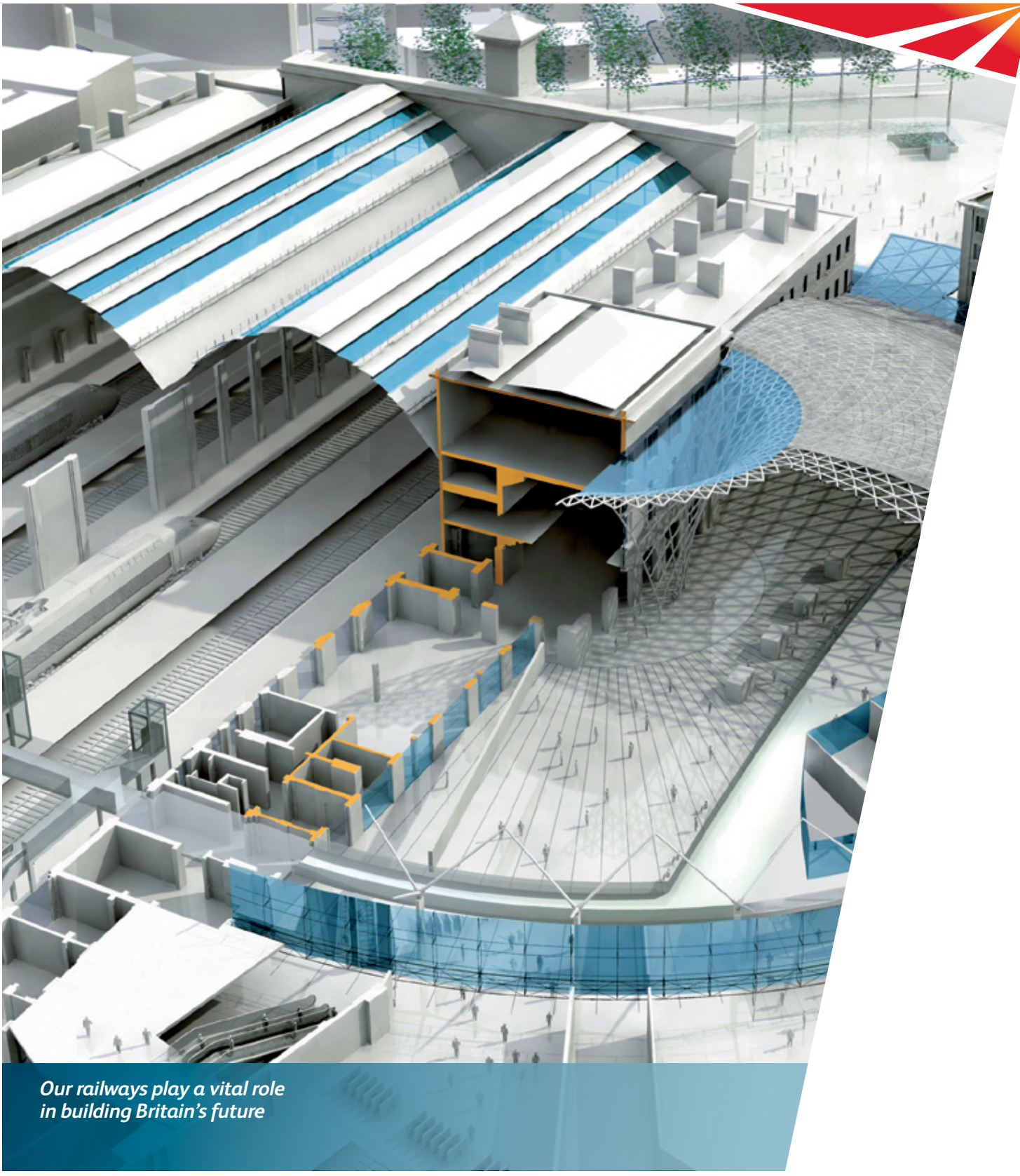
Moving ahead
Planning tomorrow's railways

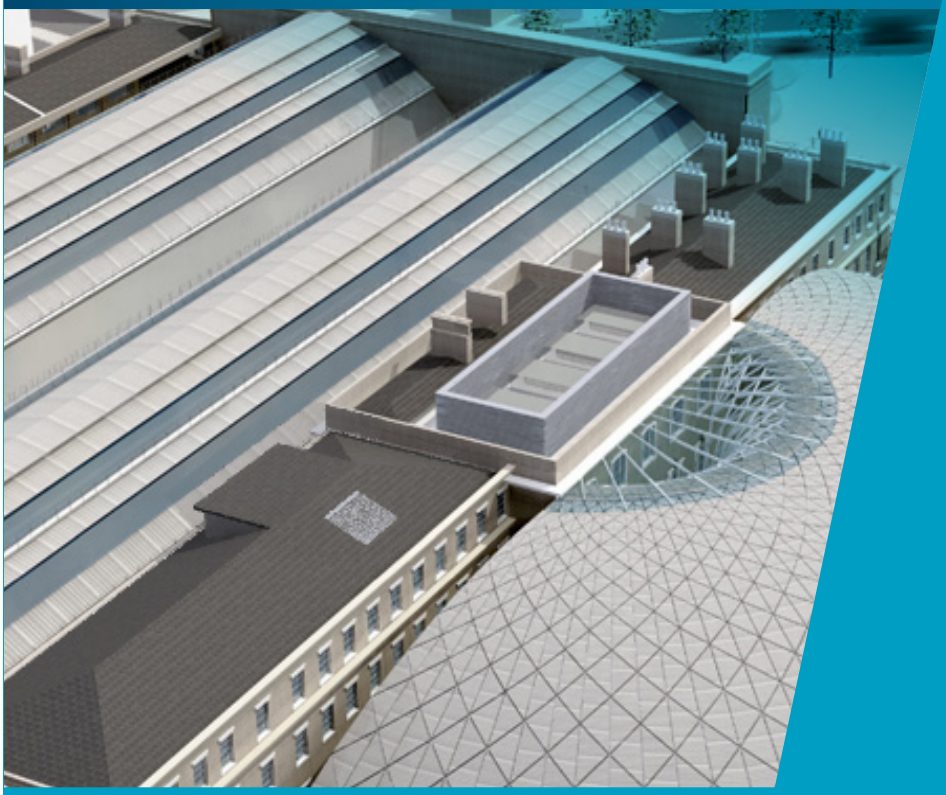
NetworkRail



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

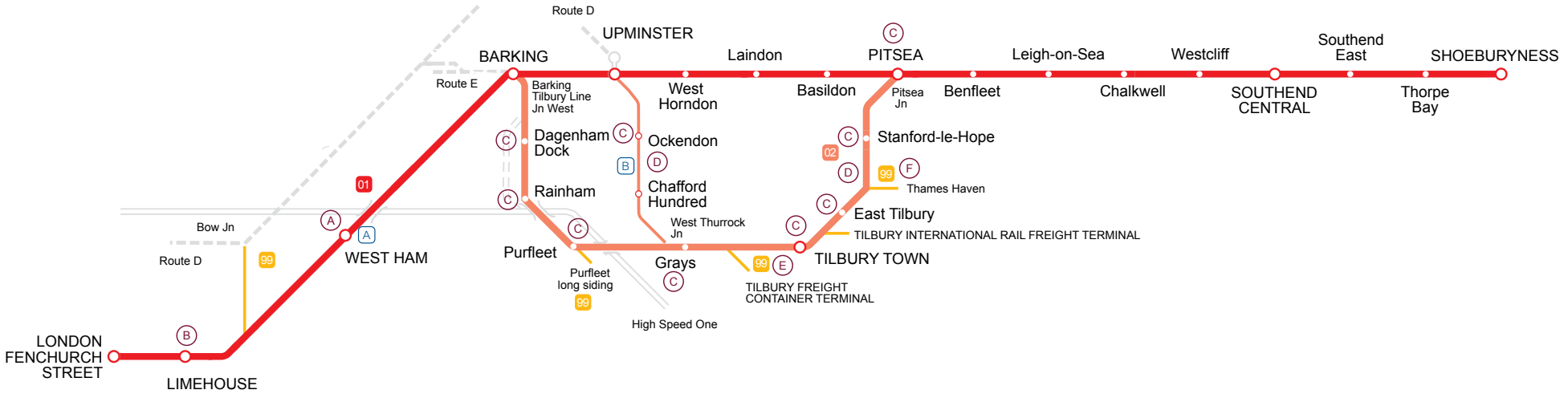
Planning tomorrow's railways

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 F
Thameside

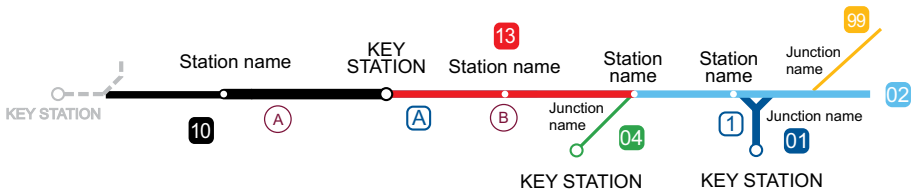
Route Plan F
Thameside



Key
London & SE Commuter
Freight only

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

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

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

The route is included in the Greater Anglia Route Utilisation Strategy (GA RUS), which was published by Network Rail in December 2007 and established by the Office of Rail Regulation in February 2008. The GA RUS covers the period to 2021, but also includes a longer term view of the strategy for meeting continued growth.

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 Thameside route are already operating at or close to capacity in terms of train paths.

The GA RUS has looked at options and recommendations for accommodating future growth on the Thameside route and these recommendations are being taken forward in Control Period 4 (CP4) to meet the capacity metrics set by the DfT in their High Level Output Specification (HLOS) published in July 2007.

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.

The current c2c franchise is due to expire on 29 May 2011. DfT issued a consultation document for the replacement Essex Thameside franchise on 21 January 2010. The closing date for consultation responses is 19 April 2010.

Today's route

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

- main line between Fenchurch Street and Shoeburyness (F.01)
- the Tilbury Loop between Pitsea and Barking via Rainham (F.02)
- a line connecting Chafford Hundred (adjacent to the Lakeside shopping complex) with Upminster and Grays (F.02)
- there is also a freight only branch line to Thames Haven (part of F.99).

Current passenger and freight demand

Passenger demand has been growing rapidly on the Thameside route and has increased by around 4 percent over 2007. The route sees a large volume of commuter traffic into central London and the Docklands (30,000 peak passengers a day were recorded in the autumn 2008 counts) as well as leisure traffic, especially to the major shopping development at Lakeside between Grays and Upminster.

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 LUL Jubilee, District and Hammersmith & City Lines) and at Limehouse (with onwards journeys via the Docklands Light Railway).

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 is growing year on year by 4-5 percent. This demand could be further increased by the development of the proposed deep sea London Gateway Port (at Shell Haven on the Thames Haven branch), which received approval in May 2007. These revised forecasts show that London Gateway Port 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 Tilbury Loop due to major construction initiatives, including the provision of additional housing in the London Gateway and the East of England, the growth of the City and Docklands, as well as continuing construction of the Olympic venues.

The High Speed 1 interchange sidings at Ripple Lane for freight services to and from the Channel tunnel are now operational and proposals have been put forward that could allow European gauge freight vehicles to transfer from the exchange sidings into the adjacent distribution sidings on the national network.

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

Current services

Passenger services on the Thameside route are currently operated by c2c. DB Schenker, Freightliner Ltd, Freightliner Heavy Haul Ltd, Direct Rail Services Ltd (DRSL), First GBRF and Colas Freight all operate regular freight services on the Thameside route.

The passenger services operated by c2c are affected by the complexity of the network and the different stopping patterns. There is 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
- to Fenchurch Street via the Tilbury Loop from Grays and Pitsea.

Figure 1 contains the morning peak arrivals at Fenchurch Street between 08:00 and 09:00.

The Thameside Route features a number of connections to private port and industrial railheads for customers that handle a wide variety of railfreight traffic to / from the UK and continent, variously: Import and export finished autos (Dagenham Ford, Purfleet CdMR), Short sea and deep sea intermodal traffics (Port of Tilbury, Barking Russell Group, Purfleet CdMR), Aggregates & cement (Dagenham, Tilbury, Thurrock, Purfleet, Thameshaven Branch), Containerised domestic waste (Dagenham), Rail served warehousing (Barking), MOD supplies (Shoeburyness) Olympic construction supplies (Bow, Lea Interchange) LUL infrastructure services (Barking interchange).

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

Figure 1 Current train service level (Peak)

Station	No. of services
Basildon	4
Grays	7
Ockendon	3
Shoeburyness	4
Southend Central	6

Figure 2 Current train service level (Off Peak)

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

Figure 3 Tonnage

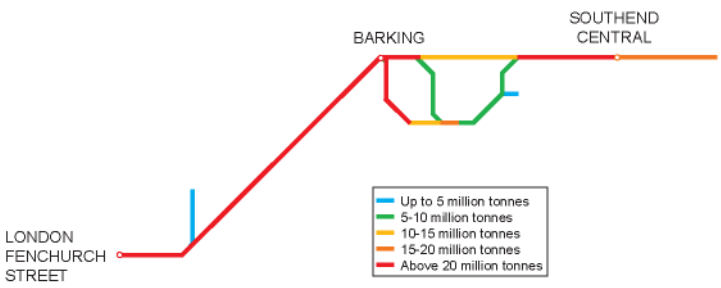


Figure 3 shows the total annual tonnage levels on the route.

Figure 4 summarises the Traffic volumes.
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Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	7	0	7
Train tonne km per year (millions)	1,901	153	2,054

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 5 Linespeed

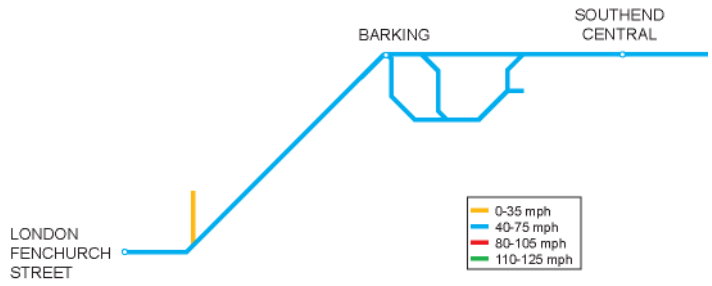


Figure 6 Electrification

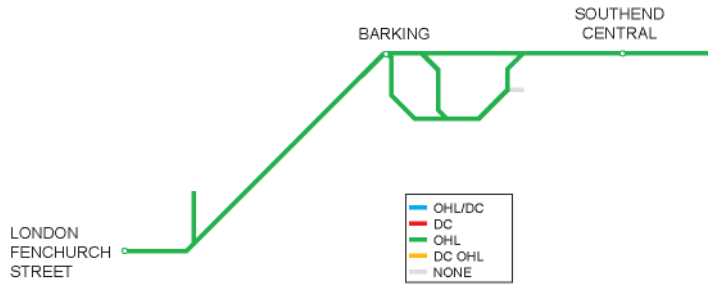


Figure 7 Route availability

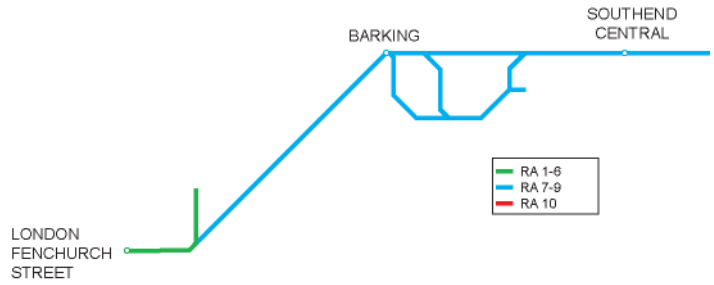
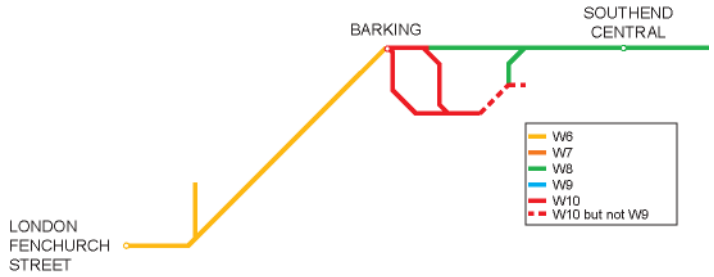


Figure 8 Gauge



Current capacity

The 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 stopping services at West Ham and Limehouse restricts the track capacity into Fenchurch Street and this coupled with a restricted four platform layout at Fenchurch Street itself makes it difficult to run additional trains in the peak hours.

Key issues on the route are:

- lack of an alternative electrified route for freight services away from the Great Eastern between Forest Gate and Stratford
- limited signalling capacity to allow additional trains to stop at West Ham
- the single line track section between Upminster and Grays that has only one passing loop
- passenger crowding is an issue at West Ham owing to interchange with the underground LUL Jubilee, Hammersmith & City and District Lines.

Figure 9 shows the current train service level on key sections of the route.

Figure 9 Current train service level (peak trains per hour)

Route Section	
Shoeburyness to Thorpe Bay	6
Thorpe Bay to Laindon	8
Pitsea to Stanford-le-Hope	6
Stanford-le-Hope to Grays	7
Ockendon branch (Grays to Upminster)	4
Laindon to Upminster	12
Upminster to Barking	16
Grays to Barking	4
Barking to Fenchurch Street	20

Current performance

Figure 10 shows the current PPM for the TOC running along the route.

The passenger train services on the route are operated by c2c and although there can be difficult performance issues caused by the intensity of the peak service, the Thameside route is one of the highest performing routes on the national railway network. However when a problem does occur 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, especially on the area between Barking and Fenchurch Street.

Analysis of recent performance shows the main problems to be level crossing failures, possession overruns and external impacts; trespass and vandalism.

Figure 10 2009/10 PPM

TOC	Forecast MAA	As at period
c2c	96.3%	11

Section 2: Tomorrow's railway: requirements

HLOS output requirements

Figure 11 below shows the HLOS output requirement for the total demand to be accommodated on the former strategic route which includes Route F: Thameside.

Figure 11 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

Figure 12 Peak Hour Arrivals to be accommodated by Strategic Route

London Terminals	Peak three hours			High- peak hours		
	Assessed demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Assessed demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Fenchurch Street	26,000	2,500	67	13,900	1,600	76

Future demand in CP4

The Regional Spatial Strategy focuses on 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 services.

Passenger demand is predicted to increase by 1 to 1.5 percent a year during the morning peak across the Thameside route in the GA RUS. More recent government predictions for house building imply that passenger numbers would increase at about double that rate and unless capacity is increased, the level of on-train crowding could suppress demand growth.

Stratford (linked to the Thameside route via interchange with the LUL Jubilee Line at West Ham) 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 working with the ODA 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 London Gateway Port when it becomes operational. At Ripple Lane potential future gauging works would allow UIC (European) gauge traffic running from the Continent access to Dagenham & Barking freight railheads via the High Speed 1 line exchange sidings.

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

- peak commuting is growing to central London and the Docklands
- the Stratford City development
- developments in the Docklands
- development of a deep sea London Gateway Port

The GA RUS covers demand on the Thameside route and recommends train lengthening for passenger 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 London Gateway Port becomes established and continues to grow. It is expected that aggregates volumes will continue to rise as the level of construction work for house building increases and Crossrail; this too has been taken into account in the revised industry forecasts.

Section 3: Tomorrow's railway: strategy

Figure 13 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 15 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 13 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2011	12-car trains on c2c main line		Increase in peak capacity
2011	12-car trains on Tilbury Loop and Ockendon branch	Platform extensions	Increase in peak capacity

Figure 14 Capacity enhancements to meet HLOS peak capacity in CP4

Description	Additional vehicles involved	Station served	0700 – 0959 Capacity Impact	0800 – 0859 Capacity Impact
Thameside 12-car running on main line	20	Fenchurch Street	2,400	1,600
Thameside 12-car running on Tilbury Loop	28	Fenchurch Street	3,200	2,000

Figure 15 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
Fenchurch Street	28,500	36,900	42,500	66%	15,500	17,300	20,900	75%
Other London Termini*	533,400	699,900	803,300		266,800	304,000	353,700	

* 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.

Development of the London Gateway Port will bring significant demand for increased freight services across the route.

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

Figure 16 Tonnage growth

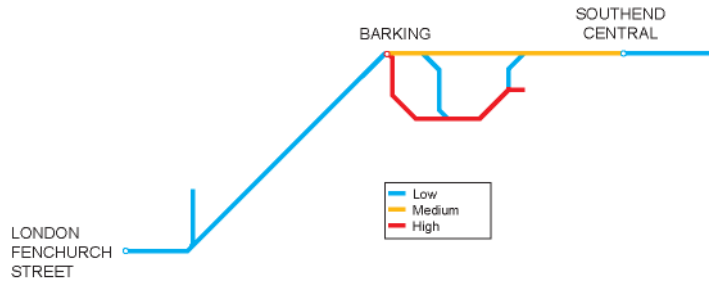


Figure 16 indicates the forecast percentage change in tonnage to 2019.

Future train service proposals

Network Rail has been working with c2c and the DfT on developing plans for meeting growth in CP4.

c2c

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

Additional 4-car units required to operate 12-car services could be berthed at the existing East Ham and Shoeburyness depots.

Freight services

The following parts of the route are predicted to see higher freight flows due to the development of London Gateway Port:

- London Gateway Port to Barking via Purfleet

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 from the Thameside route was along the Great Eastern route from Forest Gate Jn to Stratford (Route D) and then via the NLL via Primrose Hill (Route E).

The Gospel Oak to Barking route and the North London Line between Gospel Oak and Acton (Route E) 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 via Forest Gate and Stratford. This was achieved by TIF programme funding and included gauging works through Hampstead Heath tunnel, which was a major obstacle on the NLL. Additional proposed works including strengthening and re-signalling on the Gospel Oak to Barking will further help freight movements from the Thameside route 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 Great Eastern and NLL routes. Freight management between Anglia and ECML and WCML is critical if freight is to flow smoothly across the NLL.

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.

Tonnage

Increased demand for freight traffic as a result of the development of the London Gateway Port will cause much higher tonnages to traverse the Thameside route, 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:

- London Gateway Port to Barking via Purfleet

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 Tilbury Loop and the line via Ockendon, platforms are being extended to permit the operation of 12-car trains in 2011, which will support the proposed housing developments and is one of the key milestones for CP4.

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 c2c and the DfT on delivering capacity improvements in CP4 and is continuing to develop proposals for CP5 and beyond.

The GA RUS examined the growth and capacity issues on the Thameside route and recommended running longer services on all routes. Network Rail is working with c2c and the DfT to deliver platform extensions to support the introduction of 12-car trains on the Tilbury Loop (CP4) and infrastructure improvements to permit more trains to stop at West Ham (CP4). In the longer term the single line via Ockendon may have to be addressed if additional services are required via this route.

Future performance

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

Figure 17 sets out the planned PPM for each TOC. 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. 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 96.3 percent PPM and this is expected to continue at approximately this level through to the end of March 2010 as an outcome of the Joint Performance Improvement Plan (JPIP).

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 Every Time' 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 switches and crossovers
- improved protection of the 650v signalling supply which is prone to rodent damage in urban areas
- integrated Train Planning System is being trialled on c2c route, which will help to unlock capacity on the network that may be constrained by the current planning environment. The system plans at a lower level of granularity and it is anticipated that during the development of timetables it will improve efficiency of processes and timetable accuracy.

The route plan is being developed around these key points and the desire to focus on maintaining current levels of performance through mitigation against major incidents. The plan therefore only shows a slight PPM forecast improvement during CP4 to 95.3 percent PPM on c2c by April 2014.

Figure 17 Forecast PPM MAA – CP4 plan

	2010/11	2011/12	2012/13	2013/14
c2c	95.1%	95.2%	95.3%	95.3%

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.

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.

On the Thameside part of the route, 12 week cyclic maintenance is sustained on weeknights over the main line between Fenchurch Street and Shoeburyness, with other specific cyclicals for signalling and telecommunications on a 24 and 52 week pattern. On the Tilbury Loop maintenance is carried out in six 27-hour annual possessions over the whole line between Barking and Pitsea, although these are split to offer access to Grays where possible. There is also a weeknight cyclical to the east of Thames Haven Jn which occurs on a 12 weekly cycle.

Although the introduction of cyclical access onto the 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. On Thameside the use of simplified bi-directional signalling to allow both passenger and freight services to operate during single line possessions on the main line has now been introduced, 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 route, enhancements will be required if additional services are to be operated on lines, which are already operating at, or very close to, capacity.

Electrification of the Gospel Oak to Barking route (Route E) 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 Great Eastern route (Route D).

Different scenarios were explored in the GA RUS with significant input from stakeholders and the capacity being delivered by the train lengthening in CP4 will need to be reviewed against future demand across the route that could materialise from further house building in the Thames Gateway in CP5.

The Strategic Freight Network vision includes making the North Thameside area a key freight route. The new Port at London Gateway will become a major UK Port and expand rail freight several fold. The existing terminals serving a variety of commodities will also expand. All this traffic will use the cross London network before joining the London radial lines to the West & Wales, West Midlands, North East, North West and Scotland.

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

- station capacity
- station facilities
- car parking
- new stations to serve developments.

Network Rail is working with the train operators 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).

A study by Passenger Focus showed that if parking is deterred due to lack of capacity, rail patronage will be reduced as customers either drive further to alternative stations or drive all the way to their final destination.

The Regional Spatial Strategy identified the Thames Gateway as a key growth area and a new station at Beam Park is being considered by the London Development Authority to serve proposed housing developments in the Rainham – Dagenham corridor.

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 18 Proposed enhancements in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010	(B) Limehouse Interchange	Interchange link between National Rail and DLR	Improved station facilities	Third Party	5
2011	(C) Platform extensions on the Tilbury Loop and Ockendon branch	12-car platform extensions	Capacity Enhancement	Periodic Review 2008	4
2011	(D) Traction Power Supply Upgrade	Provide power supply to support longer trains on Thameside route	Capacity Enhancement	Periodic Review 2008	3
2011	(E) Tilbury Power Station rail link	New connection to Tilbury Power Station	New Freight Connection	Third Party	3
2011	(F) Thameshaven track doubling	Doubling of track for London Gateway Port development	Capacity Enhancement	Third Party	3

NRDF candidate schemes in CP4

Figure 19 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011	(A) West Ham resignalling	Alterations to signalling headways and check on station capacity - Increased capacity and improved interchange with the DLR and District Line/JLE	Capacity Enhancement	Network Rail Discretionary Fund	3

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 20 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 20 Summary of estimated renewals costs and activity volumes

£m (2010/11 prices)	2010/11	2011/12	2012/13	2013/14
Renewals				
Track	4	5	11	5
Signalling	-	-	-	-
Civils	2	1	7	8
Operational property	5	5	2	2
Electrification	1	1	2	2
Telecoms	-	-	-	-
Total renewals	**12**	**13**	**21**	**17**
Renewals volumes				
Track				
Rail (km)	7	11	11	11
Sleepers (km)	3	4	6	6
Ballast (km)	3	4	6	6
S&C (equivalent units)	0	0	3	3
Signalling				
Conventional (SEU)	0	0	0	0
ERTMS (SEU)	0	0	0	0
Level crossings (no)	0	0	0	0

Appendix

Figure 21 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
F.01	Fenchurch Street – Shoeburyness	FSS2 (FSS1 & 3)	London & SE	DfT	No	W8 (various)	8 (3)	75 (various)	25kv AC	TCB	3 (2)	2
F.02	Tilbury Loop	TLL (UPG)	London & SE	DfT	No	W10 (W8)	8	70 (60)	25kv AC	TCB	3 (OTIS)	2 (1)
F.99	Freight Lines	various	Freight	DfT	No	various	various	< 40	various	TCB (OTW)	various	2 (1)

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

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