Route Plans 2007
Route 7
Great Eastern

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Route 7 Great Eastern

Route context

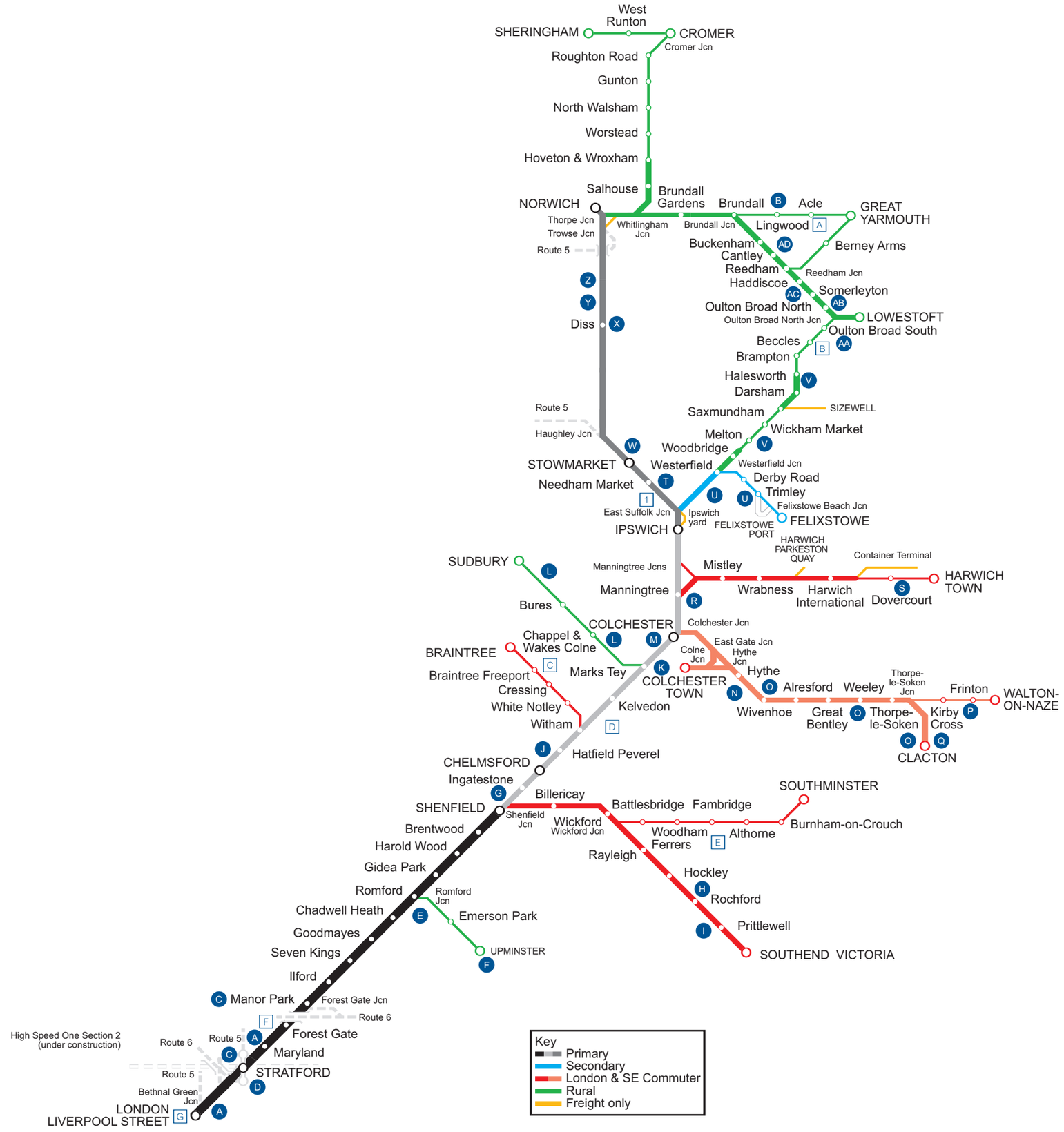
The Great Eastern main line runs from London to Norwich and has a number of branches that serve the coastal resorts of Southend, Clacton-on-Sea, Walton-on-the-Naze, Felixstowe, Lowestoft, Great Yarmouth, Cromer and Sheringham, as well as the Norfolk Broads, the east coast ports (including Harwich and Felixstowe) and the lines to Braintree, Southminster, Sudbury and Upminster. The main line competes with the primary road network and rail services penetrate into the City of London. The route serves one of the fastest growing regions in the country with densely populated areas at its southern end and some key locations along its length, including the Essex county town of Chelmsford and the regional centres of Colchester, Ipswich and Norwich. The main markets are commuter travel to London, in particular to the city and the Docklands, and business and leisure travellers. The route also provides the main artery for substantial freight traffic between the east coast ports of Felixstowe and Harwich and the rest of England via London. Along with the West Anglia and Thameside routes, the Great Eastern route is also included in the Greater Anglia Route Utilisation Strategy (RUS), which examines future growth and how it will be met over a time period of ten years commencing from the RUS Establishment date (expected to be December 2007). A draft document for consultation is due to be published in April 2007. 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, the current network is already operating at or close to capacity in terms of train paths. The Greater Anglia RUS will look at options and recommendations for accommodating future growth and some developing options are discussed in this route plan.

Today's route

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

- the main line from London to Norwich (07.01, 07.02 and 07.03);
- branches to Upminster (07.09), Southend and Southminster (07.05), Braintree (07.06), Colchester Town, Clacton and Walton (07.08) and Harwich (07.07); and
- the Sudbury branch (07.10), and the remaining branch lines in Norfolk and Suffolk (07.11), including the important freight route between Ipswich and the port of Felixstowe (07.12), which is the country's largest container port. There is also a short freight only branch to Sizewell Power Station (07.04).

Route 7 Great Eastern



Passenger and freight demand

Passenger demand is growing steadily on the route especially into both central London and the Docklands, which continues to expand (passenger numbers in the Great Eastern morning peak rose by 3.4% between 2005 and 2006). Most of the peak demand is commuter flows from the main population centres however there is also an increasing off peak leisure market driven by successful marketing campaigns from the train operators and rail partnerships.

Main line services parallel the A12 corridor southwards from Ipswich, which feeds the M25 around London and extends all the way down into the Docklands. Road traffic in and around London however is very congested at peak times and this means that the railway tends to be the first choice for commuters especially on the suburban network, which experiences high numbers in the peak (over 57,000 passengers travelling towards London/ Stratford in morning peak) due to increasing employment in central London and the Docklands.

Although the majority of the current demand is into Liverpool Street, a significant number of passengers interchange at Stratford with onward journeys via the underground Central and Jubilee Lines, Docklands Light Railway and the North London Line. Stratford is the gateway to the Docklands from the Great Eastern main line and employment in Docklands is expanding. Stratford itself is set to benefit from new development, and demand is set to grow.

Freight demand, especially intermodal deep sea containers from the east coast ports at Felixstowe and Harwich is growing year on year by 4-5%. This demand will be further increased by the impending port developments at Felixstowe South (approved February 2006), and Bathside Bay, Harwich (approved March 2006), as well as the development of a deep sea port at Shell Haven on the Thameside route (Route 6). This is further explored in the capability and capacity sections below.

Current services

Passenger services on the route are operated by 'one', with a small number of services into Liverpool Street operated by c2c. EWS, Freightliner and GB Railfreight operate freight services on the route.

Figure 1 contains the morning peak (08:00 to 09:00 arrivals) and off peak tph frequencies into Liverpool Street.

*Harwich Town has 1 tph peak connecting service to Liverpool Street at Manningtree

Figure 1 Current train service level (trains per hour)

Originating station	tph to Liverpool Street
Ilford	1 peak/0 off peak
Gidea Park	7 peak/0 off peak
Shenfield	6 peak/6 off peak
Southend	7 peak/3 off peak
Southminster	1 peak/0 off peak (see table below)
Chelmsford	2 peak/0 off peak
Braintree	1 peak/1 off peak
Colchester Town	1 peak/0 off peak
Clacton	4 peak/1 off peak
Harwich Town /International	1 peak*/1 off peak
Norwich	4 peak/2 off peak

Figure 2 Current train service level (trains per hour)

Regional/Rural Services	tph
Romford to Upminster	2
Southminster to Shenfield	1
Walton-on-the-Naze to Colchester via Colchester Town	1
Sudbury to Marks Tey	1
Harwich Town to Manningtree (terminates at Liverpool Street)	1
Ipswich (starts at Liverpool Street) to Peterborough	1 every 2 hours
Ipswich (starts at Liverpool Street) to Lowestoft	1 every 2 hours
Ipswich to Felixstowe	1
Ipswich to Cambridge	1
Norwich to Cambridge	1
Norwich to Liverpool/Nottingham	1
Norwich to Lowestoft/Great Yarmouth/Sheringham	1 to each destination

Figure 2 contains the tph frequencies for the regional/rural services.

The route provides the main artery for long distance freight flows, from the east coast ports of Felixstowe and Harwich to the rest of England via North London as well as varying volumes of freight to local terminals and yards, especially aggregates.

Figure 3 shows the tonnage levels on the route.

Traffic volumes are summarised in Figure 4.

Figure 3 Tonnage

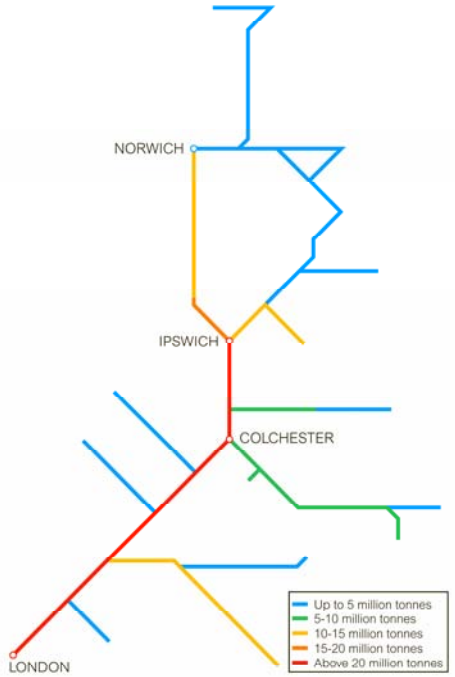


Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	21	2	23
Train tonne km per year (millions)	5,791	1,456	7,247

Current infrastructure capability

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

Figure 5 Linespeed

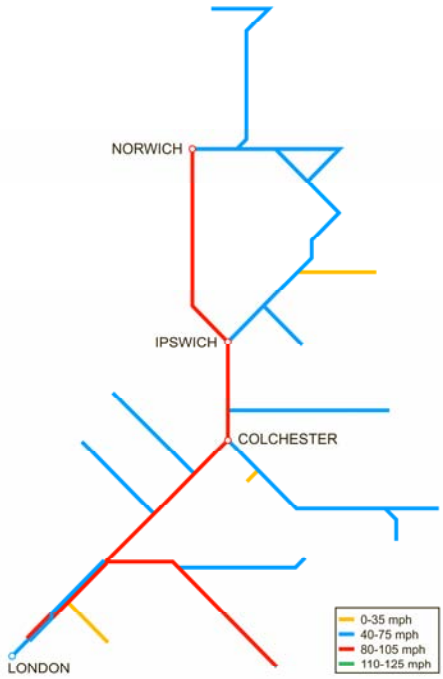


Figure 6 Electrification

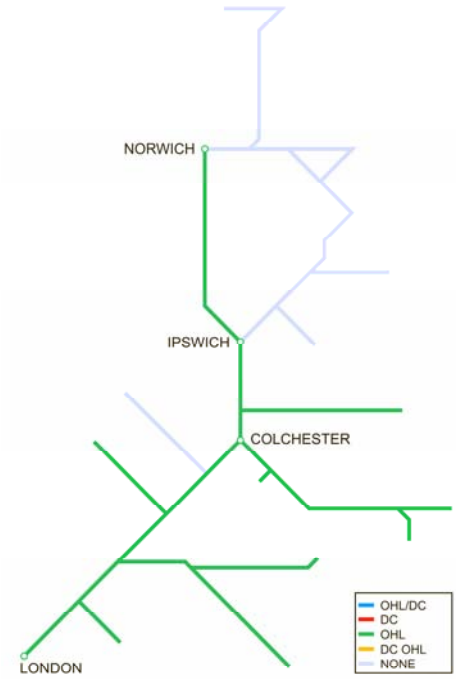


Figure 7 Route availability

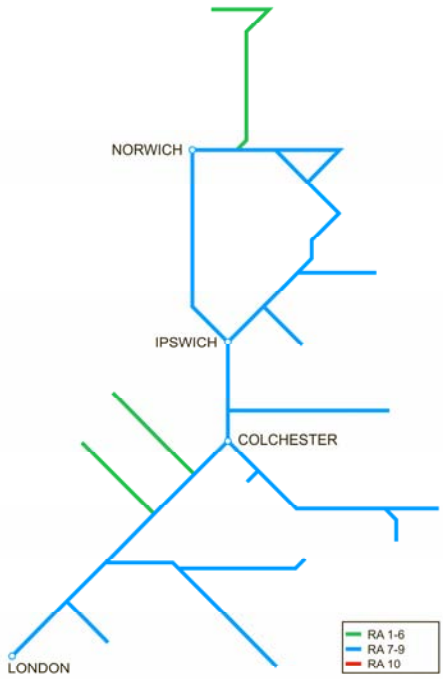
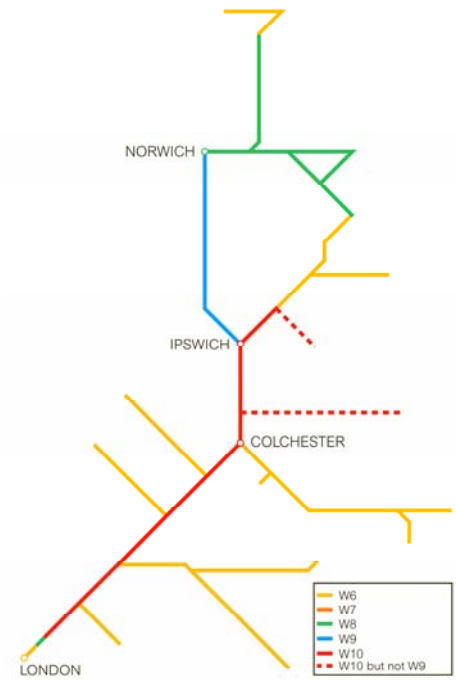


Figure 8 Gauge



Current capacity

The Great Eastern route is mainly two track and capacity is limited by the mixture of fast and stopping passenger and freight services, complex junctions, and station occupancy. Long single line sections on a number of the rural lines exacerbate these issues. There is a four track section inwards to London from Shenfield, which does allow some segregation between fast and stopping passenger services but even here the demand for stopping the majority of main line peak services at Stratford means this section of the route is close to its capacity at peak times. Outside the peak the mix of current stopping patterns north of Shenfield and the growing number of freight trains from the Thameside route, which cross the Great Eastern on the flat between Forest Gate Junction and Stratford, use almost all of the available track capacity.

Key issues on the Great Eastern route are:

- a lack of diversionary routes with W10 loading gauge capability to offer routes away from the Great Eastern for the predominantly intermodal freight traffic;
- the high volumes of freight traffic from Thameside, which has to weave across the Great Eastern route from the electric lines to the main lines on the flat between Forest Gate Junction and Stratford to access the North London Line;
- a lack of long freight loops between Haughley Junction and Stratford;
- the long single line Felixstowe Branch, which is a constraint to increasing traffic at the Port of Felixstowe;
- a mixture of fast and stopping services on the two track Great Eastern main line between Colchester and Shenfield;
- intensive platform utilisation and congestion on the throat at Liverpool Street station;
- the long single line track sections on the East Suffolk Line;
- the three track throat to Norwich station; and
- passenger capacity is an issue at Stratford station on the route due to increasing passenger numbers at peak times and high levels of transfers to the underground and Docklands Light Railway.

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

Current performance

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

'one's Public Performance Measure below also includes the services that they operate on the West Anglia route.

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 fast and stopping services and intensity of the peak service 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 route to be track circuit failures,

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

Route Section	tph
Norwich to Diss	4
Ipswich to Manningtree	5
Thorpe le Soken to Hythe	5
Colchester to Marks Tey	10
Braintree branch	1
Witham to Hatfield Peverel	11
Chelmsford to Ingatestone	13
Southend Victoria to Wickford	7
Wickford to Shenfield	8
Shenfield to Gidea Park (electric line)	7
Gidea Park to Romford (electric line)	14
Ilford to Stratford (electric line)	15
Shenfield to Stratford (main line)	20

Figure 10 Current PPM MAA (2006/07)

TOC	MAA	As at period
'one'	87.1%	11

broken rail/track faults and point failures. The route also suffers badly from OLE problems and the inner suburban service has been affected by suicides and trespass incidents.

Future requirements

Strategic direction

With the housing growth proposed in the East of England Draft Plan and the levels of employment predicted in the London Plan, together with the growth in the Haven ports, the route will need to accommodate high levels of passenger and freight growth. In common with other London commuter routes, particularly the West Anglia line, one of the routes' key functions is feeding workers into London to support the city's economy. London is a world-leading financial centre which makes a net contribution to the national economy and it is thus essential that the transport links are provided to facilitate this growth. To this end the strategy for the route over the next 10 years will be set through the Greater Anglia RUS process. This document also contains a look forward to some of the longer term plans for the route.

In terms of dealing with freight growth our strategy has been set out in the Cross London RUS and the Freight RUS. These strategies describe the industry growth forecast and our strategy for dealing with the growth in traffic. On Great Eastern, this strategy requires the two off peak freight paths per hour to be protected in future timetables. It also assumes that the growth in East Coast Ports traffic will be accommodated by modest increases in traffic on the GE main line with the majority of the growth being routed via an upgraded Ipswich – Peterborough – Nuneaton route.

To accommodate the high levels of growth in passenger demand on the Great Eastern route, additional peak services on both the inners and outers and train lengthening on the branches is likely to be proposed. This may require some infrastructure works including lengthened loops and the construction of a turnback. More details can be found in the capacity section below.

Crossrail would impact upon the route, but as funding has not yet been committed for the project, the RUS needs to consider the situation without Crossrail, identifying any capacity deficiencies.

Future demand

Underlying passenger growth is predicted to increase by a little under one per cent a year during CP4. This rate of growth is severely constrained by crowding which, unless relieved, affects growth on the outer services more severely than the inners.

Unconstrained passenger growth is estimated to be around double this rate. Additional growth may be generated by development in the Stratford area and possibly around Southend Airport. There is a need to handle a significant anticipated increase in passenger flows associated with the Olympics in 2012.

The demand for freight paths is forecast to increase by 10-15 paths a day on the route by 2014/15. This increase is predicted primarily as a result of development of the East Coast container ports and Shell Haven. The level of construction work scheduled over the next 10 years (including house building and the Olympics) will require an increase in the volume of aggregates hauled on the route and this has been taken into account in the industry forecasts contained in the Freight RUS.

Future services

'one' as the principal passenger operator on the route are broadly in agreement with the interventions described below. They are keen that the full value of rail to the London economy is understood, so that the benefits of providing the required peak capacity and frequency are realised. They also see the need for improvements to Stratford station and running longer trains on the GE branches.

The freight operators are keen to see the capacity provided to meeting growth, especially for the container and aggregate traffic. All operators were involved in providing growth forecasts for the RUS programme.

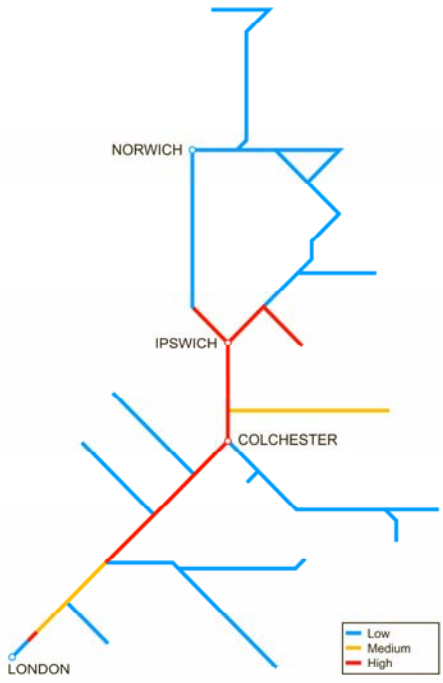
Norwich services

To meet peak demand on these services higher capacity stock will be needed. This will require consideration of introducing 12-car EMUs in place of some of the intercity sets, together with some re-diagramming of existing sets. In the long term, in order to provide further capacity on the outer services wholesale replacement of the intercity sets with 12-car EMUs and a review of calling patterns needs to be considered.

Great Eastern Outers

To meet forecast growth, extra services will be required and it is assumed in the RUS that this entails an additional service from Colchester and an extra train from Chelmsford in the high peak hour. In addition, calling more services at Stratford will enable loads between services to be evened up. Shoulder peak trains need to be strengthened as growth occurs.

Figure 11 Tonnage growth



Great Eastern Inners

Two additional trains will be required to meet medium term growth. In the longer term, additional services will be required.

Cross country routes

On the cross country services some strengthening of peak trains radiating from the regional centres will be required. In addition, the option of making the Ipswich – Lowestoft service hourly will be examined in the RUS.

Freight services

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

- Felixstowe port to Ipswich Yard (includes the whole of the Felixstowe branch and part of the East Suffolk Line between Westerfield and East Suffolk Junction);
- Bathside Bay to Manningtree Junctions (Harwich branch);
- Ipswich Yard to Stratford along the GE Main line; and
- Ipswich Yard to Haughley Junction (to access the ECML via the West Anglia cross country route – Route 5).

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

Figure 11 indicates the forecast percentage change in tonnage to 2016.

Future capability

Gauge

The Freight RUS sets out the highest priority routes to be cleared for the transportation of 9'6" high containers on standard wagons (known as W10 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 still no alternative diversionary 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 Great Eastern route. Also there is currently no alternative diversionary route for W10 and W9 gauge freight traffic from the Thameside route. This traffic will also increase as permission has recently been granted to develop a deep sea container port at Shell Haven on the Thames Haven branch.

The West Anglia cross country route from Ipswich to the East Coast Main Line via Bury St Edmunds, Ely, March and Peterborough (part of Route 5) was identified by the SRA as one of the highest priority routes for upgrading, which should be secured through 'Section 106' planning commitments by port developers. However options to increase the gauge and upgrade the route from Barking to Gospel Oak (part of route 6) for Thameside freight traffic will also need to be explored.

Consequently the Freight RUS is examining routeing issues and studies are continuing into ways of increasing the future gauge specification for these routes to W10, which if completed could offer welcome relief to track capacity along the Great Eastern route and improve opportunities for weekend engineering works.

Linespeed

Modest improvements to linespeeds on some rural routes could give longer turn round margins at origin and destination stations, which would improve operation and performance as well as

increasing demand. Improvements to linespeeds are being explored as part of the GA RUS.

Tonnage

Increased demand for freight traffic to and from the east coast ports will cause much higher tonnages to be sustained across the Great Eastern route.

Platform lengths

It is generally accepted that the practical approach to continued 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.

Most of the outer suburban and main line Great Eastern stations can already accommodate twelve car EMUs and loco hauled rolling stock of up to eleven coaches. The inner suburban line stations with the exception of Shenfield and Stratford can only accommodate eight car formations and there are few opportunities for extending platforms without extensive infrastructure works, which would be very expensive. In the long term Crossrail (if implemented) is planned to operate 10 coach formations with the use of selective door opening as a possible option where necessary.

Future capacity

The analysis being carried out for the RUS has indicated that the options detailed below need to be considered for meeting growth. Longer term options are also considered. It should be noted that the options below cover capacity in the high peak hour, however, some strengthening of shoulder peak services will be required.

Great Eastern Outers

To enable more trains to call at Stratford will require the extension of Platform 10a to take 12-car trains. Shoulder peak trains need to be strengthened as growth occurs, therefore works may be required on the remaining outer suburban branches to enable longer trains to operate where required.

Great Eastern Inners

Two additional trains will be required to meet medium term growth. In the longer term, additional services will be required and (pending Crossrail) it will be necessary to build a turnback at Chadwell Heath in order to permit further services to operate.

Southend/Southminster services

In order to allow all trains to run at full length it is necessary to lengthen the loop at Fambridge (on the Southminster branch) so that 12-car trains can pass. Further interventions include calling more trains at Stratford to even up loadings and spreading the peak load into the shoulder peak.

Cross country routes

The option of making the Ipswich – Lowestoft service hourly is likely to require the construction of a loop.

With the expansion of Felixstowe and the development of Bathside Bay, the growth in deep sea maritime container traffic is key to the route. Gauge and capacity works between Felixstowe and South Yorkshire are being developed in conjunction with HPUK, and a TIF bid has been submitted for W10 gauge clearance on the Peterborough – Nuneaton route. Capacity enhancements on the Ipswich – Nuneaton route are being examined in the Freight and GA RUSs.

Other investment issues

We will continue to carry out regular reviews of the renewal workbanks with a view to identifying the opportunity for enhancements, particularly driven by the business needs of the operators (generally to be funded thorough NRDF and other means). In addition, these reviews consider the longer term needs of the route when specifying renewals, whether for power supply, OLE, capacity or line-speed.

Growth associated with the Olympics works is, in part, being addressed by a range of third party schemes.

Future performance

Figure 12 shows the forecast reduction in Network Rail delay minutes compared with 2006/07.

Figure 13 shows the forecast PPM for the main TOC running along the route.

Figure 12 Forecast reduction in delay minutes

	2007/08	2008/09
% reduction in delay minutes	11%	18%

Figure 13 Forecast PPM MAA

TOC	2007/08	2008/09
'one'	90.1%	90.5%

The delivery of improvements in train performance is one of our key priorities. This is being progressed by ensuring that infrastructure and network management caused delays are systematically reduced. This is being addressed by the recent introduction of a fully integrated control centre for East Anglia, which is already starting to bring benefits by improving communications, streamlining the decision making process and delivering an improved service to customers.

Broken rails/track faults and track circuit failures are being addressed by our renewal programmes and other improvements in performance are being achieved through Joint Performance Improvement Plans.

We are continuing with our day to day maintenance and our policy of targeting our enhanced maintenance and renewals at performance hotspots. This includes our annual programmes of targeted performance improvement schemes across the route. Other improvement measures and initiatives include an improved possession strategy to maintain track circuits at key locations, fencing renewals to prevent trespass and vandalism and a rolling programme of tamping to improve track faults.

We will continue with our programme of component replacement of the Overhead Line Equipment, however most of the OLE problems are caused by fixed termination equipment, much of which is of a very old design, and needs to be seasonally re-tensioned according to the weather. We are currently considering options for replacement of the fixed termination overhead line equipment located between Liverpool Street and Chelmsford/Southend Victoria with a modern, high reliability system. The existing fixed termination system design currently leads to the application of temporary speed restrictions during periods of high temperatures. In addition, major dewirements have occurred at a number of locations on the route over 2005/06, emphasising the need for urgent action to progress the replacement of the OLE equipment.

As part of our Greater Anglia RUS work we will be looking at junction margins and allowances, and the potential for timetable improvements.

Engineering access

The high level of capacity utilisation on the route has meant that in the past there has been difficulty in gaining access for maintenance and renewals work. As a result a cyclic maintenance regime was introduced that allows weekend maintenance possessions on a twelve week cycle at our key junctions and locations. Additionally Liverpool Street and Shenfield have weeknight possessions of varying frequencies and we are also sustaining working time equivalent to seventeen 54-hour possessions per year in order to carry out the track renewals programme.

In conjunction with the operator, a Sunday service using only a two track railway between Bethnal Green and Shenfield was introduced, which allows us to take full possessions on any two adjacent tracks of the four track section.

Although the introduction of cyclical access onto the Great Eastern route is delivering improved maintenance and performance in most places, the need to run ever increasing services to cater for rising demand in both passenger and freight and a corresponding desire for greater access for regular maintenance to address the resulting wear and tear on our assets may require a revision of the current regimes. Also we are continuing to work with operators on improving weeknight maintenance on the two track Shenfield to Colchester section of the GE mainline, which will now benefit from Bi-Di signalling throughout as this equipment is to be installed on the last remaining section between Marks Tey and Colchester.

In addition we will be investigating the practicalities of:

- improved gauging on the West Anglia cross country route, which would allow a diversionary route for W10 gauge freight trains and may free up space on the congested Great Eastern main line north of Shenfield for increased weeknight maintenance;
- undertaking more work for other disciplines in existing possessions planned for track renewals; and
- taking long blockades rather than frequent smaller possessions.

Opportunities and challenges

We anticipate that accommodating growth in commuting to central London and the Docklands will be a significant challenge on the route, together with continued developments around Stratford including the interchange with the High Speed One line to the Channel Tunnel, the expanding DLR network and the Olympics in 2012. This combines with the east coast ports expansion and freight from Shell Haven as well as the potential effects of Crossrail on parts of the Great Eastern main line and other sections of the route that are already operating at, or very close to, capacity.

Compatibility with Crossrail is also considered, however, funding is not currently available to carry out elements of the Crossrail scheme (other than improvements of a very minor nature). Clearly this is likely to lead to some renewals having to be replaced before the end of their design lives and may involve additional disruption to services.

Many scenarios will be explored in the Greater Anglia RUS and we will be seeking significant input from our stakeholders. Suggested initiatives and options for provision of the capacity and performance improvement required from the Great Eastern network are set out in the future requirements section and where not already committed will need to be thoroughly assessed by the Greater Anglia RUS.

Delivering future requirements

Expenditure

Figure 14 shows the planned level of expenditure on renewals on this route over the next two years. However, the precise timing and scope of renewals remains 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.

Figure 14 Forecast expenditure

£m (2006/07 prices)	2007/08	2008/09
Renewals		
Track		
Plain line	31	32
Switches and crossings	24	20
Other	1	–
Track total	56	52
Civils		
Underbridges	5	6
Overbridges	1	1
Bridgeguard 3	1	–
Earthworks	12	9
Retaining walls	1	–
Other	0	0
Civils total	19	16
Signalling		
Resignalling	25	33
Minor works/other	1	0
Over–planning	(2)	–
Signalling total	25	34
Electrification		
AC systems		
HV switchgear	3	1
OLE re–wiring	–	0
OLE campaign change/refurbishment	1	1
OLE structures	1	1
Other	1	1
Electrification total	7	4
Telecoms		
Concentrators		
Large	0	–
Customer information systems (CIS)	0	0
Other	2	0
Telecoms total	2	1

Operational property		
Stations		
Managed	1	1
Franchised	2	1
Lineside buildings	0	–
Operational property total	4	2
Plant and machinery		
Fixed plant		
Point heating	1	1
Signal supply points	0	0
Depot Plant	1	–
Other	0	1
Plant and machinery total	2	3
Total Renewals	**115**	**110**
Enhancements (funded by		
Network Rail		
Planned		
Ilford depot protection system	0	1
Total	0	1
Network Rail (RAB)		
Planned		
Colchester – Marks Tey bi–directional signalling	1	2
Other	0	0
Total	1	2
Potential schemes	–	2
Total	1	4
Other third party		
Planned		
Stratford regional station	20	16
Stratford city development	1	2
Thorntons' fields	1	1
Bridge 19 demolition	3	–
ODA Bridges	1	1
Other	1	2
Total	27	21
Potential schemes	2	16
Total	29	37
Total Enhancements	**30**	**42**

Figure 15 Forecast volumes

	2007/08	2008/09
Track		
Plain line (km)		
Rail	45	48
Sleepers	43	45
Ballast	43	45
Total	131	138
Switches & crossings (no.)		
Complete renewal	47	38
Partial renewal/reballasting	8	–
Abandonment	5	15
S&C (equivalent units)	52	46
Other (km)		
Drainage	2	–
Civils		
Underbridges (m²)	3,821	3,990
Overbridges (m²)	57	210
Bridgeguard 3 (m²)	200	–
Earthworks (m² slope surface)	39,600	85,614
Retaining walls (m²)	250	–
Signalling		
Resignalling (SEUs)	–	329
Electrification		
AC systems		
HV switchgear (cb)	30	7
OLE campaign change/refurbishment (t. length)	176	75
OLE structures (no.)	30	25
Telecoms		
Concentrators		
CIS (stations)	6	–

The planned volume of renewals is detailed in Figure 15.

It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning 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.

Maintenance

Figure 16 shows the planned level of expenditure on maintenance on this route over the next two years.

Figure 16 Forecast expenditure

£m (2006/07 prices)	2007/08	2008/09
Maintenance	44	40

Infrastructure investment

Figure 17 highlights schemes that are planned for completion in the financial year shown:

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
C Liverpool Street to Ilford/Stratford (07.01)	Blockade to cover the demolition of Bridge 19 and associated infrastructure works for the East London Line Extension; may also cover some proposed renewals including plain line track, S&C at Bethnal Green West Junction and maintenance activities	Enhancement and renewals. Will allow extension of East London Line services to Dalston	Structures, OLE and track	TfL (for Bridge 19 ELL works)	4	2008/09
D Stratford Platform 10a and freight loop(07.01)	Construction of a freight loop and extension of platform 10a	Provides additional station and track capacity to accommodate growth anticipated from employment in docklands, the developments at Stratford and the Olympics	All asset types	ODA	3	2010
D Stratford Regional Station Upgrade (07.01)	Construction of Northern Ticket Office, decluttering platforms, reopening eastern subway and platform widening	Provides additional station capacity and safety	Station works	ODA	4	2010
E Gidea Park – Chadwell Heath (07.01)	Plain line track renewal	Renewal	Track	Network Rail	3	2008/09
G Shenfield S&C (07.01)	Like for like renewal	Renewal	Track	Network Rail	4	2007/08
H Magnolia Road embankment (07.02)	Embankment stabilisation work	Renewal	Earthworks	Network Rail	2	2007/08
K Marks Tey to Colchester bi-directional signalling (07.02)	Installation of simplified bi-directional signalling (SIMBIDS)	SIMBIDS will enable longer periods of single line working, which will help improve performance, maintenance and track quality	Signalling	Network Rail Discretionary Fund	3	2008/09
L Marks Tey to Sudbury (07.10)	Plain line track renewal	Renewal	Track	Network Rail	4	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
M Colchester South S&C (07.02)	S&C renewal	Renewal	Track	Network Rail	3	2007/08
N Hythe S&C (07.08)	S&C renewal	Renewal	Track	Network Rail	3	2007/08
O Colchester to Clacton resignalling (07.08)	Like for like resignalling scheme	Renewal	Signalling	Network Rail	5	2009/10
P Thorpe-le-Soken to Walton-on-the-Naze (07.08)	Plain line track renewal	Renewal	Track	Network Rail	4	2007/08
Q Clacton S&C (07.08)	S&C renewal	Renewal	Track	Network Rail	3	2008/09
R Manningtree South S&C (07.02)	S&C renewal	Renewal	Track	Network Rail	3	2008/09
S Bathside Bay (near Harwich) (07.07)	Rail connection to new port development	To allow freight train services to access and egress new deep sea port development	Track and signalling	Third Party funded scheme. Port development has just received approval from DfT.	0	TBC
U Ipswich to Felixstowe Freight Upgrade (07.12)	Partial track doubling and associated signalling. Three additional sidings in Ipswich Yard	Increased capacity to meet growth in freight train demand associated with the proposed expansion of Felixstowe Port	Track and signalling	3rd Party	4	2011/12 (subject to confirmation from the developer)
V East Suffolk Line RETB (07.11)	Renewal of RETB signalling system	Renewal	Signalling	Network Rail	0	2011/12

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
W Haughley Junction S&C (07.03)	S&C renewal	Renewal	Track	Network Rail	3	2008/09
X Thrandeston Bog (07.03)	Embankment strengthening work	Renewal	Earthworks	Network Rail	4	2008/09
Y Flordon S&C (07.03)	S&C renewal	Renewal	Track	Network Rail	3	2007/08
Z Diss to Trowse (07.03)	Plain line track renewal	Renewal	Track	Network Rail	4	2008/09
AA Oulton Broad Swingbridge (07.11)	Like for like bridge renewal	Renewal	Structures	Network Rail	2	2007/08
AB Somerleyton Swingbridge (07.11)	Like for like bridge renewal	Renewal	Structures	Network Rail	2	2008/09
AC Reedham to Somerleyton (07.11)	Plain line track renewal	Renewal	Track	Network Rail	3	2008/09
AD Reedham Swingbridge (07.11)	Like for like bridge renewal	Renewal	Structures	Network Rail	2	2008/09
B Brundall Jcn to Yarmouth (07.11)	Plain line track renewal	Renewal	Structures	Network Rail	4	2007/08

Figure 18 highlights other schemes under consideration.

Figure 18 Infrastructure investment under consideration

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage
A GE OLE Stage 1 (Liverpool Street – Forest Gate) (07.01)	Replace fixed termination OLE with modern auto tensioning equipment	Renewal	OLE	Network Rail	3
I Southend Airport station (07.05)	New station	New station as part of growing development of Southend Airport	Signalling and station	3rd Party	3
J New station north of Chelmsford (07.02)	New station with long loops	New station to serve a growing housing development	Signalling, track and station	3rd Party	1
T Great Blakenham station (07.03)	New station	New station as part of Snoasis development	Signalling and station	3rd Party	Currently subject to public enquiry

Figure 19 highlights route enhancement aspirations

Figure 19 Route Enhancement aspirations

Project	Project description	Output change	Main asset type(s)	Funding	Status
D Stratford Capacity Enhancement Works (07.01)	Additional signals to allow more mainline trains to stop	Provides additional capacity through the use of closing up signals	Signalling	ODA	Under consideration as part of the Greater Anglia RUS work
F Upminster LUL/NR Link (phase 1) (07.09)	New connection between GE Romford to Upminster branch and LUL at Upminster	To allow LUL stock movements	Track	None	Scheme no longer proceeding.
F Upminster Branch Freight Link (07.09)	Provide a new fully signalled connection and upgrade track on Romford to Upminster branch	To allow transfer of engineering trains and new rolling stock between NR and LUL	Track and signalling	None	Scheme supeceeded by a new proposed link at Barking (see Route 6).
V East Suffolk Line capacity improvements (07.11)	New passing loop and signals	Provides increased capacity to facilitate an hourly train service	Track and signalling	Network Rail	Under consideration as part of the Greater Anglia RUS work

Non infrastructure developments

Figure 20 The following significant timetable schemes for the route are under development

Figure 20 Timetable development

Description	Key issues	Actions or options being developed	Benefits	Target timetable implementation
Greater Anglia RUS	Overcrowding, journey times, freight capacity and regional growth	Early stages of option development	Improved capacity, performance and reduced overcrowding.	December 2008

Figure 21 Other projects

Description	Key issues	Actions or options being developed	Benefits	Start date
2012 Olympics	To deliver increased capacity to meet demand	Numerous schemes in development to facilitate passengers travelling to and from the Olympic venues	Improved capacity.	Ongoing.
Crossrail	Effects on capacity between Shenfield and Liverpool Street			
Smartcard introduction	Revenue protection and flexible ticketing	TfL/ATOC to take forward	Revenue increase and potentially demand management improvements.	

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	No of Tracks
07.01	Liverpool Street – Shenfield	LTN1	Primary	DfT	No	W10	8	90 (70)	25kv AC	TCB	2 mins	4 (6)
07.02	Shenfield – Ipswich	LTN1	Primary	DfT	No	W10	8	100 (90)	25kv AC	TCB	3	2
07.03	Ipswich – Norwich	LTN1 (LTN2)	Primary	DfT	No	W9 (W8)	8	100	25kv AC	TCB	3	2
07.04	Freight Lines	various	Freight	DfT	No	W6 (W8)	various	various	various	various	OTIS	1
07.05	Shenfield – Southend Victoria/Southminster	SSV (WIS)	London & SE	DfT	Yes	W6	7	80 (60)	25kv AC	TCB	3 (OTIS)	2 (1)
07.06	Braintree Branch	BRA	London & SE	DfT	No	W6	6	50	25kv AC	TCB	OTIS	1
07.07	Harwich Branch	MAH (NTE)	London & SE	DfT	No	W10	8	60 (45)	25kv AC	TCB	4 (OTIS)	2 (1)
07.08	Walton and Clacton Branches	COC (various)	London & SE	DfT	No	W6	7	75 (50)	25kv AC	TCB	4 (OTIS)	2 (1)
07.09	Romford – Upminster	ROU	Rural	DfT	No	W6	8	30	25kv AC	OTW	OTIS	1
07.10	Sudbury to Marks Tey	SUD	Rural	DfT	Yes	W6	6	50	None	OTW	OTIS	1
07.11	East Suffolk line and Norfolk Branches	various	Rural	DfT	Yes	W6 (W8)	7 (6)	various	None	RETB (various)	various	various
07.12	Felixstowe – Ipswich Yard	FEL (various)	Secondary	DfT	No	W10	7	50	None	TCB	OTIS (4)	1 (2)

Capacity and operational constraints
A Acle: Passing loop length restricts capacity
B Halesworth – Oulton Broad: Single track section with no passing loops
C Braintree Branch: Single track section with no passing loops
D Shenfield – Colchester: Intensively used track section almost at capacity
E Southminster Branch: Single line with only one passing loop
F Forest Gate – Stratford: Capacity constrained by a mix of passenger and freight trains
G Liverpool Street – Bethnal Green: Lines almost at capacity

Other issues on the route
1 Potential strategic freight route would require an upgrade to this section

Note

This Route Plan forms part of the business plan suite of documents which is produced annually and in accordance with our network licence condition 7. Our plans and the way in which we intend to achieve those plans are summarised in the Business Plan itself. This document provides further detail on the specific plans for this Strategic Route including the expenditure over the next two years to the end of Control Period 3.

This year our business plan focuses on the remainder of Control Period 3 (to March 2009). We shall provide a submission to the Office of Rail Regulation in October 2007, which will set out our view of the expenditure and activities that will be required in Control Period 4 (2009/10 to 2013/14).

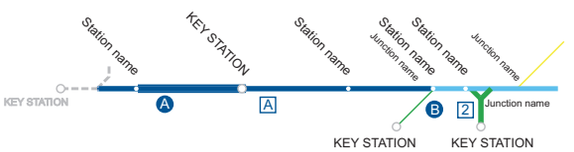
The Route Plan shows in more detail how the strategies set out in the Business Plan will be delivered at a route level across the network, and how we are working with our customers and other stakeholders to improve the performance and utilisation of the network. It presents a portfolio of activities to develop the network.

The expenditure section contains tables showing the planned level of expenditure and volumes on renewals on the route over the next two years, split by asset category. Expenditure figures are shown in 2006/07 prices, and are rounded to the nearest £1 million. An entry of £0 indicates spend of less than £0.5 million. It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning 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.

Please note that figures in tables may not sum to the totals shown, because of rounding.

The other documents in the business plan suite can be found on the Network Rail website www.networkrail.co.uk

Key to route diagrams



Capacity and operational constraints
A Location: capacity or operational constraint

Issues on the route
1 Location: issue on the route

Key planned projects
A Location: planned project on the route

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 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
- High Speed One - under construction
- Non operational line

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This Route Plan is part of a set.
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