Route Plans 2007
Route 5
West Anglia

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Route 5 West Anglia

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Route context

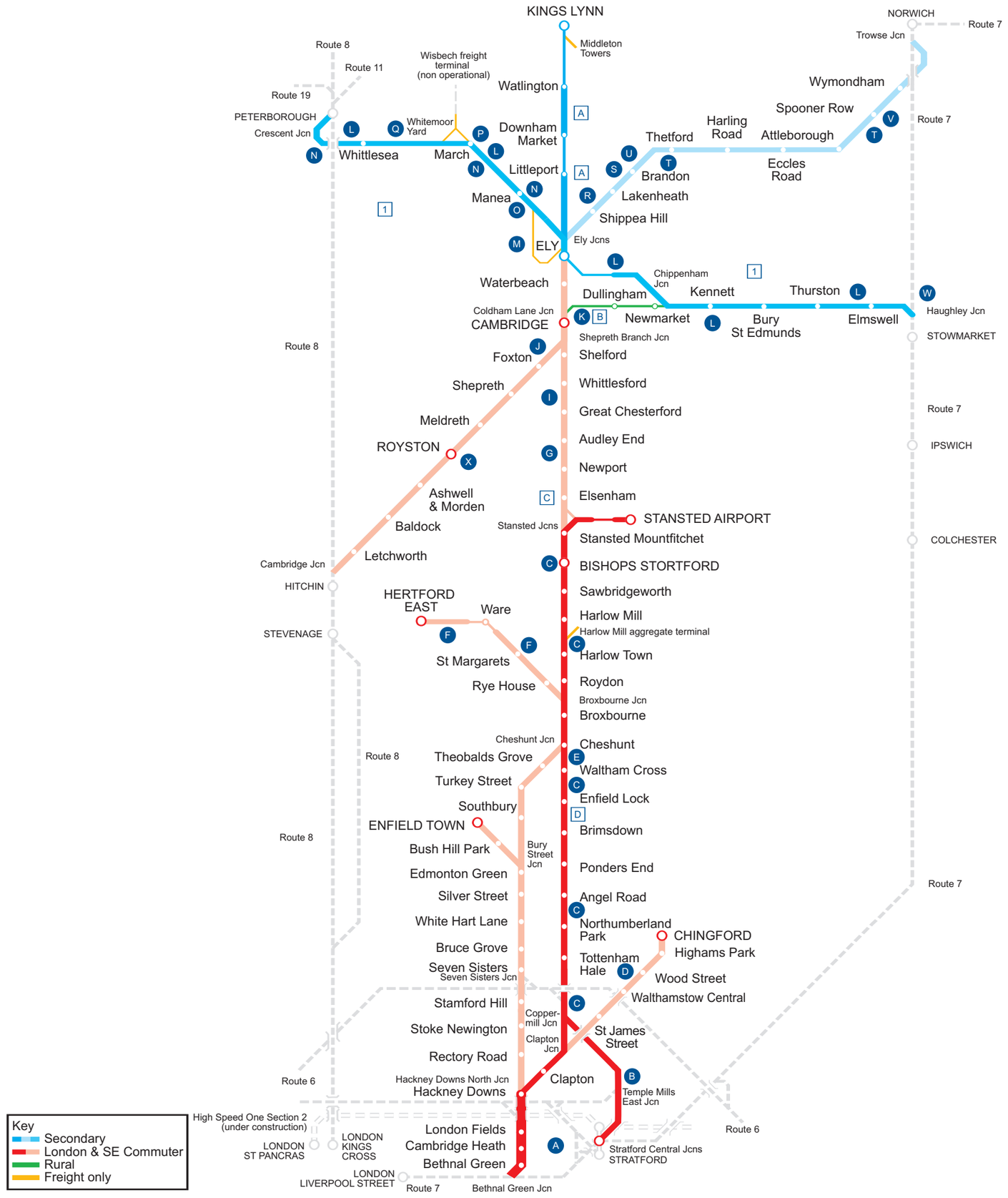
The West Anglia route carries main line services to the London terminals of Liverpool Street and Kings Cross, supports a busy suburban network in North London, Essex and Hertfordshire, rural services in Cambridgeshire, Norfolk and Suffolk, and inter-regional services from East Anglia to the Midlands and the North of England. The main line south of Cambridge largely parallels the M11 and rail services penetrate right to the heart of London. The route serves one of the fastest growing regions in the country with densely populated areas at its southern end and two significant traffic generators at Cambridge and Stansted Airport. The main markets are commuter travel to London, in particular to the city and the Docklands, and leisure travel, especially to Stansted Airport. The route provides an important corridor for freight services to and from the ECML and the east coast ports of Harwich and Felixstowe. The route is 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 and continued growth to Stansted Airport. However, the current network is already operating at or close to capacity in terms of train paths.

Today's route

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

- the West Anglia main line (05.01, 05.02, part of 05.05 and 05.06), which runs from Kings Lynn to London and includes the two routes between Liverpool Street and Cheshunt, one via Tottenham Hale (the Lea Valley) and one via Seven Sisters (the Southbury Loop). It also includes the branch to Stansted Airport;
- the cross country lines from Norwich to Peterborough via Ely, and Haughley Junction (on the Great Eastern route) to Cambridge and Ely (05.07,05.08 and 05.09); and
- West Anglia inner and outer suburban branches, to Chingford (05.04), Enfield Town (part of 05.02), Hertford East (05.03) and to Hitchin (part of 05.05). There is also a short freight line from Kings Lynn to Middleton Towers (05.10).

Route 5 West Anglia



Passenger and freight demand

Passenger demand is growing on the route (for example 2006 peak passengers are 2% higher than in 2005) especially into both central London and the Docklands, which continues to expand. 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 increased low cost flights from Stansted Airport and successful marketing campaigns from the train operators.

Main line services compete with the M11 corridor, which extends down into the eastern approaches to the city. Road traffic from the end of the M11 to the City is very congested at peak times and this means that the railway tends to be the first choice for commuters. In 2006 there were approximately 10,200 passengers per day travelling into London on the main line peak services.

The suburban network also experiences high numbers of passengers in the peak (16,000 in the morning peak in 2006) and this is due to increasing employment in central London.

Although the majority of the current demand is for travel into Liverpool Street, a significant number of passengers interchange with the underground Victoria Line at Seven Sisters, Tottenham Hale and Walthamstow Central. At Seven Sisters especially, there is limited station capacity, which causes overcrowding and suppresses demand.

Stansted Airport currently handles over 20 million passengers per annum (mppa) and BAA plc expects the maximum permitted throughput of 25 mppa to be achieved by 2006/07.

There are already five off peak Stansted services per hour into London – four fast to Liverpool Street and one slow to Stratford – plus one northward to Birmingham and demand is set to grow.

The introduction of an hourly passenger service between Norwich and Cambridge has been very successful and has generated increased demand between these major regional transport hubs. In addition there is healthy growth on the Interurban services from the region to the west Midlands and the North West.

Demand for movement of intermodal deep sea containers from the east coast ports at Felixstowe and Harwich is growing year on year by 4-5%. This demand could be further increased by the impending port developments at Felixstowe South (approved February 2006), and Bathside Bay, Harwich (approved March 2006). Increasing use of 9' 6" containers at the ports is raising capacity issues as the only route cleared for these larger containers on standard wagons (known as W10 gauge) is down the already congested Great Eastern main line and across North London. There is therefore increasing demand to run more of this traffic over the cross country route via Bury St Edmunds, Ely, March and Peterborough, this is further explored in the capability section below.

Current services

The passenger services are operated by 'one', FCC and Central TOCs, with freight services operated by EWS, Freightliner and GB Railfreight.

Figure 1 contains the morning peak (08:00 to 09:00 arrivals) and off peak passenger trains per hour frequencies into the London terminals.

Figure 1 Current train service level (trains per hour)

Originating Station	tph to Liverpool Street	tph to Kings Cross
Enfield Town	4 peak/2 off peak	n/a
Chingford	4 peak/4 off peak	n/a
Cheshunt/Broxbourne	2 peak/2 off peak	n/a
Hertford East (includes 2 peak to Stratford)	4 peak/2 off peak	n/a
Stansted Airport	4 peak/4 off peak	n/a
Royston	0 peak/0 off peak	2 peak/0 off peak
Cambridge	3 peak/2 off peak	2 peak/3 off peak
Kings Lynn/Ely	1 peak/0 off peak	2 peak/1 off peak

Figure 2 Current Train Service Level (trains per hour)

Regional/Rural Services	tph
Stansted Airport/Bishops Stortford to Stratford	1
Ipswich (starts from Liverpool Street) to Peterborough	1 every 2 hours
Ipswich to Cambridge	1
Norwich to Cambridge	1
Norwich to Liverpool/Nottingham	1
Stansted Airport to Birmingham New Street	1

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

The West Anglia network carries a mixture of traffic types with significant variations in speed, acceleration and stopping patterns.

The passenger services above are operated by a mix of inner and outer suburban electric multiple units, 90mph main line electric multiple units and diesel multiple units on the rural sections of the route.

As well as an intensive passenger network the route provides an important cross country link for several long distance freight flows, from the east coast ports of Felixstowe and Harwich to the Midlands and the north of England that would otherwise have to be routed down the already congested Great Eastern main line and across London. The route also sees varying volumes of freight to local terminals and yards, including aggregates and mixed commodities. There is a major Network Rail national logistics unit depot based at Whitemoor, between Ely and Peterborough, which feeds track components, ballast and other materials around the network. The freight services on the West Anglia route are primarily diesel hauled with a few electrically hauled services at the southern end of the route.

There is no segregation between freight or passenger traffic on the West Anglia main line or the cross country routes.

Figure 3 shows the tonnage levels on the route.

Traffic volumes are summarised in Figure 4.

Figure 3 Tonnage

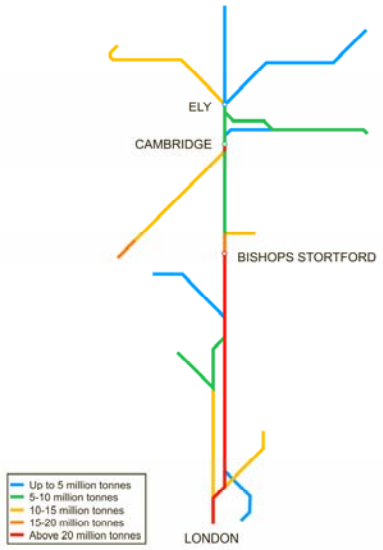


Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	16	1	17
Train tonne km per year (millions)	2,964	1,059	4,024

Current infrastructure capability

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

Figure 5 Linespeed

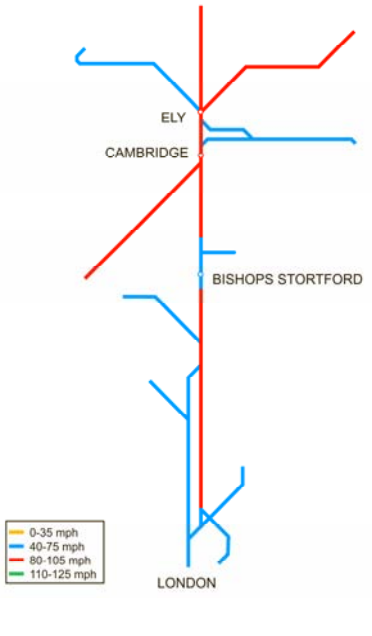


Figure 6 Electrification

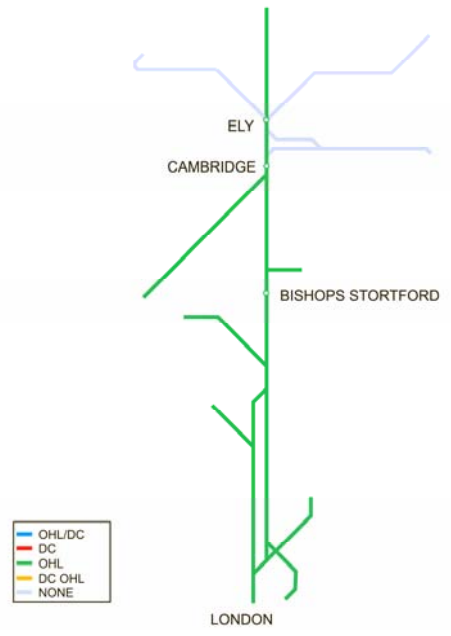


Figure 7 Route availability

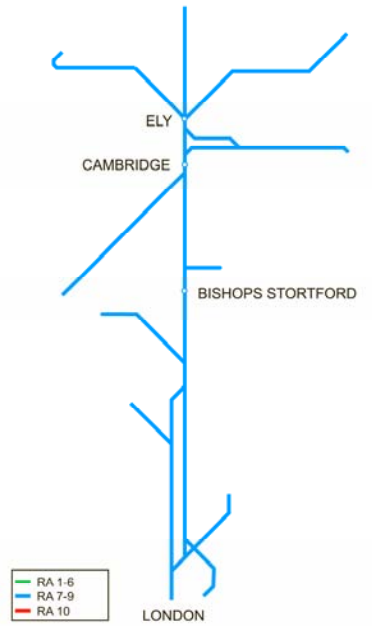
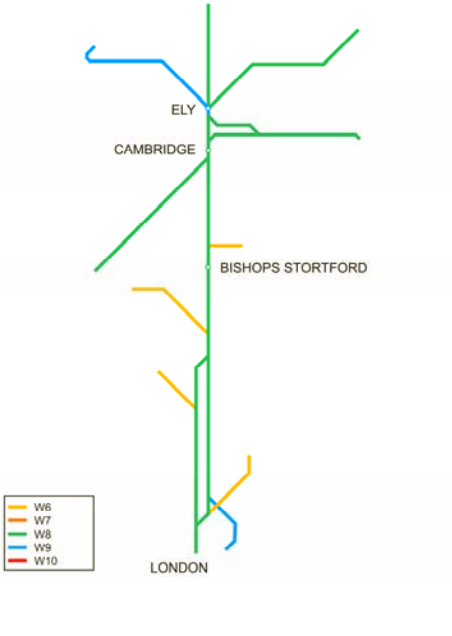


Figure 8 Gauge



Current capacity

There are serious issues of capacity on the West Anglia route. This is due to the mixture of services and stopping patterns, many flat junctions and single line sections. Overall route capacity is constrained by a combination of these factors. Additionally the suburban lines into Liverpool Street are heavily used in the peak and there is little capacity to run additional trains.

Key issues on the West Anglia route are:

- the mixture of fast and stopping services on the two track Lea Valley line giving rise to congestion and performance risk through much of the day;
- lack of W10 gauge cleared route;
- any additional services on the congested Lea Valley line will impact on the length of time the level crossings are closed to road traffic;
- the layout and operation of Cambridge station including one long single platform with a scissor crossover in the middle that has to accommodate through services in both directions and which causes problems with access to and egress from the north facing bay platforms;
- intensive platform utilisation and congestion on the throat at Liverpool Street;
- the single track Stansted Airport Tunnel currently being used at capacity and single track sections north of Ely, between Ely and Soham and between Chippenham and Cambridge;
- absolute block signalling on the cross country lines coupled with long signal sections between Bury St Edmunds and Kennet;
- convergence of three lines at Ely North Junction including single lead junctions and reduced functionality;
- high congestion on the two track section between Cheshunt and Broxbourne junctions; and
- passenger overcrowding on the platforms at Cambridge, Seven Sisters and Tottenham Hale stations at peak times, constrictive passageways and large numbers of passengers transferring with LUL services at the latter stations.

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 TOCs running along the route.

The passenger train services on the route are mainly operated by 'one', FCC and Central Trains running cross country services from Norwich to Liverpool/Nottingham and Stansted Airport to Birmingham. The cross country services will transfer to new operators under the DfT refranchising proposals scheduled for November 2007.

Figure 9 Current Train Service Level (peak trains per hour)

Route Section	
Letchworth to Hitchin	8
Royston to Letchworth	6
Cambridge to Royston	4
Seven Sisters to Hackney Downs	6
Clapton to Hackney Downs	14
Enfield Town branch	4
Chingford branch	4
Cheshunt to Tottenham Hale	12
Hertford East branch	4
Harlow Town to Broxbourne	8
Stansted Airpot branch (includes 1 to Birmingham)	5
Audley End to Newport	4

Figure 10 Current PPM MAA (2006/07)

TOC	MAA	As at period
Central Trains	84.2%	11
One	87.1%	11
First Capital Connect	88.5%	11

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 the intensity of the peak service means that an incident can cause a knock on effect on following services that can quickly result in large amounts of reactionary delays for what might be initially a small specific delay.

Analysis of recent performance shows the main problems on the route to be track circuit failures and trespass incidents, particularly affecting the inner suburban services.

Future requirements

Strategic direction

We expect that the route will continue to see high levels of passenger and freight growth. The main drivers of this will continue to be growth in commuting to central London and the Docklands, and the increased leisure market due to growing expansion at Stansted Airport. Port developments at Felixstowe and Bathside Bay on the Great Eastern route will bring significant demand for increased freight services, which will make providing diversionary routes for W10 gauge freight traffic across the West Anglia cross country route a high priority if capacity is not to be compromised on the congested Great Eastern route via London.

We believe that the solution to passenger growth and future capacity requirements can be potentially met by a combination of several initiatives:

- changes to the timetable structure to reduce the mix of different train types and the number of conflicting moves;
- train lengthening, often supported by platform lengthening and other rolling stock changes that would require a complete review of the available traction power supply;
- incremental enhancements (which can be delivered as improvements to planned track and signalling renewals in many cases) and certain limited stand alone enhancements. These have the potential to improve performance, enable specific increases in train paths and facilitate timetable restructuring;
- provision of additional passenger capacity at Cambridge, Seven Sisters and Tottenham Hale; and
- a review of car parking to look at way of improving access to the network.

To accommodate the high levels of growth on the West Anglia route additional peak services and train lengthening is likely to meet passenger growth. This may require some infrastructure works including longer platforms and additional tracks. More details can be found in the capacity section below.

Future demand

The emerging Regional Spatial Strategy focuses on housing and employment development in East Anglia, including the Cambridge area and the whole Harlow-Stansted-Cambridge-Peterborough corridor. Cambridge is a location of national importance in knowledge-based industries. Peak passenger journeys towards London are predicted to grow by around 2.7% per year over the next few years, based on current capacity. However, unless capacity is improved around half the potential demand will be suppressed.

Stansted Airport is continuing to grow rapidly nearly tripling its throughput in the last five years due to the growth in the low cost airline market and passenger numbers are predicted to rise to 35 million passengers per annum by 2012. The government white paper into the future of air travel proposed the construction of a second runway at Stansted, which could further increase growth at the airport to 70-80mppa. The strategy for meeting growth up to 35mppa could potentially involve the operation of 12 car trains to London. However to cater for the demand created by a second runway, changes to the infrastructure may be necessary and Network Rail, BAA and DfT are undertaking a number of studies to look at development of the rail corridor. The new direct service between Stansted Airport and Stratford was introduced in December 2005.

London has also been chosen as the host city for the 2012 Olympics and Network Rail are now working with the Olympic Delivery Authority on the development 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.

The Greater Anglia RUS is exploring growth on the corridor and will provide a series of options on how growth could be met. The RUS is planned to be published for consultation in April 2007. The following factors are likely to influence the growing demand on the West Anglia route:

- expansion of the east coast ports and the increased use of 9’ 6” containers on expanding intermodal freight services means that providing a W10 cleared cross country route is a high priority;

- Cambridge to London demand has doubled since 1996 and is likely to increase further over the next 10 years due to housing growth around Cambridge and employment growth in London and Docklands;
- peak commuting is growing to central London, the Docklands and regional centres;
- major housing and employment led regeneration in the Lea Valley;
- there are significant planned developments at Cambridge and Chesterton;
- the Cambridge guided bus project is likely to bring increased numbers of passengers from outlying areas to interchange at Cambridge station; and
- growing demand between the regional centres of Norwich, Cambridge and Ipswich.

Future services

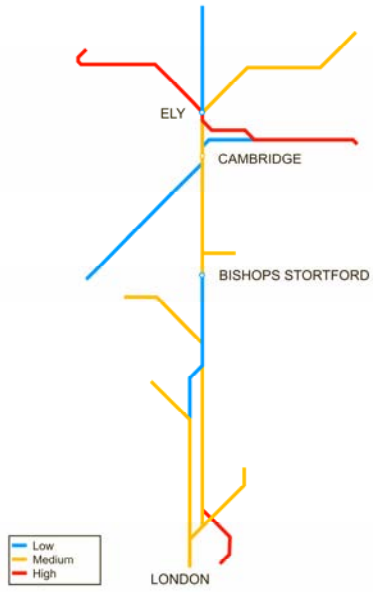
'one', as the principal passenger train operator on the route, have provided Network Rail with their view on how they see development of the route. They broadly agree with the growth forecasts for the route and the interventions described below. They have also emphasised the need for enhancement, and as well as looking at options for train lengthening they also advocate provision of additional infrastructure to enable more frequent services to operate.

'one' have emphasised the need for additional access to Stratford as well as Docklands, however, they acknowledge that additional trains will not be able to run through Stratford to Liverpool St until Crossrail is built.

The Greater Anglia RUS is exploring the options for meeting growth through additional and lengthened train services and on each main service the options include the following:

- post 2016 additional trains from Stansted are likely to be required but this is still under evaluation in conjunction with BAA;
- on the Enfield Town/ Cheshunt services trains have recently been lengthened to 8 cars. In conjunction with this additional Cheshunt – Seven Sisters shuttles are also a possibility;
- on the Chingford branch options include: operation of 9 car trains, the operations of shuttle services to Walthamstow Central or Stratford or the deployment of new high capacity rolling stock; and
- in the short term deployment of class 315 units instead of class 317s would create additional capacity on the Hertford East services.

Figure 11 Tonnage growth



Transport for London in their 2025 Vision have put forward similar responses to growth, however, they advocate a 4 train per hour service on all metro services all day, which will trigger the need for additional infrastructure in the Lea Valley. In the long term they envisage running additional trains to London via Stratford, but again acknowledge that this will not be possible until Crossrail is built.

The freight operators have emphasised the need for freight paths to depots on the West Anglia main line to be protected and also support development of the cross country freight route. The FOCs provided input to the industry wide freight forecasts, which have formed the input to the RUSs.

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

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 (on the Thameside route), via Forest Gate 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 W10 gauge freight traffic from the east coast ports and further expansion is proposed at both Felixstowe and Bathside Bay (near Harwich). The 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 gauge enhancement. Consequently work will be undertaken to improve gauge between Felixstowe/ Bathside Bay and Yorkshire, funded by the ports' developer under a Section 106 agreement. This work also includes capacity improvements on the Felixstowe branch and to Ipswich yard. A Transport Innovation Fund (TIF) bid has also been submitted for gauge improvements across to Nuneaton and the WCML. It is anticipated that further bids will be submitted for additional capacity works on the cross country route that may include doubling Haughley Junction, improving headways at Kennett and commissioning Ely West Curve.

Linespeed

Modest improvements to linespeeds on the cross country route between Newmarket and Cambridge could give longer turn round margins at Cambridge station, which would improve operation and performance as well as increasing demand, however this may only be possible in conjunction with increased infrastructure and would be funded from the NRDF provided that a successful business case can be made.

Target linespeeds will be set for each main route section, so that when assets are renewed any historic restrictions can be removed where practical.

Tonnage

Increased demand for freight traffic to and from the east coast ports of Felixstowe and Bathside Bay will cause much higher tonnages to be carried across the West Anglia strategic route section, Peterborough – Ely – Haughley Jcn, due to the need to provide a diversionary route for W10 gauge freight to the WCML away from the congested Great Eastern route between Ipswich and Stratford (Route 7). The additional traffic will bring capacity issues on this strategic route section, which will need to be upgraded for route availability and gauging to W10. The following parts of the route are predicted to see the highest increases of freight tonnage carried:

- Haughley Junction to Ely Dock Junction; and
- Ely North Junction to Crescent Junction (Peterborough).

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.

As part of their franchise commitment FCC are looking to run 12 car trains from Kings Cross to Cambridge on their fast services, which will entail platform extensions on the GN route. Subsequently the Thameslink programme includes plans to extend the platforms of Meldreth, Shepreth and Foxton stations, on the Hitchin to Cambridge route section, to accommodate 8 car trains.

The GA RUS has been considering growth on West Anglia services and it is likely to recommend platform extensions on the outer services, so that growth can be met on the Stansted and Cambridge corridors. Additional rolling stock, berthing and power will also be required, as well as consideration of a new 12 car island platform at Cambridge.

Fragile routes

Network Rail engineers have identified a set of 'fragile routes' across the country where the addition of any further loco hauled traffic would have a significant impact on the residual life of track and/or structures. The key section within this route, that has been identified as a fragile route which has clearly defined additional tonnage/train numbers is Ely – Norwich.

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.

Currently most of the West Anglia main line is already operating at, or very close to, capacity and there are few options for increasing the number of train paths available at peak times (or, on some corridors, for changing the stopping patterns) without providing additional infrastructure.

The Greater Anglia RUS is exploring the options for future capacity and on each main service the options include the following:

Figure 12 Forecast reduction in delay minutes

	2007/08	2008/09
% reduction in delay minutes	9%	17%

- platform extensions on the Cambridge/ Stansted corridor. Post 2016 additional services will require additional infrastructure in the Lea Valley and up the route to Stansted;
- on the Chingford branch options may include: the operation of shuttle services to Stratford, which would require the construction of Hall Farm curve; and
- in the longer term on the Hertford East Branch use of high density rolling stock or platform extensions are likely to be required.

To facilitate increased services to regional locations on the cross country route sections, the capacity requirements could also involve:

- a reduction of the long absolute block signalling section between Kennett and Bury St Edmunds;
- doubling the track between Ely Dock Junction and Soham;
- opening Ely West Curve to bi-directional travel, which would allow direct travel between Norwich and Peterborough without reversing at Ely;
- doubling Haughley Junction (which currently only has a single lead) where the Peterborough – Ely – Haughley Jcn crosss country route section meets the Great Eastern main line; and
- a range of loops including Ely.

Further path capacity may also be generated by changes to the train timetable and service mix. This also has a role in improving performance by improving service interaction.

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 TOCs running along the route. 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 introduction of a fully integrated control centre for East Anglia, which is already bringing benefits by improving communications, streamlining the decision making process and delivering an improved service to customers.

The southern end of the West Anglia route was resignalled in 2001 – 2003, which is delivering improved reliability and performance.

Track circuit failures are being addressed through our renewals programmes and other improvements in performance, such as improved fencing and CCTV monitoring to deter trespass and vandalism, are being achieved through the 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.

Network Rail also carries out regular reviews of the renewal job banks to assess the scope for enhancing them to include performance and capacity improvements. Where a business case is proven these schemes are funded through the NRDF. Schemes currently being considered include: Ely West Curve, signalling the turnback facilities at Seven Sisters and Walthamstow Central, provision of reversible working into Broxbourne from the Hertford East branch, plus the capacity/performance improvements at Haughley Jn and Kennett mentioned previously.

A further scheme (suggested by 'one') involves the provision of an up loop at Tottenham Hale to enable services to be turned back during times of service perturbation. This scheme could potentially be enhanced to allow a Tottenham Hale – Stratford service to operate clear of the mainline.

Route wide performance analysis carried out under the RUS has shown that level crossings and trespass and vandalism are among the highest causes of delay, and further assessment of the crossings is to be undertaken.

Figure 13 Forecast PPM MAA

TOC	2007/08	2008/09
Central Trains	85.7%	
One	90.1%	90.5%
FCC	89.4%	89.8%

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.

Safety requirements are compounded by overhead line arrangements that limit possession flexibility. As a result a cyclic maintenance regime was introduced that allows a regular number of weeknight, Saturday and Sunday night possessions over different sections of the line on 12 or 24 week cycles.

Although the cyclic maintenance strategy delivered both improved maintenance and performance in most areas it soon became apparent that even greater synergy was needed. A review of the strategy has been undertaken by Network Rail working together with the train operators and as a result a revised set of cyclic possessions, which allow a better balance between the train operators' requirements and our requirements for maintaining the track, were introduced in March 2006. A further review of access on the corridor is now underway.

During the Greater Anglia RUS we will continue to explore ways in that we can improve our possession regimes, which will include investigating the practicalities of:

- increased use of single line working (where practical and safe) to reduce the disruption to operators; and
- separate OLE feeds to depots so that the depot can still operate when it is adjacent to a possession of the running line.

Opportunities and challenges

We anticipate that accommodating growth in commuting to central London and the Docklands and continued growth in Stansted Airport demand will be a significant challenge on parts of the West Anglia main line and other sections of the route, which are already operating at, or very close to, capacity.

Many scenarios are being evaluated in the Greater Anglia RUS in conjunction with our stakeholders. Suggested initiatives and options for provision of the capacity and performance improvement required from the West Anglia 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	15	12
Switches and crossings	0	3
Other	0	–
Track total	16	15
Civils		
Underbridges	6	3
Overbridges	0	1
Bridgeguard 3	0	1
Footbridges	0	0
Earthworks	1	–
Tunnels	0	0
Other	0	–
Civils total	8	5
Signalling		
Resignalling	1	0
Minor works/other	11	16
Over–planning	(3)	–
Signalling total	9	16
Electrification		
AC systems		
HV switchgear	4	2
HV cables	0	0
Booster transformers	0	0
OLE re–wiring	0	1
OLE spanwires	–	0
OLE campaign change/refurbishment	0	2
OLE structures	–	0
Other	0	0
Electrification total	4	5
Telecoms		
Concentrators		
Large	0	–
Small	0	0
Customer information systems (CIS)	0	–
Long line public address (LLPA)	0	0
Other	1	0
Telecoms total	2	0

Operational property		
Stations		
Franchised	2	1
Depots		
Light maintenance	–	0
Lineside buildings	0	–
Operational property total	2	1
Plant and machinery		
Fixed plant		
Point heating	0	0
Signal supply points	0	0
Other	0	0
Plant and machinery total	0	1
Total Renewals	**41**	**44**
Enhancements (funded by)		
Network Rail		
Potential schemes	1	0
Total	1	0
Network Rail (RAB)		
Planned		
Other	0	-
Total	0	0
Potential schemes	1	12
Total	1	12
Other third party		
Planned		
Angel Lane loop	2	12
West Anglia route development	1	2
Ely car park	0	1
Other	0	1
Total	3	16
Potential schemes	1	15
Total	3	31
Total Enhancements	**6**	**42**

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 15 Forecast volumes

	2007/08	2008/09
Track		
Plain line (km)		
Rail	25	22
Sleepers	24	17
Ballast	25	17
Total	74	55
Switches & crossings (no.)		
Complete renewal	1	6
S&C (equivalent units)	1	6
Other (km)		
Drainage	1	–
Civils		
Underbridges (m²)	3,059	2,288
Overbridges (m²)	–	8
Bridgeguard 3 (m²)	–	139
Earthworks (m² slope surface)	7,757	–
Tunnels (m²)	–	500
Electrification		
AC systems		
HV switchgear (cb)	31	4
HV cables (km)	–	2
Booster transformers (no.)	15	–
OLE re–wiring (t. length)	–	14
OLE campaign change/refurbishment (t. length)	–	213
Telecoms		
Concentrators		
Large (no.)	1	–
Small (no.)	–	5
Voice recorders (no.)	1	–

Figure 16 Forecast expenditure

£m (2006/07 prices)	2007/08	2008/09
Maintenance	34	32

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
A Regents Canal bridge (05.01)	Strengthening works	Renewal	Structures	Network Rail	3	2007/08
B Temple Mills S&C	S&C and plain line track renewal	Renewal	Track	Network Rail	3	2008/09
F Broxbourne to Hertford East (05.01)	Plain line track renewal	Renewal	Track	Network Rail	4	2007/08
G Newport Viaduct Waterproofing (05.05)	Renewal of waterproofing and brickworks	Renewal	Structures	Network Rail	5	2007/08
H Great Chesterford Wire Degradation (05.05)	Rewiring of interlocking	Renewal	Signalling	Network Rail	4	2008/09
I Duxford & Hinxton Level Crossing renewal (05.05)	Level crossing renewal	Renewal	Signalling	Network Rail	5	2008/09
J Level Crossing renewal programme (05.05)	Level crossing renewals	Renewal	Signalling	Network Rail	1	2009/10
K Cambridge Concentrator Renewal (05.05)	Like for like telecoms renewal	Renewal	Telecoms	Network Rail	6	2007/08
K Cambridge CCTV Renewal (05.05)	Like for like renewal of signalling supervisory systems	Renewal	Signalling	Network Rail	4	2007/08
K Cambridge TDM renewal (05.05)	Like for like signalling renewal	Renewal	Signalling	Network Rail	1	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
K Cambridgeshire Guided Busway (05.05)	Asset protection during construction of the guideway	Protection of our assets during scheme construction	All asset types	Cambridgeshire County Council funded scheme has received planning and funding approval	4	2007/08
N Ely to Peterborough signalling renewals (05.07)	Like for like resignalling scheme	Renewal	Signalling	Network Rail	4	2008/09
P March Area Signal Box Renewals South (05.07)	Like for like signalling renewal. Includes works at Whitemoor	Renewal	Signalling	Network Rail	5	2009/10
O Manea Bridges (05.07)	Like for like bridge renewal covering 22 spans	Renewal	Structures	Network Rail	4	2008/09
P March West S&C (05.07)	S&C renewal	Renewal	Track	Network Rail	3	2008/09
Q Three Horse Shoes (05.07)	Like for like signalling renewal	Renewal	Signalling	Network Rail	1	2010
R Brandon, Lakenheath & Shippea Hill Interlocking renewals (05.09)	Like for like signalling renewal	Renewal	Signalling	Network Rail	1	2010
S Ely North Junction to Thetford (05.09)	Plain line track renewal	Renewal	Track	Network Rail	4	2007/08
T Norwich to Ely Pole Route renewal (05.09)	Like for like signalling renewal	Renewal	Signalling	Network Rail	4	2009/10
V Spooner Row Signal Box and LC (05.09)	Like for like signalling renewal	Renewal	Signalling	Network Rail	4	2008/09

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
W Haughley Junction S&C	S&C renewal	Renewal	Track	Network Rail	3	2008/09

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
D Tottenham Hale station improvements (05.01)	Still being developed	Improved station facilities and capacity	Station	Developer	1
K Cambridge station and forecourt development (05.05)	Station improvement works in association with a property development	Improved station facilities and capacity	Station	Developer	0 (subject to planning permission)
K Chesterton Junction new station (05.05)	New station north of Cambridge	New station to serve a new housing development	Station	Under consideration	2
L W10 Gauge Clearance (05.07)	Gauge clearance of the cross country route from Haughley Junction to Peterborough in connection with the port developments at Felixstowe and Bathside Bay	To accommodate freight train growth and act as a diversionary route for W10 gauge traffic on the Great Eastern route (route 7) south of Manningtree	Structures, track, signalling	In development for funding by port operator	4
X Royston car park (05.05)	Car park extension	Improved customer facilities	Station	Third party	1

Figure 19 highlights route enhancement aspirations.

Figure 19 Route Enhancement aspirations

Project	Project Description	Output change	Main asset type(s)	Funding	Status
C West Anglia Route Development (05.01)	Route upgrade. May include additional tracks, doubling Stansted Airport tunnel, platform lengthening and a power upgrade	Improved capacity and performance. To accommodate future growth at Stansted Airport	All asset types	BAA/DfT	In development for Third Party funding
E Cheshunt Bay Platform Extension (05.01)	Platform extension to accommodate 8 car trains	To accommodate future growth	Station	'one'	Completed
M Ely West Curve bi-directional signalling (05.07)	Signalling changes to remove reversing movements at Ely	Provides an alternative to running via Ely for cross country trains between Norwich and Peterborough releasing capacity and improving journey times and performance	Signalling	Transport Innovation Fund/Network Rail Discretionary Fund	Under consideration as part of the Greater Anglia RUS work
U Brandon Freight Terminal (05.09)	Additional siding in new location	Improves operations and safety	Track	None	No longer required as traffic moved to an alternative terminal

Non infrastructure developments

Figure 20 shows significant timetable schemes for the route that 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
London 2012	To deliver increased capacity to meet demand	Numerous schemes in development to facilitate passengers travelling to and from the Olympic venues	Improved capacity	Ongoing
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. OTIS: One Train In Section

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
05.01	Bethnal Green – Stansted Airport	BGK (TLA)	London & SE	DfT	No	W8 (W6)	8	various	25kv AC	TCB	3	2 (4)
05.02	Hackney Downs – Cheshunt	HDT (ENT)	London & SE	DfT	No	W8 (W6)	8	50 (60)	25kv AC	TCB	3	2
05.03	Hertford East Branch	HEB	London & SE	DfT	No	W6	9	60 (various)	25kv AC	TCB	4	2
05.04	Chingford Branch	CJC	London & SE	DfT	No	W6	7	50	25kv AC	TCB	3	2
05.05	Cambridge Lines	BGK (SBR)	London & SE	DfT	No	W8 (W9)	8	various	25kv AC	TCB	3 (4/5)	2
05.06	Ely – Kings Lynn	BGK	Secondary	DfT	No	W8 (W9)	8	90 (various)	25kv AC	TCB	various	1 (2)
05.07	Peterborough–Ely–Haughley Jn	EMP (CCH)	Secondary	DfT	No	W9 (W8)	8	75 (various)	None	TCB (AB)	various	2 (1)
05.08	Coldham Lane Jn – Chippenham Jn	CCH	Rural	DfT	No	W8	8	60	None	TCB (TB)	OTIS	1
05.09	Ely – Norwich	ETN	Secondary	DfT	No	W8	8	75 (90)	None	AB (TCB)	AB	2
05.10	Freight Lines	various	Freight	DfT	No	various	8 (6)	various	various	OTW (TCB)	4 (OTIS)	various

Capacity and operational constraints
A Littleport – Downham Market & Watlington – Kings Lynn: Single track sections limit capacity
B Cambridge station: Single through platform
C Stansted Airport Tunnel: Single track
D Tottenham Hale – Broxbourne: Mixed use of fast and slow services constrains capacity and potential journey time reductions

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).

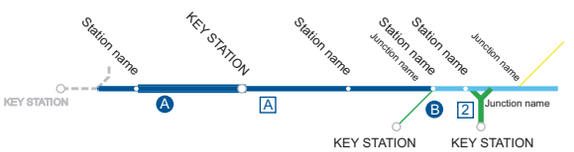
The Route Plan shows in more detail how the strategies set out in the Business Plan will be delivered at a route level across the network, and how we are working with our customers and other stakeholders to improve the performance and utilisation of the network. It presents a portfolio of activities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