



Route 5 West Anglia

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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 (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 context

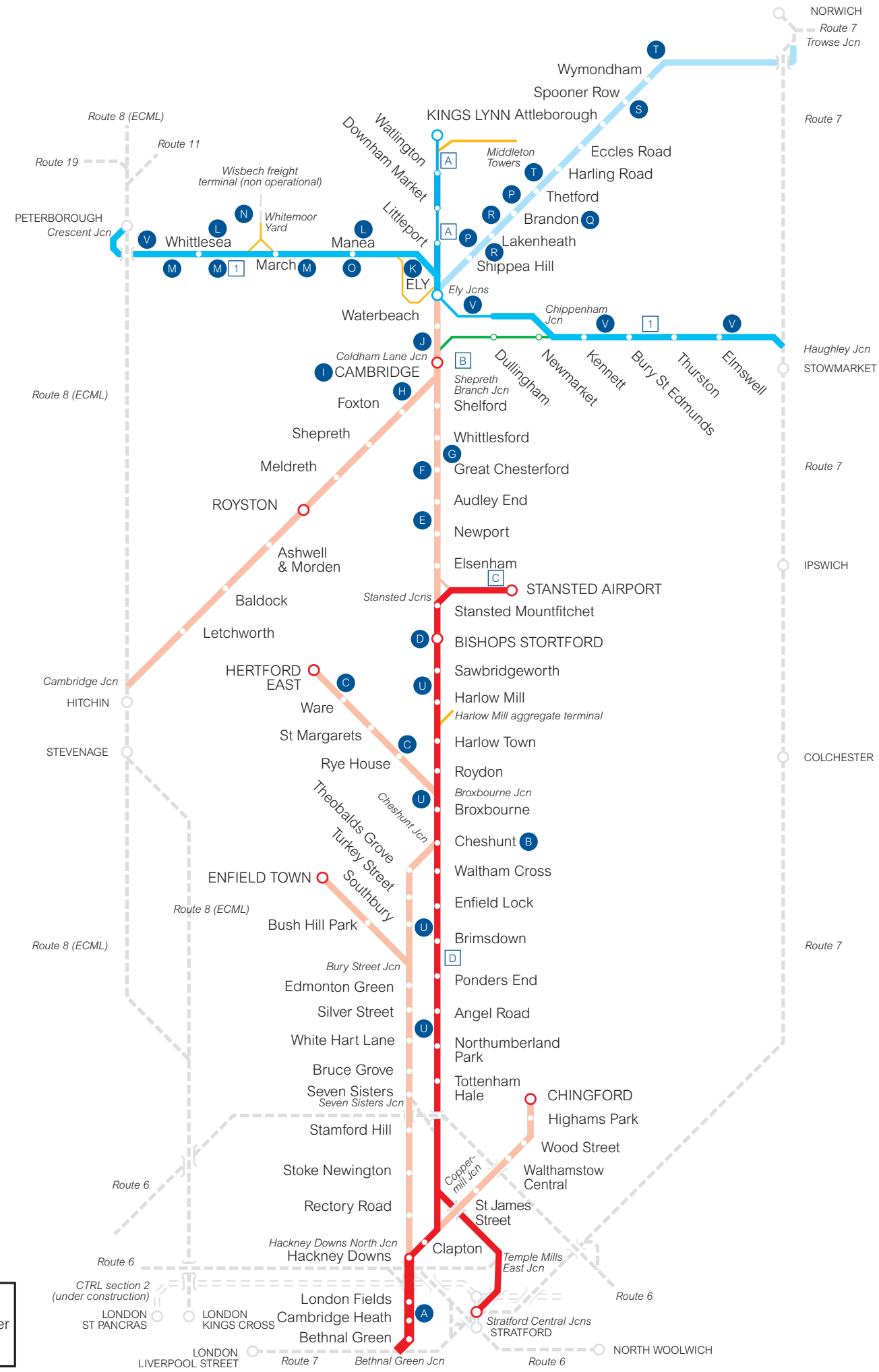
The West Anglia route carries main line services to the London terminals of Liverpool Street and Kings Cross, supports a busy suburban network in North London, Essex and Hertfordshire, rural services in Cambridgeshire, Norfolk and Suffolk, and inter-regional services from East Anglia to the Midlands and 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 RUS, work on which has started in February 2006 and will cover the period to December 2017. The Eastern Regional Planning Assessment (RPA), covering the period from 2011 to 2021, was published by the DfT on 16th 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.

Route 5 West Anglia



Key	
■	Secondary
■	London & SE Commuter
■	Rural
■	Freight only

Passenger and freight demand

Passenger demand is growing on the route (for example 2004 peak passengers are nearly 5% higher than in 2003) 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.

The suburban network also experiences high numbers of passengers in the peak 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 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.

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), which received minded approval from the DfT in late 2005. 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 route is used by One, WAGN 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 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	2 peak/2 off peak	n/a
Stansted Airport	4 peak/4 off peak	n/a
Royston	0 peak/0 off peak	1 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 services.

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.

Current traffic

The West Anglia network carries a mixture of traffic types with significant variations in speed, acceleration and stopping patterns. This involves a complex mix of diesel hauled freight trains, inner and outer passenger suburban services, 90mph main line electric multiple units and passenger diesel multiple units on the rural sections 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.

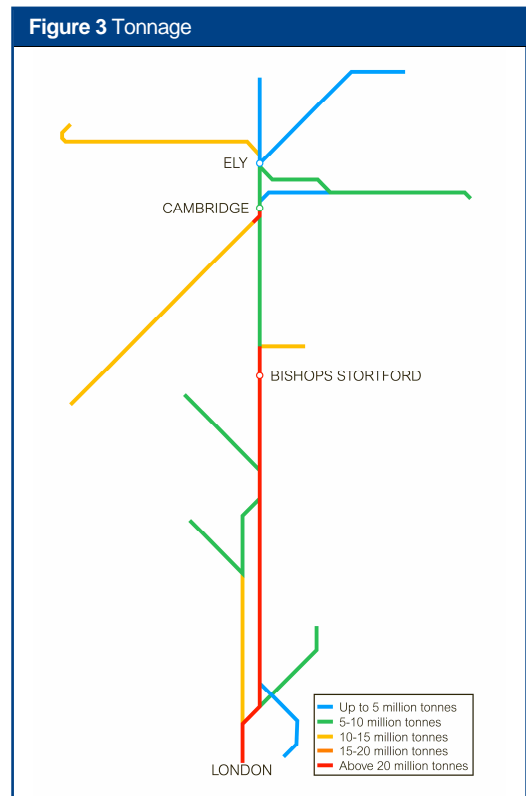
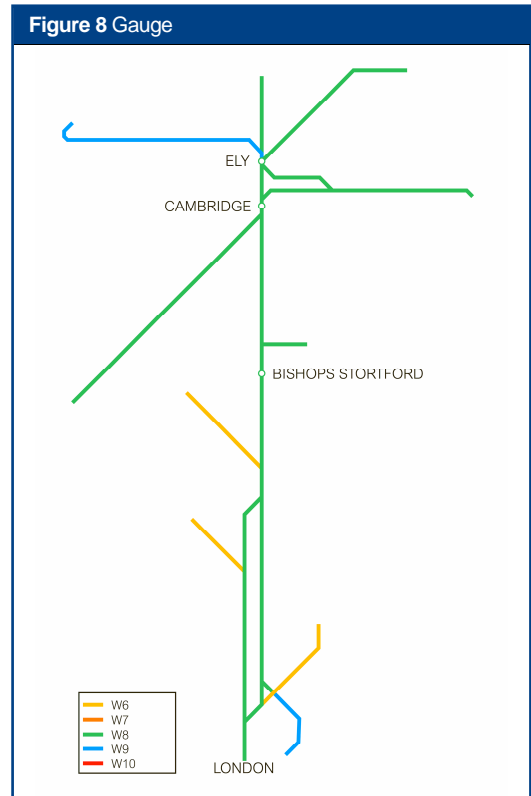
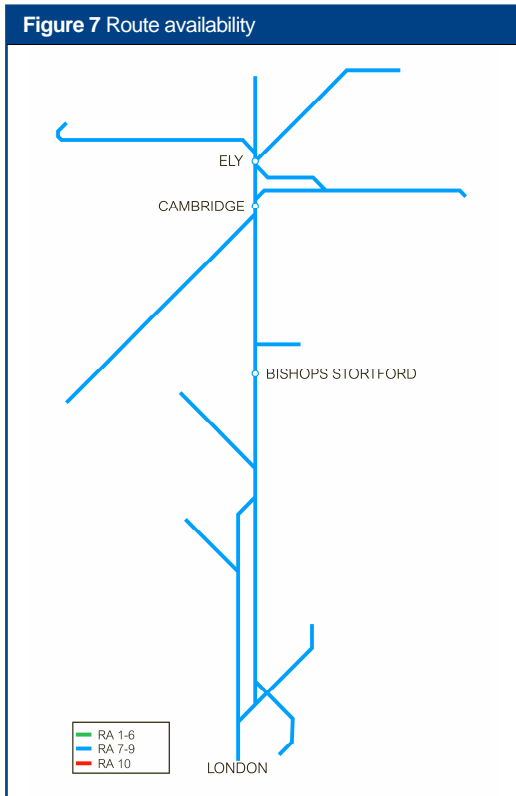
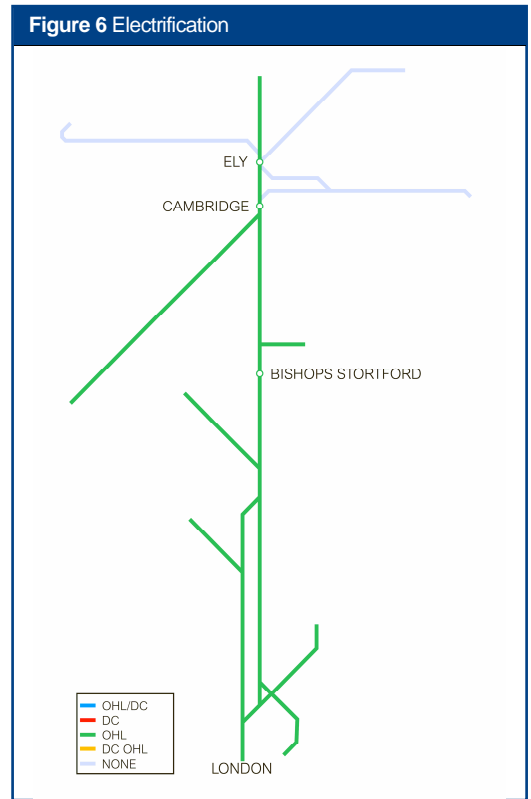
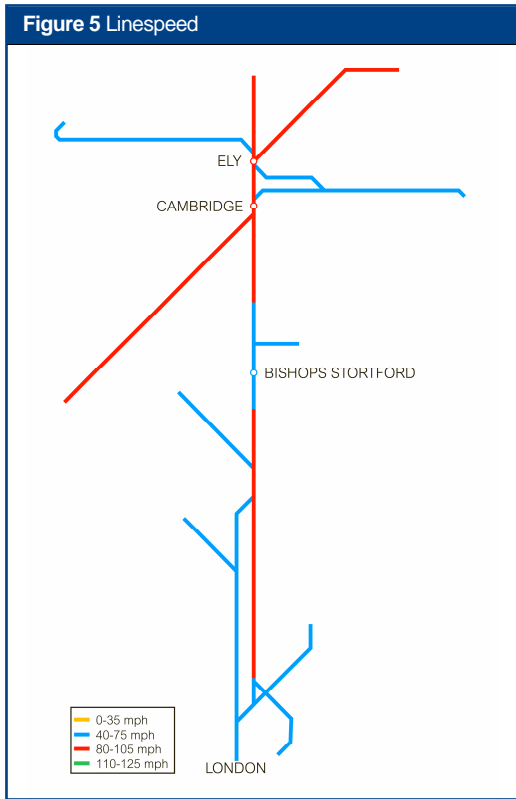


Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	16	1	17
Train tonne km per year (millions)	3,098	1,181	4,278

Current infrastructure capability

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



Current capacity

There are serious issues of capacity on the West Anglia route, because of 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;
- 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;
- 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, WAGN and Central Trains running cross country services from Norwich to Liverpool/Nottingham and Stansted Airport to Birmingham.

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	15
Enfield Town branch	4
Chingford branch	4
Cheshunt to Tottenham Hale	11
Hertford East branch	3
Harlow Town to Broxbourne	8
Stansted Airport branch	5
Audley End to Newport	4

Figure 10 Current PPM MAA (2005/06)

TOC	MAA	As at period
Central Trains	76.8%	10
One	86.7%	10
WAGN	88.9%	10

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 the performance figures for 2005 shows the main problems on the route to be track circuit failures and trespass incidents, particularly from children/youths affecting the inner suburban services.

Measures to improve performance over the route are outlined in the future performance section below.

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.

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. However, continued growth is also expected into central London and Docklands where employment is expanding together with growing demand at Stansted Airport.

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

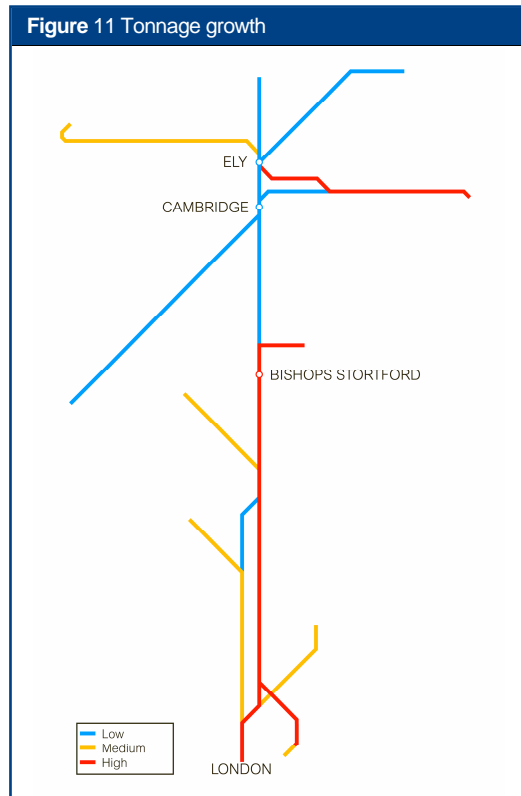
35 million passengers per annum by 2012. The government white paper into the future of air travel proposed the construction of a second runway at Stansted, which could further increase growth at the airport to 70-80mppa. The strategy for meeting growth up to 35mppa could potentially involve the operation of 12 car trains to London. However to cater for the demand created by a potential 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 development work has already started that has identified a number of potential improvements that could be made in order to ensure that the increased demand for travel to Stratford is met during the course of the games. A detailed specification of what is required for the games is awaited.

The Greater Anglia RUS will explore these growing areas of demand and will provide a series of options on how these might be tackled. The RUS is planned to be published for consultation in January 2007. The following factors are likely to influence the growing demand on the West Anglia route:

- 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;
- growing demand between the regional centres of Norwich, Cambridge and Ipswich; and
- potential expansion of the east coast ports and the increased use of 9' 6" containers on expanding intermodal freight services.

Figure 11 indicates the forecast percentage change in tonnage to 2015.



Future capability

Gauge

The SRA Gauging Policy published in June 2005 set out a proposed intermodal freight network 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 late 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 studies are continuing to examine the feasibility of future gauge specification for the cross country route to W10, which will be funded by the east coast ports developers in view of their 'Section 106' planning

commitments now that planning consent has been received.

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.

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 sustained 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 and will also require additional maintenance due to increased wear and tear on the infrastructure. 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 will often be 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.

The Thameslink programme includes plans to extend the platforms of Meldreth, Shepreth and Foxton stations, on the Hitchin to Cambridge route section, to accommodate 12 car trains.

Other train lengthening may also be possible on the West Anglia main line to Cambridge and Stansted Airport but this will need to be thoroughly assessed by the Greater Anglia RUS in terms of rolling stock provision and power supply assessment.

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 rail freight industry has recently provided to Network Rail a set of 10 year traffic forecasts, and we are presently assessing their implications. The

key route section within this route that has been identified as a fragile route and has clearly defined additional tonnage/train numbers projected by the industry 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 will explore the causes of and seek to provide solutions to the increasing capacity needs of the West Anglia route and some examples of areas that will be explored are:

- the two track Lea Valley line, which has a difficult current mix of both fast and stopping services. This section will come under intense pressure from increasing demand for commuting and growth at Stansted Airport. Any additional services on this section of the route will impact on the length of time the level crossings are closed to road traffic;
- the restrictive track layout of Cambridge station, which could be greatly improved by the construction of an island platform, that would relieve congestion, create additional capacity and improve station working;

- train lengthening options for some of the lines and service groups, (as discussed above) however these may need to be supported where necessary by platform lengthening or other measures such as selective door opening where supported by the rolling stock; and
- the use of new and reconfigured rolling stock.

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; and
- doubling Haughley Junction (which currently only has a single lead) where the Peterborough – Ely – Haughley Jcn cross country route section meets the Great Eastern main line.

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 2005/06.

* the negative figure below is an initial worsening of performance anticipated from the effects of an increased density in train service.

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

Figure 12 Forecast reduction in delay minutes

	2006/07	2007/08	2008/09
% reduction in delay minutes	-3%*	0%	6%

Figure 13 Forecast PPM MAA

TOC	2006/07	2007/08	2008/09
Central Trains	83.8%	84.5%	84.5%
One	88.4%	88.9%	89.3%
WAGN	90.0%	90.6%	90.8%

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 starting to deliver improved reliability and performance.

Other improvements in performance are being achieved through Joint Performance Improvement Plans, and the use of Six Sigma continues to bring improvements to specific performance problems (see the Management Plan).

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 portable CCTV cameras to monitor trespass and vandalism hotspots and better vegetation management to improve signal sighting and reduce adhesion problems

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 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 current strategy has been undertaken by Network Rail working together with the train operators and as a result a revised set of cyclic possessions, which allows a better balance between the train operators' requirements and our requirements for maintaining the track, will be introduced in March 2006. This will bring improved train performance whilst allowing more efficient access for maintenance.

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:

- 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 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.

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;
- measures to spread the peak demand and smooth the high peak requirements. A number of possible measures will be explored in the Greater Anglia RUS;
- 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; and
- provision of additional passenger capacity at Cambridge.

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 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 three 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 (05/06 prices)	2006/07	2007/08	2008/09
Renewals			
Track			
Plain Line	23	19	18
Drainage	0	0	0
Track Total	23	20	18
Civils			
Underbridges	5	6	4
Overbridges	–	–	1
Bridgeguard 3	0	0	1
Footbridges	0	0	–
Earthworks	–	1	–
Culverts	0	–	–
Other	0	–	–
Civils Total	5	7	6
Signalling			
Resignalling	–	–	0
Minor works/other	8	12	11
Signalling Total	8	12	11
Electrification			
AC Systems			
HV switchgear	0	1	5
HV cables	–	0	0
Booster transformers	–	0	0
OHL campaign changes/refurbishment	0	1	1
OHL spanwires	–	–	0
OHL structures	0	0	0
Other	0	0	0
Electrification Total	0	2	6
Telecoms			
Concentrators: large	0	0	–
Concentrators: small	–	0	0
Other	0	0	0
Telecoms Total	0	1	0

Plant and machinery			
Fixed plant	1	0	1
Signal supply point	–	0	0
Point heating	0	1	1
Plant Total	1	1	1
Operational property			
Stations	4	3	2
Light maintenance depots	0	–	–
NDS depots	1	–	–
Lineside buildings	0	1	–
Operational property Total	5	4	2
Total Renewals	43	46	46
Enhancements (funded by)			
Network Rail (RAB)			
Other	0	–	–
Network Rail (RAB) Total	0	–	–
Other Third Party			
BAA Stansted (West Anglia Route Development)	0	1	–
Chesterton junction new station	0	1	3
Other	0	–	–
Other Third Party Total	0	2	3
Total Enhancements	1	2	3

Figure 15 Forecast volumes

	2006/07	2007/08	2008/09
Track			
Rail (km)	31	29	29
Sleepers (km)	26	24	24
Ballast (km)	27	25	25
Drainage (km)	1	1	1
Civils			
Underbridges (square metres)	2,647	5,703	1,999
Overbridges (square metres)	29	129	171
Footbridge (square metres)	–	–	–
Embankments (square metres)	–	1,357	–
Culverts (square metres)	10	–	–
Electrification			
AC Systems			
HV switchgear (CBs)	–	5	28
HV cables (km)	–	–	2
OHL re-wiring (tension length)	–	37	147
OHL structures (no)	1	–	3
Telecoms			
Concentrators: large (no)	1	–	–
Concentrators: small (no)	–	5	–
Voice recorders (no)	1	5	–
Plant and machinery			
Signal supply point (no)	–	1	1
Point heating (point end)	30	65	93

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 three years.

Figure 16 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Maintenance	35	33	30

Infrastructure investment

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

Figure 17 Planned infrastructure investment						
Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
A Regents Canal bridge (05.01)	Strengthening works	Improved asset condition	Structures	None	3	2007/08
B Cheshunt Bay Platform Extension (05.01)	Platform extension to accommodate 8 car trains	To accommodate future growth	Station	Yes	6	2006/07
C Broxbourne to Hertford East (05.01)	Plain line track renewal	Improved asset condition and performance	Track	None	1	2007/08
D Bishops Stortford S&C (05.01)	Life extension works	Improved asset condition and performance	Track	None	1	2007/08
E Newport Viaduct Waterproofing (05.05)	Renewal of waterproofing and brickworks	Improved asset condition	Structures	None	4	2006
F Great Chesterford Wire Degradation (05.05)	Rewiring of interlocking	Improved asset condition and performance	Signalling	None	4	2008/09
G Duxford & Hinxton Level Crossing renewal (05.05)	Level crossing renewal	Improved asset condition and performance	Signalling	None	4	2007/08
H Harston & Hauxton Level Crossing renewal (05.05)	Level crossing renewal	Improved asset condition and performance	Signalling	None	1	2008/09
I Cambridge Concentrator Renewal (05.05)	Like for like telecoms renewal	Improved asset condition and performance	Telecoms	None	1	2006/07

Figure 17 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
1 Cambridge CCTV Renewal (05.05)	Like for like renewal of signalling supervisory systems	Improved asset condition and performance	Signalling	None	4	2007/08
1 Cambridge TDM renewal (05.05)	Like for like telecoms renewal	Improved asset condition and performance	Signalling	None	1	2008/09
1 Ely to Peterborough signalling renewals (05.07)	Like for like resignalling scheme	Improved asset condition and performance	Signalling	None	4	2007/08
M Kings Dyke, Three Horse Shoes and Stonea (05.07)	Like for like signalling renewal	Improved asset condition and performance	Signalling	None	1	2008/09
N March Area Signal Box Renewals South (05.07)	Like for like signalling renewal. Includes works at Whitemoor	Improved asset condition and performance	Signalling	None	5	2007/08
O Manea Bridges (05.07)	Like for like bridge renewal covering 22 spans	Improved asset condition	Structures	None	4	2007
P Ely North Junction to Thetford (05.09)	Plain line track renewal	Improved asset condition and performance	Track	None	1	2007/08
R Brandon, Lakenheath & Shippea Hill Interlocking renewals (05.09)	Like for like signalling renewal	Improved asset condition and performance	Signalling	None	1	2008/09
S Spooner Row Signal Box and LC (05.09)	Like for like signalling renewal	Improved asset condition and performance	Signalling	None	4	2007/08
T Norwich to Ely Pole Route renewal (05.09)	Like for like signalling renewal	Improved asset condition and performance	Signalling	None	4	2008/09

Figure 18 highlights uncommitted schemes under development.

Figure 18 Infrastructure investment under consideration					
Project	Scope	Enhancement or output change	Main asset type(s)	Status	
1 Cambridge station property development (05.05)	Station improvement works in association with a property development	Improved station facilities and capacity	Station	Funded by the developer	
1 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 approval	
2 Chesterton Junction new station (05.05)	New station north of Cambridge	New station to serve a new housing development	Station	Under consideration	
3 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	Under consideration	
3 Brandon Freight Terminal (05.09)	Additional siding in new location	Improves operations and safety	Track	Under consideration	
1 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	In development for Third Party funding	
1 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	

Non infrastructure developments

Figure 19 shows significant timetable schemes for the route that are under development.

Figure 19 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 20 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.	

Figure 21 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