

London Rail: Response to Network Rail's Consultation Draft of the Greater Anglia Route Utilisation Strategy

Executive Summary

The analysis and conclusions of TfL's Eastern Route Corridor Plan (ERCP) and Network Rail's Greater Anglia Route Utilisation Strategy (RUS) are broadly similar. TfL's response to the individual proposals of GARUS are summarised in Table 1 below and relies heavily on the outputs of the ERCP. Whilst catering for the rate of growth in demand identified by both studies is challenging, there is already evidence that the demand forecasts of both, and particularly those of ERCP, may be exceeded.

TfL regards the areas of greatest concern to be the West Anglia routes and the future routing of rail freight container services.

The West Anglia Main Line must not only cater for one of the highest growth rates in commuter traffic to London in the South East, but also cater for a proposed increase of nearly 2.5 times in the number of passengers using Stansted Airport and meet the Mayor's objectives for a minimum of 4 tph at all stations in London. Currently 8 West Anglia stations fail to meet this standard, Angel Road and Northumberland Park failing to do so miserably. Providing the necessary capacity to achieve this is crucial. Substantive investment in additional tracks and possibly replacement road crossings may be necessary. TfL looks forward to working with Network Rail, the Department of Transport, BAA and local authorities to determine how to address this most effectively.

The potential growth in rail freight container traffic facilitated by the three East Coast port developments is welcome and supports the London Plan and Mayor's Transport Strategy. The development of national rail routes that relieve London of through freight movements is supported. Even without expansion of passenger rail services in the South East, growth in rail traffic to and from the East Coast ports would, however, require enhancement of the capacity and capability of the routes that provide access to and from these ports to the East and West Coast Main Lines and thence the Midlands, North of England and Scotland.

On existing West Anglia and LTS services train lengthening is the preferred approach to increasing capacity. On the latter, the issue is primarily one of the timing/phasing of the introduction of longer trains whereas on West Anglia the merits of new, higher capacity rolling stock as part of a cascade of stock across West Anglia and Great Eastern services should be examined further as a possible alternative. On Great Eastern, platforms cannot be lengthened and the issue is how better to use the network to provide some additional peak services and whether they would be sufficient to adequately meet demand.

GARUS puts forward no options to specifically address issues of station capacity and station facilities. It does, however, identify locations where stations may have difficulty coping with the increased numbers of passengers expected, e.g. the national rail platforms, staircases and subway leading to the Underground at Seven Sisters, and recognise the potential crowding implications on Underground services, the Victoria Line and Central Lines in particular, of additional rail interchangers. TfL is very

aware of these issues and is working with a variety of partners to address them. TfL will also be working to achieve an acceptable base level of provision of facilities at all stations.

Finally, TfL advocates an approach to the provision of rail services and facilities that covers different types of services, improved accessibility and the improvement of passenger facilities, to provide a better rail offer to travellers and the community. It also advocates a holistic approach in terms of short, medium and long term planning. GARUS is essentially short term planning. It and the implementation of its recommendations must not lose sight of the longer term development of the rail system to meet our needs post 2021.

Table I: Summary of TfL London Rail comments on options put forward by Consultation Draft of GARUS

GARUS Options		TfL Comments
1	Lengthen peak trains on Thameside Main Line to 12-car	A relatively straight forward option with good business case. Strongly supported by TfL Lengthening is required on all peak services to meet TfL's crowding requirement. Some demand attracted from Great Eastern and District lines.
2	Lengthen peak trains on Tilbury Loop and Ockendon Branch	Requirement to lengthen platforms reduces attractiveness of business case. Some demand attracted from District Line. Grays 'starters' continue as 8-car and could still 'breach' TfL crowding standard. Need to lengthen trains is heavily dependent on development of 'brownfield' sites in the corridor served. Potential for appropriate phasing of the project.
3	New rolling stock on the Anglia inter-city services	Inter-city services were not assessed by the ERCP. The potentially significant increase in capacity is however noted.
4	Run two additional Great Eastern outer services in the peak hour	A relatively straight forward option with positive business case. Eases crowding but does not entirely eliminate standing inwards from Chelmsford. Strongly supported by TfL.
5	Stop all Great Eastern outer and Anglia inter-city services at Stratford	Particularly important in terms of regeneration and accessibility. Assessment needs to take wider benefits into account. If it is not possible to stop all services at Stratford, TfL would first exclude services from Norwich.
6	Run additional peak services on Great Eastern inners from Gidea Park	ERCP concluded that 2 additional tph could be operated. In order to meet TfL's crowding requirement this option needs combining with new, higher capacity rolling stock. Greater service regularity also provided by all services starting at Shenfield or Gidea Park If possible more than 2 additional tph would be welcome but still might be insufficient to remove overcrowding.
7	Lengthen peak trains on the Chingford route to 9-car	See comments on options 9 & 10. ERCP met its crowding standard by introduction of higher capacity rolling stock.
8	Lengthen peak trains on the Cambridge and Stansted routes to 12-car	In relation to Cambridge, lengthening of semi-fast services might be sufficient to meet crowding requirements. Stansted growth has only taken account of G1 expansion.
9	Lengthen Hertford East peak services to 12-car	ERCP options for WA inner suburban services centre on a higher capacity rolling stock inner suburban railway, all services being 8-car.
10	Lengthen peak trains to	

	Enfield Town to 9-car	TfL is happy to support any feasible options that provide the necessary capacity but notes the issues at London stations – difficulties of platform lengthening at Northumberland Park and of stopping 9-car trains at Stoke Newington – and that Cheshunt services would remain an odd-one-out 8-car operation.
11	Run two peak hour shuttle services to Seven Sisters	TfL supports the establishment of 4 tph on Southbury Loop throughout the day not just the peak hour. ERCP did not take a shuttle service forward because of likely difficulties of turning trains at Seven Sisters.
12	Increase capacity on the West Anglia Main Line by sections of 3/4 tracking	The preferred solution in terms of the amount of capacity that could be created. Best means of ensuring a minimum 4 tph at Angel Road, Northumberland Park and Ponders End and more than that at Enfield Lock, and Brimsdown. Majority of additional services should go to Stratford – bringing improved access to Stratford and Docklands. BAA’s proposals for rail to serve Stansted G2 should be considered in this context. Longer term development of services would depend on Crossrail and/or increased platform and approach track capacity at Liverpool Street.
13	Increase frequency between Ipswich and Peterborough to hourly	Not part of ERCP’s remit. This should be considered in conjunction with a programme to increase capacity of cross country route for containerised freight. TfL would not wish to see the latter compromised.
14	Increase frequency on the East Suffolk Line to hourly	Not part of ERCP’s remit. Should not compromise provision of capacity for rail freight serving growth of Felixstowe port.
15	Run an hourly service to Saxmundham	
16	Relieve crowding on non-London service (north of Cambridge)	Not part of ERCP remit. Any measures taken would not be expected to have a significant impact on services in London.
17	Accommodate higher demand for containerised traffic	Gauge clearance and capacity enhancement on the Gospel Oak Barking Line and the Felixstowe to Nuneaton route are essential. The capacity provided on the Felixstowe to Nuneaton route needs to be sufficient to accommodate the growth in container traffic to and from the Haven Ports and diversion of some existing traffic from the North London Line.
18	Improved route availability, Ipswich to Peterborough	Supported.
19	Improvements to train performance	Supported. Improved operations to and from Ockendon branch would be welcome. The ERCP identified operational and safety issues associated with the level crossing on the WA Main Line. There are also much wider issues involved the replacement of these level crossings.
20	Improve industry efficiency of engineering access	TfL recognises the implications of extended hours of operation to better match those of the Underground.
21	Match power supply to future needs	ERCP acknowledged that power supply issues may arise from its proposals but did not attempt to quantify them. Acquisition of new stock may provide opportunity to acquire regenerative braking capability to help reduce overall power requirement.
22	Improve access to the network	GARUS needs to be clearer on how it proposes to ensure these issues are addressed. TfL’s Park-and-Ride Framework does not support additional station parking in inner London and applies strict criteria to proposals in outer London. A co-ordinated approach to cycle access issues and the

		provision of cycle parking facilities is needed.
23	Meet future berthing needs	ERCP acknowledged that adequate berthing may be an issue especially if substantial train lengthening is pursued. Cannot be addressed further until stock options are finalised.

TfL London Rail: Response to Network Rail's Consultation Draft of the Greater Anglia Route Utilisation Strategy

Introduction

- 1.1 TfL London Rail has been a member of the Steering Group that has overseen the preparation of the Consultation Draft of the Greater Anglia Route Utilisation Strategy (GARUS) and of the study's Demand Sub-Group which has examined, in rather more detail, issues related to modelling, demand forecasts and the financial appraisal of options. TfL welcomes that involvement and now is pleased to comment on the Consultation Draft of the GARUS.
- 1.2 This response is primarily based on the outputs of TfL London Rail's own Eastern Rail Corridor Plan (ERCP), a medium term study that looked at the development of rail services, infrastructure and facilities in this corridor, and Rail 2025, TfL's longer term strategy for rail serving London. The outputs of the GARUS and TfL's studies are similar in terms of the level of growth in demand they identify it will be necessary to cater for and, in many cases, the means they put forward to address this issue.
- 1.3 It is important to recognise that in railway planning terms the timescales of GARUS and the ERCP are essentially short term. Their core modelling work does not include such potentially influential schemes as Crossrail and Thameslink which, if approved, could only at the earliest be operative towards the end of the period under consideration.
- 1.4 Similarly, only the impacts of the G1 proposals for the expansion of Stansted Airport are considered by ERCP although GARUS and ERCP look forward to the possible impact of G2. Both Network Rail and TfL are involved with BAA and DfT in considering BAA's rail proposals to accompany the G2 proposals, for the West Anglia rail corridor. TfL will be responding to BAA's proposals separately and urging that Stansted's requirements are considered in the light of the development of all the region's needs. A holistic approach is needed in terms of timescale, needs and solutions encompassing infrastructure, stock, services, stations and facilities.
- 1.5 Whilst it is very important to address the short to medium term capacity issues that face the railway, GARUS should look to, and be preparing the way for, development beyond its immediate timescale. It might make greater reference to the likely implications on demand and capacity of proposals like Crossrail but, equally significantly, consider longer term alternatives should preferred schemes not be given the go ahead.

Context

- 1.6 The area covered by Network Rail's GARUS is particularly important to London. It includes three important radial rail corridors into London. Historically all three have particularly high concentrations of commuter traffic, primarily bound for the City but now increasingly destined for the employment centres of Docklands and Thames Gateway. The three corridors are:

- The West Anglia routes covering the mainline via the Lea Valley and the Southbury Loop via Seven Sisters and their branches. Services over these routes are currently operated by ‘one’, with the exception of services from Stansted Airport to and from the Midlands that are operated by Central Trains at present but which will become part of the new Cross Country franchise.
- The Great Eastern routes covering the mainline to Chelmsford, the route to Southend via Shenfield, and their branches. Services on these routes are also operated by ‘one’.
- The London, Tilbury and Southend (LTS) routes covering the mainline via Upminster, the Tilbury Loop which diverges from the mainline between Pitsea and Barking, and its Ockendon branch that diverges from the Loop west of Grays to join the mainline at Upminster.

Development

- 1.7 Plan led growth in the ERCP/GARUS area is expected to be the basis of over 500,000 new jobs and well over 330,000 new homes (See Annex 1) by 2021. The routes above will serve many of the most significant growth areas in London and the South East over the next 20 years. These include two of the four national Sustainable Communities growth areas – Thames Gateway and the London-Stansted-Cambridge-Peterborough corridor – which, at their London ends, intersect at Stratford. Stratford is particularly important. It is one of 5 London Plan Opportunity Areas located in the area. It is London’s most important interchange outside the Central Area and, of course, the primary location of the London 2012 Olympics, which on its busiest days will attract upwards of 500,000 visitors.
- 1.8 Other developments that will generate significant traffic for the railways include BAA’s proposals for Stansted Airport, where proposals to maximise the use of the existing runway could increase the airport’s throughput to 35 mppa (Generation 1) and proposals to build a second runway could almost double that figure by 2030 (Generation 2). The area is also the centre of country’s port growth with proposals for three deep sea container terminals approved – at Felixstowe South, Bathside Bay (Harwich) and Shellhaven, east of Tilbury. Such developments will add significantly to the demand from rail freight for capacity on some key sections of the routes above.

Growth

- 1.9 Railplan forecasts the following % passenger growth (AM peak) up to 2016 on the routes in the above corridors:

West Anglia

Mainline (services via Tottenham Hale)	28%
Enfield Town/Cheshunt (services via Seven Sisters)	28%
Chingford Line	15%

Great Eastern

LTS	16%
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LTS	17%
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This growth assumes network enhancement only by committed schemes and in that respect represents constrained growth.

1.10 TfL consider Railplan is the most accurate model for forecasting future trips within London. However, Railplan’s zones become increasingly large with distance from London and the zones themselves are not defined to best reflect potential concentrations of growth. With the allocation of trips to the transport network via zone centroids the model may not represent fully the potential number of rail trips, or reflect passengers’ travel behaviour, outside London as well as it does inside London. For these reasons, London Rail feels demand forecasts for West Anglia services from Cambridge and Stansted may be underestimated in the ERCP.

Crowding

1.11 A major objective of TfL is ensuring that the rail services provided have sufficient capacity to meet demand, especially to meet the demand anticipated in major growth areas. TfL considers there is insufficient capacity when the level of demand in relation to capacity breaches the crowding standards that it applies to services into London. The crowding standards employed by TfL’s RCP process are the following:

- the number of passengers standing per square metre of standing space should be less than 3; and,
- no one should stand, except by choice, on a journey for more than 20 minutes.

1.12 If no further schemes are committed, the above growth in demand produces crowding that breaches the above standards on most services by 2016. In Table 2 below, for ease of presentation, the first criteria is generally applied to inner suburban services and the second one to outer suburban ones. The level of **crowding on all the services highlighted in red needs to be addressed**. This analysis corresponds well to that of GARUS.

Table 2: Level of Peak Hour Crowding in 2016, Committed Schemes Only

Service Group	Inner Suburban Services			Outer Suburban Services		
	Average number of passengers standing per sq m of standing space breaches TfL standard over part of the route.	Average number of passengers standing per sq m of standing space at busiest point.	Average number of passengers standing per sq m of standing space does not breach TfL standard at any point.	Passengers standing on a journey for more than 20 minutes	Extent of standing	No passengers standing (except by choice) on a journey for more than 20 minutes.
West Anglia Service Groups¹						
Broxbourne	√	3.0				
Cheshunt	√	5.0				
Chingford			√			
Enfield Town	√	5.0				

Hertford East	√	4.1				
Cambridge				√	Harlow to Tottenham Hale	
Great Eastern Service Groups						
Shenfield	√	5.2				
Gidea Park	√	4.9				
Ilford			√			
Braintree						√
Chelmsford						√
Colchester/ Colchester Town				√	Chelmsford to Liverpool St.	
Ipswich				√	Chelmsford to Liverpool St.	
Southend Victoria				√	Shenfield to Liverpool St	
Southminster				√	Billericay to Liverpool St	
Thorpe-le-Soken/Clacton				√	Chelmsford to Liverpool St.	
London, Tilbury and Southend Service Groups²						
Shoeburyness/Thorpe Bay/Southend Central	√	6.0		√	Basildon to Fenchurch St.	
Laindon			√			√
Grays	√	4.7		√	Upminster to Fenchurch Street.	
Pitsea/Stanford-le-Hope	√	5.1		√	Rainham and Upminster to Barking.	

Source: TfL 'Eastern Rail Corridor Plan', Arup, 2006

- ¹ Stansted Airport Services are not included in this analysis.
- ² All LTS services counted as inner suburban but the extent of standing is included for information.

1.13 TfL's objectives for National Rail serving London go beyond ensuring there is sufficient capacity on the system to meet reasonable demand. TfL seeks that rail makes a full contribution to achieving the Mayor's five over arching objectives that apply across his strategies. Whilst accepting these are not primary objectives of GARUS, TfL wants to improve people's access to jobs and services and through this help to foster a more inclusive society. This

involves ensuring Opportunity Areas and other growth areas, major centres and interchanges have frequent services from as wide a variety of destinations as possible.

- 1.14 This is translated into delivery of a more integrated transport network and a closer alignment of NR with the Underground in such areas as first and last trains. All NR stations should have a minimum service frequency of 4 tph throughout the day. Within the GARUS area of London there are a number of instances where this is not so – at Enfield Town and Bush Hill Park, on the Southbury Loop, the stations between Brimsdown and Northumberland Park on the West Anglia Main Line and Dagenham Dock and Rainham on the Tilbury Loop, 10 stations in all. It is a priority of TfL to address this. GARUS does not address this despite the impression sometimes given in the document, e.g the options listed against point 4 in Table 7.3.
- 1.15 The stations themselves should also have improved facilities, increased passenger security and a better environment in and around the station. More measures to increase ease of access to, and use of, stations by the mobility impaired should be implemented and co-ordinated with those on the Underground and other modes. More direct and attractive access routes for pedestrians and cyclists should also be identified and provided.
- 1.16 TfL's response to the GARUS proposals to increase the capacity of the three main radial corridors within the area, is primarily in terms of their impact on capacity but, in reviewing options to increase capacity, it will also take account of the contribution those options may have on achieving other objectives such as improved accessibility, increased security, better stations and a more attractive passenger environment.

West Anglia Routes

- 2.1 West Anglia services very easily divide into outer and inner services. The ERCP classed outer services as those from Cambridge and Stansted Airport and the inners as those from Broxbourne/Cheshunt, Hertford East, Enfield Town and Chingford.

Outers

- 2.2 **TfL supports the GARUS proposal to lengthen train services from Cambridge and Stansted Airport, initially to an all 8-car service and then, as demand requires it, to 12 car services.** The only question is what proportion of services should be lengthened and when. TfL's Railplan models the 3 hour peak period with peak hour demand and capacity being taken as percentages of the whole, therefore changes such as train lengthening, are applied to the whole 3 hour peak. The business case for possible changes was made on the same basis and produced a positive result for lengthening across the peak. In the case of both the Cambridge and Stansted services, train lengthening may be phased with the most critically loaded services being lengthened first.
- 2.3 For Cambridge services, Railplan modelling suggested that by 2016 only the semi-fast services (2tph) required lengthening, this having the benefit that the stations involved (with the exception of Broxbourne) already have sufficiently long platforms. However, as noted earlier, Railplan's modelling of demand outside London is probably over cautious, and, in practice, the demand shown by GARUS requiring at least part of all peak services from Cambridge (2 tph semi-fast and 2 tph all stations service) is accepted by TfL and all Cambridge services could well require 12 car trains somewhat in advance of 2016.
- 2.4 What are appropriate services for Stansted Airport is an issue that extends beyond the timescale of GARUS and ERCP. How quickly Stansted services will need to be built up to 12 car trains will largely be determined by the outcome of the Stansted Airport expansion, G1 and G2 proposals. One runway used to capacity (the G1 proposal) is likely to require some of the busiest trains of the existing service to be 12 car. Particularly important to the G2 proposals is not only the frequency or length of services to Stansted but the stopping pattern of those services. BAA's longer term proposal is to remove Bishops Stortford, Harlow and other intermediate stops north of Tottenham Hale, from Stansted services, in effect, making them 'true' Airport Express services. Dedicated services can be of value. The needs of airport passengers with luggage and often limited knowledge of the system can sit uncomfortably with those of regular commuters and other passengers. The two needs can be met by different services providing sufficient track capacity can be provided to cater for non-airport demands.
- 2.5 What GARUS clearly shows, in the peaks, is that the majority users of Stansted Airport services are passengers to and from Harlow and Bishops Stortford. Both these stations, and particularly the former, serve areas identified as significant growth centres. Withdrawal of stops from Stansted Express services would require replacement and enhanced stops and services to replace them. The Mayor is also seeking the development of West Anglia services to better serve the population and employment needs of the London area, including a minimum 4

tph service at the intermediate stations north of Tottenham Hale. Stansted has long been part of these plans, being an important potential employer of residents from the London Lea Valley. This, however, will certainly be the case with an expanded airport as communities in Hertfordshire and Essex will find it increasingly difficult to supply the required labour force.

- 2.6 Future services to Stansted Airport must include a mix of services that provide for a high proportion of passengers to use rail and provide for good access for workers, including those from the London Lea Valley, whilst not constraining the provision of services to cater for local and regional growth in the Lea Valley. The necessary infrastructure must be provide to accommodate these requirements.**

Inners

- 2.7 Both the ERCP and GARUS indicate a similar level of growth on the inner suburban services. The ERCP's core approach to these services is to ensure that all services are 8 car and that the stock operated on them is higher capacity rolling stock, similar to that to be introduced on London Overground services. By having greater standing space, more acceptable on shorter distance journeys than on other National Rail routes, demand is spread within the carriages and TfL's crowding criteria are not exceeded.
- 2.8 TfL accepts a financial appraisal may find it difficult to justify investing in such stock and its acceptability to the travelling public in London needs to be firmly established – in this the experience of London Overground will be particularly relevant. Some initial reaction to the introduction of higher capacity rolling stock on the future London Overground services has been that the introduction of new stock, and new approach it signifies, outweighs any disadvantage arising from the loss of seats. West Anglia stock (and stations) have changed little over the last 20 years. New stock may be seen as symbolic of a new approach to the whole railway. Within the GARUS period, the current Class 315s and 317s are likely to require replacement. **The industry needs to examine what type of stock and internal layout is most appropriate and which will have the greatest positive impact overall on the travelling public.**
- 2.9 **TfL would support the GARUS proposals for 9 car trains on the Enfield Town and Chingford services**, if this were seen as a more effective and attractive response than the introduction of higher capacity rolling stock and if more detailed analysis, found it to be technically feasible and financially justified. TfL has some reservations about availability of stock and ease of operation of 9-car services, especially as the Cheshunt service remain 8-car. Even with inter-working of Enfield Town and Chingford stock, there may be difficulty in provided a suitably flexible 9-car fleet.
- 2.10 It is noted that in the current GARUS analysis, considerably greater rail user benefits accrue from 9-car operation of the Enfield Town Line than from that of the Chingford service. TfL's analysis suggests that 9 car 313 trains surplus from Silverlink Metro could enhance capacity and performance on the Chingford and Enfield Town services. The displaced Class 315 units could then

be allocated to an enhanced service between Shenfield and Liverpool Street as a precursor to the more significant capacity enhancement provided by Crossrail.

- 2.11 The suggested 12-car trains on the Hertford East route provide slightly more rail user benefits than those gained, as above, by 9-car trains on the Enfield Town Line but at considerably greater cost, resulting in an unattractive business case. The ERCP analysis suggests 12-car operation of the Hertford East branch may be generous provision in terms of demand. Much of the demand on Hertford East services is between the Lea Valley Line stations and Liverpool Street which can be served by other services in the Lea Valley. The ERCP did model an option of 10-car trains across inner services, using existing class 315 and 317 stock, and this met TfL crowding standards on all routes up to 2016. 10-car formations would however be difficult to operate and, like 12-car trains, would involve platform lengthening or Selective Door Opening. **It was decided not to pursue this option.**
- 2.12 The GARUS option to meet demand on the Southbury Loop service is by the introduction of a 2 tph 8-car peak hour shuttle to Seven Sisters. It is not clear whether the existing 2 tph on this route were also modelled as 4 or 8-car services. With the completion of the Cheshunt Bay the services can now be 8-car. It is a Mayoral objective to have a minimum service of 4 tph at all London stations. **A peak hour Cheshunt to Seven Sisters shuttle would achieve this in the peak hour to complement that achieved on the Enfield Town Line.** The positive business case derived by GARUS is encouraging.
- 2.13 **TfL would like to see an all day 4tph operated on both the Enfield Town and Cheshunt routes, bringing this minimum level of service to Enfield Town, Bush Hill Park, Southbury and Turkey Street** (and Theobalds Grove outside London). 2025 identified that this could be achieved in the short to medium term without any infrastructure works.
- 2.14 The ERCP identified the Lea Valley as having relatively poor access to Docklands. This resulted from a number of factors, the low frequency of direct services to Stratford from the Lea Valley, the limited number of stopping trains at some local stations, and the fact that the majority of passengers would probably choose to access their final destination via Liverpool Street. To address these issues, the ERCP assessed an option that include 4 to 8 tph all stations service to Broxbourne. Destinations beyond Broxbourne were not modelled but undoubtedly at least part of the service would proceed onwards. Although not primarily a capacity relief intervention, these services did attract some passengers from the Enfield Town route and, with wider benefits taken into account, did have a positive benefit cost ratio.
- 2.15 The above option would require **4 tracking or part 3 and part 4 tracking of the Lea Valley Mainline from Coppermill Junction to Broxbourne Junction. TfL supports GARUS in its inclusion of a similar infrastructure option.** In the case of GARUS 6 tph operated to Stratford – 2 tph semi-fast services each from Cambridge and Stansted and 2 tph all stations services from Hertford East. The exact service pattern would be open to discussion but a

priority outcome from 4 tracking would be to ensure all stations in the London Lea Valley had a minimum 4 tph throughout the day.

- 2.16 The London Lea Valley is one of London's major growth areas with regeneration expected to address local employment issues and help counter social deprivation. The basic 1 tph service to Angel Road and Northumberland Park is total unacceptable for these areas. The survey work shown in Table 3.8 of GARUS is informative. **It shows usage of the intermediate stations in the London Lea Valley to be rather greater than is the case in other rail industry data**, and the annual usage of Enfield Lock and Brimsdown to be equivalent to that of towns outside London such as Tamworth and Trowbridge. TfL would advise that additional services are used to provide all the stations in the Lea Valley with an attractive service, providing opportunities for local travel and access to Liverpool Street and to more distance attractions.
- 2.17 TfL is currently considering a revised service specification for the Lea Valley that would provide a holistic solution to all the future requirements of rail in this corridor – local, regional and airport driven. **TfL strongly urges all parties involved (DfT, Network Rail and BAA) to work together to ensure such additional infrastructure is provided along with a phased programme of service enhancement to meet forecast demand.**
- 2.18 The level crossings on the West Anglia Main Line are a significant focus of local concern. There are 3 within the GLA area at Ordnance Road (Enfield Lock), Green Street (Brimmsdown) and Marsh Lane (Northumberland Park). The crossings have a major impact on road traffic and pedestrians, 'down time' seriously affecting car and, in the case of Ordnance Road, bus traffic, thus leading to community severance. They also lead to concerns related to safety. There have been fatalities at these crossings in recent years. Level crossings at Lincoln Road (south of Enfield Town) and Hale End Road (Highams Park) cause less concern due to the lower frequency of service on the Enfield Town and Chingford lines.
- 2.19 Clearly the impact on the level crossings of any 3 / 4 tracking of the Lea Valley Line will be a major consideration. Safety will be paramount and the impact on the local community also a major concern. Whether crossings on a 3 or 4 track railway will be acceptably at all is open to debate. Ideally, the provision of extra tracks should be taken as an opportunity to provide alternative crossings of the railway. The existing crossings could perhaps be replaced by one or two bridges with improved pedestrian links. **TfL urges a detailed study of the optimal solution for the affected level crossings should the number of tracks on the West Anglia Main Line be increased.**

Great Eastern Routes

- 3.1 Great Eastern offers a clear distinction between inner services that start at locations from Shenfield inwards and operate on the 'E-Lines', and outer services that operate on the Mainline to Chelmsford, including its branches, that extend beyond into Essex and East Anglia, and the Shenfield to Southend Victoria line.

Inners

- 3.2 Opportunities for capacity enhancement on these services are limited as intermediate stations are generally restricted to 8-car services. Significant capacity increases are therefore limited to higher capacity rolling stock – again a recommendation of TfL's ERCP – and additional services. The GARUS suggests up to 4 or 5 additional services might be possible in the peak hour. **TfL supports GARUS in providing for as many additional services per peak hour as possible.** Its ERCP only considered 2 additional services were possible. It did, however, combine the extra services with a more regular service pattern with all services starting from either Shenfield or Gidea Park. The GARUS proposal includes a more dispersed service pattern, including some services starting from a new turn back facility at Chadwell Heath.

Outers

- 3.3 Both studies recommended an additional 2 tph in the peak hour. As services on the Main Line corridor are more overcrowded than on the Southend corridor, this seems the obvious routing for the additional trains. **Standing can extend as far out as Chelmsford, and thus the GARUS suggestion that the additional trains start from Chelmsford is supported by TfL.**
- 3.4 TfL believes there are many accessibility benefits from stopping all outer services, including the Norwich services if possible, at Stratford. It would also even out loadings on outer services – currently those services that stop at Stratford are more crowded – providing performance benefits. In light of the above, it is disappointing the GARUS benefit cost ratio for this option is so negative. It is hoped this can be revisited, especially as some of the infrastructure requirements associated with the proposal have now been committed as part of other programmes, e.g. the extension of Platform 10A at Stratford. The Business Case for stopping services is likely to have improved. Any works at Stratford will need to be carefully co-ordinated with the Olympics building programme.
- 3.5 **The remit of TfL's ERCP did not include intercity services from Norwich. It does, however, support the GARUS recommendation to replace the existing stock with new, higher capacity stock.** The proposal has high costs and benefits but is financially positive overall. This would give a substantial increase in capacity and mean that more capacity may be available at Colchester, easing the pressure on Great Eastern services.

LTS

- 4.1 A distinction between inner and outer services is not particularly relevant on LTS. It is more appropriate to divide the services into Mainline (taking the most direct route from Southend Central) and Tilbury Loop services. The latter, in turn, can be subdivided into the main Tilbury Loop services and those via the Ockendon branch. In the peak Tilbury Loop services start at a number of locations, e.g. Pitsea and Grays, but in the off-peak 2 tph start at Southend and operate via the Ockendon branch, and 2 tph start at Grays and operate via Rainham.
- 4.2 Like other corridors in this sector, options for peak capacity enhancement are limited by the capacity of the its Central London terminal – Fenchurch Street. Opportunities to stop services short and turn them back could exist but they would not make a great deal of sense in terms of the traffic objectives of passengers. On all the services, the most obvious and efficient option of increasing capacity is through train lengthening.
- 4.3 **TfL supports the GARUS proposal to lengthen Mainline services.** The ERCP showed this service group to have the highest density of standing of any in the study area. Lengthening requires no changes to stations and platforms and is primarily a matter of acquiring the stock and crews. The GARUS option of lengthening only selected peak services can and should be done relatively quickly. The main issue is if and when lengthening to 12 car will need extending throughout the peak.
- 4.4 The areas served by the Tilbury Loop are identified for substantial plan led growth. Some of the sites earmarked for growth are reliant on improved transport access for that potential to be realised. Growth predictions and timescales may well be less robust in these areas than elsewhere in the GARUS area. **TfL supports the GARUS proposals to lengthen Tilbury Loop services, initially ensuring all peak services are 8 car and then introducing (possibly phased) of 12 car services if, and when, growth in demand requires it.**
- 4.5 In the peak, all LTS stations within London have the Mayor’s minimum service requirement of 4 tph. Off-peak this is not the case at the London stations of Rainham and Dagenham Dock. With GARUS’s concentration on peak capacity, TfL would not expect it to deal with the off-peak service at **Rainham and Dagenham Dock** but it does **anticipate Network Rail’s support to achieve 4 tph off-peak at these stations.** TfL is committed to identifying a means for this frequency increase to occur, especially as it will assist in the regeneration of a deprived area of London, will work with interested parties to find the best way of achieving this.
- 4.6 That rail should provide access to development is a major objective of the London Plan. TfL acknowledges the proposals for new stations on the Tilbury Loop at Renwick Road and Beam Reach, both proposals closely linked to regeneration opportunities. **Previous work that suggests one new station is possible within the current stock and pathing resource is noted and TfL would urge the Network Rail to consider this possibility.** In these localities, it

is as important a contributor to catering for potential demand as is train lengthening. TfL will work with the Thames Gateway Development Corporation and the Boroughs to determine priorities in respect of the new stations. Clearly any new station should have a minimum 4 tph peak and off-peak.

- 4.7 Although not a proposal of GARUS, TfL through its ERCP, firmly supports more services on the LTS stopping at Stratford, particularly in the peak hour when only 4 of the 20 tph through the station stop. **TfL supports the work of the Network Rail and the ODA to achieve more stops at West Ham.**

Impact on the Underground

5.1 One of the areas of greatest uncertainty is the impact on the Underground and at Underground stations, of the proposed capacity/demand increases on National Rail. Clearly the greatest impact is likely to be at the main rail/underground interchanges, including the Central London terminals. London Underground has identified the following locations as ones where the proposals in GARUS could cause capacity problems.

- **West Ham** - c2c capacity/demand increases and more trains stopping at West Ham adding to increased number of interchangers arising from development at Stratford and increased movement in Canning Town to Stratford corridor resulting from DLR take over.
- **Stratford** – potential issue of dealing with additional interchangers and passengers attracted by development arising from more outer services stopping there.
- **Tottenham Hale** – could see large increase in use by originating and destination passengers and interchanges from developments in the area, the large increase in demand expected on the Lea Valley rail services and the proposed growth of Stansted Airport.
- **Liverpool Street** – general increase in passengers passing through the station.

5.2 TfL does recognise and support where GARUS has identified station capacity as an issue – particularly at the major interchanges of Stratford, Tottenham Hale and Seven Sisters. Plans for upgrading Stratford (Regional Station) and Tottenham Hale, led by ODA and TfL respectively, to enable them to accommodate major developments within their catchment areas are progressing well. The Olympics is a significant factor here. As well as Stratford, the ODA is looking at funding proposed changes at West Ham both to enable more services to stop there and to accommodate the number of people using the station during the Olympics. As yet, however, no scheme or potential sources of funding has yet been identified to upgrade Seven Sisters Station. **London Rail supports GARUS in identifying Seven Sisters as a station that will need to be similarly addressed.**

5.3 Liverpool Street Station is a somewhat different issue. Various aspects of its capacity may be questioned – its approach tracks, platform capacity as well as internal circulation space – but the extent of that questioning may only become critical following the outcome of major proposals such as Crossrail. Once a base situation is established, including which of the GARUS options for capacity enhancement are a preferred option, the longer term requirements of Liverpool Street, with or without Crossrail, should be addressed.

5.4 Much of the concern of London Underground relates to the impact of increased rail demand on the Underground's services, not necessarily at the point of entry/interchange onto the network, but also included the impact on services as they reach the Central Area. Table 3 compares crowding on relevant sections of the Underground of a base situation in 2004 with that expected in 2025. Although this includes a general rate of growth, the Underground is concerned it is not able to incorporate the impact of some large individual demand generators. The situation in 2025 incorporating committed schemes including PPP upgrades.

This, for instance, accounts for the fact that there is no further deterioration of the situation on the Victoria Line between Seven Sisters and Highbury & Islington. Highlighted in red is where the base 2025 crowding is expected to be at the equivalent level to London Rail's overcrowded category and/or where crowding is continuing to become greater. Clearly, the areas of greatest concern are those of onward movement through the Central Area – the Victoria Line from Kings Cross to Oxford Circus and the Central Line from Liverpool Street to Bank.

Table 3: Recent and Forecast Levels of Crowding in AM Peak on Relevant Underground Lines

	2004	2025 (committed schemes)	Change
Victoria Line			
Tottenham Hale – Seven Sisters	Busy	Crowded	Increase
Seven Sisters – Finsbury Park	Maximal	Busy	Reduction
Finsbury Park to Highbury & Islington	Crowded	Crowded	No change
Highbury & Islington to Kings Cross	Very Crowded	Crowded	Reduction
Kings Cross to Euston	Crowded	Very Crowded	Increase
Euston to Warren Street	Crowded	Very Crowded	Increase
Warren Street to Oxford Circus	Very crowded	Very crowded	No change
Central Line			
Liverpool Street – Bank/Monument	Crowded	Very crowded	Increase
Bank/Monument – St Pauls	Crowded	Crowded	No change
St Pauls – Chancery Lane	Crowded	Crowded	No change
Chancery Lane - Holborn	Busy	Busy	No change
Sub Surface Lines			
Liverpool Street – Aldgate	Seats taken	Some standing	Increase
Aldgate – Tower Hill	Some standing	Busy	Increase
Tower Hill – Monument/Bank	Busy	Busy	No change
Monument/Bank – Cannon Street	Busy	Busy	No change
Cannon Street – Mansion House	Busy	Busy	No change
Mansion House - Blackfrairs	Busy	Busy	No change

Source: London Underground

Key

Seats free	0 to 50% of seats taken
Seats taken	50% to 100% of seats taken
Some standing	0 to 1 paxs/sq.m
Busy	1 to 2 paxs/sq.m
Crowded	2 to 3 paxs/sq.m
Very crowded	3 to 4 paxs/sq.m
Maximal	>4 paxs/sq.m.

Freight

6.1 All the necessary planning consents have been granted for three major port developments in the GARUS area – at Felixstowe South, Bathside Bay (Harwich) and Shell Haven. These port developments will cater primarily for deep sea container freight, expected to be the focus of considerable growth, 4% pa up to 2030. Container traffic is by far the largest freight demand on the rail network in the GARUS area. Most of this traffic requires paths to and from the east coast ports to the East and West Coast Main Lines.

Table 4: Intermodal Container Traffic – tpd (in each direction) between the East Coast Ports and the East and West Coast Main Lines

To/from	Base (2005)	Additional trains arising from port development	
		WCML	ECML
Haven Ports	22	+20	+8
North Thameside	14	+17	+6

Source: TfL London Rail derived from 'Eastern Rail Corridor Plan' Arup, 2006

6.2 This is in line with GARUS (Table 4.12) with potential growth of 28 tpd from the Haven Ports and 23 trains per day from Shell Haven.

6.3 The East Coast Ports Development Study identified the following possible additional freight paths on the network:

- 13 daily between Haven Ports, Ipswich and Willesden using the Great Eastern and North London Lines;
- 14 daily between Haven Ports and Peterborough via the cross county route;
- 12 daily between Shell Haven and Willesden via Stratford, heavily constrained by the Forest Gate to Stratford section; and,
- 6 daily between Shell Haven and Willesden via the Barking - Gospel Oak Line, constrained by junction and platform conflicts at Gospel Oak.

6.4 Even if no additional paths are needed for passenger services, **TfL agrees with the RUS (section 5.3.4) that there is a shortfall in capacity on the Great Eastern (and North London Line) by 2014/15**, made worse by the lack of W10 gauge on potential alternative routes. TfL is extremely concerned at the prospects of additional freight trains between Forest Gate and Stratford having to cross all four Great Eastern tracks at Stratford to access the North London Line, and of any additional freight trains sharing the 2 track North London Line between Stratford and Dalston with TfL's proposed 8 tph passenger service.

6.5 If the growth in container traffic is to be accommodated two key issues have to be addressed: gauge clearance and capacity enhancement. W10 gauge is needed to accommodate 9'6" (High Cube) containers, increasingly becoming the norm for the deep sea container trade, on standard wagons. Currently, the Great Eastern, Thameside and the North London Line are W10 cleared. W10 clearance needs extending to those (sections of) routes above not already cleared. Capacity enhancement is also needed, primarily on those currently 'under-utilised' freight routes. **TfL agrees with the RUS that the Gospel Oak Barking Line needs to be upgraded to accommodate Shell Haven to WCML traffic** (the outcome of a TIF bid to achieve this is awaited) **and that the cross country route needs to**

become a strategic freight route (section 5.3.8) to cater for the bulk of additional traffic generated by the Haven Ports developments.

- 6.6 The extent of upgrade of the cross country route is critical and is related to forecast growth in demand. There are three key issues:
- the timescale over which this growth might take place;
 - whether all the growth will be ‘generated’ or part will be abstracted; and,
 - the routing of the growth and of existing traffic.
- 6.7 **TfL has a rather more demanding requirement of the cross country route than GARUS, up to 16 tpd more, see Table 5.**

Timescale

- 6.8 The estimates of growth in additional container trains come from the individual enquiries into the proposed port expansions – at Felixstowe South, Bathside Bay and Shell Haven. **The majority of the Haven Ports development and up take of the container handling capacity created is expected to occur by 2015/16.** Accommodating this demand falls within the core timeframe of the RUS. Growth arising from the Shell Haven development may, by that time, be around 8 additional trains per day. **Most Shell Haven growth is likely to come between 2015 and 2023.**

Extent of Growth

- 6.9 As the growth prediction for each port development was prepared independently of the others, it is open to speculation as to whether a proportion, and if so what proportion, of the predicted growth might be common to each development. As a worst case scenario, **the ERCP assumed all the growth would occur independently.**

Routing of Freight

- 6.10 The routing of the additional traffic is critical. **The ERCP assumed all growth between the Haven Ports and the East and West Coast Main Line should be routed via the cross country route and all Shell Haven to West Coast Main Line traffic via the (upgraded) Barking to Gospel Oak Line, leaving only Shell Haven to East Coast Main Line traffic to go on the North London Line via Stratford.** GARUS assumes a proportion of the new traffic from the Haven Ports is routed via the Great Eastern and NLL making use of currently unused paths. It is TfL’s longer term objective to increase the number of passenger services on the Gospel Oak to Willesden Junction section of the London Overground network beyond that contained in the concession. As the Cross London RUS (p.6) noted this would require ‘that relatively few of the existing freight services using the North London Line would have to transfer to the cross country route’. Currently there are 6 to 8 deep sea container tpd bound for the WCML. **The ERCP looked at diverting existing Haven Port to East and West Coast Main Line traffic from the Great Eastern and NLL** giving an overall requirement of the Cross Country route of around 46 tpd, say the equivalent of 3 paths per hour throughout a 16 hour working day with a minimum 1 path per hour for passenger services.

- 6.11 **The ERCP and GARUS assessments for the Cross Country route** (Table 5) could be regarded as high and low requirements although there are circumstances that could take potential demand outside this range at both ends of the scale.

Table 5: Cross Country Route: Capacity Required for Container Traffic, tpd Ipswich to Peterborough

	Current	2015	2023
GARUS	8	14	30
TfL RCP	8	35	46

Source: TfL London Rail derived from 'Eastern Rail Corridor Plan' Arup, 2006

- 6.12 Nevertheless, there is a consensus on what needs to be done: any divergence relates to the timing and specification of the measures needed. **Network Rail should build on this consensus and develop a phased programme to deliver specified levels of capacity increase on different routes corresponding with particular levels of growth in container traffic.**

- 6.13 The transition from one phase to another can be accelerated or deferred according to the rate of growth. Such a programme should include;

Committed Schemes

- (a) A section 106 agreement with Hutchison Ports UK, the developer of Felixstowe South and Bathside Bay, for some capacity enhancements from Felixstowe to Ipswich and W10 gauge enhancement from Ipswich to Peterborough, ensuring a second gauge cleared route from the Haven Ports to the ECML.
- (b) Provision of a freight loop at Stratford – between Great Eastern and North London Line – as part of the North London Railway Infrastructure Project programme of works.

Short to Medium Term (up to 2012)

- (c) Gauge clearance of cross-country route Peterborough to Nuneaton and implementation of a north facing chord to WCML at Nuneaton would allow existing paths to be used for deep sea container traffic to the WCML (currently the paths only provide limited access to the ECML). Improved signalling headways at Kennett through installation of IBS would further give a marginal increase to the capacity of the route between Kennett and Bury St Edmunds of 3 tpd. This whole package is currently the subject of a TIF bid and a decision is awaited. GARUS suggests this would provide sufficient 'slack' in the total capacity of the cross country route for an extra 9 tpd to the WCML.
- (d) W10 gauge clearance of the GOB and capacity enhancement, allowing Shell Haven to WCML traffic to use this as an alternative to the NLL, providing relief to the NLL and Great Eastern by avoidance of the Forest Gate Junction. As noted above, these works are also the subject of a TIF bid.

TfL urges Network Rail and all concerned to work for the approval of these TIF bids. Their implementation may meet NR requirements for 2014/15 but

TfL's requirements and/or higher port development led growth would require further capacity enhancement.

Other short to medium term schemes to be considered should be:

- (e) Electrification of the Gospel Oak to Barking Line providing, for freight, an alternative cross London route to the NLL for traffic from Shell Haven. The scheme would provide environmental benefits, reduce operating costs and benefit rail passengers on the route.
- (f) The West Anglia Lea Valley route could provide an alternative route to the Great Eastern for Haven Ports to WCML traffic. This would utilise the cross country route to Ely and come south and via Coppermill Junction to the Lower Lea Valley, accessing the NLL via Temple Mills East and Lea Valley junctions. To be fully effective this needs W10 clearance. Use by freight would also be helped by 4 tracking. Although perhaps only intended as a diversionary route, e.g. to avoid Stratford during construction of, and the period of, the 2012 Olympics, this route could become more significant, especially if the pressures on the Great Eastern and North London Lines are not fully addressed by other means.

Medium to Longer Term - post 2012

- (g) Further capacity enhancement of cross country route as detailed in section 5.3.6 of GARUS. What needs to be established is the number of paths this would make available for freight and any upgrade of passenger services, how close would it be to providing for 46 tpd and what further measures would be necessary should that target not be met.

6.14 TfL wants to establish with Network Rail (i) what capacity for freight a second phase of enhancement of the cross country route would provide, and (ii) how the necessary level of diversion of existing freight traffic off the NLL to deliver TfL's long term objectives for passenger services can be achieved.

Annex 1: Summary of Planned Growth within the Area Served by Greater Anglia RUS

			Growth to 2016/2021	
Rail Corridor		Area	Housing	Jobs
West Anglia	Outside GLA	Cambridge Sub-region	66,100	71,400
		Stansted		6,200
		Great Dunmow	2,650	
		Bishops Stortford	2,000	
		Harlow	20,700	40,000
		Broxbourne	2,500	
		North Weald	6,000	
		Within GLA	Upper Lea Valley	7,000
	Sub-Total			106,950
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Great Eastern	Outside GLA	Suffolk Coastal	3,730	8,000
		Ipswich	20,110	18,000
		Babergh	1,400	3,400
		Colchester	17,100	14,200
		Tendring	8,500	6,100
		Braintree	1,200	
		Maldon	2,400	
		Chelmsford	14,000	
		Brentwood	2,900	
		Basildon*	8,000	8,500
		Rochford	4,600	3,000
		Southend*	4,000	8,000
	Within GLA	Ilford	9,000	2,000
		Lower Lea Valley/ Stratford	32,000	50,000
Sub-Total			129,940	123,200
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LTS	Outside GLA	Thurrock	18,500	26,000
		Basildon*	2,700	2,500
		Castle Point	4,000	2,000
		Southend*	2,000	5,000
	Within GLA	London Thames Gateway	44,000	129,500
		Sub-Total		73,200
Central London/City Fringe			5,100	85,000
Total			315,190	505,800

Source: TfL London Rail derived from 'Eastern Rail Corridor Plan' Arup, 2006

Based on figures behind Draft East of England Plan and Draft Further Alterations to the London Plan

* Growth has been apportioned between the two routes