High Speed Rail

in the

South East

Greengauge 21

April 2014

1. Introduction

High –Speed One – and the services that run over it – both international and domestic – have been an undoubted success. Peak period services operated by Southeastern are now experiencing crowding, with standing passengers despite the application of a premium fare. The question is how best to build on this success (relieving overcrowding as far as possible) and in a way that generates the best returns for the south east's economy.

Greengauge 21 has prepared this report on behalf of the South East Local Transport Board in response to a brief of 28 November 2013 (attached at Annex A).

Remit
The aim of the exercise was to examine the scope for new high-speed rail services and routes in the south east of England. Specifically, we were asked:

i. To undertake an outline review of connectivity to the existing HS1 route from across the SELEP area (that is, the counties of Essex, Kent and East Sussex), including outline proposals for improvements and possible extensions

ii. To review and identify the next steps required from the 2013 study by *Greengauge 21* on connecting HS1 and HS2 with a dedicated High Speed link, and the importance of Stratford International to the SELEP area

iii. To identify what outcomes, particularly with regard to economic benefit, could be achieved by such proposals for new HSR routes

iv. To identify the capacity which could be realised on the existing rail network as a result of increased HS1 patronage.

It was agreed that there was no requirement to prepare new demand forecasts given the timescale and aims of the project.

A lot of information is to hand and work underway, and we were invited to make contact with key stakeholders (who would typically be members of, or represented on, the SE Local Transport Board) – and this we have done. We would like to acknowledge the time that people made available to us and

their contribution to this report; responsibility for the contents and conclusion remain with Greengauge 21 alone.
We had discussions with:

- Network Rail
- Southeastern Trains
- Vince Lucas (SE LTB and SELEP member)
- Kent County Council
- High Speed One.

Approach

We have drawn on the recently published draft SELEP Strategic Economic Plan (SEP) to ensure our conclusions on priorities are informed by the over-arching strategic economic aims for the area.

It was agreed early on that this work would ignore the question of the outcome of the Davies Commission, and so we have presumed that there is no new airport in the Thames Estuary.

The nature of the rail industry planning process is that it is conducted with 5-year time horizons; schemes and funding for the period 2014-2019 are now settled, but service patterns can and will continue to evolve; early planning and appraisal work is in hand for the next 'control period' 2020-2024 ('CP6') and after that there is an expectation that HS2 will be delivered – and so the question of the HS1 – HS2 link would then be relevant, for example.

This suggests that an approach that looks at options for the short term (2014-19) the medium term (2020-2024) and the long term (2025 and thereafter) will be most helpful in this case.

Outline

In the next chapter, we consider the current levels of connectivity to HS1 and present evidence of the impact of HS1 on the property market. Then, in Chapter 3, we set out a long list of the possible ways to improve HS1 services and the economic value of HS1 to the region. Here we also show how various initiatives for rail service development would line up against the development proposals contained in the SEP. [An outline economic benefit assessment of short term options remains to be added to this chapter].

Chapter 4 is concerned specifically with the question of the HS1 – HS2 link. In considering the question of the HS1 – HS2 link we draw not only on the earlier Greengauge 21 work on this subject but also on discussion with TfL who have kindly shared their thinking on how to improve the HS1 – HS2 link.

Chapter 5 is concerned with the role of Stratford International and Regional stations which is critical for connectivity between Essex locations and the HS1 catchment. Chapter 6 explores the questions around new rail links and the related issue of released capacity. Chapter 7 sets out our draft conclusions.

2. Review of HS1 Connectivity

Journey times and services

The services which currently operate on HS1 are the following, in the standard hour:

- 2 trains per hour from Faversham to St Pancras via Gravesend and Ebbsfleet
- 2 trains per hour from Ashford to St Pancras (of which 1 is from Dover and 1 from Ramsgate via Canterbury West).

In the peak hour, additional trains operate, with the following principal changes from the standard hour pattern:

- Dover and Ramsgate trains split and join at Ashford, providing 2 trains an hour to/from each
- A small number of Dover trains are extended to and from Deal
- Some Faversham trains are extended to/from Ramsgate along the North Kent line.
- There are a small number of trains to and from Maidstone West and a small number of trains operating between Ebbsfleet and St Pancras only.

All trains are operated by class 395 Javelin trains, operating in either 6- or 12-car formation.

HS1 was conceived initially as a means of reducing the journey time and increasing the number of international trains operating from London to Paris and Brussels. It was supported by Kent County Council at the time because it was expected to free up capacity on the existing rail network for better commuter services and to carry more (channel tunnel) freight, as well as provide accessibility gains to East Kent. The decisions on connectivity to the existing rail network at Ebbsfleet and Ashford allowed the development of a domestic high-speed rail service which started operation when the second phase of the project was completed into St Pancras.

Eurostar is the current sole provider of international services, although DB (and, reputedly others) are in various stages of development for the introduction of passenger services which would be either complementary to, or in competition with, the existing Eurostar services. Eurostar services call at Ebbsfleet and Ashford, but the level of service provided has been the subject of ongoing concern and debate. Eurostar services do not serve Stratford.

A small number of freight trains operate each day on HS1, from the Channel Tunnel through to Ripple Lane, near Barking.

This report is largely concerned with the domestic high-speed services, which are operated by Southeastern as part of a franchise let by the Department for Transport.

Significant journey reductions have been delivered from Kent towns to central London as a result of the introduction of the high-speed services, as shown in Figure 1 below. The figures in black indicate the classic line journey times before the introduction of the high-speed services in December 2009 and the figures in red indicate the peak and off-peak journey time with today's high-speed services.

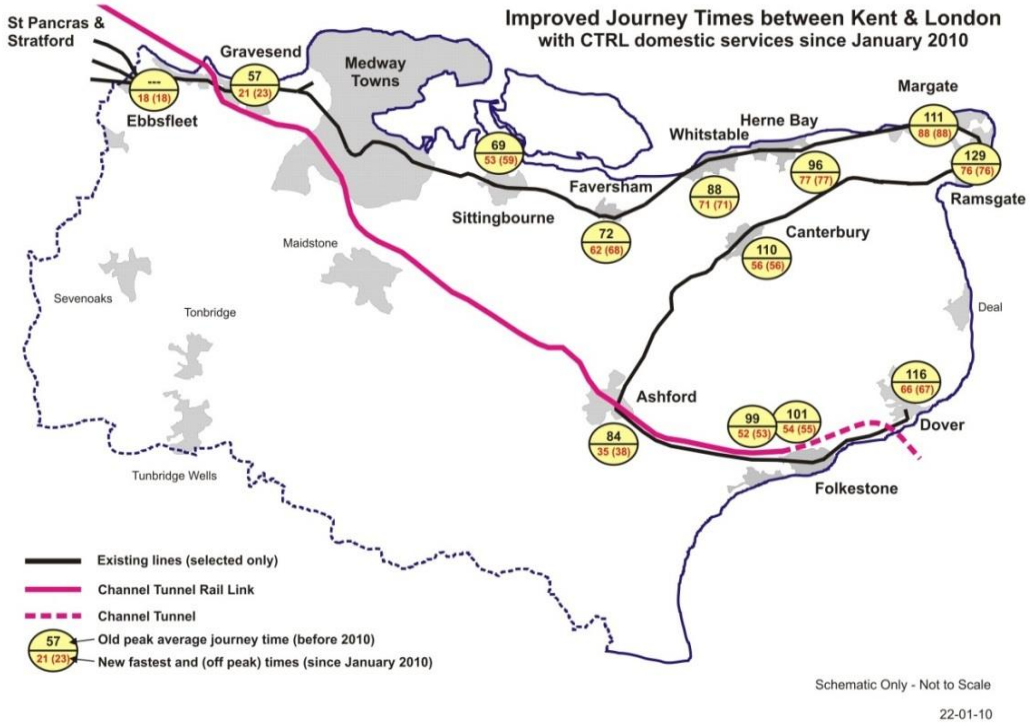


Figure 1: Comparative assessment of journey times from Kent to London pre-and post-HS1

It will be recognised that journey time savings have been greatest for the Ashford/East Kent route, The improvement has been less pronounced on the North Kent services, although still transformational for Gravesend.

Journey times from across Kent to central London are illustrated further in Figure 2 which shows at a glance the greater accessibility that HS1 has provided. The analysis under-pinning this diagram uses the fastest journey time from National Rail Enquiries with a 15 min penalty added for every interchange required.

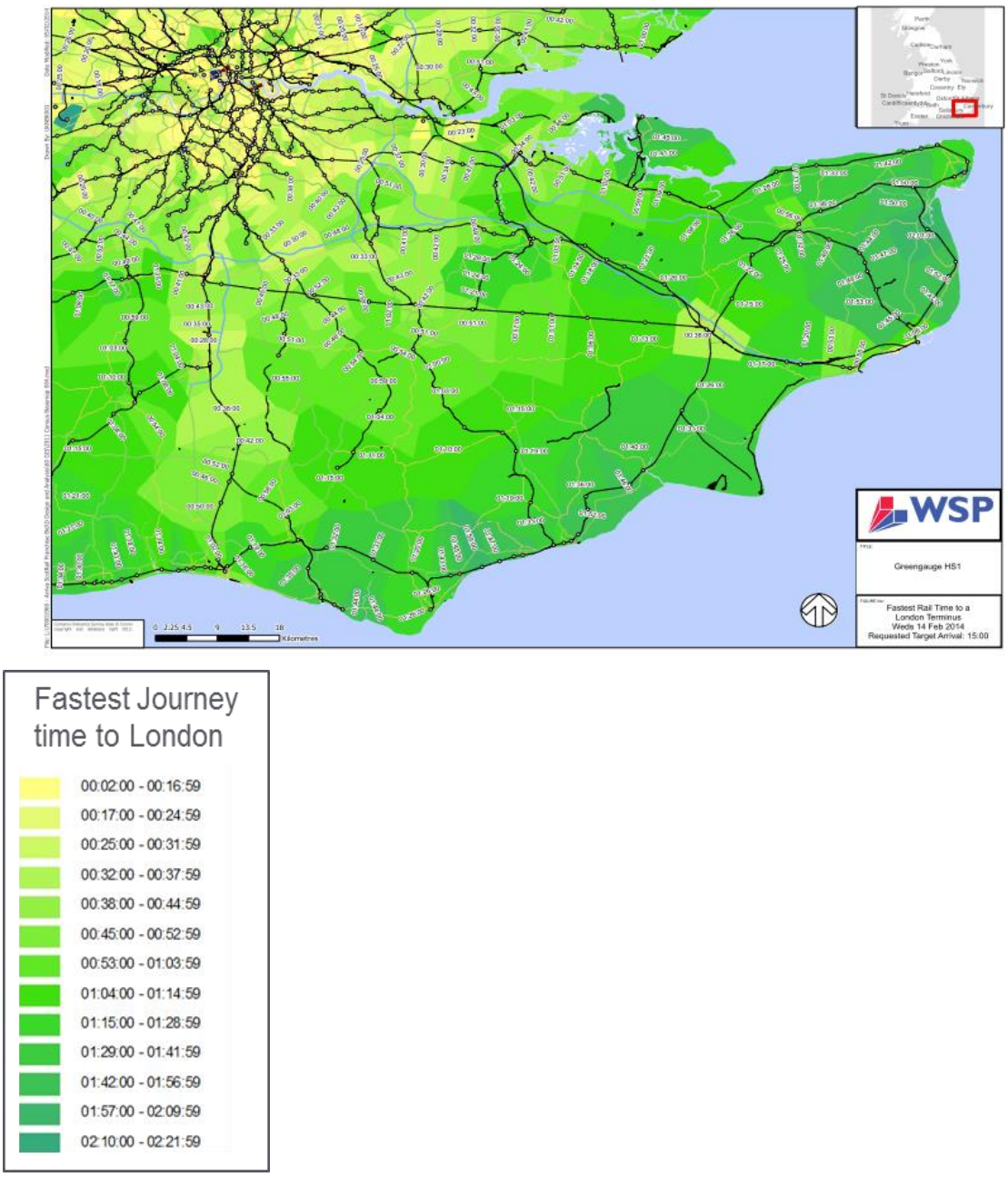


Figure 2: Journey times to London from Kent, East Sussex and Essex.
Demographic make-up

Demographics of the HS1 market

The demography of the 5 mile catchments of three of the key stations served by HS1 services is shown in Figures 3-5. Since Stratford and St Pancras are largely 'destination' stations, this part of the analysis centres on south of the Thames locations. It will be seen that the catchments are markedly different for these three locations, and so the response to, and take-up of, fast connections with central London will inevitably also vary.

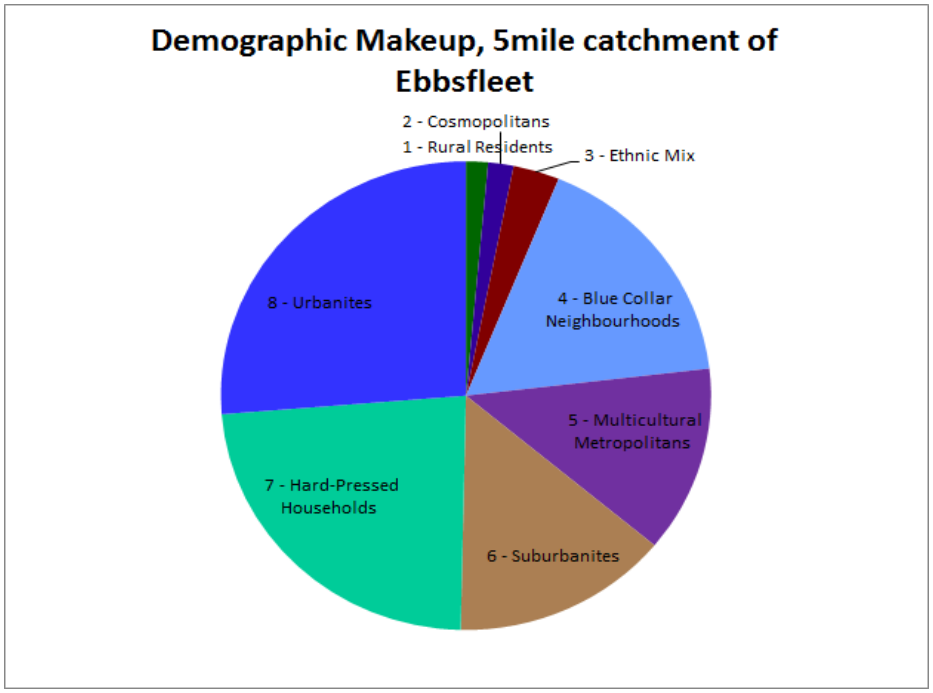


Figure 3: Demographic make-up, 5 miles, for Ebbsfleet.

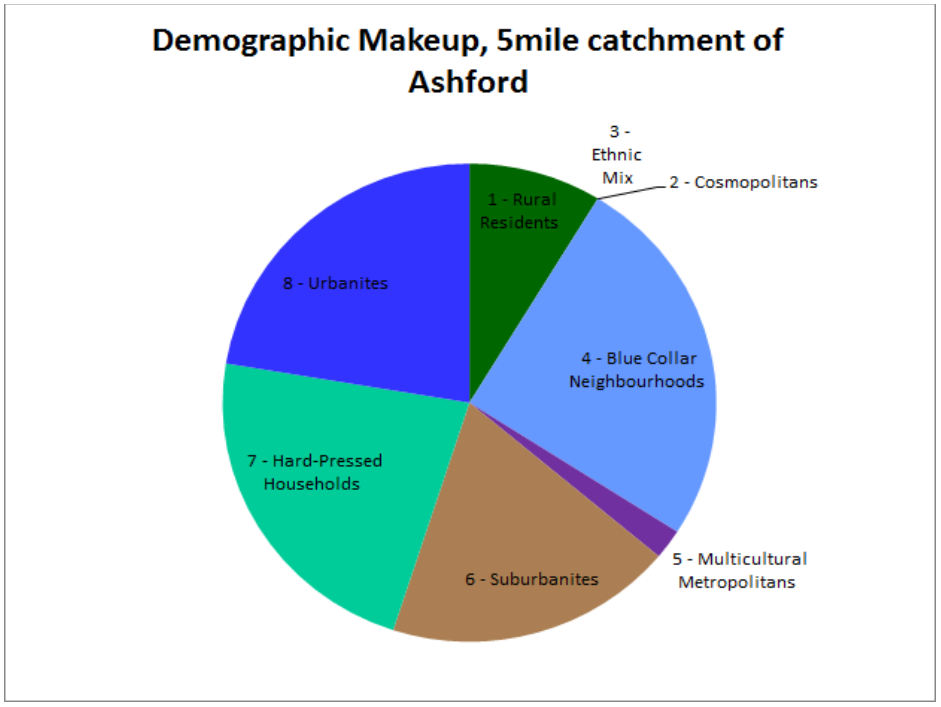


Figure 4: Demographic make-up, 5 miles, for Ashford.

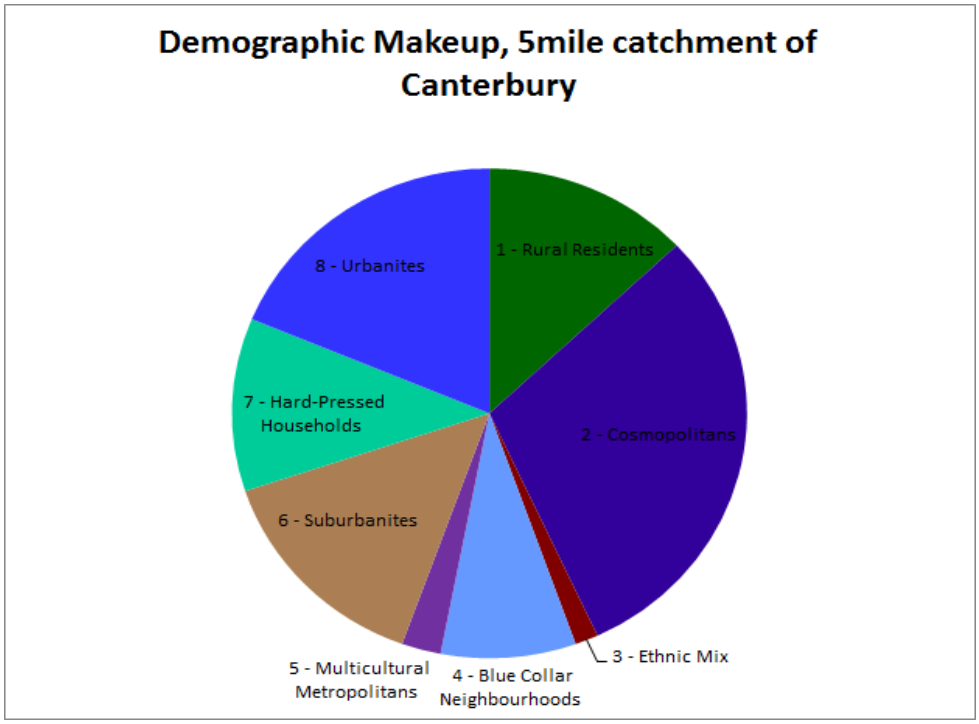


Figure 5: Demographic make-up, 5 miles, for Canterbury.

To set these three selected stations in context, it is helpful to see the overall scale of catchment of major stations across Kent, in terms of resident population. Gillingham, Maidstone and Ebbsfleet have the largest 5 mile catchments, in that order. Looking at tighter catchments, for instance within a 1 mile band (walking distance, for many), there is a much more even spread of towns and cities across the county.

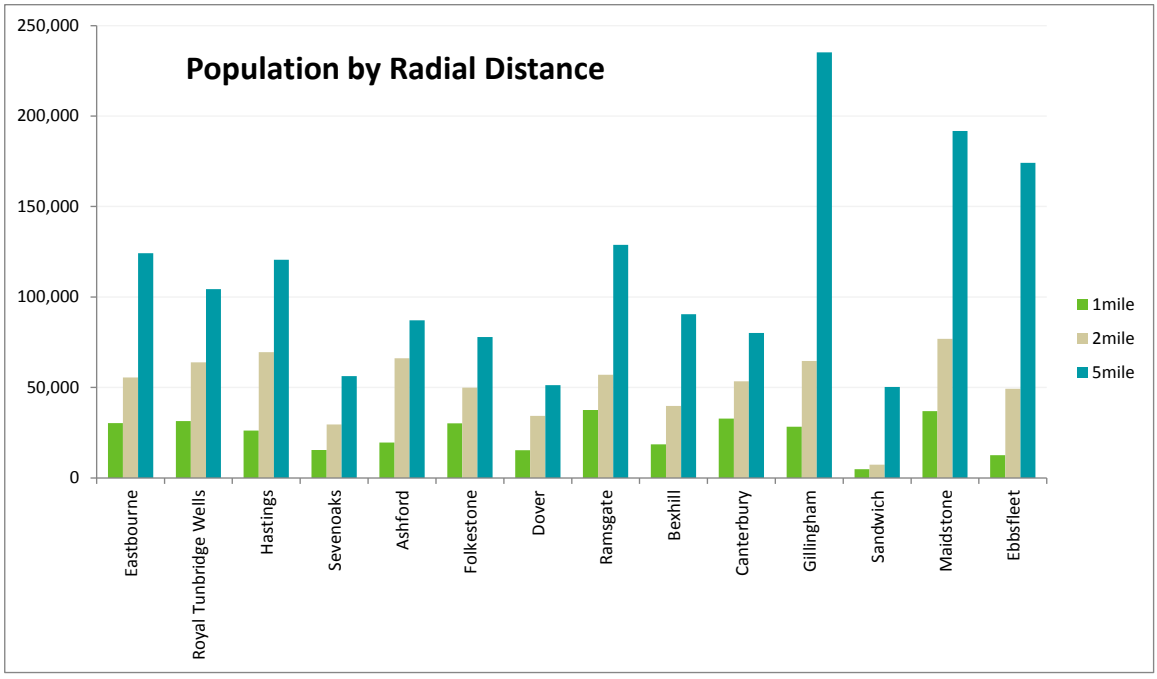


Figure 6: Population by radial distance from major stations in Kent

The demographic make-up of Kent, together with indicative station catchment areas, is shown in Figure 7. A number of station groupings overlap: there is a variety of routes that passengers can use, and their choice may be driven by price, reliability, service quality, journey speed and the availability of station parking, rather than simply by the distance to the nearest station.

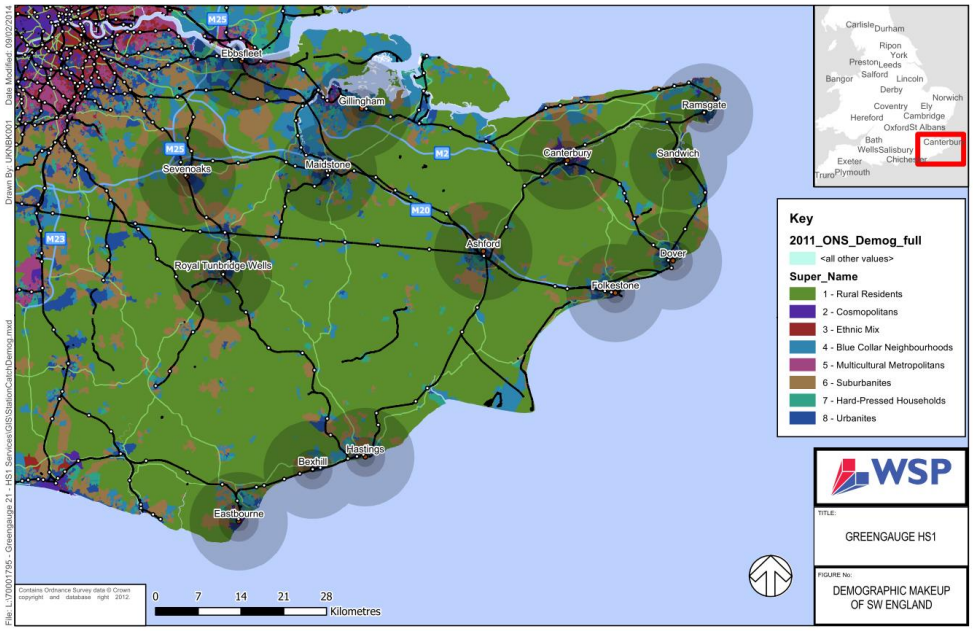


Figure 7: Demographic make-up of Kent

Bus access and car parking

The principal feeder bus service to stations on HS1 and stations served by high-speed trains is Ebbsfleet. Ebbsfleet is served by the Fastrack bus service which provides links to Bluewater and Northfleet, as shown in the map below.

Fastrack bus service in the Ebbsfleet area

Other stations such as Canterbury West and Ashford are served by local buses. Unlike at Ebbsfleet, the focus has been on evolutionary development of the overall public transport offer.

Congestion in station car parks is frequently cited as a disincentive to travel. In addition, the levels of traffic congestion into the town centre stations, above all Canterbury and Ashford, mean that some passengers may choose other ways of completing their journey, and Ebbsfleet was originally conceived as a parkway station for much of Kent and beyond. It is however notable that the high-speed shuttles from Ebbsfleet to London did not prove attractive to passengers, frequently having plenty of spare capacity upon arrival in London. Their extension to places off HS1 from Ebbsfleet is testament to the desire of passengers not to drive for longer distances than necessary to reach the railway station.

Ebbsfleet has extensive car parks, designed to support property and commercial development. This has not yet occurred and the car parks have plenty of capacity for growth in the medium and long term. Existing stations

on the other hand have in some instances very limited station parking. This is a contentious area for some planning authorities but the full value of HS1 and its services is constrained by access arrangements, and it would be sensible to carry out an audit and see what further facilities can be provided.

The idea of a Station Travel Plan promoted by the Campaign for Better Transport is the best way forward on access matters, looking at the obstacles to cycle access/parking and walk access as well as facilities for taxis, minicabs, buses, kiss and ride and park and ride.

Impacts of HS1 on Property Prices

We have interrogated data collected for the Kent Property surveys to assess whether HS1 services have impacted on property values. The following two figures indicate current house prices and the level of change since 2011.

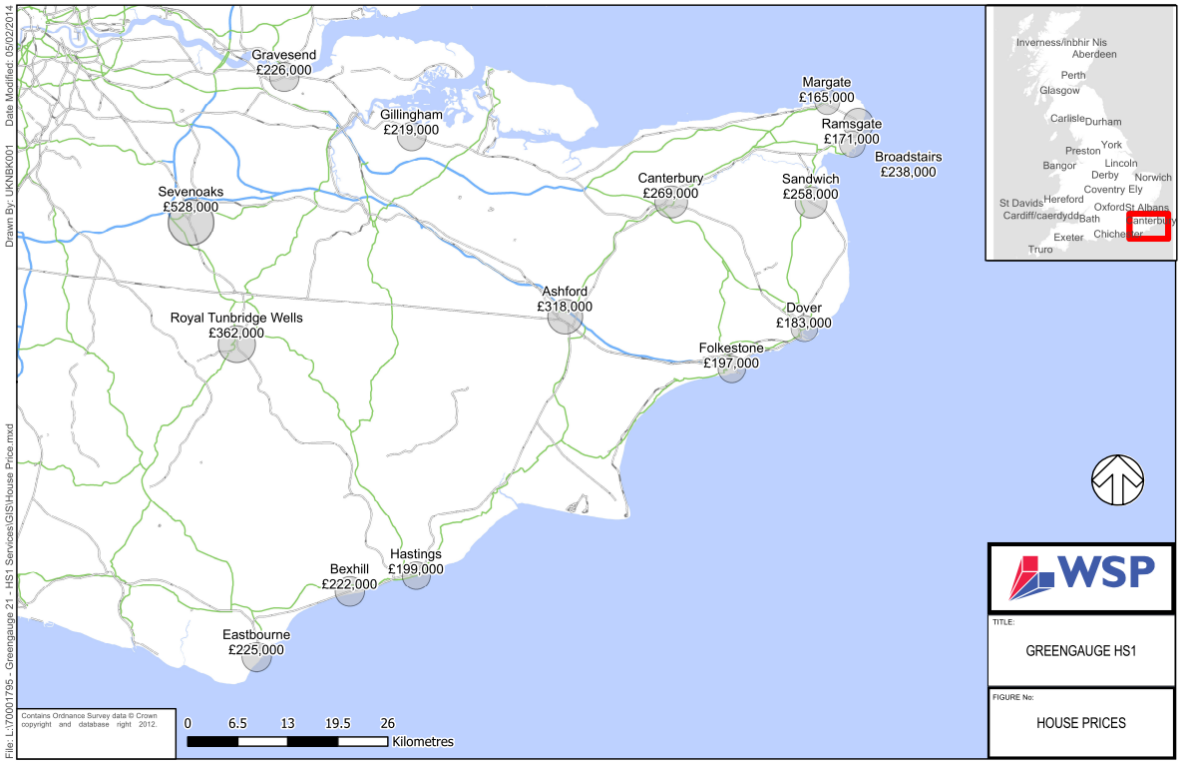


Figure 8: Average house prices, Kent.

While of course many factors influence the prices of specific houses, towns and neighbourhoods, it is clear from Figure 8 that locations with quicker connections to central London are regarded as more valuable.

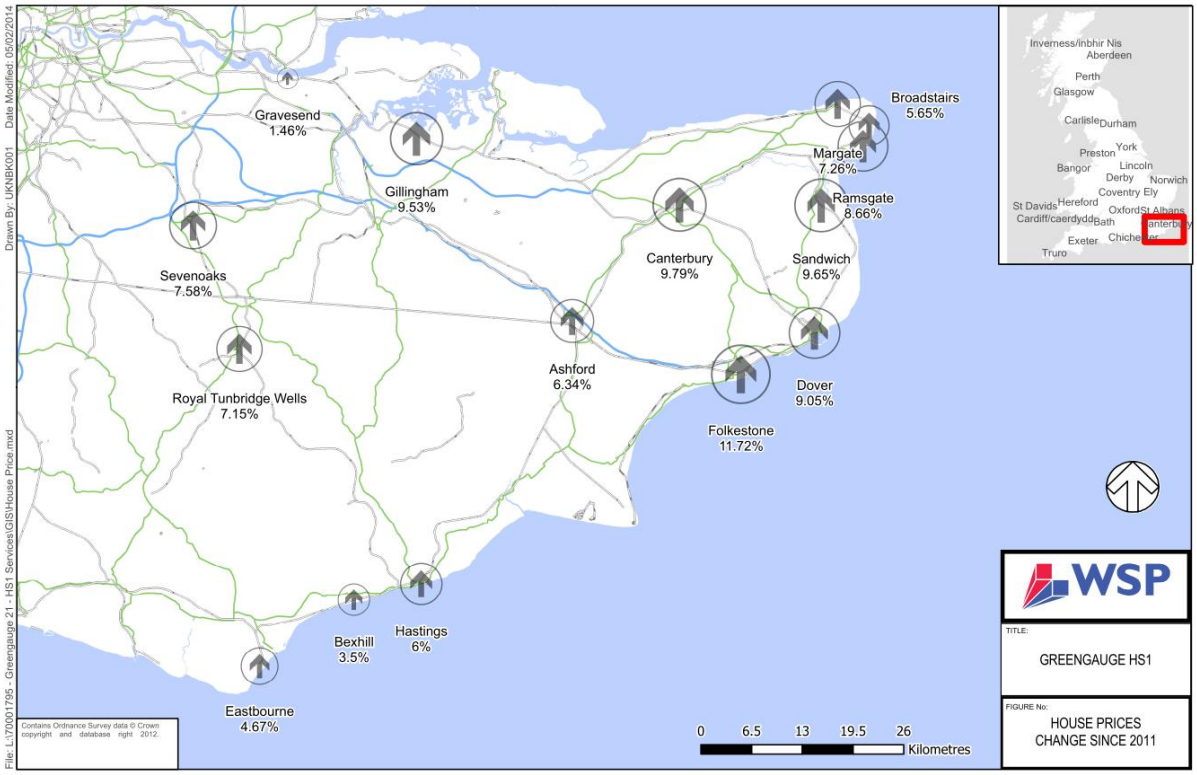


Figure 9: House price rises since 2011, Kent.

This analysis covers a short (two year) period, during much of which, the economy was scarcely growing. Nevertheless there were some significant rises in house prices over this period. A particularly interesting contrast is between house prices in the seaside towns of East Kent, which are served by HS1 services, and those in East Sussex, which are not: prices in Kent have grown more strongly than those in East Sussex. Folkestone, which has the fastest connection of the coastal towns to London using HS1, has had the highest rate of housing price growth. Bexhill, which has a very slow rail journey time to London, has recorded the lowest house price growth.

3. Potential to Increase and Improve HS1 services

In this chapter, we consider ways by which the services running on HS1 could be expanded and improved. We describe options for the immediate term (December 2014), and then the short term five-year period (2014-19) the medium term 5-year period which is at the early stages of the rail industry planning process (2020-2024) and the longer term (2025 and thereafter).

Immediate term: Southeastern Trains' plans

Southeastern is leading a consultation at present that would see a set of related changes to the high-speed service timetable that would bring a number of benefits:

- Faster and more reliable journeys
- More peak capacity from Ashford
- All day high-speed services for Sandwich and Deal.

The key device to bring this about is that the high-speed trains that operate from St Pancras to Dover (via Ashford) and Faversham (via the Medway Towns) would be linked, and operate a loop service around Thanet. This will help to improve performance and reduce journey times caused by the current practice, at Ashford, of splitting and joining trains. There are some consequential changes for the 'conventional' SouthEastern Trains services. Subject to agreement on these proposed changes, the new timetable will be introduced in December 2014.

Short-term 2014-19

Linespeed improvements between Ashford and Ramsgate

A programme has been developed with Network Rail for the improvement of line-speeds between Ashford and Ramsgate. When combined with the abandonment of splitting and joining at Ashford, this is expected to save 6 minutes on the Ashford – Ramsgate journey, 3 minutes either side of Canterbury West. It is expected that this will be delivered within Control Period 5 (2014-9).

Canterbury West frequency enhancement

Whilst not a feature of the current plans, growth to and from Canterbury has been significant - with a journey time to London of only 55 minutes - and it is a general presumption that demand will support an expansion of the all-day service to London from 1 to 2 trains per hour. At weekends, 12-car trains are deployed on some services to Canterbury because of the level of patronage.

Medium term 2019 -2024

Include Hastings within HS1 service network

Hastings has never been included in the list of destinations served by trains from HS1. Yet it suffers a slow journey time to London (via Tunbridge Wells), and the opportunity to connect Hastings with HS1 has attracted the interest of MPs and others.

Because of the design of Ashford station and the fact that the Ashford – Hastings line remains unelectrified, operating services from Hastings over HS1 is simply not possible at present. However, Network Rail is now developing a package of works which would provide the necessary track and signalling in the Ashford area to permit HS1 trains to access platforms 1/2 which are the only ones which can be used by trains to and from Hastings. In addition, Network Rail is developing a proposal for the electrification and enhancement of the line which runs from Ashford to Hastings via Rye. Their work has been based on providing an hourly fast path for an HS1 train, and a two-hourly local train, calling at intermediate stations.

The good business case will rest on the very significant journey time reductions from Hastings to London (90 minutes to 68 minutes).

It is possible that such a scheme *could* be implemented in Control Period 6 (2019-24), and Network Rail is discussing this with industry and external stakeholders in order to define an agreed position. It might be necessary to implement the project in the subsequent control period for which project prioritisation is yet to take place.

Delivery of a HS1 service for Hastings may require the procurement of additional rolling stock, and clearly this has its own lead time, and may need to be considered as part of a wider programme for the development of the HS1 services or in conjunction with the needs of other newly electrified lines, such as Great Western.

If electrification were also to be carried out on the Uckfield branch, this would permit all trains currently operated by Southern to be electric, with consequential economies in depot and maintenance arrangements.

Transmanche Metro

For some years partners on both sides of the English Channel – principally the Région Nord Pas de Calais and Kent County Council – have developed plans for a regional stopping service which would operate through the Channel Tunnel. The costs of a separate service are extremely high, and so discussions have been held more recently with Eurostar with a view to amending the

calling patterns of some of the existing Eurostar services, to add calls at Ashford and Calais in some, and withdraw them in others.

Part of the aim is for passengers from Ashford to have a much better service to Paris/Brussels, and for residents around Calais Fréthun station to have a good service to London, but the proposal has also been developed in order to stimulate the market between the two towns, further south to Lille and Brussels, and north to Ebbsfleet and Stratford.

It is understood that Eurostar has not yet decided how and whether it might wish to implement such changes, and a timescale for delivery is unknown.

Technical changes to Ashford chords

Eurostar has purchased a fleet of Siemens Velaro D trains – a derivative of the German ICE trains – to permit it to operate to new destinations. These trains will not be equipped with the necessary technical systems to allow them to operate into Ashford station: the implication of this is that all trains will have to bypass Ashford. The same is true for Deutsche Bahn (DB) which intends to commence operations to London from Frankfurt and Cologne possibly in 2016.

Kent County Council has commissioned technical work examining the installation of HS1-standard train control systems on the link lines from HS1 to Ashford and through the station, and this work will form an input into the industry's infrastructure planning process.

Eurostar will continue to operate its existing train fleet when the new trains are delivered and these can continue to operate into Ashford station. But in the longer term, the company may well wish to replace its remaining older fleet and it is only at Ashford that there will be a need for a different operational capability. It is unlikely that it will find there is a commercial case for fitment for such a limited purpose. Kent County Council is well aware of the problem and wishes to make sure that Ashford is not excluded from being served by international trains in future for technical reasons.

Thanet Parkway

Plans have been under discussion for some years on the possibility of a new Parkway station in Thanet. This would help to stimulate demand for high-speed services, which would call at the station, and act as a means to stimulate the economy of parts of East Kent.

Network Rail has a well-understood process for assessing the impact of new stations, involving a thorough evaluation of the demand and the operational

implications, as well as the engineering issues involved in the construction of the platforms and buildings.

Longer term (2024 onwards)

New station or link to Maidstone

In recent years, a limited number of high-speed services have been introduced from HS1 to Maidstone West in the peak hours. One medium-term possibility is their operation all day, although an important consideration will be the level of demand and means of serving some of the intermediate stations. At the moment, during the day demand on the route from Strood to Maidstone West is quite low, although it has improved with the deployment of better rolling stock.

An all-day high-speed service to Maidstone West is not being pursued at the moment; focus is more on improving the services to Maidstone East, partly through the Thameslink Programme. However, the possibility of a new station on High Speed 1 close to Maidstone has been discussed in the past, potentially on a short link line to HS1.

The implementation of such a scheme would have significant implications for the operation and performance of High Speed 1, and without doubt, High Speed 1, Network Rail and the wider industry would wish to evaluate the consequences in detail before lending their support.

The technical difficulties should not be underestimated. A new station on HS1 would require a lengthy section of four-tracking. New connections also require lengthy lead in/out sections to permit trains to leave and join the high-speed line at 225km/h to reduce the potential adverse impact on line capacity.

The better approach is therefore to seek to improve services for Maidstone via the two existing routes.

Crossrail extension beyond Abbey Wood

It has been suggested that an extension to Crossrail services from Abbey Wood to Ebbsfleet or Gravesend might be desirable, potentially to serve the proposed theme park on the Swanscombe peninsula. The existing line to the east of Abbey Wood would be converted into a Crossrail route, and might see services start/finish at Gravesend or the Medway (an aspiration set in the SELEP draft Strategic Plan).

Such an extension of Crossrail would provide better access from South East London and Dartford to HS1 services at Ebbsfleet. HS1 access from the

Docklands area would also be improved, including from Canary Wharf, but other areas such as the Royal Docks are already linked directly to HS1 at Stratford.

In summary, there may very well be a case for Crossrail extension but its impact on HS1 is not likely to be large. Connectivity with HS1 services could substantially be achieved by the provision of a direct pedestrian/cycle link between Northfleet and Ebbsfleet stations. While this would entail a lengthy weather-protected bridge route, its costs would be small compared with major rail infrastructure projects and its benefits may be sufficient to merit the scheme proceeding (and this of course could be done much earlier).

New HS1 station north of the Thames

In the past a suggestion had been made for the construction of a new station on HS1 between Dagenham Dock and Purfleet. As previously noted in relation to Maidstone, the technical difficulties should not be underestimated. Such a new station would require a lengthy section of four track railway including lead in/out sections and it would also impose a journey time penalty on any high-speed services calling there. Moreover, in future these trains would probably already be full. While there may be local benefits, in network strategy terms this would only work if the station was to be used primarily to access areas of employment, rather than serving a residential commuter catchment.

Assessment against the Strategic Economic Plan

As is the case elsewhere in South East England, rail travel is dominated by commuter flows into London. South of the Thames, the busiest stations are in West Kent:

Area	Annual Demand to London
Eastbourne	750,000
Royal Tunbridge Wells	2,180,000
Hastings	340,000
Sevenoaks	2,980,000
Ashford	1,500,000
Folkestone	500,000
Dover	280,000
Ramsgate	250,000
Bexhill	320,000
Canterbury	890,000
Gillingham	1,000,000
Sandwich	60,000
Maidstone	910,000

The maps below are taken from the draft of the Strategic Economic Plan for the South East area (preliminary submission) and illustrate:

- the provision of transport and expected population growth in Kent in headline terms
- the pattern of expected housing growth in Kent by 2026
- the profile of businesses in East Sussex.

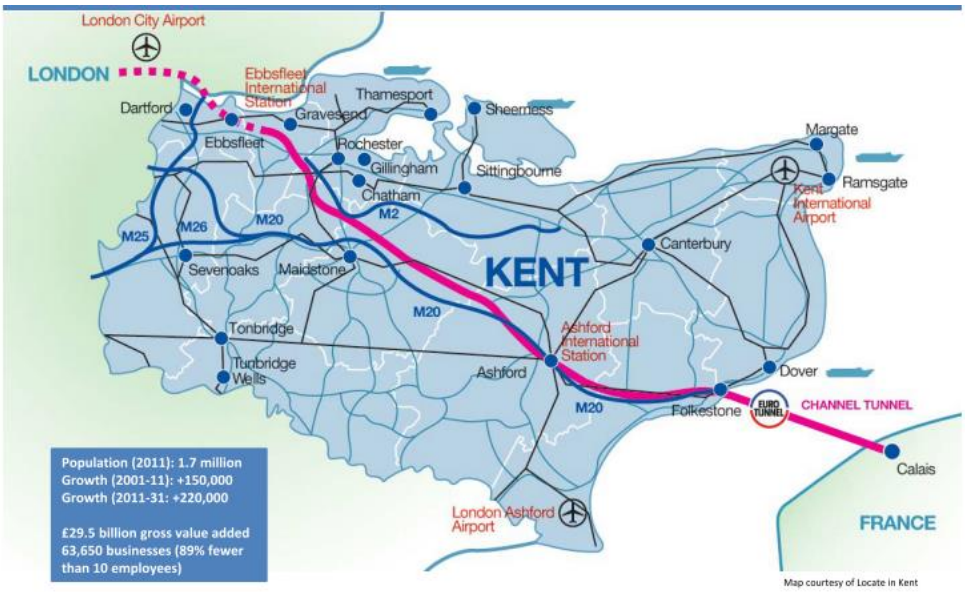


Figure 11: Transport provision in Kent

As shown in Figure 11, the Strategic Economic Plan envisages substantial population growth – of 220,000 over the 1.7m current levels (+13%) – in the period to 2031.

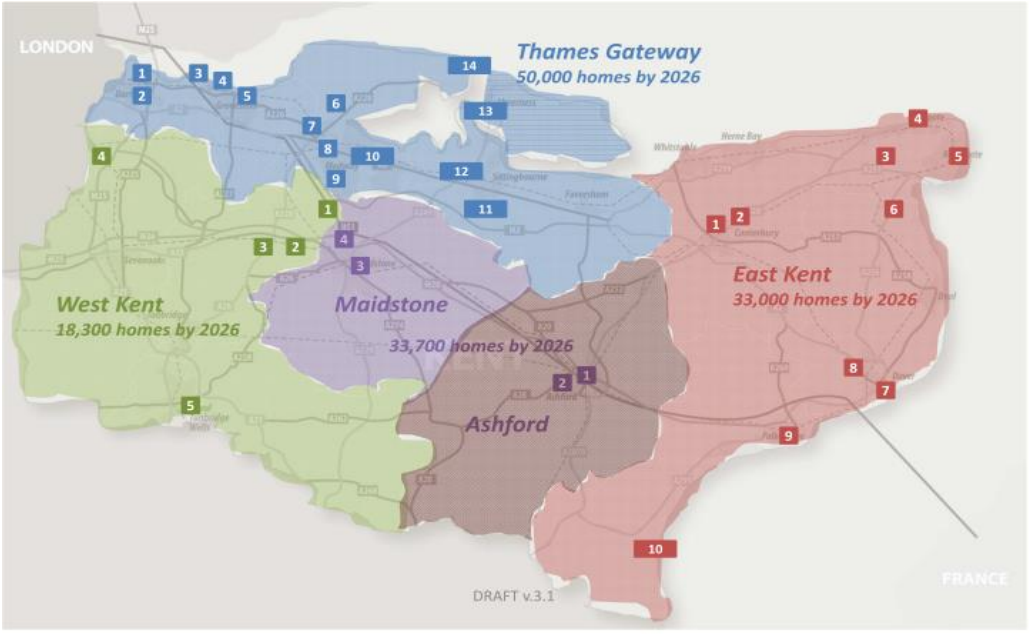


Figure 12: Pattern of expected housing growth across Kent

Figure 12 shows where significant growth in housing is expected to occur; while East Kent has traditionally had less than average development, HS1 services are expected to stimulate demand for new housing and new business and employment, and primarily London-bound commuting, but increasingly inwards-bound as well. The very significant growth shown in the Thames Gateway area demonstrates the continuing priority given to its development.

In general, the pattern of planned housing growth supports the plans developed by the railway for the evolutionary development of services and rail capacity and the full exploitation of HS1 in particular.

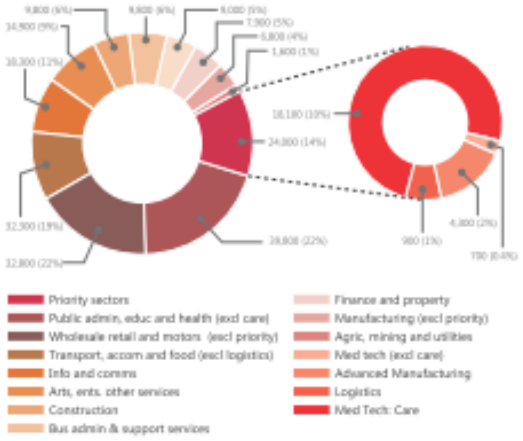


Figure 13: East Sussex main sectors by percentage and the sectors by percentage that sit within the government's priority sectors

Business activity in East Sussex is illustrated in Figure 13, which we have included because of the potentially significant impact of the inclusion of Hastings as a destination from HS1. This will stimulate demand in the Hastings/Bexhill area for new houses and new business, and is likely to play a major role in the economic regeneration of the area. The particular demand in this area is for technical medical specialists, as one of the government's priority sectors. Success in this aim will be supported by the provision of a high-quality, high-speed connection with London.

4. The HS1 – HS2 link

Greengauge 21 carried out a study into the HS1 – HS2 Link in 2013.[1] This work showed that:

i. While the demand for international travel for services that could use a HS1 – HS2 link is relatively small, there is significant demand for *domestic* travel over the link

ii. The limited capacity link that is currently planned would not be able to accommodate the scale of domestic demand in terms of train paths

iii. Providing domestic services from HS2 destinations such as Manchester, and Birmingham to Stratford/Ebbsfleet/Ashford offers a means to provide direct access to *existing* international HSR services with easy interchange at border controlled stations as well as meeting domestic demand

iv. The capacity of HS2 to accommodate non-Euston (central London) services is limited, especially in the longer term, and this means that while the link could connect with HS2 at Old Oak Common, it would be highly desirable for there to be a westward extension of the HS1 – HS2 link to connect with the existing national network (and it was shown how this could be achieved at modest cost). There would be little attraction in operating services to a terminus at Old Oak Common from HS1 (whether domestic or international).

In the early development of the South Eastern High Speed services, consideration was given to operation in off peak periods on a cross London basis – for instance to Milton Keynes. Such an arrangement would have needed to use the existing single track connection from HS1 to the north London Line at Camden Road and the connection via Primrose Hill to the West Coast Main Line. On a limited frequency off peak basis, this type of operation might be feasible. But this would be just a matter of best utilisation of rolling stock needed for peak period St Pancras services between peak periods and would have little benefit. The value of cross-London connections lies in their all-day availability and multiplicity of market objectives – as is achieved for instance by the Thameslink operation.

The current HS2 plan, as contained in the now-deposited Hybrid Bill, provides for a single track connection that leaves the HS2 route at Old Oak Common and proceeds in an independent tunnel to the Primrose Hill area. From Primrose Hill to Camden Road, the line merges with the existing double track

[1] See Travel Market and the HS1-HS2 link www.greengauge21.net/publications/travel-market-demand-and-the-hs1-hs2-link/

route, which would be operated as two parallel reversible lines, one for (domestic) freight services (this section of line is used to get trains from Felixstowe to the West Coast Main Line, for example), the other for trains running from Old Oak Common to HS1. Camden Road station would be reconfigured to retain this separation – and accommodate the London Overground service – before joining the existing single track connection to HS1. The track to be used for HS1 – HS2 services has been specified so that it could accommodate European gauge trains – and this requires wider track spacing – which in turn means widening existing double track viaducts, and large bore tunnels. It has been said that this connection would allow three trains/hour to operate in each direction, but:

- We have seen no work showing how this lengthy single track connection would operate satisfactorily for HS1 (which currently operates to very high standards of service punctuality) even if the HS2 connection trains are 'flighted'
- There are no service plans developed for HS2 international services and HS2 capacity constraints imply in any event that these might need to operate no further north than Old Oak Common. We judge it to be very unlikely that there would be a commercial case for such services – it would always be far better to operate to/from St Pancras
- The domestic service plan identified in the previous Greengauge 21 study would not require the European gauge that is built into the current HS1-HS2 design.

The difficulty with international services is that they require passengers to pass through border control checks. These are expensive to provide, especially if throughput is limited to a few services/day and there is a corollary that through international trains are not permitted to mix domestic and international passengers.[2]

In effect, there is no sensible plan for services that could use the HS1 – HS2 link. If it is progressed to implementation as part of the first phase of HS2 (the current plan), it may be little used. Domestic services could not operate west of Old Oak Common so would only fulfil a feeder/interchange function; there would be no international services because there would be no commercial

[2] On train border control is one way of overcoming these problems but that generates a need for interview rooms etc on-board; another approach Greengauge 21 has suggested before is to segment any through international train into a domestic section (for use either side of the Channel Tunnel, but passing through it empty) and an international section (available only to those making the border crossing in/out of the Schengen Area, and inevitably with a tail off in patronage as trains make station calls deeper into each country). Overall seat utilisation would be poor, but the problem of an opportunity cost on providing an international train path could be overcome in this way.

market for them to serve. This means that there will be little benefit to the South East area, essentially because there is low likelihood of a service being introduced with a suitable level frequency to make using it advantageous over existing or planned cross-London links (in future, Crossrail will provide a connection between Stratford and Old Oak, for instance).

Another approach would be to acknowledge that the HS1 – HS2 link needs further thought and to make passive provision for its inclusion as an add-on to HS2 at a later stage. The problem with this approach is that it will be apparent that there is no developed plan for using a better specified link, so little confidence will be placed in it ever materialising.

So we have to consider is it worth retaining an ambition to develop a HS1 – HS2 link and if so to what end?

We believe that the HS1-HS2 link is an opportunity to provide better access to the South East area, and that SELTB/SELEP should seek ways to promote it as an opportunity of potentially major regional economic benefit. Its successful development will also expand the South East's access to HS2 services significantly. But clearly the specification of the HS1-HS2 link needs a re-think.

We can describe in outline terms what a re-specified HS1-HS2 link would look like and what it could achieve. It should have the following capabilities:

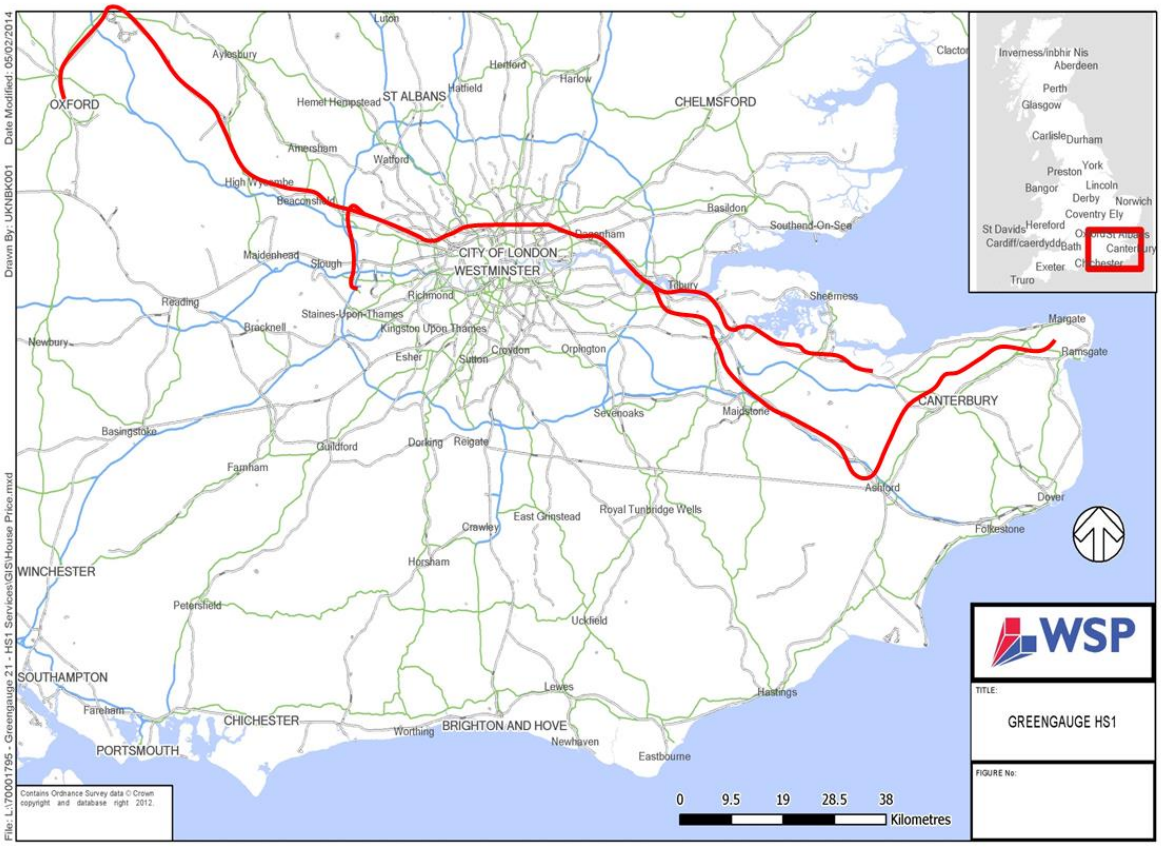
i. It should be developed as a double track connection
ii. It should be designed to UK (rather than EU) loading gauge[3], reducing its cost and potentially making alternative designs more feasible
iii. It should provide for passenger interchange at Old Oak Common
iv. It should be connected to the existing railway west of Old Oak Common to allow a high-value cross-London train service specification to be developed, avoiding reliance on the future availability of spare HS2 train paths.

In practice this might be achieved by a re-specified Camden Road scheme that avoids the need for viaduct widening for gauging reasons, or by a tunnelled approach if such a solution can usefully be developed (TfL is considering the latter currently).

[3] This would be suitable for 'Javelin' Class 395 trains, for example, but not the next generation of Eurostar trains. This does *not* preclude use of the link by international services, since the original Eurostar fleet is built to existing gauge and the majority of HS2 trains will be designed to operate on UK gauge railways.

Connection west of Old Oak Commons is straightforward. The Great Western Main Line is operating at capacity at this point and would not be able to accommodate additional trains, such as from a HS1 link. On the other hand, the surface route to Ruislip and beyond is intact and available (the HS2 route is designed to be underneath in tunnel) and is an alignment readily capable of restoration to double track (currently it has only a once/day service). Such a connection would be feasible at low incremental cost.

Services could run as illustrated below, using the HS1 –HS2 link.



Kent HS1 stations and Stratford would gain a connection with places served by the Chiltern line, which would need to be electrified and upgraded; services would be operated by Class 395 units or their successors. It would also be possible to access Heathrow using the planned Phase 2 connection from HS2 (which would be connected to the surface railway near West Ruislip rather than the parallel HS2 line). Services could operate to/from destinations such as Oxford, Aylesbury, High Wycombe, Birmingham and Heathrow. These direct connections should be of great value to the economies of the South East area (and to Stratford and Docklands) because of the increased accessibility they

will provide to places west of London, including Heathrow Airport. The main commuter towns in the Chilterns would gain a direct feed into Crossrail (at Old Oak Common) as well as a fast route to Stratford and Kent – with the scope to use such services for connection into international services, transferring at a suitable HS1 station (Ebbsfleet has the most services currently, and of course is provided with border control facilities).

In addition to such domestic services, it would be possible to operate international services to/from Heathrow. This has long been an ambition of various key stakeholders, including British Airways. The connection described here enables this to happen without adversely impacting on HS2 capacity.

Moreover, this approach points the way to an efficient solution for north of England direct international services. These could be provided by extending Europe-HS1-Heathrow services *via* the planned Phase 2 northern connection to HS2. Such trains – which would serve the Heathrow HS2 station – would be provided with border control/clearance at this station call (where border control staff and facilities are at hand), with the train proceeding northwards as a domestic service able to carry a mix of domestic and through international passengers.

There might be other variations of these routes and services to be considered in due course. But the importance of pressing ahead with these plans now to the next stage of development is that their very existence makes clear that a re-specified HS1-HS2 link, even if it needs to be deferred from its current mid-2020s opening, would be a worthwhile project. The same cannot be said of the current position because there are no viable plans to use (even a re-specified) HS1-HS2 link. Deferral in those circumstances – without a clear plan for what a HS1-HS2 link should accommodate - would inevitably lead to subsequent abandonment and it would soon enough be thought better simply to save the costs of passive provision for the link altogether.

5. Stratford International

As noted in Chapter 3, while suggestions have been made from time to time about locating an additional station on HS1 north of the Thames (possibly between Dagenham Dock and Purfleet) in practice such ideas have not got very far. Access to such a station would be poor and would risk adding to pressures on the A13. Slowing down services to make the station call would have disbenefits to be taken into account and unless there was a substantial length of four-tracking so that non-stop services could proceed, overtaking stopping services as appropriate without slowing down, there would be an adverse capacity effect on HS1.

So that leaves Stratford International as the best means of accessing locations in Essex – and indeed Stansted and places across East Anglia.

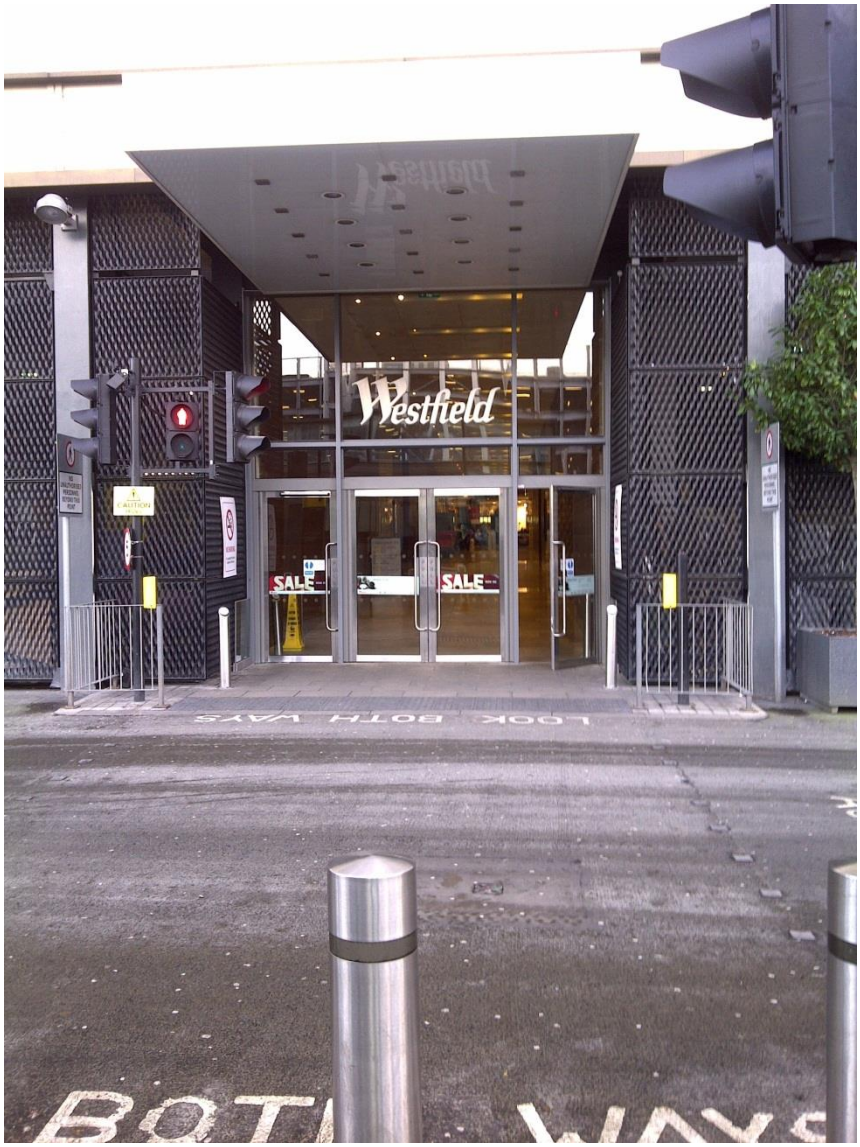
Stratford International station is now reported as being well used by HS1 Southeastern Trains' commuters. The most recent published data shows usage levels of around 600,000 annual passengers for 2011/12; this may be contrasted with the 22mppa using Stratford regional station.

There is now the opportunity to travel onwards from Stratford International by DLR but the service frequency is only 8 trains/hour and there is no direct connection to the major employment centres on the Isle of Dogs or the City (Bank). So for many, the best option is to walk to the regional station, from which there is a rich variety of good Underground, Overground and national rail connections, to which Crossrail will be added from 2019.

In practice, the walk connection is reasonably quick – perhaps a little over 5 minutes, with nearly all of the route under cover, achieved by walking through the Westfield shopping centre. The problem is that signage is non-existent or downright misleading. What could be a key interchange for the South East area – for trips such as Chelmsford-Medway towns by rail) is undermined, and the occasional user would be lucky to find an efficient walking route between the two stations.

We were told that TfL took responsibility for the signage at the time of the development of facilities for the Olympic Games in 2012. What is needed is simple and clear signage on how to walk to the regional station at Stratford from the island platform at International served by the high-speed Kent services (and the reverse). Instead there is a sign suggesting that the Eastern exit from International is a route to Westfield shopping centre when it is in practice the fastest route on foot between the two stations. On reaching the

top of the escalators provided, there is still no sign to the regional station, simply an entrance to Westfield shopping centre, across a service road (see below).



The reverse route is slightly better marked, but the over-riding impression is that this is a retail facility and its location astride the key connection for rail passengers between Essex and Kent is simply unrecognised. The naming of the two stations (international and regional) of course doesn't help.

The alternative to using this route if travelling by rail across the Thames Estuary (aside from the limited frequency DLR connection which is not an effective route to/from Stratford Regional's main line platforms that serve Essex) is to travel *via* central London, making a connection between Liverpool Street and say Cannon Street or London Bridge stations by underground.

The barrier to movement across the Thames by public transport could be significantly overcome in the first instance by proper signage between Stratford International and Stratford Regional.

There is a restriction on the use of Travelcards for journeys between Stratford and St Pancras on the high-speed services. But there is no reason why journeys via Stratford International should not be identified as the best way to make most Essex – Kent journeys by train, avoiding the high fares associated with travel into the central fares zone 1.

6. The potential for New Lines

Wider high-speed rail network development

Government has in-hand work on HS2 (to be developed in two phases) and preliminary studies of the possibility of high-speed rail between northern England and Scotland. Within Scotland, Transport Scotland is examining the case for investment in the central belt, with high-speed rail that would both connect Edinburgh and Glasgow and link southwards towards the English border.

In southern England, besides the HS1-HS2 link described above, there is a plan in Phase 2 of HS2 to provide a connection to Heathrow Airport, but this now awaits the outcome of the Davies Commission.

Greengauge 21 produced a plan for a national high-speed rail network in 2009 in its *Fast Forward* report. This envisaged two north-south lines, one on the eastern side of the country (see Figure 14).

Figure 14: Schematic representation of two north-south lines

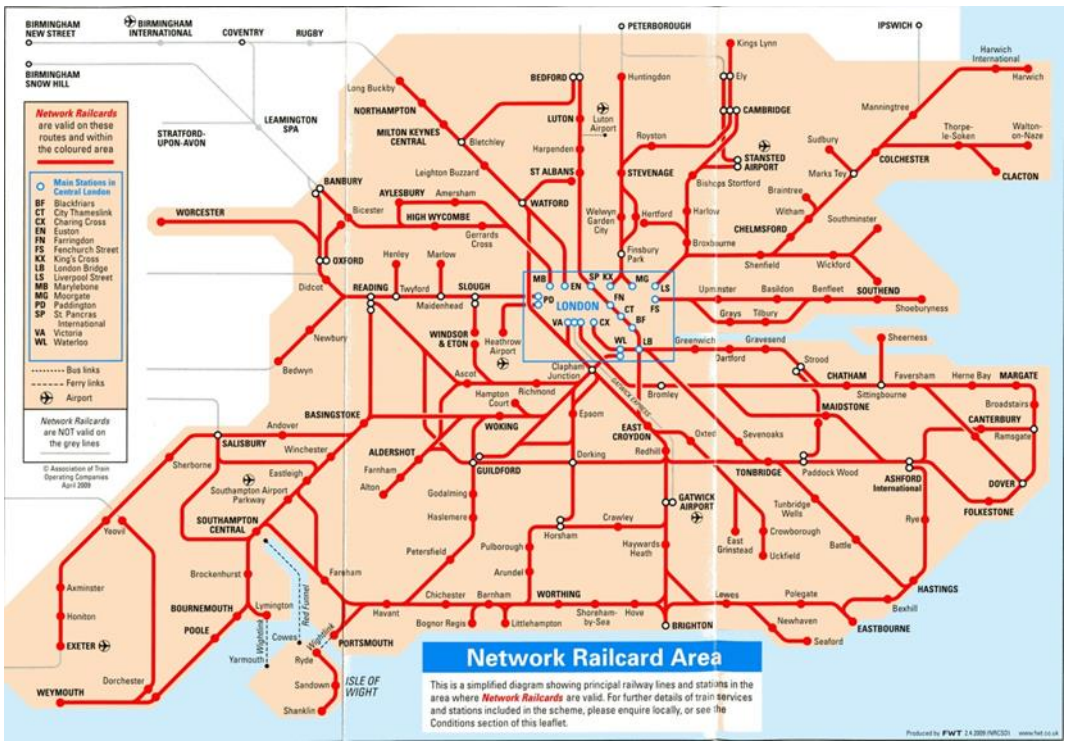
The schematic representation shown here indicates that the second high-speed line could serve Stansted airport and interface with HS1 in London. No work has been carried out on a second HSR terminus in London, but clearly Stratford is a possibility – although many would consider this not to be sufficiently central. It would however support the kind of network connectivity illustrated above, although on current programming its development is unlikely before the late 2030s.

From time to time the suggestion is made that an orbital HSR line around London might be worthwhile, broadly following the M25. No feasibility studies have been carried out. Its value is likely to rest on consideration of airport access. Junctions are likely to be a critical design factor. This and the importance of creating a rail-freight route around London (which would obviate the need to run railfreight services from say the Thames Gateway port across inner London) would suggest that any such connections would be

better developed as conventional speed railways (although they could nevertheless be connected with high-speed lines).

The largest demand for further service and infrastructure from HS1 (*i.e.* beyond serving central London as it does today) would lie to the north and west of London (bigger markets) rather than to the north/east (East Anglia). As we have seen, in any event, improvements at Stratford, starting with better signage could achieve a lot in improving north-south rail connectivity across the Thames Estuary. Better connectivity to places to the north and west of London can be most readily provided by the HS1-HS2 connection; the alternative is really a much lengthier piece of new infrastructure around London following the M25.

Further improvements at Stratford could include re-visiting the travelator connections originally intended. But that would still mean a lengthy dog-leg to achieve cross-Estuary rail connectivity. The Essex and Kent rail networks operate largely in isolation from one another. As the Thames Gateway grows and develops, cross-Thames travel will increase, enabling the fuller potential including in labour market development to be realised. All of this demand currently has to be accommodated on the road network, the role of which is not in doubt – and is indeed shortly to be expanded to a high-quality three carriageway facility. But there is a clear strategic gap in rail provision.



The question therefore arises as to whether more direct rail access across the Thames should be considered. This might be connected to HS1 south of the river as well as the conventional rail network but clearly north of the Thames it would be a question of connecting to the existing network. On both sides of the estuary this means creating links which 'cut across the grain' of a London-centric network with very few non-radial features. In practice, this is very unlikely to be a high-speed link which would constrain its geometrics and increase costs significantly. Much more likely, a rail link that would create a wide range of connections from the major trip generators on both sides of the Thames is the central requirement. It could have a crucial role in delivering on the aim to expand and enhance the SELEP area's labour markets, as set out in the draft Strategic Economic Plan.

The objective would be to create a link that would maximise connectivity both sides of the Thames. While cross-Thames railfreight flows are small, they could grow and become significant, especially if operation across the inner London rail network can be avoided (which is in effect closed to freight during two daily 3-hour long peak commuting periods).

One way of considering major schemes such as a new Thames rail crossing would be as an increment to other projects. The possibility of adding a rail connection as part of the Lower Thames Crossing project is worth at least preliminary consideration. There are two alignment options now being considered following consultation: Option A which puts another crossing alongside the existing Dartford crossing and a more expensive Option C which makes the crossing just to the east of Tilbury and Gravesend.

With Option A, it might be possible to add a rail tunnel alongside the existing and planned crossings. To the south this would potentially join the Stone Crossing – Dartford line adjacent to M25 Junction 1A and on the north bank of the Thames, a connection to the Purfleet – Grays line might be possible, but gradients would be steep and there are many obstacles that would need to be overcome. In effect this would be a line that would link south east London to Grays/Tilbury/Southend. It would be of little value for rail freight.

Option C is more promising territory, although to make use of this new crossing corridor, it would be necessary to build lengthier rail connections. To the north, there could be relatively easily created a link to the line from Tilbury Town towards East Tilbury. This could be used to access Southend, but to make the new Thames crossing really useful and provide wider connectivity across Essex, it would need to be complemented by a new north-south connection past Basildon to the Southend Victoria Line, Billericay and a new connection towards Ingatestone. To the south connection could be made with the Gravesend Hoo Junction Line and/or, with a lengthier route, the direct Medway Towns - Victoria line near Meopham/Sole Street – and further connections towards Maidstone might be worth considering too. Together this would create a cluster of service possibilities, in effect offering a rail alternative to the eastern segment of the M25.

Of course, it might be considered better to progress the lower Thames road crossing independently, but it would seem that the Option C scheme is in broadly the right area to create a useful addition to the rail network that could

be of benefit to both passenger and railfreight, and provide real connectivity across the South East area.

The project remit includes consideration of released capacity. An eastern freight bypass for London (which as noted requires more than a Thames crossing) could have a very significant effect, freeing up busy lines in London for service expansion where there is clearly strong demand growth – and this would be included in any appraisal of such a scheme. Any assessments would also need to take into account the capacity relief that the Thameslink and Crossrail investments will provide over the next few years.

7. Conclusions

Priorities for short, medium and long term

We have sub-divided the recommendations into short, medium and long-term delivery timescales. The medium and longer term recommendations will need some early facilitation if they are to be achieved within indicated timescales.

Short term

- Support Southeastern's plans for a recast of services in December 2014.
- Seek rapid improvement of signage and information at Stratford Regional and International stations and publicise the benefits of the connection available more widely.
- Provide a weather-protected walk and cycle connection between Northfleet and Ebbsfleet stations
- Support Network Rail's programme of line speed improvements between Ashford and Ramsgate
- Support the case for St Pancras-Canterbury West frequency enhancements
- Support the conclusions of the technical work examining the installation of HS1-standard train control systems on the link lines from HS1 to Ashford and through the station

Medium term

- Support the provision of direct high-speed services to Hastings and work with the industry to plan the delivery of the package of schemes in an efficient and effective way, including addressing additional rolling stock needs.
- Seek evolutionary development of the conventional speed network, taking advantage of the benefits of resignalling, the removal of level crossings, to reduce journey times and improve capacity on the classic network that supports Southeastern's high-speed services when running away from HS1.
- Seek the provision of an all-day high-speed service to Maidstone West, potentially in conjunction with linespeed improvements south of Strood.
- Seek to come to an agreed position with the rail industry on the potential value of a new station at Thanet Parkway, and if supported, undertake technical analytical work to support its opening within 10 years.

Long term

- Support the development of an HS1-HS2 link that is double-track and able to support frequent regional (and more limited frequency) international services.
- Support the provision of high-speed services beyond London, such as to Milton Keynes (pre-HS2) and Heathrow and Oxford (post-HS2).
- Seek stakeholder views on the desirability and implications of an extension of Crossrail beyond Abbey Wood to Gravesend/Medway – with or without

the theme park on Swanscombe peninsula, and progress development as an incremental phase of Crossrail accordingly.

- Identify engineering options for the construction of a rail link across the Thames Estuary for freight and passenger services, and identify how services could be incorporated within a rail network of Essex and Kent, using available track capacity away from the congested London core area
- For the very long term, explore the potential for additional Kent services to use Thameslink, including from Medway Towns/North Kent. This may in turn free up HS1 capacity for further East Kent/East Sussex services on HS1

Annex A: Remit

South East
Local Transport Board

28 November 2013

HIGH SPEED RAIL IN THE SOUTH EAST

Invitation to Submit Fee Proposal

Context

At their meeting on 4th October 2013 the South East Local Transport Board (SELTB) agreed that a fee proposal be sought for a feasibility study to be undertaken of existing, and the likely demand for possible new High Speed Rail (HSR) routes in the south east of England.

Scope of Work

- To undertake an outline review of connectivity to the existing HS1 route from across the SELEP area, including outline proposals for improvements and possible extensions.
- To review and identify the next steps required from the study by Greengauge21 on connecting HS1 and HS2 with a dedicated High Speed link, and the importance of Stratford International to the SELEP area.
- To identify what outcomes, particularly with regard to economic benefit, could be achieved by such proposals for new HSR routes.
- To identify the capacity which could be realised on the existing rail network as a result of increased HS1 patronage.

Output and timeframes

- Draft report to be presented to SELTB at their meeting on 14th February 2014 for discussion

- Final report to be submitted to the SELTB by 14th March 2014

Governance and Process

- Proposal to be capped to include all fees and expenses and a maximum of £15k
- Proposal to include full details of the project team and there experience
- Proposal to include proposed invoicing arrangements
- Proposal to include a detailed breakdown of the methodology to be adopted and timeframes for key stages and output
- Key stakeholders to be engaged will include Network Rail, train operators, bus operators, local transport authorities and others that emerge as the work progresses
- Consultants to liaise directly with David Freestone (SELTB Secretariat) and provide weekly updates by email

Please contact David Freestone on 01375 652091 or dfreestone@thurrock.gov.uk if you require further information.