

Long Term Planning Process

# *South East Route: Kent Area Route Study*

## *Technical Appendix*

May 2018



***System Operator***

Planning a better network for you





Introduction	03
1 Consultation responses	04
2 Conditional Outputs Table	90
3 Conditional Outputs 1 & 7 - London Bridge Metro	91
4 Conditional Outputs 2 & 8 - London Victoria Metro	96
5 Conditional Outputs 3 & 9 - High Speed	99
6 Conditional Outputs 4 & 10 - London Blackfriars	108
7 Conditional Outputs 5 & 11 - London Bridge & Victoria Main Lines	123
8 Depots and Stabling	127
9 Conditional Output 13 - Marshlink	130
10 Conditional Output 18 - Ebbsfleet Southern Link	151
11 Conditional Output 20 - Freight	152
12 Conditional Output 21 - Improved passenger circulation at stations	156
13 Transport for London's Metroisation concept	162

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*House building as part of Ebbsfleet Garden City*



## WHAT IS... GRIP?

This acronym is widely used in the industry and refers to the Governance for Railway Investment Projects and has been developed based on industry best practise with significant guidance and input from the Association of Project Management (APM), Chartered Institute of Building (CIOB) and Office for Government Commerce PRINCE2® project delivery framework.

There are eight formal stages to the GRIP process:

1. Output definition
2. Pre Feasibility
3. Option Selection
4. Single Option Development
5. Detailed Design
6. Construction, Testing & Commission
7. Scheme Handback
8. Project Close Out.

Often with Route Study schemes, we are at the pre-output definition stage - we know something needs to be done but we are not necessarily sure what, how or if it can be done!

These Pre-GRIP schemes are taken forward for early development to identify what solutions could be available before launching into a fully fledged scheme.

Due to the vagaries of the schemes at this stage they have a high optimism bias. In other words, a high percentage (60%) of the forecast cost of the scheme is added to cover for future changes when the scheme goes forward into GRIP.

It is anticipated that the eventual cost of the scheme will be reduced however this is not always the case as further development work, surveys and design work can highlight previously unknown issues.

1. This Technical Appendix provides the technical evidence to support the conclusions and choices for funders presented in the main [Route Study](#) document.

2. [Section 1](#) details the responses to the Draft for Consultation. This section includes general and line of route comments and is more detailed than previous Route Studies.

3. From [Section 2](#), the areas of technical analysis outlined are capability analysis, concept development (at pre-GRIP level), cost estimation, business case analysis and passenger capacity analysis at stations.

4. The evidence is presented in the order of the 'conditional outputs', to align with the main document.

### Capability Analysis - Assumptions & Methodology

5. The understanding of the capacity available on the network today is critical to assess whether any additional services can be accommodated in the timetable. The December 2015 timetable and current train planning rules have been used as a basis for the capability analysis for each capacity driven conditional output. For each service route for the conditional output, an assessment was undertaken in three stages aligned to the 2024 and 2044 option.

- **Lengthen Services – 2024:** The usable platform lengths for all stations on the routes were reviewed to assess whether they can accommodate the required lengthened services in their existing state or require platform extensions.
- **Additional Paths – 2024:** The routes were reviewed in the Timetable Planning System (TPS) to assess the opportunities for the required additional paths. This included a review of the service pattern of trains travelling on each route and their interaction at junctions.
- **Maximum Number of Paths – 2044:** A theoretical assessment was made for each route that identified the maximum possible number of trains which the current infrastructure, timings and rules will allow between junction points. This essentially looks at signalling headways.

6. The growth forecasts align with the DfT's 'Network Modelling Framework'. The forecast for 2023-43 is the same as the Market Study, whilst shorter term growth is forecast to be much higher. This is likely to be driven by interventions that have occurred since

publication of the Market Study or are committed such as timetable and rolling stock changes. (NMF 1.7.1; Run IDs: 4965, 4966, 4967, 4968, 4969, and 4970; DfT interpretation of PDFH 6.0, including the GJT trend; Demand Driver Vintage: January 2018; Semi-unconstrained demand forecasts).

### Concept Development

7. Where the projected passenger demand cannot be accommodated on the existing network or a connectivity gap has been identified, potential interventions were identified and assessed. These are presented as choices for funders. The engineering assessment undertaken has been at a high level and forms the pre-GRIP stage of development in terms of Network Rail's governance process for infrastructure project development. The aim of the assessment is to determine whether potential concepts identified are technically feasible and capture some early thinking about risks, opportunities, deliverability and planning.

### Cost Estimation

8. Indicative cost estimates have been prepared for some potential interventions. The estimates are based on pre-GRIP data available, concept drawings and high level specification of the scope. To reflect the level of information available to support the estimate production, a contingency sum of 60% has been added. The estimates do not include inflation.

### Business Case Analysis

9. Business case analysis has been undertaken to demonstrate to funders whether a potential investment option offers value for money. The analysis follows DfT WebTAG guidance, taking into account the net investment cost, including capital, operating expenditure and revenue, as well as benefits such as time savings, reduced road congestion (as people shift to rail) and revenue from passengers.

### Stations Analysis

10. Concepts have been developed for interventions at three stations across the route, which are national priorities for crowding and congestion. These are Lewisham, Peckham Rye and Denmark Hill. Bromley South and Brixton have also been identified for improvements to aid passenger flow. The concepts are high level and based on pre-GRIP data available.



Figure 1.1 - Distribution of consultation responses by South East Districts and London Boroughs

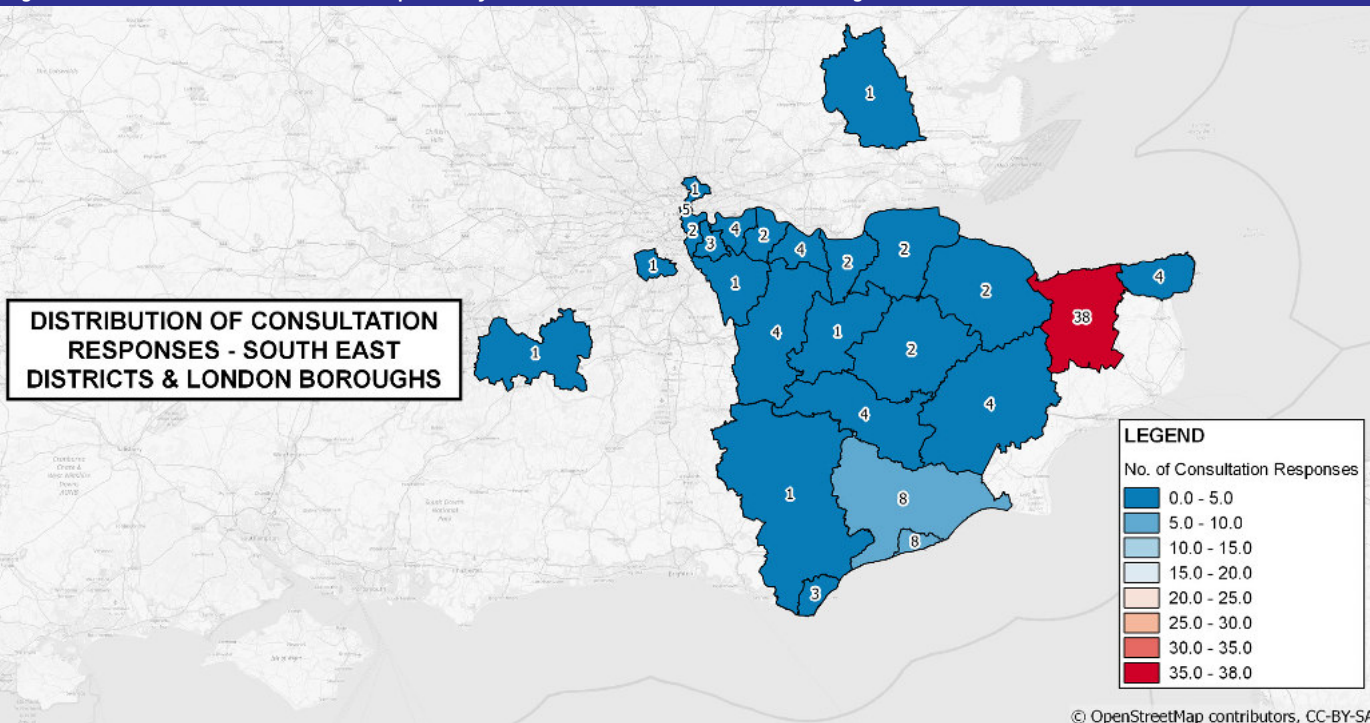
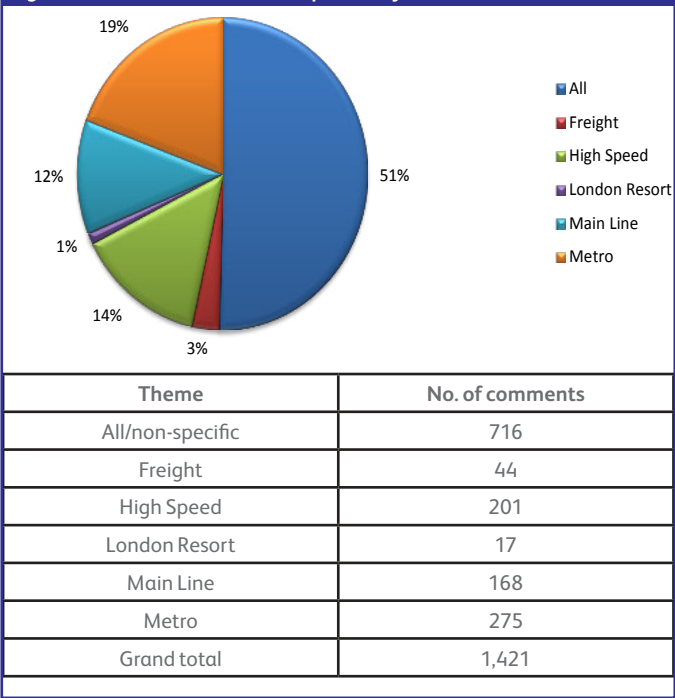


Figure 1.2 - Breakdown of the responses by theme



1.0. This section of the Technical Appendix complements [Chapter 1](#) of the Route Study, and looks at the responses in more detail. [Pale blue text](#) indicates cross-references within the Technical Appendix whilst [orange text](#) is referencing the current version (May 2018) of the Kent Route Study - in many cases this is slightly different to the 2017 Draft for Publication due to the inclusion of a new Chapter 1. **Black text** is a direct quote from the response. The consultation period ran between 14 March and 30 June 2017 so some comments may be dated.

## Understanding the data

1.1. [Figure 1.1](#) shows where responses came from by local authority borough or location if it is off the map.

- 1.2. The respondents were then categorised into the following groups:
- Business
  - Community Group
  - Education
  - Hospital
  - Local Authority
  - Member of Public
  - Member of Parliament
  - Professional Body
  - Residents Association
  - Transport Industry
  - User Group

- 1.3. The data shows that there were 188 themes, totalling 1,421 comments. [Figure 1.2](#) shows the split of theme.
- 1.4. The data presented over the following pages will look at some of the responses in greater detail, but where several responses have been received in the same subject, there will not be so much detail on individual responses but a representation of the whole where appropriate.
- 1.5. The key themes being looked at are those that attracted over five responses (89 subjects) but the others may also be mentioned.



## 1.1 General subjects

Many of the 'All' category subjects will be dealt with in the following section:

- Longer trains
- Housing growth
- More trains
- Better journey times
- Better connectivity
- Improved frequency
- Modal shift
- Improved commuting travel
- Stopping patterns
- Prioritisation of schemes
- Freight
- More tourism/leisure usage
- Employment growth
- Modal interchange
- Power supply
- Improved journeys
- Digital Railway
- Timetable issues
- Improved reliability
- Improved accessibility
- Interchange issues
- Freight connectivity
- North - South Kent and non-London routeing
- New/reopened stations
- More car parking
- Third party funding (private sector)
- Impact on the community
- Baseline state (current condition of infrastructure/timetable)
- Third party funding (public sector)
- Before 2024, not 2024-44
- Route Study document comments and compliments
- Direct trains to London
- The impact on business
- Improved bicycle provision
- Improved station environment
- Improvements
- On-train improvements
- Reconfigured seating layout
- Depots and Stabling
- Fares and ticketing
- Cross-boundary issues
- Improved access to healthcare/hospital
- Improved opportunities to employ qualified staff
- Improved interchange with Eurostar services
- Passenger growth forecasts
- Most stations will need upgrading due to increase in passenger demand
- Splitting/attaching trains
- Extra customer information screens on long platforms
- Resignalling
- Re-boring tunnels
- Loss of connectivity
- The impact of Network Rail's organisational changes
- The proposed 2018 South Eastern Franchise timetable
- Improved information
- Removal of toilet entrance fee at Network Rail managed stations
- Phased conversion of the DC network to an AC network
- Support of Kent Community Rail Partnership



1.1 General subjects

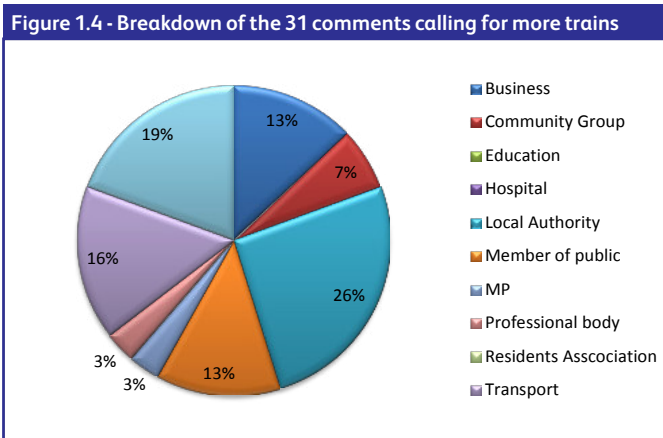
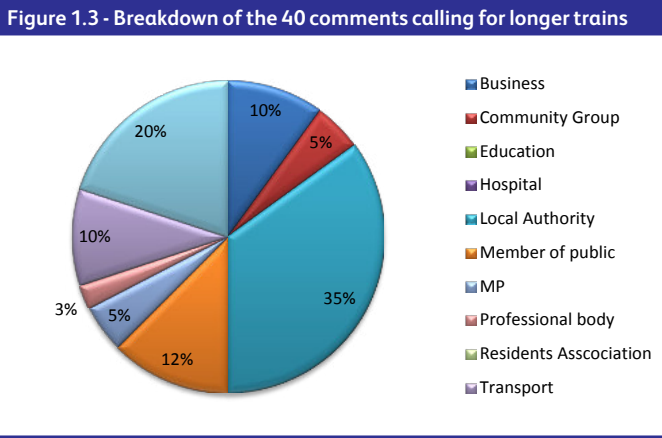
1.1.1. There were 40 comments on longer trains, (breakdown in [Figure 1.3](#)), mostly in support of the concept. Longer trains feature heavily in all parts of the strategy to provide more capacity on the trains (breakdown in [Figure 1.4](#)).

1.1.2. Housing Growth was a key subject with 34 comments and has led to changes to the relevant sections of the Route Study.

1.1.3. More trains was a popular theme with 31 comments and London terminal capacity remains the biggest issue here (see the Metro section) but additional trains on Marshlink, the Medway Valley Line and other routes were all mentioned.

1.1.4. Better journey times and better connectivity attracted 29 comments.

- Improving journey times is not always as simple as making a line faster, and often that in itself is not easily achievable. The closer to London or key junctions, generally, the slower trains run because they are slotting in between other services. This is one of the reasons TfL suggested Metroisation and DfT South Eastern Franchise proposed changes to the existing services to reduce some of the conflicting movements, freeing up more capacity and speeding trains up – however, terminal capacity remains the key constraint.



- TfL and the DfT timetables would require and provide better connectivity but some stations, such as Lewisham, but will require significant improvements to cater for interchange. Timetable planning can provide connections but sometimes require a complete timetable rewrite - this may be evidenced from 2019 when ThamesLink introduce a brand new service from Maidstone East to Blackfriars and beyond. The preceding ThamesLink train from Sevenoaks via Bat & Ball has been timed to run seven minutes ahead of the Maidstone East train. This will enable passengers from Sevenoaks and Bat & Ball to change at Otford and board the new train which will run fast to Swanley and London Bridge, which is a significantly faster train to London.

1.1.5. Improved frequency and modal shift both totalled 28 comments.

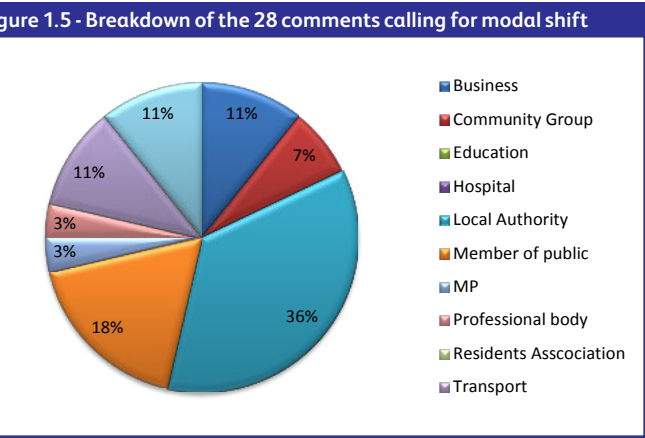
- Improved frequency is similar to the 'more trains' discussion, although metro-style frequencies on the Medway Valley Line and in the Swale Area were brought up.
- Modal shift (breakdown in [Figure 1.5](#)) is as much about getting freight off the roads and onto rail as it is getting motorists out of their cars and on the train. To achieve the former requires rail freight to be affordable, reliable and timely. A lot of businesses have adopted the 'just in time' principles which are reliant on

supplies arriving just before they are required, so the freight needs to arrive at a freight terminal in time for onward distribution. This is why it is essential that freight paths are reserved and why freight cannot be pushed to overnight pathways but should, where possible, be planned to avoid peak passenger periods, otherwise they would risk reducing capacity due to slower operating speeds and increased headways. The biggest challenge for modal shift for container traffic from road to rail is the high cube container which is detailed in [section 10](#).

1.1.6. 26 comments were in support of improved commuting travel, some of these tie into frequency and journey time improvements but also refers to on-train seating layout and facilities as well as on-platform facilities such as canopies and shelters.

1.1.7. Stopping patterns received 24 comments, they varied between more stops and fewer stops and will be discussed in more detail by Line of Route.

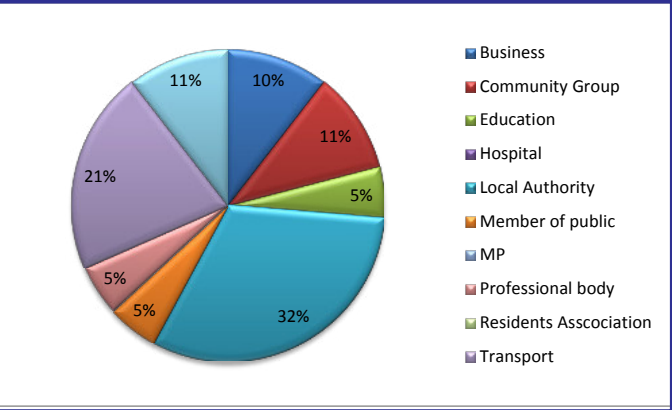
1.1.8. Prioritisation of schemes was mentioned in 21 comments, these were mostly asking that plans shown as beyond 2024 be brought forward for 2019-24 delivery. In some cases this may be possible but, for some schemes, such as improvements to Charing Cross station, a lot of development work is required, which will probably take several years, before any work is even started on the ground.





1.1 General subjects

Figure 1.6 - Breakdown of the 19 comments referring to freight



1.1.9. There were 19 comments on freight services, more tourism/leisure usage and employment growth

- Freight services remain a core function of the network and are just as important as passenger trains; this is recognised by Network Rail, see [Figure 1.6](#).
- Improvements to the Marshlink services, amongst others, are seen as key to improving tourism/leisure travel; see [Figure 1.7](#). By making tourism by rail easier, off-peak passenger numbers will rise and may see further challenges on some routes - this is why London Resort Theme Park has its own separate section.
- Most of the themes mentioned above would lead to employment growth, as people are able to travel to work on quicker, more frequent, additional or more comfortable trains. Access to a new job market and the ability to rely on a more frequent service may encourage people to look further afield or leave their cars at home, [Figure 1.8](#) shows the breakdown.

1.1.10. Modal interchange was the theme of 18 comments, this is mostly about bus, taxis, car or DLR connectivity at stations.

- Southeastern seek third-party funding for station improvements through the Section 106/Community Infrastructure Levy and Network Rail has set up a team with a similar remit to maximise the use of such funds for the benefit of the railway's customers be they passenger or freight. This is introduced in [Chapter 7](#) of the Route Study.
- It is a requirement of Network Rail, by the Government, to maximise improvements through these channels, to reduce the burden on the tax payer. Network Rail's Chairman and Chief Executive are on record explaining that if a house builder is going to make more money due to good rail connections, then they can afford to spend some of the additional money on improvements to the network.
- It has also been recognised that with the number of houses required to be built in the short to medium term, a small contribution per unit could pay for the improvements required to cater for these new residents.

Figure 1.7 - Breakdown of the 19 comments on more tourism/leisure usage

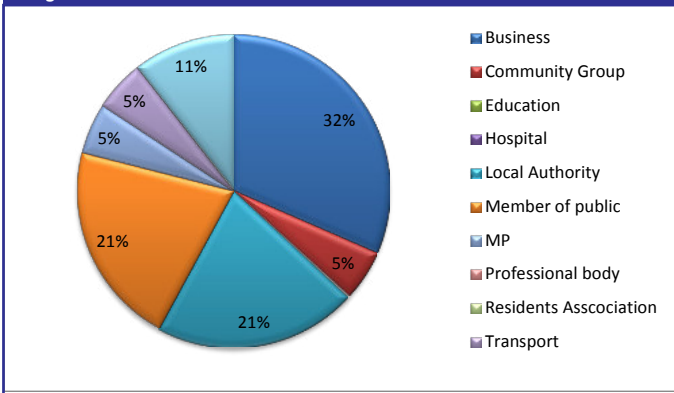
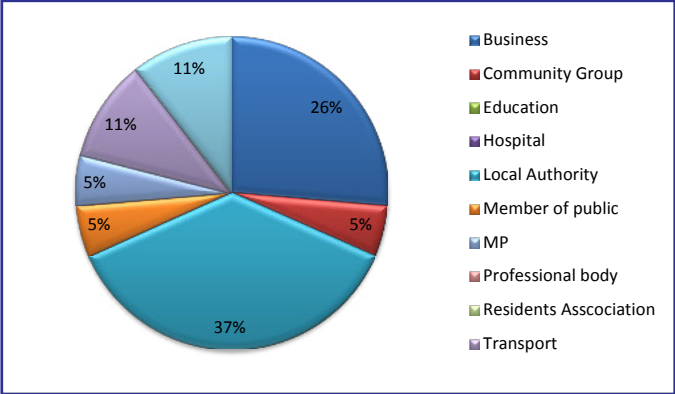


Figure 1.8 - Breakdown of the 19 comments on employment growth



1.1.11. Power supply and improved journeys had 16 comments each, The latter has been detailed above.

- There are power supply constraints across Kent due to the age of the third rail power supply network and the way it is managed and modelled, which is to say that it is bolstered for the next big timetable change but existing weaknesses in the system are only taken into account as an enhancement to a renewal or priced options to schemes. This is often because different rolling stock has different demands on the network but as the older trains are phased out, new power-hungry trains may replace them (continuous power draw for air conditioning being one cause).
- Network Rail has modelled the network based on expected timetables in 2018/19, however, with a new South Eastern Franchise starting in 2019, this modelling will have to be reviewed and further power supply enhancements are likely for any major timetable changes in the early-2020s. Network Rail's System Operator function is looking at ways of managing the timetable and power supply to ensure both are compatible.



# 1.1 General subjects

1.1.12. Digital Railway and timetable issues both had 16 comments. Timetable issues are mainly covered in the relevant sections and some of the above explains the reason for timetabling restrictions.

- Digital Railway has moved forward significantly on the Kent Area so this section has been updated with the latest roll-out plan for the introduction of Traffic Management. **Figure 1.9** shows the breakdown of comments.

1.1.13. Improved reliability and improved accessibility had 15 comments.

- Reliability on a complex network is subject to hundreds of influences, from infrastructure to trains and external factors such as weather. Dedicated teams in each of the train operating companies and Network Rail look at all delay-causing incidents and look for ways to minimise disruption.
- Some reliability issues are caused by congestion on the network whilst others are the failure of one of millions of individual components. Digital Railway's Traffic Management System will help with the day-to-day operation of the railway and decision making during times of disruption but there will always be issues. Even an almost 'closed' system like the Victoria Line on London Underground, which does not have to interface with the weather, level crossings etc., suffers disruption caused by the failure of

Figure 1.9 - Breakdown of the 16 comments on Digital Railway

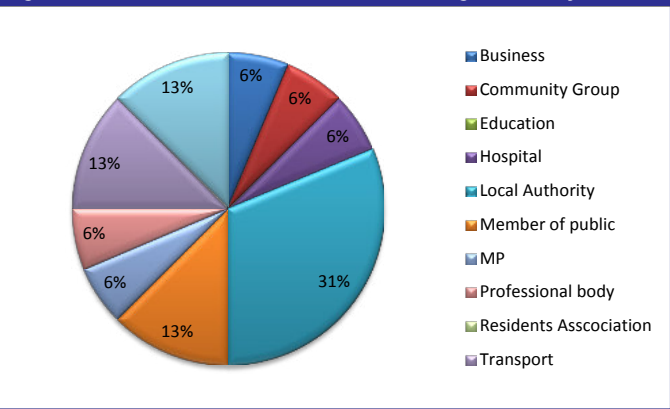
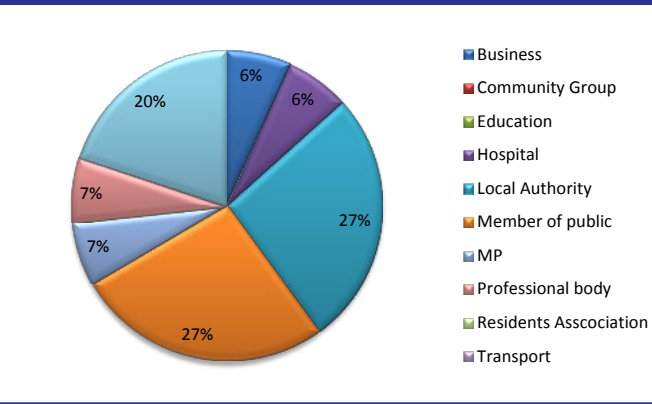


Figure 1.10 - Breakdown of the 15 comments on improved accessibility



components in the signalling, power supply or trains - it simply is not possible to remove this. However, when systems are upgraded or replaced, it is expected that the new equipment is more reliable or has back-up or fault alerting systems to ensure reliability.

- There is a national Access for All fund, managed by Network Rail on behalf of the DfT, to upgrade stations to improve access to the network for all users, regardless of disability. This work includes lifts and platform improvements to reduce stepping distances and gaps, see **Figure 1.10**.
- Trains currently in operation in Kent have doors at the 1/3rd and 2/3rd positions which are better for entry and egress but does put the doors slightly away from the platform edge. One of the issues at platforms with tightly curved platforms, such as Strood or Lewisham, is that the rigid coach does not bend with the curve (being a solidly built vehicle) so the ends of the vehicles are closer to the platform than the centres which are quite a distance from the platform. Some new trains are being introduced that have a central door as well as at 1/3rd and 2/3rd positions so it will be interesting to see how this issue is resolved.

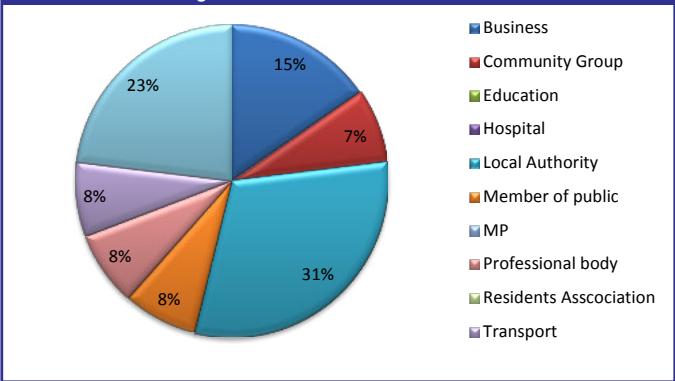
1.1.14. There were 14 comments on interchange issues, this is for stations where you generally change trains rather than leave the station. Peckham Rye, for example, sees a lot of interchange

between London Overground, Southern, Southeastern and ThamesLink services - as already detailed in the Route Study, this station is not designed for the large number of interchanging passengers between its four platforms.

1.1.15. 13 comments were about freight connectivity and North-South Kent and non-London routeing.

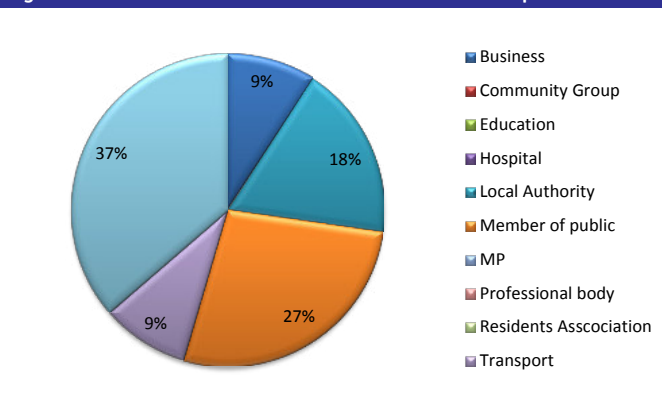
- Freight connectivity includes existing and possible future freight flows. Aggregate Industries, a major freight customer, is looking for ways to reduce the journey time of trains to Kent and South East London so that the locomotive and/or wagons can be used for a second freight flow later the same day, whilst RiverOak Strategic Partners highlighted the possibility of providing freight connections to Manston Airport, should they reopen it as a freight airport.
- North-South Kent and non-London connectivity (**Figure 1.11**) was widely seen as an issue and many people agreed with the proposals set out in the Draft Route Study. Some suggested their own solutions such as SHRIMP (St Leonards & Hastings Rail Improvement Group) who identified coastal services from Hastings via Rye to Ashford International and wider Kent via Folkestone or Canterbury to the Kent Coast and Medway, or via Maidstone. These proposals will be looked at in more detail in the coming sections.

Figure 1.11 - Breakdown of the 13 comments on North-South Kent and non-London routeing



1.1 General subjects

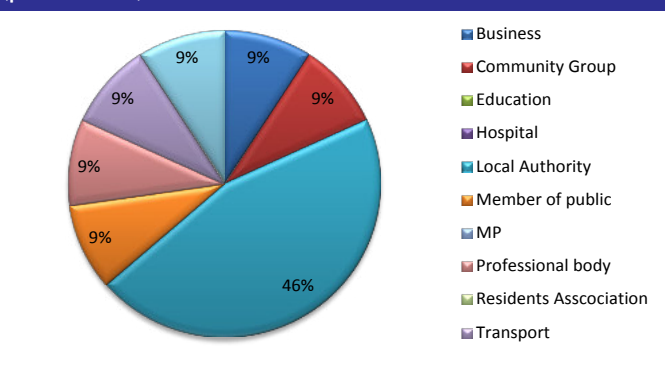
Figure 1.12 - Breakdown of the 11 comments on new/reopened stations



1.1.16. New/reopened stations, more car parking, third party funding (private sector) and the impact on the community had 11 comments apiece.

- The new/reopened stations mentioned in the responses are shown in Figure 1.12 and will be discussed in the relevant section
- As can be seen in Figure 1.13, private sector funding was discussed, details of Network Rail's Business Development team can be found in Chapter 7 of the Route Study.
- From the outset, the Route Study stated that it is not remitted to look at car parking, however, given its importance at stations, Network Rail's System Operator function will be working with the passenger train operating companies, local authorities, Highways England and other stakeholders on the car parking strategy for, initially, third party funding.
- Impact on the community has both positive and negative connotations, for example, East Sussex County Council highlighted the benefits of significantly reducing the journey times to London and Ebbsfleet International, which could enable local residents to get jobs in London or at London Resort Theme Park, whilst Bean Residents Association and Southfleet Parish Council are concerned about Ebbsfleet Southern Link being constructed through their community.

Figure 1.13 - Breakdown of the 11 comments on third party funding (private sector)

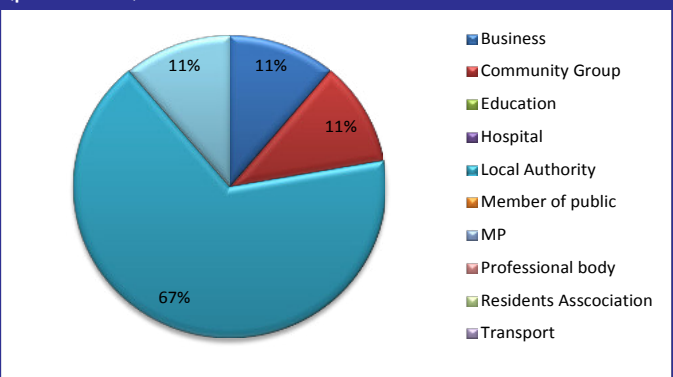


1.1.17. 10 comments were received on the baseline state; these were mainly concerns about the assumptions made by the Route Study Working Group on the timetable and condition of the network in 2019, the baseline year. Whilst we understand their concerns, the year was dictated by the process and included all of the known major timetable changes, such as the post-Thameslink Programme December 2018 Timetable. What has become very obvious since the publication of the Draft for Consultation, is that the December 2018 timetable will be quite different from that previously used and there is a high probability that in the early-2020s the new South Eastern Franchise operator will change the timetable significantly, however, a line had to be drawn in the sand in 2015 when the Route Study began. A further update to the assumptions appears in Chapter 3 of the Route Study.

1.1.18. Nine comments were received on the following subjects: third party funding (Local Enterprise Partnerships (LEPs) etc), 'before 2024 not 2024-44' and comments on the Route Study document.

- Third party funding through devolved government funding (Local Enterprise Partnerships (LEPs)) or local authorities includes the possibility of bidding for LEP funds to contribute to enhancements, this has proved successful with the line speed enhancements between Ashford International and Ramsgate, As mentioned above, Network Rail South East Route has a dedicated team looking for third party funding for enhancement schemes. Figure 1.14 shows the breakdown of responses.

Figure 1.14 - Breakdown of the nine comments on third party funding (public sector)



• Prioritisation was also mentioned earlier, some people explicitly stated that schemes should be brought forward for completion before 2024, not between 2024 and 2044.

- Comments on the Draft for Consultation document covered everything from minor spelling mistakes or inaccuracies to complimenting the ease of use over previous Route Studies and its predecessor, the Kent Route Utilisation Strategy. Where possible, changes have been made in the final documents.

1.1.19. Eight comments were received on direct trains to London and the impact on business.

- Direct to trains to London come in various forms, such as extending the Bromley North Branch services to London, direct Marshlink services to London St Pancras International or retaining the London Charing Cross or London Victoria services on some metro routes instead of Metroisation.
- Helen Whatley MP (Faversham and Mid Kent) highlighted the benefits to leisure, commuting and business travellers of having the Faversham -Ashford Link whilst the owner of Hastings-based company Beaming, and others, praised the opportunities for business travellers to/from Hastings if Marshlink is connected to the High Speed network.



## 1.1 General subjects

1.1.20. There were seven comments on improved cycle provision and improved station environment.

- The former is both on-train and at stations but both are an issue for train operators and Network Rail and could be provided/enhanced using third party funding.
- The latter is referring to more litter bins, platform seating, waiting shelters, extensions of canopies etc.

1.1.21. Improvements, on-train improvements, reconfigured seating layout, depots & stabling, fares & ticketing issues and improved business travel all received six comments each.

- Improvements was too generic as it involved most subjects referred to as 'improved...'
- On-train configuration and reconfigured seating is pretty much the same thing although the former were forwarded to the DfT for the South Eastern Franchise consultation
- The Depots & Stabling section in **Chapter 3** of the Route Study has been updated to include details of the sidings and capacity across Kent. This highlights the impact of longer fixed-formation trains. Further information can be found in **Chapter 8** of this document
- The Draft for Consultation clearly stated that fares and ticketing issues are not in scope for the Route Study. However, the train operators, DfT and TfL representatives on the Working Group have seen these comments.

1.1.22. Five comments were received on cross-boundary concerns - these included freight services to the West Country/West Coast Main Line via the North Downs Line through Tonbridge, avoiding Redhill, through Guildford and on to Reading, Gatwick Airport passenger services and freight through South London to the West Coast Main Line. More details are given later in this chapter.

1.1.23. Improved access to healthcare/hospital, improved opportunities to employ qualified staff, improved interchange with Eurostar services, passenger growth forecasts and most stations will need upgrading due to increase in passenger numbers all received four comments.

- Improved access to healthcare/hospital comments came from a member of public who had contacted Network Rail via Live Chat to show support for the Faversham - Ashford Link as their hospital appointments had been moved from Canterbury to Ashford whilst Kings College Hospital NHS Foundation

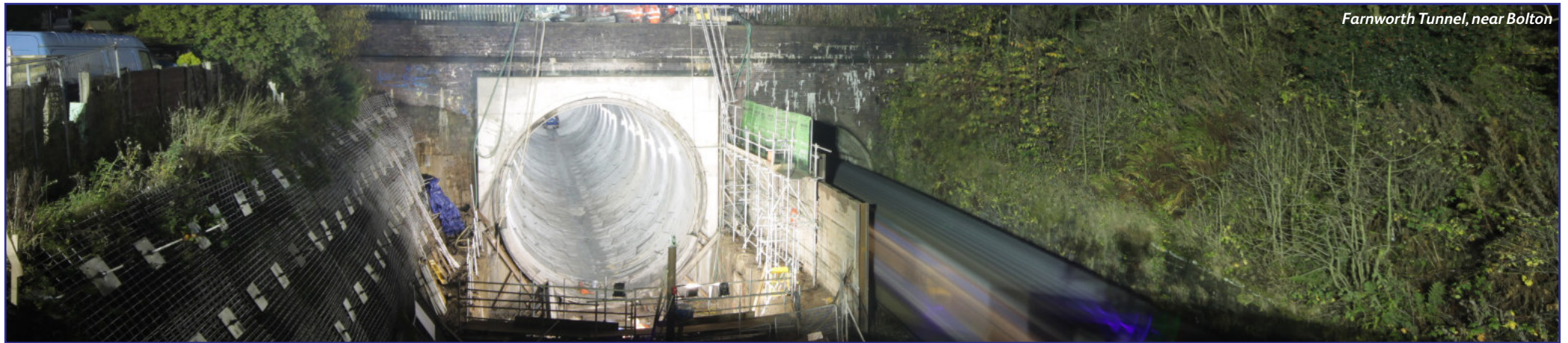


Kings College Hospital, Denmark Hill

- Trust explained the requirements of the Trust and its users & staff of the rail network
- The Trust also commented on the ability to attract qualified staff through a robust rail service
- Dartford Borough Council pointed out that the London Resort Theme Park will attract staff not just from East Kent but West Kent and South East London too

- The owner of Beaming, in Hastings, explained that the direct High Speed service would make them more attractive to customers and future employees.
- Similar comments were made by a member of public and Kings College Hospital NHS Foundation Trust.

## 1.1 General subjects



Farnworth Tunnel, near Bolton

1.1.24. Four comments referred to improving access to Eurostar services.

- Eastbourne Chamber of Commerce welcomed the opportunity for improved connections with the introduction of Marshlink High Speed services
- London Resort Holdings recognise that Eurostar connections are key for their theme park
- Ashford Borough Council highlighted the requirement for the continuation of Eurostar services to call at Ashford International, particularly in 2020 to provide connections to the Sandwich Open Golf Tournament
- A member of the public mentioned that the Ebbsfleet Southern Connection would provide better access to Eurostar services to parts of West Kent and South East London.

1.1.25. Several people questioned the passenger growth forecasts, this is dealt with in [Chapter 4](#) of the Route Study.

1.1.26. The comment that most stations will need upgrading due to the increase in passenger numbers means funding for this will likely come through third parties or the franchisee as part of their agreement with the DfT.

1.1.27. Three comments were received about splitting and attaching trains, extra customer information screens (CIS) on long platforms, resignalling and reboring tunnels. The subject of splitting and attaching portions of trains will be dealt with in the Main Line section as all three comments were about the current practice at Tunbridge Wells.

- Extra CIS on long platforms would enable passengers to keep abreast of the train running information and may encourage them to spread further along the platform, reducing crowding and congestion at part of the train or platform covered with a canopy. This is usually dealt with by the train operator but if it can be expected to reduce dwell time (the amount of time the train waits in the platform for alighting and boarding), then there may be a business case for the extra CIS through performance improvement or third party funding
- The resignalling section of [Chapter 3](#) in the Route Study has been updated to reflect the latest plans. Additional considerations appear later in this chapter

- Reboring tunnels is particularly important to users of the Hastings Line where the tunnel bores are too narrow to support two tracks so the line is single track through the tunnel and double-track either side. This is a capacity constraint and performance risk.
  - In 2015, Network Rail re-bored Farnworth Tunnel near Bolton. It was decided to re-bore one of the two single-track tunnels so the track was realigned to access one whilst the other was enlarged. The tunnel was filled with concrete foam and then completely re-bored using a nine-metre diameter tunnel boring machine. This machine built a new tunnel that was wider than the tunnels used in Crossrail and the Channel Tunnel because it is a two-track bore with overhead line equipment for the electrification of the line. The upgrade took about six months to complete.
  - Network Rail's innovation team have looked at a tunnel enlargement machine which widens the tunnel without filling it with concrete first. There is a version of the machine that could have a single track running through it to enable diesel trains to run but this would make the bore much larger than is required. There is more information on this subject later in this chapter.



## 1.1 General subjects

The River Medway passing Rochester Castle



1.1.28. The loss of connectivity, the impact of Network Rail's organisational changes and the proposed 2018 South Eastern Franchise timetable all received two comments.

- A member of public from Hackney was disappointed that the Kent Route Study did not look at the wider connectivity to other London Boroughs and specifically, the East London Line to New Cross and New Cross Gate, particularly the latter as Govia Thameslink Railway's timetable proposals for Southern in December 2018 will remove the New Cross Gate stop on fast trains, severing the easy link to Gatwick Airport.
- The Campaign to Protect Rural England was concerned that there is 'poor provision of rural rail services'. "For those without a car (around 25% of households) the rail service is a lifeline, and any reduction in service or frequency will have a disproportionate effect when no alternatives exist".
- Aggregate Industries commented on the "devolution of Network Rail to regional routes and proposals to deepen alliancing with the principal Passenger Franchise could have a negative impact upon freight. We have concerns to express on two levels, firstly the passenger franchise and Network Rail avoid, favouring passenger traffic to the harm of freight traffic and secondly because freight traffic will typically be undertaken across multiple routes, neighbouring routes work effectively together and regional focus does not become the sole driver".
- The Chartered Institute of Logistics and Transport (CILT) had this to say:
  - "The [South Eastern] franchise consultation document proposed closer partnership working between the franchisee and Network Rail. In principle we support better partnership between operator and track authority as it would allow much better communication (particularly at times of service disruption) and mutual understanding of each other's objectives. Partnership between Network Rail and the main passenger operator must not be at the expense of other operators on the line and in particular must not reduce already limited capacity to operate freight trains. Inadequate capacity for freight operation already constrains development of links that could help to ease flows on the highway network. Freight operators must be accorded fair treatment in terms of capacity planning and performance.
  - "There is already a joint Network Rail/Southeastern Kent Integrated Control Centre and some joint cooperation but there is a perception that the joint performance team has been slow to become fully operational which should not be the case with any future joint working arrangement."
- Aggregate Industries also shared their concerns on South East Route performance metrics - "in order to protect the interests of freight traffic in this region, we would wish for the performance and promotion of freight services to be identified as part of the key metrics for Network Rail's route to achieve. In addition, for Network Rail's System Operator and freight and national passenger route roles to be clearly defined and capable of influencing the local decision making."
- These are important observations, however, there are checks and balances in the system to ensure that freight is not pushed out of the timetable and Network Rail's Routes, System Operator and Freight teams will continue to work together with the rail freight community.
  - It should be noted that the DfT, Network Rail and the franchise bidders are working hard to ensure co-operation works and have shared goals.
  - It is expected that these issues have been resolved in the development of the Network Rail devolution in the months since the response was written.

## 1.1 General subjects

*Rochester station, the area to the left is to be redeveloped as part of the Rochester Riverside regeneration project*



1.1.29. Rt. Hon. Sir Michael Fallon MP (Sevenoaks) called for improved information:

- “In a sufficiently timely and accessible manner through innovative new technologies such as on journey-planning applications that work on real-time information. Network Rail needs to work with South Eastern operators to deliver this.
- “The provision of information before, during, and after a journey, in addition to sufficient communication during and after disruption are vital to creating a sustainable rail network that works economically but also that works for passengers”.
- This is a subject that is always pertinent as it can be hard to disseminate information quickly and accurately. The introduction of Traffic Management should improve the information flow automatically.

1.1.30. London TravelWatch called for the toilet entrance fee at Network Rail managed stations to be removed. This has already happened at South East Route stations: London Bridge, London Charing Cross, London Cannon Street and London Victoria.

1.1.31. One member of public called for phased conversion of the DC network to an AC network (i.e. transferring from third rail to overhead power supply, [see [Chapter 3](#) of the Route Study for more details]. Over time “the benefits for HS1 and Victoria Mainline fast lines eventually using 25kV OHLE should lead to the eventual conversion. Metro and London Bridge services are adequately supplied by 750V DC. Those lines expected to have regular freight movements should be both gauge cleared and become 25kV OHLE”.

- The Draft for Consultation explained that conversion is not currently planned, however, this person felt that this “lack of strategic clarity creates three challenges
  - i) Rolling stock specification
  - ii) Life expired equipment replacement (dependent on stock)
  - iii) Infill Electrification. A clear signal of strategic intent is required.”

- Unfortunately, such phasing is not as clear cut as that, most new rolling stock is, however, provided with provision for a pantograph and the ability to operate from the third rail and overhead, which future proofs it. The cost of overhead catenary equipment and installation is very high and currently not supported by funders.
- [Chapter 6](#) in the Route Study includes a challenge to Network Rail’s suppliers to develop a solution that the Office for Rail and Road will accept to enable the further expansion of the third rail network.
- A further challenge to provide on-train batteries that would allow trains to accelerate with maximum amps rather than drawing all that power from the third rail should also be investigated.

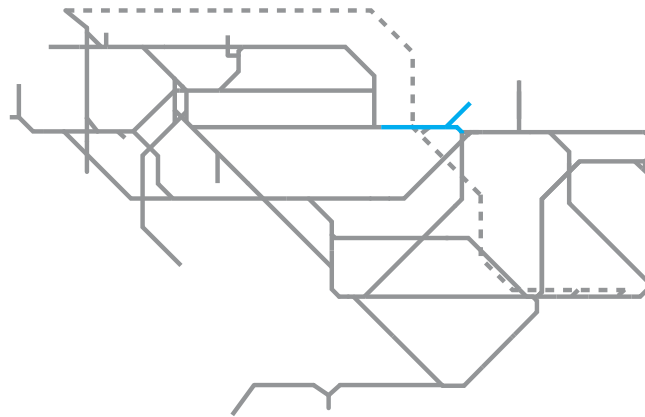
1.1.32. The Kent Community Rail Partnership called on Network Rail to support the Community Rail Partnership which the South East Route and System Operator are happy to do and will endeavour to be more involved.



## 1.2 Metro areas

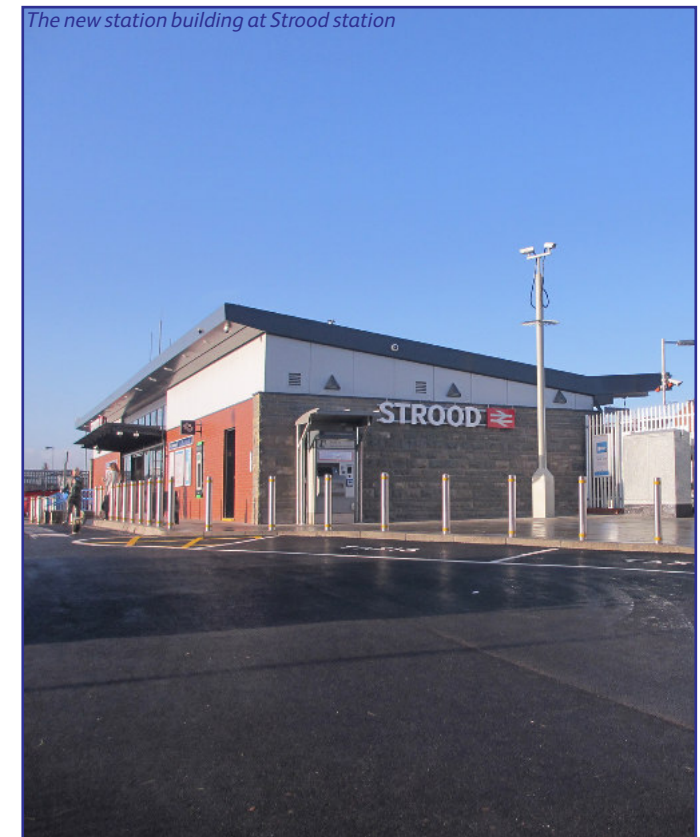
The Metro Area attracted 165 comments. Starting from the outside and working in to London, we will look at the responses in this order:

- London Bridge Metro
  - Strood to Dartford
  - Dartford to London Bridge via Woolwich and Greenwich
  - Dartford to Lewisham (exclusive) via Bexleyheath
  - Dartford to Hither Green (exclusive) via Sidcup
  - Orpington to London Bridge
  - Hayes Branch
  - Bromley North Branch
  - London Bridge to Cannon Street
  - London Bridge to Charing Cross
- London Victoria Metro
  - Trains via Herne Hill
  - Trains via the Lewisham Line and Denmark Hill
  - London Victoria station
- Blackfriars Metro
  - Trains via Catford Loop and Denmark Hill
  - Trains via Elephant & Castle
- All
  - Some comments referred to all Metro routes and are not specific to a line of route
- Airports
  - There were some comments specifically referring to airport connectivity from various parts of the Metro area.



### Strood - Dartford

1.2.1. There were 44 comments on this section of line, 18 referred to the extension of Crossrail towards Gravesend (although this is now referred to as Crossrail towards Ebbsfleet).



#### 1.2.2 Rebuild of Strood station

1.2.2.1. Kent County Council, Kent and Medway Economic Partnership and South East Local Enterprise Partnership mentioned the reconstruction of Strood station.

1.2.2.2. The station building at Strood underwent a £2.8M upgrade as part of the National Stations Improvement programme and Medway Council's regeneration of the local area, the new station is bright, modern and compliments the neighbouring Rochester station which itself was upgraded in 2015. The new Strood station building opened in late 2017.

## 1.2 Metro areas

## Hoo Junction area



### 1.2.3 Hoo Junction or Grain Branch station reopenings and the reintroduction of passenger services to Grain Branch

1.2.3.1. Network Rail's System Operator team are working with Medway Council to identify the challenges of reintroducing passenger services to the Grain Branch. In its comments, Medway Council said:

- The council is preparing a new Local Plan to provide direction on the future growth of the area. The new Local Plan will cover the period up to 2035, providing for the number of homes and jobs and supporting infrastructure that the area will need. The aim of the Local Plan is to ensure that Medway grows sustainably, to provide land for housing, employment, infrastructure and services, whilst protecting the area's environment and heritage. The current 'Development Options' consultation is the second formal stage in preparing the new Local Plan. Subject to

outcomes of an independent examination by a planning inspector, it is anticipated that the new Local Plan will be adopted in 2020.

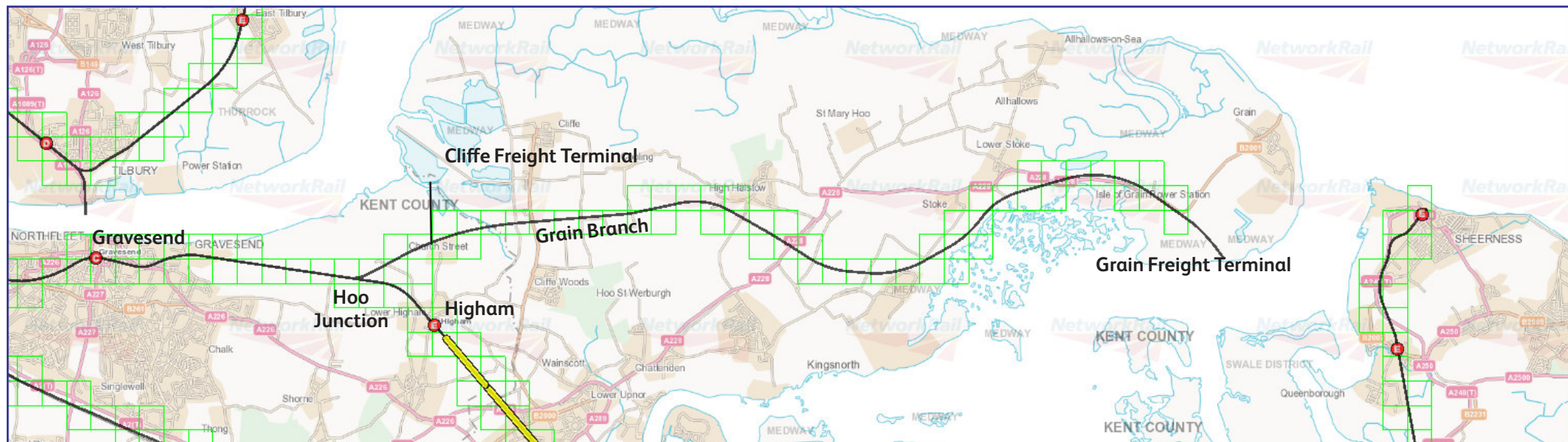
- The North Kent Strategic Housing and Economic Needs Assessment (March 2015) established the development needs for housing, employment and retail in Medway to 2035:
  - 29,500 homes;
  - 155,000 m<sup>2</sup> industrial land;
  - 164,000 m<sup>2</sup> warehousing land;
  - 50,000 m<sup>2</sup> office space;
  - 35,000 m<sup>2</sup> comparison retail space; and
  - 10,500 m<sup>2</sup> convenience retail space.

- The scale of growth in Medway is challenging; the resident population is forecast to increase by one-fifth to 330,220 in 2035. Residents have stated their concerns about transport issues and traffic congestion during the recent Development Options consultation. An interim traffic assessment has established the likely impacts as a result of growth by 2026 through the council's new Strategic Transport Model.
- The interim traffic assessment demonstrated that congestion will be significantly worse in the next 10 years without the necessary highway mitigation or the successful implementation of sustainable transport initiatives. Clearly this scenario would have far-reaching implications for sustainable growth in terms of productivity, liveability and air quality which is emerging as a national priority public health issue.



## 1.2 Metro areas

### Grain Branch overview



- Network Rail intends to safeguard the long established international freight routes between the Channel Tunnel and London (para 3.15.3), while utilisation will rise from just 12 percent in 2012 to 38 per cent by 2044 (para 3.15.5). In other words, there is sufficient capacity to meet forecast demand for rail freight across the network. Meanwhile, Figure 3.14 shows that, in 2024, the Grain freight line will serve only one train every four hours. At para 5.14.8, this line has not been identified as a preferred route for enhanced gauge works for 'high cube' container movements. If this under utilised piece of infrastructure is not considered as a strategic route for significant growth in freight, its potential role should be explored to make the Hoo Peninsula a sustainable location for growth, while maintaining freight movements during off-peak periods.
- The council's recent Local Plan 'Development Options' consultation document proposes significant growth for the Hoo Peninsula in three out of four scenarios. The council understands that many commuters currently drive from villages to stations at Strood, Gravesend or Ebbsfleet; with the possible scale of growth

forecast, a continuation of this commuting pattern is not sustainable or desirable. It is understood that the line is not electrified (para 2.2.11), however it could have an important role to support growth in this relatively remote location, which is constrained by the Four Elms Roundabout in particular.

1.2.3.2. As a consequence of the above, Medway Council are proposing to safeguard land for a new rail station served by the Grain Branch in the next Local Plan consultation. Long-term aspirations for a modern employment park at Kingsnorth could also be served by a freight facility. Discussion between Network Rail and the Office for Rail and Road has identified how the third rail network can be expanded although a completely new operating practice will need to be devised - see the Innovation Challenge on **Page 78** of the Route Study.

1.2.3.3. This is also a unique opportunity to work with the freight community on the upgrade of the line for passenger services and the interface with the freight facilities at Hoo Junction.

1.2.3.4. It is recognised that some land north of the existing North Kent Line at the London-end of Hoo Junction has been protected as part of the Crossrail scheme for a possible future depot.

1.2.3.5. Kent Community Rail Partnership listed the extension of Medway Valley Line services from Strood to the Hoo Peninsula in their response. This would require a new spur connecting the North Kent Line with the Grain Branch whilst avoiding Hoo Junction freight yard, this could even have some freight benefits for trains heading towards the Medway Towns.

1.2.3.6. Other services that could be extended are those that terminate at Gravesend or extended Crossrail/Elizabeth Line services.

#### 1.2.4 Crossrail extension towards Gravesend/Ebbsfleet International

1.2.4.1. Further details of this scheme can be found in **Chapter 6** of the Route Study and **Paragraph 1.2.11** later in this section.



## 1.2 Metro areas

### 1.2.5 Northfleet - Ebbsfleet International interchange issues

1.2.5.1. Northfleet and Ebbsfleet International stations are within sight of each other, however, they are not joined and have an extensive walking route, crossing a major road, the Thames Way (see right).

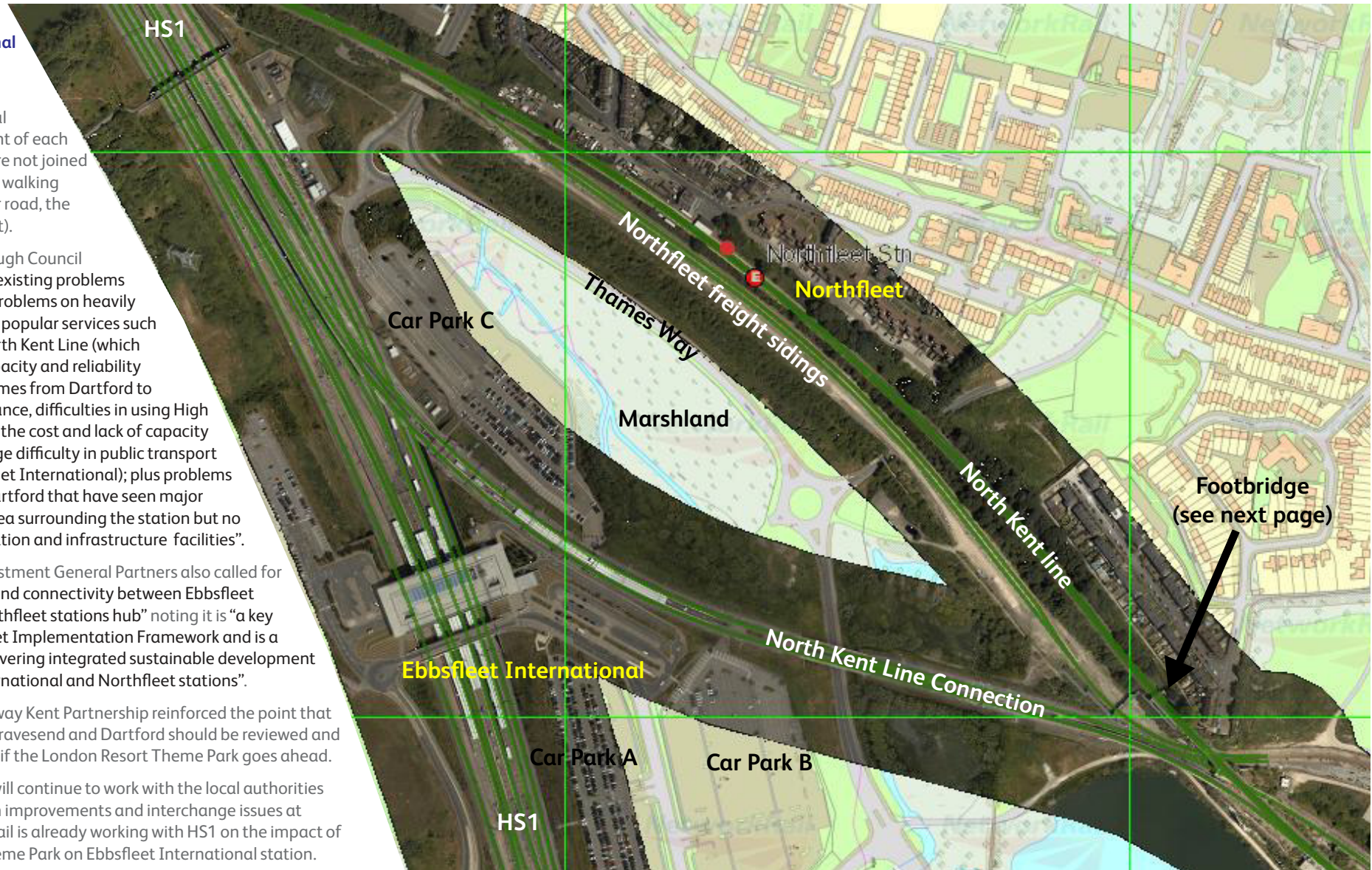
1.2.5.2. Dartford Borough Council highlighted that “Key existing problems with services include problems on heavily used and rapidly more popular services such as Dartford on the North Kent Line (which suffers from major capacity and reliability issues), slow journey times from Dartford to London given the distance, difficulties in using High Speed services (due to the cost and lack of capacity of services and the huge difficulty in public transport interchange at Ebbsfleet International); plus problems at other stations in Dartford that have seen major development in the area surrounding the station but no investment at all in station and infrastructure facilities”.

1.2.5.3. Ebbsfleet Investment General Partners also called for “enhanced transport and connectivity between Ebbsfleet International and Northfleet stations hub” noting it is “a key feature of the Ebbsfleet Implementation Framework and is a priority for EIGP in delivering integrated sustainable development around Ebbsfleet International and Northfleet stations”.

1.2.5.4. Thames Gateway Kent Partnership reinforced the point that all stations between Gravesend and Dartford should be reviewed and improved, particularly if the London Resort Theme Park goes ahead.

1.2.5.5. Network Rail will continue to work with the local authorities and funders on station improvements and interchange issues at Northfleet. Network Rail is already working with HS1 on the impact of the London Resort Theme Park on Ebbsfleet International station.

Northfleet and Ebbsfleet International area





## 1.2 Metro areas

London-end of Northfleet station with the entrance to the freight sidings



## 1.2.6 Northfleet freight terminal

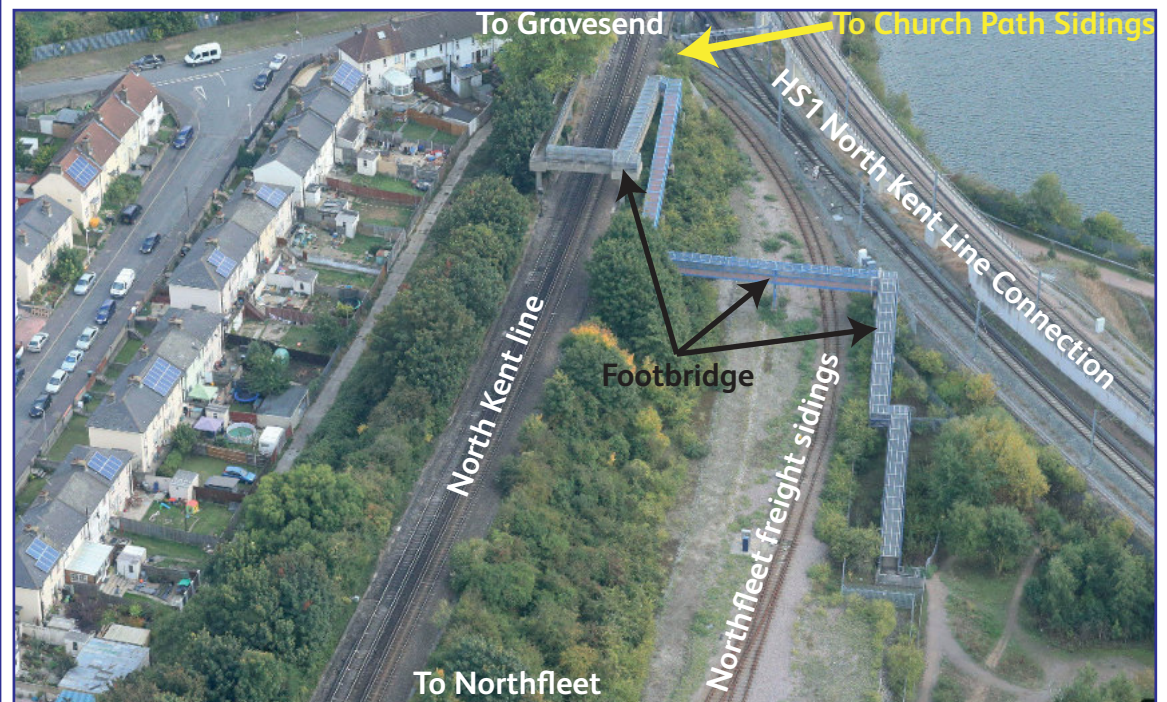
1.2.6.1. Adjacent to Northfleet station, sandwiched between the North Kent Line and the Thames Way road, see left. The siding continues under the North Kent line to adjacent to HS1 Church Path sidings (below).

1.2.6.2. Northfleet Properties LLP stated it “has an interest in the existing rail terminal at Northfleet, which provides an important multi-modal interchange for aggregates and construction traffic. The rail link is operational and therefore it should be shown on all diagrams of the current rail network. The operation of this terminal should be safeguarded within any future proposals for the area, including extending Crossrail to Ebbsfleet.”

1.2.6.3. Gravesham Borough Council also recognised the potential of the sidings, “Rail freight needs proactive promotion across the network – use of the recently developed facilities at Northfleet being a good example. There is however a downside because of the implications for track capacity and in timetabling terms it is necessary to provide paths in a regular interval timetable, many of which may not be used”.

1.2.6.4. Freight is discussed later in this section. It is evident that these facilities could be particularly important should the London Resort Theme Park go ahead. There are also some sidings close by on HS1 infrastructure that could be significant for the development.

Country-end of Northfleet freight sidings





## 1.2 Metro areas

## Swanscombe to Stone Crossing



## 1.2.7 Existing issues at Swanscombe and Stone Crossing stations

1.2.7.1. Swanscombe and Stone Crossing stations are both on the North Kent line between Gravesend and Dartford and are served by stopping services rather than the semi-fast trains from the Medway Towns although from May 2018 they will become ThamesLink stations served by the Rainham - Luton service.

1.2.7.2. This section of line actually has four stations in about 2.5 miles, namely Northfleet, Swanscombe, Greenhithe (for Bluewater) and Stone Crossing.

1.2.7.3. Swanscombe station will be the closest railway station to the London Resort Theme Park, should that go ahead and is at the top of a long thin strip of chalk that carries the railway line, along with a bridge, over HS1 and the former chalk pits.

1.2.7.4. Greenhithe station was extensively rebuilt in 2008 with new buildings and a footbridge replacing the subway. It has direct Fastrack bus service to Bluewater Shopping Centre.

1.2.7.5. Stone Crossing station is located London-side of a former level crossing, which was recently replaced by a footbridge. There are very few amenities at the station, with access to the platforms gained from the level crossing. Close by, on the north side, is Asda's

Dartford Distribution Centre, several retail parks and head office buildings between the railway, the A282 Dartford Crossing and the River Thames. South of the railway line is housing and fields to the A226 London Road.

1.2.7.6. The level crossing is scheduled for closure in 2018, replaced by a footbridge.

1.2.7.7. Dartford Borough Council stated that "the high levels of current and future growth in the Borough is largely concentrated on the north Kent from Dartford station, through Stone and Greenhithe towards Swanscombe (and Ebbsfleet). A central part of accommodating this growth is delivering on the substantial modal shift expected with new development".

1.2.7.8. Kent and Medway Economic Partnership suggested that Swanscombe and Stone Crossing railway stations "urgently require upgrades/rebuilds".

1.2.7.9. Thames Gateway Kent Partnership went further and said:

- "Whilst Ebbsfleet is likely to be marketed as the arrival point for rail passengers visiting the Resort, Swanscombe station could be particularly important for access by employees at the Resort as well as a proportion of visitors. In both cases passengers could be

arriving during off-peak periods and travelling in both 'flow' and 'contra-flow' directions. The current station is non-DDA compliant and has very poor access. We would urge Network Rail carefully to review proposals for Swanscombe station in light of further information and analysis relating to the Resort proposals, as well as reappraisal of growth projections for the area, and to plan for whatever upgrading can be achieved within the physical constraints of the location;

- "Further consideration should be given to the positioning of and access to Stone Crossing station, so as to maximise its potential to serve Crossways Business Park and nearby developments such as The Bridge (the other side of the A282 Dartford Crossing approach, but linked a dedicated Fastrack rapid transit service route), and Stone itself. The existing station has poor access and is rather close to Greenhithe station. If there were potential to re-locate the station up to half a kilometre further west it could play a more strategic role in supporting growth and sustainable travel patterns; As part of the C2G [Crossrail towards Gravesend] scheme Northfleet station is under consideration as one of the options for the location of a Crossrail station or terminal linking to Ebbsfleet International".

## 1.2 Metro areas



1.2.7.10. As mentioned before in this chapter, Network Rail will be pleased to work with funders and other stakeholders on improvements to existing stations. The level crossing at Stone Crossing was closed in early 2018.

1.2.7.11. Having four stations so close together does result, however, in slower journey times. Should the proposed Crossrail Extension towards Ebbsfleet scheme go ahead with two additional tracks, discussions should be held as to whether the services should no longer call at these stations, on a new alignment, and Crossrail services call instead, with improved interchanges at Dartford and Northfleet/Ebbsfleet International.

### 1.2.8 Dartford station existing issues and improvements

1.2.8.1. Dartford station is constructed at the top of a large retaining wall and consists of two island platforms serving four tracks. The line curves through the station and the platforms are quite narrow, particularly for such a busy interchange station. A footbridge connects the platforms to the station building, which was rebuilt in 2013.

1.2.8.2. Thames Gateway Kent Partnership indicated that “a significant quantum of development, particularly in Dartford, is outside the Garden City boundary. Growth has been focused at mixed use locations north of the town centre, for instance at The Bridge and Northern Gateway (adjacent to Dartford Station). New housing completions in Dartford are running at around 1,000 per annum, and a central principle in accommodating this growth is trying to deliver substantial modal shift towards public transport. Capacity, connectivity and quality are going to be vital. TGKP would therefore support Dartford BC’s request that upgrading Dartford Station (section 3.16) should be given early priority”.

1.2.8.3. A view that Dartford Borough Council agreed with and they added that “Objection is made to the lack of clear plans set out in current consultations for upgrading stations to address future capacity as well as

dealing with the current inadequacies of the stations and providing a safe, accessible and modern standard expected by current and prospective customers. The contrast in quality of stations with ones upgraded by Transport for London not so far away is stark.

- “The Route Study [4.16] recognises the importance of station upgrades given the increasing passenger circulation issues arising. It is highly disappointing that not only is Dartford station not recognised as a priority until 2024 to 2044 [Figure 4.15], despite current concerns over not only its convenience but its safety. The refurbishment of the forecourt did not benefit the bridge and steps to the platforms which are extremely narrow relative to the volume of passenger flows. At peak times, congestion can on stairs raises safety concerns. With projected growth in and around the station, it is likely that the station concourse will suffer from capacity constraints”.

1.2.8.4. If the extension of Crossrail towards Gravesend goes ahead, the current plan is to segregate two platforms for those services, leaving just two for the extensive Metro services on the other lines to London and the Medway Towns. However, there are concerns that this is impractical with the number of Southeastern terminating services at Dartford and little platform capacity to extend services to Gravesend or Strood.

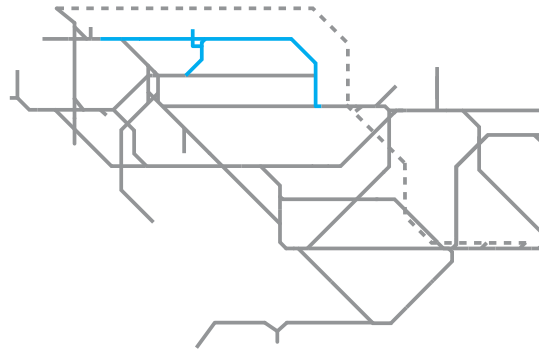
1.2.8.5. An alternative site, were it to be relocated, behind the current B&Q store, would position it on a fairly straight section of track and could enable a further two platforms to be constructed, as well as improve the platform widths and station facilities, making it a gateway to the town.

1.2.8.6. Third party funding through the Community Infrastructure Levy (CIL) or Section 106 funding could fund/part-fund the improvements to the station, however, the right solution needs to be identified, particularly with the uncertainties of both Crossrail towards Gravesend and the London Resort Theme Park which will have a major impact on the decision making.



## 1.2 Metro areas

*West of Dartford, the line splits into three separate routes to London Bridge, the Woolwich, Greenwich and Elizabeth/Crossrail lines to the north, Bexleyheath line in the middle and Sidcup line, the southernmost of the three.*



## The Woolwich, Greenwich and Elizabeth Lines

1.2.9.1. The Woolwich line, in this context, is the North Kent line from Dartford to Charlton, the Greenwich line from Westcombe Park to Deptford and the Elizabeth Line is the new name for Crossrail which will connect Abbey Wood to Reading or Heathrow Airport via Central London.

1.2.9.2. There were 74 comments spread across seven main themes, although some are similar and could simply be described as 'Metroisation/Single Terminal' issues.

1.2.9.3. Starting from Dartford, the North Kent line diverges away from the Sidcup line and then the Bexleyheath line branches off from it at Crayford Creek Junction.

1.2.9.4. At this point, Slade Green Depot is located to the east of the line, with stabling sidings within the triangle formed by the Bexleyheath, North Kent and Erith Loop lines.

1.2.9.5. The depot is the maintenance depot for the Networker (Class 465/466) fleet and is vital to the operation of Metro services.

### 1.2.10 Howbury Park freight terminal

1.2.10.1 Roxhill Developments Ltd. has a proposal for a new rail freight terminal behind Slade Green Depot which would be accessed via part of the depot. In their response they explained:

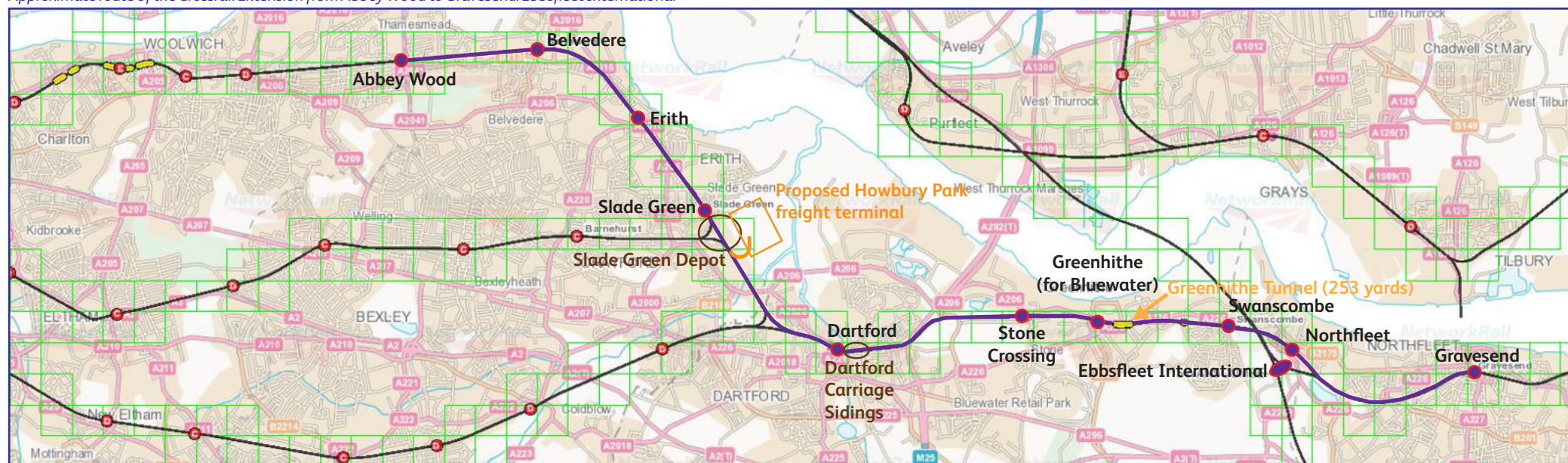
- "Roxhill is an established developer of distribution parks, with a particular interest in Strategic Rail Freight Interchanges (as defined by the Planning Act 2008 and the National Policy Statement 2014) to promote use of rail for freight movement. At present the company has secured consent for development of a SRFI at East Midlands Gateway in Kegworth, and recently secured an approval from Bexley Council (with support from Network Rail) for development of a SRFI at Howbury Park, adjacent to Slade Green depot which forms part of the South East Route network.
- "Roxhill has been working closely with Network Rail and [Southeastern] Trains since 2014 to design a new access for Howbury Park to the main line, which would share part of the existing main line access from Slade Green depot at the Dartford end. Noting in the DfT South Eastern Rail Franchise consultation document that "depots are operating at, or near capacity, which means that new ones may need to be built to enable more, or longer, trains to be introduced on the network", we have sought

to assist Network Rail and [Southeastern] Trains to improve the depot capacity and its ability to handle more / longer trains. In this regard, options under consideration at present include provision for a the new main line access to facilitate a new longer Dartford end headshunt for the depot, replacing the existing constrained 10-car headshunt with a 12-car headshunt. We have also offered assistance to Network Rail to use land controlled by Roxhill (and within existing Crossrail safeguarding directions) to be made available for expansion of stabling sidings for empty stock within Slade Green depot. We have also offered use of the Howbury Park site as an access point for any construction works required at the depot for constructing these new sidings.

- "In terms of pathing of freight trains to and from Howbury Park over the south London rail network, Network Rail has assessed the network capability and concluded that sufficient paths can be found during intra-peak and overnight periods to accommodate the emerging requirements of Howbury Park without impacting on other passenger and freight services. Most of the new trains would be expected to use the route between Slade Green and Clapham Junction via Barnehurst, but with alternative routes available via Dartford, Hither Green and Plumstead if required".

## 1.2 Metro areas

Approximate route of the Crossrail Extension from Abbey Wood to Gravesend/Ebbsfleet International



1.2.10.2. Whilst Dartford Borough Council explained that they had “refused permission for the Howbury Park development [6.14.9-6.14.11] in April 2017. Consideration was given to the ‘in principle’ potential benefits recognised in national policy of well-located full interchange facilities. However air quality and traffic impacts cannot be satisfactorily mitigated. Officers are also aware of the potential for the proposed development to generate an additional hurdle in providing the infrastructure upgrade necessary on the tracks west of Dartford station, and the potential further impediment to a Crossrail extension”.

1.2.10.3. Thames Gateway Kent Partnership also rejected the scheme because “We are also of the view that whilst it may be technically compatible with the proposed extension of Crossrail, it would certainly complicate delivery of that scheme. TGKP would therefore not welcome the proposals for Howbury Park to be taken further”.

1.2.10.4. Network Rail will continue to work with the Roxhill as they are likely to contest the planning permission refusal.

1.2.10.5. It should be mentioned that freight trains serving Howbury Park should run via Woolwich or Sidcup, rather than the Bexleyheath line which has steeper gradients and is generally avoided by freight operators.

1.2.10.6. Just to the east of the Depot is Slade Green station which is followed by Erith and Belvedere stations, the line here would have to be quadrupled under the current proposals for a segregated Crossrail extension towards Gravesend.

### 1.2.11 Crossrail and the Crossrail Extension towards Gravesend/Ebbsfleet

1.2.11.1. Abbey Wood station is the south-eastern terminus of Crossrail, now branded as the Elizabeth Line. Services commence in 2018. It will be operated completely separately to the existing railway by London Rail (MTR Corporations (Crossrail) Ltd.) for Transport for London.

1.2.11.2. The Class 345 trains are designed with passive provision for third rail power collection equipment, which is not fitted. An option for the extension towards Gravesend (now Ebbsfleet) could see this equipment being fitted but the current proposals are for a separate two-track railway running alongside the existing North Kent line.

1.2.11.3. London Resort Holdings explains why: “We support the extension of Crossrail to Ebbsfleet International. This will not only provide much improved access to the London Resort from the Docklands and other parts of East London, but release capacity for other services on the North Kent line through Greenwich to Cannon Street. It will clearly be necessary to ensure that such services run punctually and efficiently, and we understand that proposal have been made for a new alignment, following the course of the existing railway, to the east of Abbey Wood”.

1.2.11.4. Highways England said, “Highways England would be supportive of any plans to extend Crossrail further in to Kent to the Ebbsfleet Garden City area and beyond as this would be likely to transfer many existing/ potential future journeys from the highly congested M2/ A2/ M25 corridors to rail”.



## 1.2 Metro areas

1.2.11.5. Kent and Medway Economic Partnership requested, “We, like TGKP [Thames Gateway Kent Partnership], suggest that the time has come for Network Rail and the DfT to recognise the Crossrail extension to Ebbsfleet as an official scheme to be planned and scheduled as part of Network rail’s forward programme of works”.

1.2.11.6. London Borough of Bexley echoed this call:

- “The Kent Route Study describes C2G [Crossrail towards Gravesend] as a “third party proposal”, but the Council is concerned that this underplays C2G’s potential advantages of providing the railway with much needed capacity enhancement. We would encourage Network Rail to take greater advantage of the potential of C2G in its plans for the future – the scheme’s capacity benefits and support for development growth show a real alignment between the Council’s objectives and those for the railway.
- “In terms of timescale, the promoting partners would like to see C2G progress to legal powers during Control Period 6 (2019-2024), with a view to delivering the scheme in Control Period 7 (2024-2029). That offers the best practical fit with Bexley’s Growth Strategy proposals and also links well with the major development proposals in north west Kent”.

1.2.11.7. A member of the public felt there was insufficient detail on the scheme, however, it must be acknowledged that it is at an early stage in development.

1.2.11.8. Another member of public suggested that future resignalling schemes on this line should have provision for Crossrail extension towards Gravesend.

1.2.11.9. A third member of the public highlighted that “North Kent residents will take the opportunity to board Crossrail at Abbey Wood for Heathrow access. For some travellers, that choice may extend further east and south in the sub-region”.

1.2.11.10. Gravesham Borough Council pointed out that because the High Speed services are full at Gravesend “It is possible that Crossrail may attract some of this demand due it providing a direct link to Canary Wharf”.

1.2.11.11. Southeastern issued a word of caution about passenger demand post-Crossrail, “we consider that the assumptions made for the forecast for additional vehicles in 2024 for Abbey Wood as ‘zero’ is risky. Negative growth is assumed on the line; as such we think Network Rail has considered a net loss of passenger journeys from Southeastern to Crossrail”.

1.2.11.12. London TravelWatch “would support the extension of Elizabeth line services beyond Abbey Wood provided that there is sufficient infrastructure capacity provided, and that this is integrated with the existing network.

- “It is accepted that the new [ThamesLink] service from Rainham to Blackfriars and beyond, is going to be routed via Dartford, the Woolwich and Greenwich lines and London Bridge so it is anticipated that some passengers, such as those at Gravesend and Dartford, may choose this service to reach Abbey Wood for the connection to Crossrail.”

1.2.11.13. Transport for Charlton, a user group, queried, “The assumption is that demand can be met without additional carriages due to the opening of Crossrail, planned for December 2018. It is not clear whether this assessment takes account of known plans, and projected increases in residential and business numbers in the south east London area. All along the north Kent Line from Thamesmead through Woolwich, Charlton, and into central Greenwich, development is taking place on an enormous scale. In addition, tourist numbers are growing across this area, and it is expected that the Elizabeth line will itself generate further growth in this market”.

1.2.11.14. The modelling carried out by TfL included all of the growth forecast along the Thames corridor, this was used to identify the projected impact of Crossrail. The TfL model is more detailed than the usual DfT WebTAG model because TfL have access to the data for other modes of transport, not just rail, so the impact can be modelled across all modes.

*Walking route between Woolwich Arsenal and the Elizabeth Line stations*



### 1.2.12 Woolwich Arsenal Crossrail/Elizabeth Line interchange

1.2.12.1. There were no comments received about Plumstead station.

1.2.12.2. Woolwich Arsenal station is likely to be an interchange for passengers from west of Abbey Wood as the Crossrail station is a short walk away, however, the Greenwich Line Users’ Group believes “the opening of the Elizabeth line will have little direct impact on travel patterns, as few are likely to travel back to Woolwich to access it, particularly as it will be an awkward interchange involving crossing a busy main road. Far more likely is use of the planned Thameslink service with a direct connection to the line at Farringdon”.

## 1.2 Metro areas

### 1.2.13 Woolwich Dockyard platform extensions

1.2.13.1. Woolwich Dockyard station was identified as an issue for the operation of 12-car trains via Woolwich, this was welcomed by the Royal Borough of Greenwich Council.

### 1.2.14 Angerstein Wharf

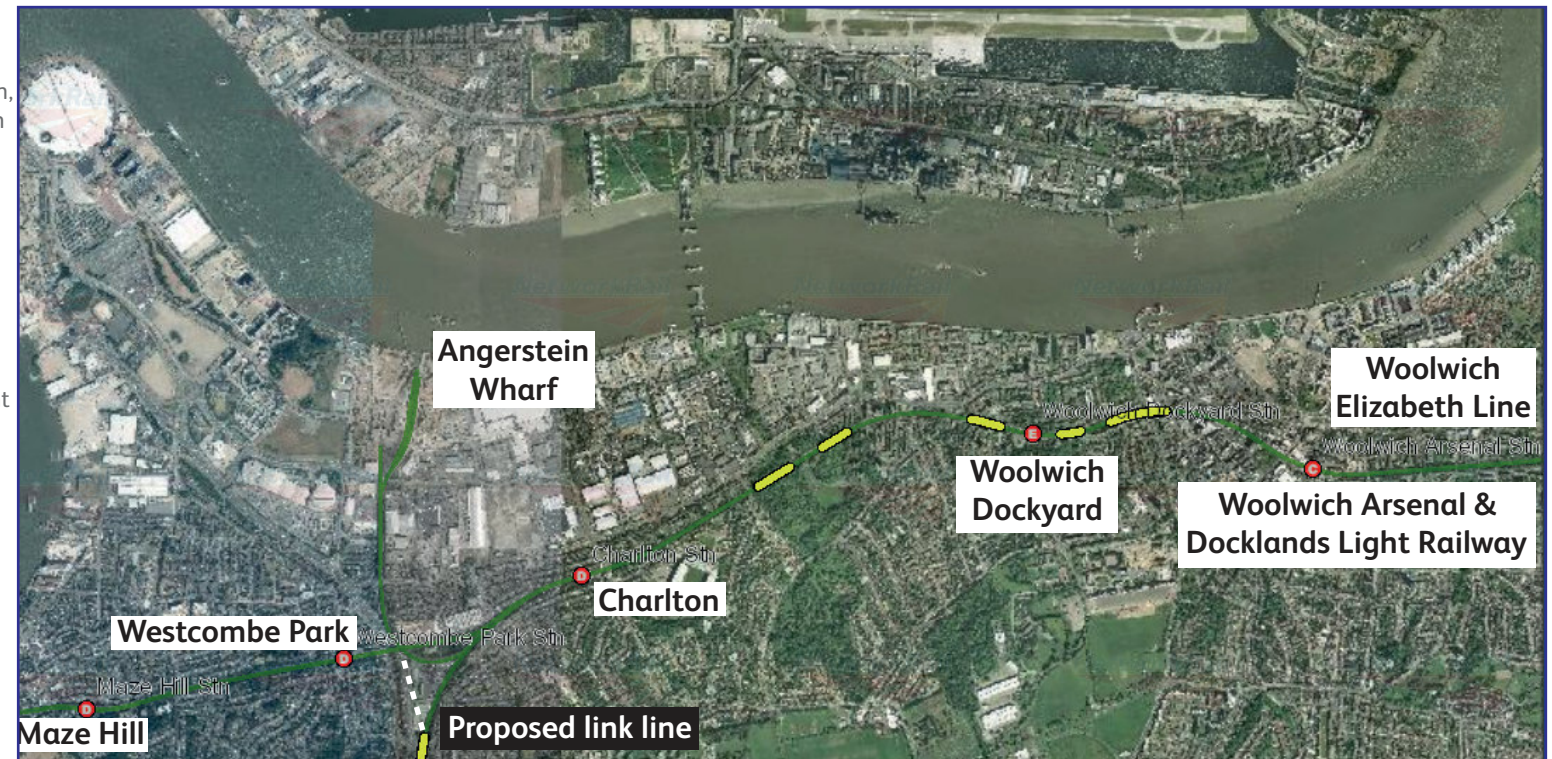
1.2.14.1. Charlton station is just east of the split of the line where the North Kent line connects across to the Bexleyheath line at Blackheath or towards London on the Greenwich line.

1.2.14.2. The short link between Charlton and Blackheath is also where another junction takes freight traffic to Angerstein Wharf.

1.2.14.3. The proposal for a new connection to enable freight trains to run directly from Blackheath to Angerstein Wharf was well received:

- “Southeastern supports the Angerstein Wharf electrification. This provides opportunities for stabling of units. In addition, this scheme takes freight locomotives away from the Charlton area which has seen a number of derailments in recent years.” Electrification was not mentioned in the Draft for Consultation but should land be available for berthing sidings it may well be worth looking at in the future.
- “The geometry of this line, and the lack of alternative routing, has also led to major service disruptions when either shed loads or derailment occurs. The current access limitation requires the trains towards West London to be routed via Abbey Wood, Sidcup, Hither Green, Lewisham and then via the South London Line. RBG [Royal Borough of Greenwich Council] is supportive of rerouting of the line Angerstein Wharf and the consequent benefits on the reliability and resilience on this part of the network”.

Aerial view of the line between Woolwich Arsenal and Maze Hill, including the Angerstein Wharf freight-only line



- “London TravelWatch supports and advocated the reinstatement of the original alignment of this branch so that access is to and from Blackheath. This is because the current alignment towards Charlton is unsuitable for the freight traffic currently using it, and has been the cause of a series of accidents in recent years that have disrupted passenger services in the area for days on end. It also provides a shorter route for the main traffic using it, thus freeing up capacity for passenger services along the North Kent and Sidcup routes”.
- “Specific freight scheme development and investment to provide benefits such as the Angerstein Junction improvement proposed on [Page 82] are encouraging and should compete for funding relative to their overall merit.” - Aggregate Industries UK Ltd.

- “The proposed western access into/out of Angerstein Wharf and the Nunhead freight loop are a good start, but we do not favour abandonment of the existing east facing connection to Angerstein Wharf as this provides a diversionary route to/from this key terminal.” - Chartered Institute of Logistics.

1.2.14.4. The Greenwich Line Users' Group, however, felt that, “The suggestion to change the link to Angerstein Wharf, so that it faces the Blackheath direction instead of the Charlton direction, seems sensible provided no significant work is required to the Blackheath tunnels. However, the number of freight trains going to Angerstein Wharf is small, so this change is unlikely to free up much extra capacity on the lines through Woolwich and Sidcup. It would also add to conflicting train movements at Lewisham, as the freight



## 1.2 Metro areas

Aerial view of the line between Maze Hill and Deptford



trains would need to go across the flat junction to reach the line on to Factory Junction and vice versa. This change, whilst sensible from the freight operator's perspective, would not be a priority for us."

1.2.14.5. A member of public suggested a new "Battersea Park to South Greenwich (Angerstein) would run stopping all stations" with more detail about a proposed scheme:

- "'Putting a smile on the South London line.' The Angerstein Wharf freight line is an underutilised resource. The proposal to add a direct connection to the Blackheath tunnel is very exciting. The scheme prevents aggregates from making extended journeys along the North Kent line to reach Lewisham. This in itself is highly important.
- "However the branch line sits at the end of the Greenwich Peninsular, which is undergoing significant redevelopment. Rail links to the southern end are poor. This freight inspired chord could have dramatic impacts for passengers. By branching off the Angerstein line to the west, a new station could serve passengers at the southern end of the peninsular. Ideally build as a through station. Later a short rail tunnel has the potential to project this new service to North Greenwich interchange.
- "The service could run along the South London Line, initially running from Battersea Park bay platform. Later extended to

Clapham Junction (or East Putney, requires junction works). Lewisham would be a capacity constraint (especially the junctions), complementary works here would aid resilience.

- "The new station for Greenwich Peninsular South would be complemented by a second new station on the proposed Angerstein link chord (gradient and platform length need careful planning). Providing passenger interchange from here to Westcombe Park station, would significantly increase connections.
- "This scheme has the added benefit of providing a suitable service to call at potential Brockley high level platforms (creating another multiplier of single change destinations). 'Putting a smile on the South London Line' has massive potential. Adding passenger services would require electrification and signalling works, however it introduces new revenue streams; between developers and TfL additional sources of funding are possible. I urge this freight scheme is designed with passive provision as described; that this wider scheme is taken forward to funders at the earliest opportunity."

1.2.14.6. Certainly, this scheme may be worth looking at in the medium term, particularly should the freight terminal close in the future.

### 1.2.15 Passengers standing from Westcombe Park towards London

1.2.15.1. The Greenwich line includes Westcombe Park, Maze Hill, Greenwich and Deptford stations.

- "The Royal Borough of Greenwich (RBG) requires clarification of the growth rates used to assess capacity. There is a concern that significant growth areas such as Woolwich and Charlton show available spare capacity on the Greenwich line by 2024 with standing first occurring at Westcombe Park. It is understood that this is due to the expectation that significant levels of passengers will change to Crossrail at Abbey Wood. This is considered a reasonable expectation but RBG require clarification on the capacity work undertaken and whether suitable consideration has been given to growth areas such as Charlton Riverside.
- "Furthermore RBG would wish the assumptions and modelling to be re-examined post-Crossrail becoming operational when as full picture of journey pattern changes is established."

1.2.15.2. This is a fair challenge from RBG, the data has been updated to reflect the greater housing growth but a post-Crossrail re-examination will occur as part of the development of the modular route study approach.

## 1.2 Metro areas

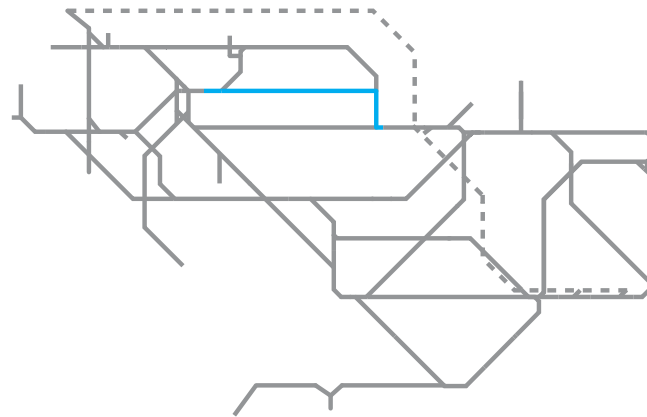


## 1.2.16 Improved connectivity

1.2.16.1. The stations on this line were originally destined to only have services to London Cannon Street after the withdrawal of Charing Cross trains to enable London Bridge to be rebuilt as part of Thameslink Programme, however, the new Rainham to Blackfriars (and beyond) ThamesLink service will provide a new route to the City and opens these stations to new journey opportunities.

1.2.16.2. Metroisation/single London terminal comments will be picked up later in this chapter.

1.2.16.3. Royal Borough of Greenwich “welcomes improvements to connectivity to the wider Kent area to improve access to jobs for Greenwich residents to key attractors such as the London Resort theme park”.

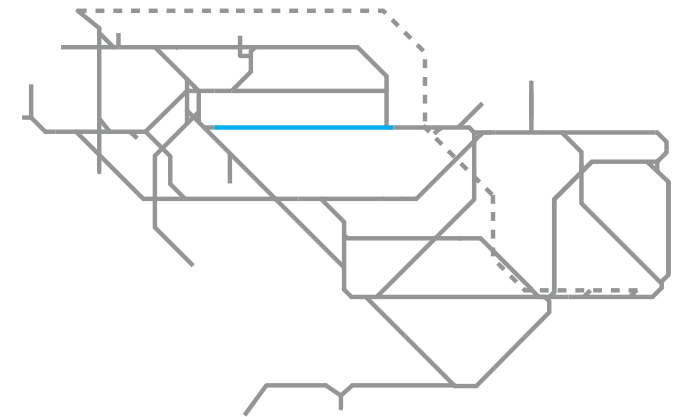


## Dartford - Lewisham (exclusive) via Bexleyheath

## 1.2.17 Crayford &amp; Erith Loop extensions

1.2.17.1. The proposal to extend the loops at Crayford and Erith was greeted positively. The extensions would create the ability to enable further 12-car running and thus improve capacity.

- “We are supportive of the interventions at the Erith Loop and Up Crayford Loop Line”. – Southeastern
- “The Council urges early completion of the proposed signal alterations on the Up Crayford Loop Line and on the Erith Loop to enable 12-car running on Cannon Street ‘loop’ services”. – London Borough of Bexley

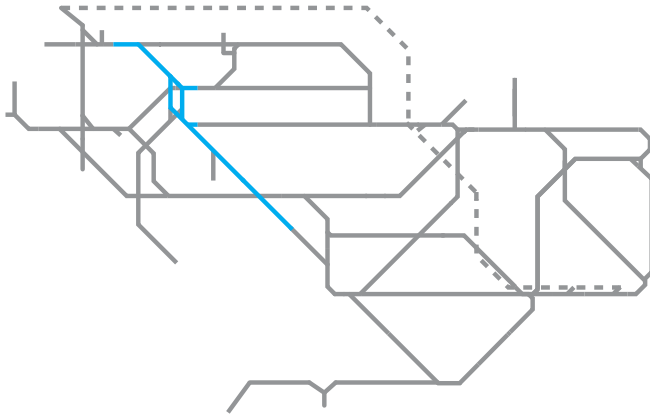


## Dartford - Hither Green (exclusive) via Sidcup

1.2.19.1. The London Borough of Bexley expressed support for twelve additional vehicles on the Sidcup line, as part of the route-wide capacity improvements.



## 1.2 Metro areas



### Orpington - London Bridge

#### 1.2.20 Orpington - Sevenoaks resignalling (to enable 24tph in each direction)

1.2.20.1. The Sevenoaks Rail Travellers Association requested that a study be done to consider options for upgrading the signalling between Orpington and Sevenoaks, to improve capacity and allow 24 train paths per hour.

1.2.20.2. Kent and Medway economic Partnership voiced their support for the suggestion. They continued, “While this proposal is not included in the current list of funding options in the Kent Area Route Study, we would encourage that this is made known to bidders for the new franchise as it would offer a substantial opportunity for service enhancement”.

1.2.20.3. Tonbridge Line Commuters agreed that a “conventional signalling upgrade provides the best solution”.

1.2.20.4. Orpington station provides an important gateway to Orpington Hospital. King’s College Hospital NHS Foundation Trust expressed their support for “the introduction of new technology to maximise train performance on busy lines with capacity pressures... In particular the mention of routes to Orpington”.

Hither Green - fast line platforms on the left, slow line in the centre and Sidcup lines to the right



#### 1.2.21 Orpington

1.2.21.1. King’s College Hospital NHS Foundation Trust highlighted that: “Orpington station serves Orpington Hospital. However, there is a 20 minute walk or bus ride of over 10 minutes on alighting at the station. Regular, reliable and frequent services are an absolute must for this station; this has a direct impact on the daily level of elective and outpatient care we can provide from this site”.

#### 1.2.22 Improved capacity at Hither Green station

1.2.22.1. Hither Green is a key station in Kent and provides a popular interchange for services to London and into the South East.

1.2.22.2. The London Borough of Lewisham requested that: “We would seek that the new franchisee is committed to deliver full step-free provision at Hither Green (Platform 1, 2 & 6)”. Whilst this is an aspiration for the new franchisee, it has been included here to show the issue of access at Hither Green station.

#### 1.2.23 Lewisham improved interchange

1.2.23.1. Lewisham has become a key interchange station for services into both London and Kent. It is a difficult station to navigate and proposals to improve the interchange were greeted positively by respondents to the Draft for Consultation.

1.2.23.2. The London Borough of Lewisham stated that, “We are relieved that Lewisham station, in particular, has been identified as a key station in need of significant investment to accommodate future growth even before the arrival of the Bakerloo line extension”.

- “We are working with TfL and Network Rail to develop a scheme to provide an expanded station and we would wish that the Route Study actively supports the delivery of those measures identified as part of the scheme. In the immediate term, we would seek a requirement that the franchisee must reopen the entrance to Platform 4 in order to relieve current station entrance crowding”
- “The reconstruction of the station would provide an opportunity to provide step-free access to the station but we would seek that any works sought to minimise the impact of construction to passengers on services passing the area. The Council feels that this workstream provides an opportunity to identify how the rail



## 1.2 Metro areas

*Aerial view of Lewisham Vale Junction, Lewisham station can be glimpsed at the junction of the Bexleyheath and Lewisham Loop lines*



network can be grown to support future growth. Some essential works are required to achieve this but we are encouraged that capacity across the network has been considered with a view to provide for the future”.

1.2.23.4. London TravelWatch also offered support and highlighted “the need to provide a North Eastern entrance and gateline from the adjacent Tesco Store car park into the station. Since the closure of the Silk Mills Path entrance, the alternative walking route into the station for passengers has added considerable additional journey time proportionate to their journey length, and added to the congestion around and through the main entrance to the station”.

1.2.23.5. Greenwich Line Users’ Group stated that, “The Greenwich – Lewisham DLR link is used to access services at Lewisham that cannot be accessed from our line. Lewisham station was never designed as a major interchange and its importance has grown over

the years. Although improvements have been made, it remains a difficult interchange to negotiate, with ingress/egress to/from platforms 1 and 4 particularly difficult. We would support a crowding relief scheme at Lewisham, as well as other enhancements that make using the station easier. These should be in place ahead of the proposed Bakerloo Line extension, as this will see a further increase in Lewisham’s importance as a south east London interchange hub”.

1.2.23.6. Transport for Charlton agreed, “We recognise that there are serious capacity issues at Lewisham, and its importance as a south east London interchange has grown significantly, not least since it provides a link to the DLR. Despite improvements it remains a difficult interchange to negotiate, especially for people with mobility problems. We would support any changes to make using the station easier”.

### 1.2.24 Grade separation at Lewisham

1.2.24.1. Bromley Council offered their support for the removal of conflicts at Lewisham.

### 1.2.25 Bakerloo Line Extension to Lewisham

1.2.25.1. The proposal to extend the Bakerloo Line was greeted with positive responses from all who commented.

- The London Borough of Lewisham stated that, “The Council strongly supports the extension to Lewisham”.
- Transport for London stated that, “Now that the spring 2017 Bakerloo Line Extension consultation has completed, we will review the case and options for extending beyond Lewisham and continue to work with Network Rail on the impact of the current proposal on their assets”.



## 1.2 Metro areas

*Aerial view of New Cross Gate on the East Croydon to London Bridge line and New Cross on the Orpington to London Bridge line. Interchange between the two station involves walking along the busy New Cross Road.*



- London Resort Holdings responded, “We support the Bakerloo line extension to Lewisham, and potentially beyond, as a means to release capacity for other trains to operate into Charing Cross and Cannon Street”.
- Transport for Charlton also supported the proposal: “The proposed extension of the Bakerloo Line would provide extra travel options and possibly additional capacity. We are aware that this is highly unpopular in some quarters but is seems worthy of serious investigation”

1.2.25.2. However, the London Borough of Lewisham raised the concern that, “The extension of the Bakerloo line to Lewisham will significantly increase interchange demand at the station and the Council raises the need to consider this demand in Network Rail’s demand assumptions”.

1.2.25.3. Network Rail considers this an important comment and has highlighted Lewisham station as one of its key station enhancement projects. Network Rail recognises that providing improvements to the interchange at Lewisham is necessary even without other projects having an impact on the station.

### 1.2.26 London Overground to Lewisham

1.2.26.1. The proposal to extend the London Overground to Lewisham was greeted positively by respondents.

1.2.26.2. The London Borough of Lewisham commented that, “The Council’s emerging Rail Vision supports an extension of the Overground from New Cross to Lewisham. This would provide more capacity, a greater increase in public transport access, and better connections between southeast London and central London. It would ensure that Lewisham joined the three other Strategic Interchanges as gateways to the Overground network for passengers on longer distance services. Due to the complex nature of the network in the borough, the service pattern is irregular. Only a proportion of trains through Lewisham can stop at Lewisham, so a disruption can have serious implications. Lewisham believes that better connectivity and resilience would come from an extension of the Overground”.

1.2.26.3. Network Rail and TfL are working closely with the London Borough of Lewisham on the provision of improved interchange at Lewisham station and its impact locally.

1.2.26.4. Bromley Council also supported the proposal, stating that, “I do not feel that the route study explored options for [capacity constraints] in sufficient detail and would ask that further consideration is given to options, including the extension of the London Overground service from New Cross to Lewisham.”

1.2.26.5. The infrastructure-based capacity constraints may be relieved through a form of Metroisation reducing junction crossing movements but would still be constrained at the London Terminals.

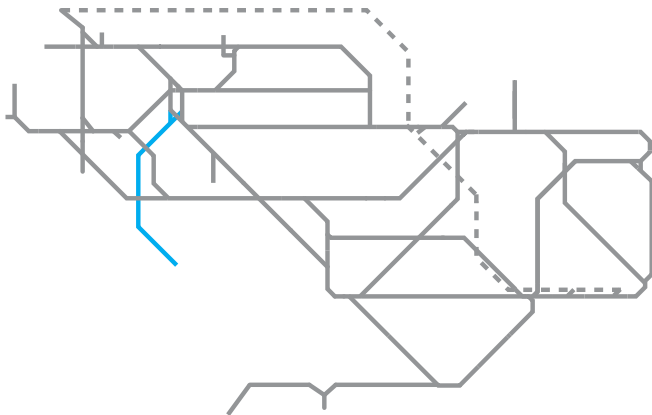
### 1.2.27 New Cross improved connectivity

1.2.27.1. The London Borough of Lewisham and Bromley Council both supported the proposal to connect New Cross to Lewisham via the London Overground.

1.2.27.2. Transport for London named New Cross in its list of stations which it feels should have greater attention given to them due to poor connectivity issues. TfL requested that a better rail service be provided, particularly because of the growth in population and employment.

1.2.27.3. In the longer term, should the freight facility at Angerstein Wharf close, the New Cross service could be extended to a new terminus on that branch.

## 1.2 Metro areas



## Hayes Branch

## 1.2.28 Ladywell station southern entrance

1.2.28.1. The London Borough of Lewisham highlighted that, “Ladywell station is correctly identified in Table 4.5 as the gateway station for University Hospital Lewisham; however, the entrance to the station makes the walk to the hospital unnecessarily long. The Council’s emerging Rail Vision proposes to provide a new entrance at the southern end of the station providing a convenient link across to the hospital. We would seek that Network Rail assist in this project as part of its future investment works”.

1.2.28.2. Network Rail would be happy to be involved in the development of a southern entrance subject to a funding source being identified.

## 1.2.29 Bakerloo Line Extension to Hayes

1.2.29.1. As with the extension of the Bakerloo Line to Lewisham, the suggested extension to Hayes was also greeted mostly positively.

- The London Borough of Lewisham wrote that, “We believe that conversion of services on the Hayes branch to Bakerloo line operation would provide a significant benefit to the wider Kent network through the availability of paths into London Bridge, as well as the intensive service provided to locations such as Catford and Lower Sydenham”.

- London TravelWatch agreed: “We support the extension of the Bakerloo Line beyond the current proposed terminus at Lewisham to take over the Mid-Kent route to Hayes and Beckenham Junction. This would give significant passenger benefits not only to passengers on the Mid-Kent route but also on other routes where the released train paths between Lewisham and Central London could be reused to increase existing train service frequencies or provide new links such as from London Bridge to St. Mary Cray and Swanley”.

1.2.29.2. However, the Greenwich Line Users’ Group raised the benefits of the extension but did not offer support: “Converting the Lewisham – Hayes line to form part of the Bakerloo Line if the extension is built would free up paths into London that other lines could then utilise, including the Greenwich line. However, we are aware this suggestion is unpopular with users of the Hayes line, and in December 2015 TfL announced that any extension beyond Lewisham would only be considered in any future phase after the proposed opening of the extension in 2028/29. This is not an option we would pursue”.



## Bromley North Branch

1.2.30 On the existing service, Bromley Council wrote: “I was pleased to note the growth in demand for the Bromley North shuttle service, reflecting the popularity of Bromley town centre as a popular destination to live, work and socialise, all supported by recent investment in the public realm of the area.”

## 1.2.31 Bakerloo Line Extension to Bromley North

1.2.31.1. Bromley Council stated that they “welcome short term measures to improve capacity and frequency on the Bromley North shuttle service, this falls well short of Bromley Council’s aspirations for the line and the level of service required to support the town centre’s status as an Opportunity Area identified in the London Plan. The Council has a clear and long held aspiration to plug the connectivity gap to Central and East London”.

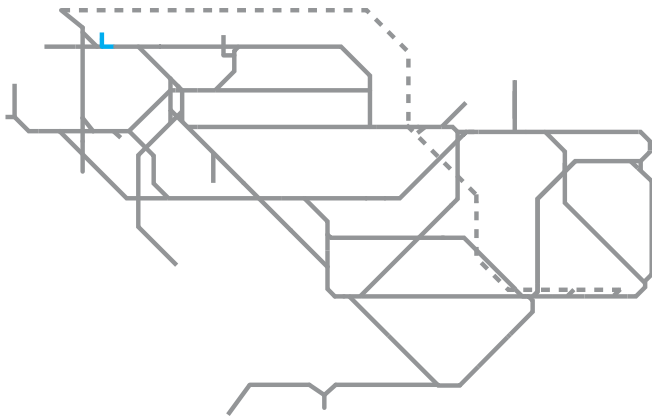
## 1.2.32 London Overground to Bromley North

1.2.32.1. Bromley Council stated that, “I do not feel that the route study explored options for this in sufficient detail and would ask that further consideration is given to options, including the extension of the London Overground service from New Cross to Bromley North”.

1.2.32.2. With the existing track layouts, a direct service from New Cross to Bromley North would be a timetabling and performance issue as trains would have to cross all lines at Grove Park.



## 1.2 Metro areas



## London Bridge to Cannon Street

## 1.2.33 London Bridge Metro train lengthening

1.2.33.1. Train and platform lengthening was supported by many respondents.

- London TravelWatch supports the proposals for Metro area platform lengthening to support providing extra capacity into London Bridge.
- Kent County Council stated that they “agree with option to extend all LB Metro to 12-car operation wherever this is practicable. This would deliver additional capacity to Dartford, Gravesend and Sevenoaks”.
- Sevenoaks District Council welcomed, “the positive suggestions to increase the number of carriages on the London metro routes from 8-car to 12-car, with a desire to improve the frequency of service from two services in the peak. By improving capacity and the frequency of service along the metro lines would create a more functional rail service in London, while freeing up capacity on faster mainline services to and from Sevenoaks and Swanley to London. This can only be achieved by improvements to the junction at Lewisham, to which will increase capacity to move rolling stock and increase the number of services on the Metro lines”.

- Sir Michael Falon MP (Sevenoaks), stated that, “I welcome the proposal to extend Metro trains to 12 carriages”.
- Transport for London also responded positively: “We are fully supportive of proposals to lengthen all London Bridge Metro services, excluding Bromley North, to 12 car in order to meet projected demand in 2024. On the Bromley North branch, we would prefer four trains per hour all day rather than the existing frequency operated by longer trains”.

1.2.33.2. However, Transport for London also raised a concern: “We welcome the move towards full 12 car operation on the London Bridge Metro routes and longer trains on the Victoria suburban network. However, almost no consideration is given as to how the network will cope with the large increase in passenger numbers forecast beyond that point”.

- Southeastern agreed, “We consider the approach for capacity should be around strengthened (longer formed services) to terminate at Charing Cross and Cannon Street which will require longer platforms. Therefore, infrastructure enhancement solutions around the platform lengths should be pursued in addition to creating extra paths into the London termini”.
- London Resort Holdings also stated that, “We support this because of the clear need for additional capacity on the North Kent lines from London, to Lewisham, Greenwich, Dartford, Gravesend and beyond. This is of relevance to visitors and staff arriving at or departing from the London Resort, and using either Northfleet or Swanscombe station. While we expect that most visitors will arrive on HS1 services, the classic line service will be of particular importance to staff travelling to and from work at the resort”.

1.2.33.3. Several respondents also voiced their support for the cascade of rolling stock.

- London TravelWatch stated, “We would also support the reconfiguration or replacement of rolling stock to give more circulation space within the trains and to make them easier to get on or off”.
- Kent County Council stated that the current operation of trains “is restricted in platforms 4, 5 & 6, where Selective Door Opening (SDO) is required for trains operating as 12-cars. KCC supports replacement of older Metro fleet with new fleet for Metro services, which would remove this restriction at Charing Cross with the provision of a new fleet with SDO”.
- Kent County Council continued that they “agree with cascade of Class 377 sets from GTR to replace most of Class 465/466 sets, to be prioritised on Maidstone East and Chatham routes”. These were introduced by Southeastern in Autumn 2017 and cascaded the Networkers to lengthen other services in the Metro area..
- Kent and Medway Economic Partnership supported “the planned cascade of rolling stock from the Southeastern Mainline to the Southeastern Metro Service. The replacement of older Metro fleet with new fleet for Metro services would enable trains from Kent and Medway to access a greater number of platforms at London Bridge and at London Victoria, as the new stock would be able to operate Selective Door Opening (SDO). KMEP welcomes the removal of the ‘Networkers’ (a type of train that serves on the metro lines to Sevenoaks), which are reaching 40 years old, and replacement by more modern appropriate rolling stock. We would encourage the extension of all metro services to 12-car operation wherever this is practicable”. [Note: the Networkers are approaching 30 years old].

## 1.2 Metro areas

### 1.2.34 London Bridge

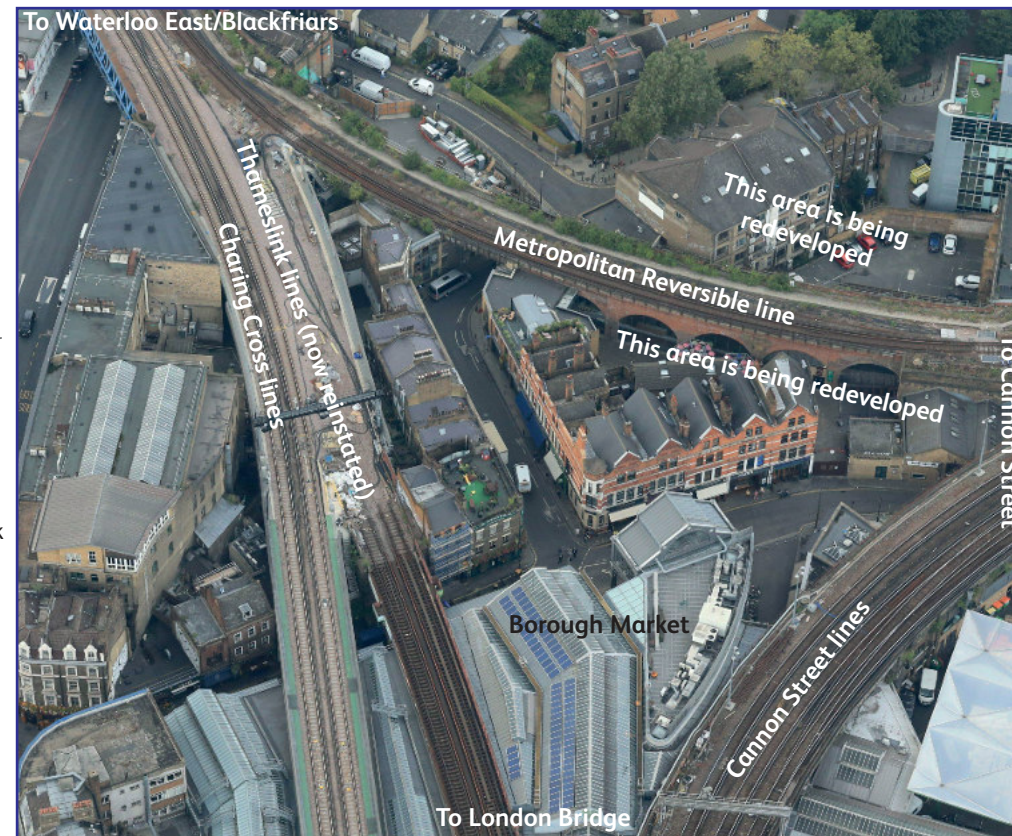
1.2.34.1. Southeastern suggested that, “London Bridge high level platforms... is where we consider there is an opportunity to cover the escalator recesses with a glass platform, providing increased passenger circulation space”.

### 1.2.35 Metropolitan Reversible siding(s)

1.2.35.1. Use of the Metropolitan Line offers the opportunity to run one extra train per hour. Various responses were initiated by the proposal.

- Hastings Borough Council voiced their support for the conversion of the line: “We would support and wish to be involved in any work which would progress and enable a case for an additional path and a power supply upgrade on this route”.
- The Royal Borough of Greenwich stated that, “Ideas to improve Cannon Street capacity at peak times are welcome, with the creation of siding on the old Metropolitan line”.
- Kent and Medway Economic Partnership also stated that they “support the proposal for an additional 12-car siding on the metropolitan reversible line outside Cannon Street. This would help to mitigate the reduction in the overall number of peak paths at Cannon Street, and ensure that the current level of much needed capacity to/from the City for Kent Route commuters is maintained”.
- ESCC agreed that, “Additional stabling / platforms in the station are required to increase capacity at this station. Conversion of the Metropolitan Reversible line will support an additional train into Cannon Street, and a major rebuild of the viaduct or remodelling of Cannon Street would provide an additional siding. It is highlighted in the Technical Appendix that these options should be investigated further. We would support the development of works to progress this scheme”.
- Tonbridge Line Commuters also expressed their support:

Borough Market Junction (off the bottom of the photo), Metropolitan Junctions (off the top) and Cannon Street approaches (right) form a triangle. There is a lot of urban regeneration underway in this area.



“Capacity in and around London terminals is correctly identified as a major constraint. We support the scheme outlined in [paragraph 6.9.3] to convert the Metropolitan Reversible line into a siding. However, greater consideration should be given to ways of making it possible to restore a second track for stabling purposes, especially given the Route Study’s assessment that there is a critical need for paths from Tonbridge. Even providing a second siding for an 8 car unit might provide capacity to run an extra shoulder peak service into Cannon Street”.

1.2.35.2. The Greenwich Line Users’ Group not only expressed

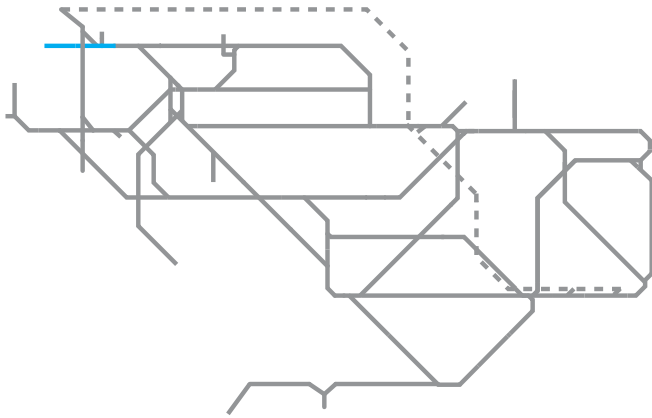
support for the scheme but also suggested it go further. They stated: “The Greenwich line currently has 6tph off-peak in the day, but only 4tph in the peaks, because of constraints at Cannon Street. Ideas to improve Cannon Street capacity at peak times are welcome, and the creation of a siding on the old Metropolitan reversible line is an innovative idea. There is scope to do more than suggested. At one time, there were two running lines on this curve, so it should be possible to reinstate two lines even if this means some changes to the Cannon Street throat. We would urge that every effort is made to create a siding that could stable two trains. Furthermore, there are two disused sidings on the west side of the bridge over the River Thames, and work could be done to look at whether these too could be brought back into use”.

1.2.35.3. However, some respondents highlighted the need to maintain the line in its current format:

- Southeastern stated: “Southeastern does not support the scheme to develop the Met Junction Reversible Line into a single 12 car siding. The section of line is a valuable option enabling empty coaching stock movements as well as shuttle services between Charing Cross and Cannon Street during engineering possessions.” Southeastern has identified alternative timetable solutions to allow more services to operate into London Cannon Street.
- Sevenoaks Rail Travellers Association agreed that, “while this is an ingenious and economical solution, we consider that further efforts should be made to make the Metropolitan Reversible Line usable as a siding in the peaks without losing the value of having a route from Charing Cross to London Bridge via Cannon Street in abnormal situations. For instance, before the London Bridge rebuilding the Metropolitan Reversible was used to provide services to Charing Cross when there were weekend engineering possessions in the Borough Market area, and the critical nature of the infrastructure in this area means that it will regularly need possessions for preventative maintenance”.



## 1.2 Metro areas



## London Bridge to Charing Cross

## 1.2.36 New entrance/exit at Waterloo East

1.2.36.1. London TravelWatch thinks that capacity and passenger circulation at Waterloo East can be improved by the platform extensions proposed, but also by building a new entrance at Hatfields, to supplement the current exit and entry arrangements via Southwark station.

## 1.2.37 Waterloo East station closure/move

1.2.37.1. The closure of Waterloo East station would occur as a result of redeveloping Charing Cross. Kent County Council offered support for the closure as it supports the rebuild of Charing Cross. However, other respondents raised concerns:

- Transport for Charlton stated that the scheme, “would put many passengers at a serious disadvantage. Even though Waterloo East is a cramped station in need of modernisation, it provides valuable direct connections to the city via the “Drain”, the Jubilee line and to the main Waterloo station. We would not favour this option”, unless there are improvements at Charing Cross.

- The Greenwich Line Users’ Group also commented, supported by the Westcombe Society. They stated, “Of the other possible schemes suggested, rebuilding Charing Cross station across the river would be a major project, and if one of the consequences of it is to close Waterloo East, it would put many passengers at a serious disadvantage. We accept Waterloo East is a cramped station, but it does provide direct connections to the Jubilee line and to the main Waterloo station, as well as to the general Waterloo and Southwark areas, that could not be replicated by an exit from Charing Cross on the South Bank. We would not favour this option unless these points were addressed”.

## 1.2.38 Direct trains to Waterloo (SW)

1.2.38.1. A member of public suggested that a new spur line (different to the original link line) could branch away from the Charing Cross line to the Cab Road alongside Platform 1 at Waterloo and taking trains forward onto the South Western Railway network. This would be extremely expensive and challenging as it would have to span The Cut between Palestra House on Blackfriars Road and Waterloo station. It would also be a performance risk as any delays incurred on the South Western Main Line Suburban routes would be imported onto the Southeastern Metro area and vice-versa.

## 1.2.39 Waterloo Link Line

1.2.39.1. East Sussex County Council agreed that a new link to Waterloo is a ‘possibility’, as part of the reconstruction of Charing Cross. There have been proposals for the reopening of the link line between Waterloo East and Waterloo South Western but this would require a hump to be built across the station concourse for the trains to pass under. It would also be a slow, constrained route. The original alignment was rarely used and closed in 1911.

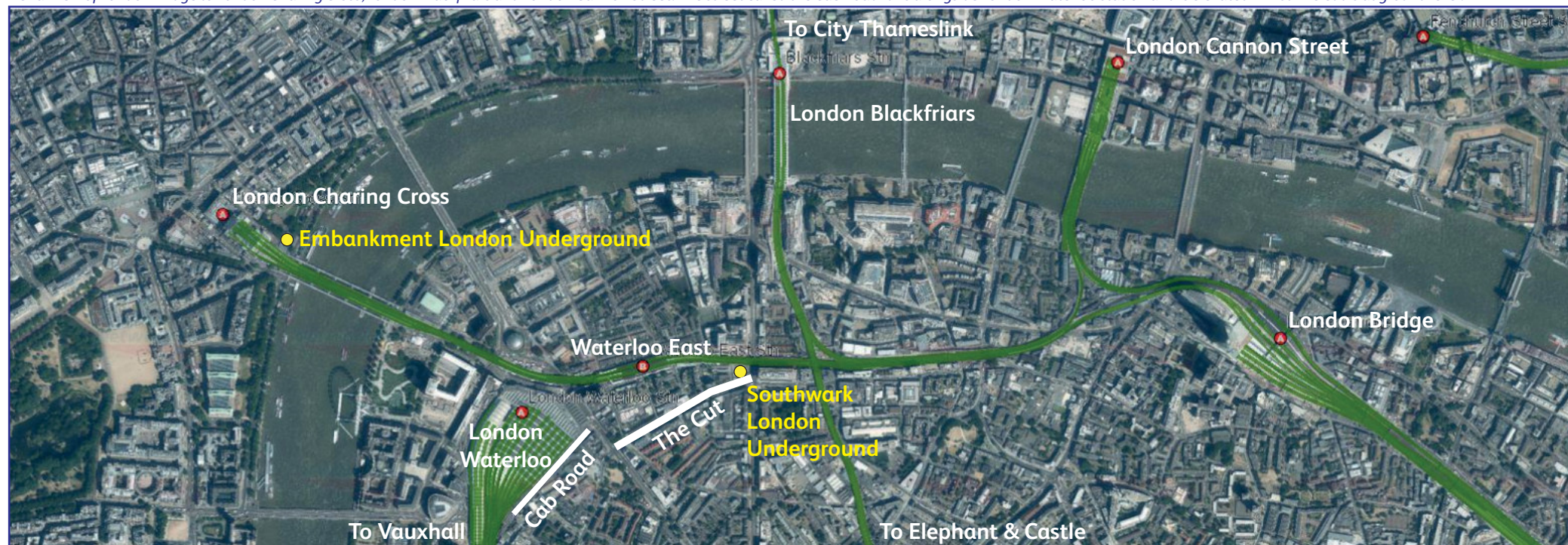
## 1.2.40 Charing Cross reconstruction (over the River Thames or widening)

1.2.40.1. The proposal to redevelop Charing Cross over the River Thames, using the Hungerford Bridge, received a mixed response.

- Kent County Council stated that they, “Agree with longer-term ambition of re-build over Hungerford Bridge (as with Blackfriars re-build) with new covered connection direct to South Bank and Waterloo Main concourse – this would enable Waterloo East to close, and use of that land to provide additional turn-back sidings to increase overall terminal capacity – this major proposal should be examined in depth with a view to fund and deliver in extended period to 2044”.
- ESCC agreed and confirmed that they “would support any work which increases the long term capacity on the approaches into and at the London termini”.

## 1.2 Metro areas

Aerial view of London Bridge to London Charing Cross, London Blackfriars and London Cannon Street. The street called the Cab Road runs alongside London Waterloo station and is elevated whilst The Cut is at ground level.



- Tonbridge Line Commuters also offered support with a caveat: “We believe that expanding capacity at Charing Cross should be given higher priority in Network Rail’s plans, given that Charing Cross is now the main pinch point on the network. The long term proposal in [paragraph 6.11.2] regarding extending the Charing Cross platforms across the river has some merit. It would potentially make journeys faster and increase capacity by removing a stop, as well as allowing all platforms at Charing Cross to take 12 car trains. However, there is potential for passengers interchanging to Waterloo Main or Southwark Tube station to be inconvenienced. As such, we would only support this proposal if the design incorporates good step free access to Waterloo and Southwark stations via travelators or similar facilities”.

1.2.40.2. Some respondents had greater concerns, and requested that other schemes be developed.

- The Sevenoaks Rail Travellers Association wrote, “While we can see that this could remove some of the train length and other operational constraints of the current station, we do not see how this will lead to the major increase in terminal capacity required if the station still has six platforms. Moreover, as the Kent Route Study says, increasing the capacity of Charing Cross would then “move the bottleneck to other locations on the route, including North East Kent Junction, Lewisham, Parks Bridge Junction and the two track section between Orpington and Sevenoaks. That is why a strategic and holistic strategy is urgently needed for the entire route, addressing all the bottlenecks, as we have suggested above. In addition we would welcome an improvement in passenger facilities at Charing Cross, and this should be at the heart of any rebuilding. However we do not

regard a station entrance at the southern end of Hungerford Bridge as an adequate connection to Waterloo. Whatever happens at Charing Cross Waterloo East should be kept open to provide good connectivity to Waterloo Main and also to the Jubilee Line at Southwark station and buses to the City on Blackfriars Road”.

- The Greenwich Line Users’ Group stated: “Increasing capacity at Charing Cross is, in any case, a challenge. Re-building Hungerford Bridge to put a station across the river is difficult, as it is hemmed in by the busy Golden Jubilee pedestrian bridges. The size of Charing Cross is not the only capacity constraint, as access is also restricted by the double track section from London Bridge across Borough Market, which is already operating at capacity in the peak hours, with the flat junction between there and Waterloo East a further constraint. If more trains cannot be got through this section, then there is little point in increasing capacity at



## 1.2 Metro areas

*Charing Cross station approaches on Hungerford Bridge, flanked by the Jubilee Footbridges*



Charing Cross. A less ambitious scheme is probably preferable for Charing Cross, which would be restricted to enabling all the platforms to take 12 car trains. Beyond that, using spare capacity at other termini (Blackfriars and Victoria) could be considered, although when services from the Dartford lines ran to Blackfriars some years ago they were lightly loaded as they offered a slower journey into the City than trains to nearby Cannon Street”.

- Transport for Charlton agreed, saying that “less ambitious schemes are preferable for Charing Cross to enabling all platforms to accommodate 12-car sets”.
- The Campaign for Better Transport said, “About 10 million passengers per year either enter or leave Waterloo East station and about a further 1 million passengers per year interchange within that station. At the Country end of the Waterloo East platforms, there is interchange with Southwark Underground station (and access for South Eastern passengers to/from the corner of Blackfriars Bridge Road and The Cut where there has

been significant recent development---including a major TFL office building). All that interchange and access would be lost if Waterloo East station were to close. During the morning peak (ignoring for a moment the temporary arrangements caused by the reconstruction of London Bridge station) many passengers arriving at Waterloo station walk through to Waterloo East in order to continue their journeys either to London Bridge or to Charing Cross. Alternative routes to London Bridge and the City are available, respectively, on the Jubilee line and the Waterloo & City line. However, the rebuilding of London Bridge has revealed that, during the morning peak, there is no spare capacity on either of these routes so they would not provide a reasonable alternative to the permanent closure of Waterloo East, especially if demand on these routes increases with the forecast increase in London’s population. Rebuilding Blackfriars to straddle the river made sense because the South Bank in the vicinity of Blackfriars Bridge had no nearby rail or Underground station: that does not apply to the vicinity of Hungerford Bridge. Moving Charing Cross

*Charing Cross station at this angle it is possible to see that some widening could be carried out*



to straddle the river appears likely to increase walking distances for the majority of passengers. What Charing Cross station would benefit from is wider platforms, with all of them long enough to accommodate 12-car trains. The interchange to/from the District & Circle lines at Embankment could also be greatly improved (rather than allowing it in only one direction during the morning peak). Those objectives would all appear to be achievable by losing some retail units and by acquiring some of the offices between the station and Villiers Street”.

- The London Borough of Lewisham has stated that they will “support any works here that facilitated enhanced metro services”.

1.2.40.3. In the short term, 12-car operations in all platforms at Charing Cross should be the goal, with further examination of the options for future expansion of the station. Simply replacing the Class 465 & 466 fleet could solve the platform capacity issues.



## 1.2 Metro areas

*The London, Chatham & Dover Railway trainshed at London Victoria station the terminus for Kent trains, the adjacent London, Brighton & South Coast Railway terminus serves Sussex Area trains.*



### London Victoria Metro

#### 1.2.41 Train lengthening

1.2.41.1. Southeastern raised the point that, “Strengthening of services with use of high density rolling stock on this line of route is wholly dependent on Network Rail delivering feasible locations for berthing, stabling and servicing. As high density rolling stock is of fixed formation, this brings operating restrictions and in some cases a loss of stabling capacity. Consideration should be given to the remodelling of depots and sidings with future design of trains in mind. Additionally, the aspiration must be to 12-car operations. To support this Network Rail must ensure Driver Only Operation equipment is operational at key stations. Petts Wood is a primary example where 12-car DOO is not operational”.

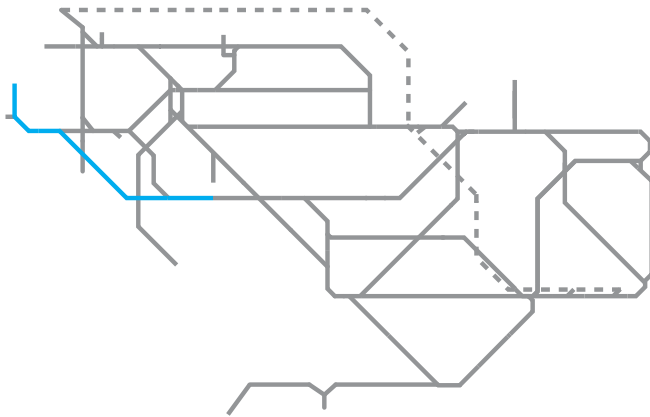
1.2.41.2. A Depots & Stabling modular route study will look at future capacity once the successful South Eastern Franchise bidder has been announced and its rolling stock requirements are understood.

1.2.41.3. Transport for London stated that, “We agree that a scheme to deliver more capacity into Victoria from both Kent and the Metro area in the longer term should be developed as part of the Route Study process. In the shorter term, we believe it may be possible to operate a small number of additional peak services to / from Victoria by making better use of existing capacity, in particular the South London Line, and by considering whether the special trains and charter services that use Victoria should be moved entirely to the off-peak”.

1.2.41.4. Open access operators have equal rights to use the network, further work is needed to examine the operation of London Victoria station looking at its approaches and platform usage.



## 1.2 Metro areas



## Trains via Herne Hill

## 1.2.42 Bromley South station issues

1.2.42.1. London TravelWatch would support the proposed upgrade of Bromley South. They stated, “We think there is a case for providing a new entrance to the station either from Kentish Way or for the adjacent Waitrose car park”.

- Bromley Council raised wider issues: “Bromley South station has benefited from some investment in recent years but still suffers from severe overcrowding at peak times. I am therefore keen for options to be developed as quickly as possible to improve the station, including assessing the possibility of a new entrance to the north and east of the station”.
- The King’s College Hospital NHS Foundation Trust highlighted that, “Bromley South is the main station used to access the Princess Royal University Hospital. On alighting at Bromley South travellers must continue their journey by bus. Although there is one single entrance and exit to the station, there are a large number of ticket gates and this helps to mitigate issues of overcrowding. However considerations must be made alongside any planned growth and development work for the area. It must also be recognised that the demand for health services is set to continue to increase”.



*The London-end of Herne Hill station. Brixton is ahead left, Loughborough Junction is ahead right. ThamesLink services use Platform 1 (left) and cross to Loughborough Junction, a similar situation occurs at the opposite end of the platform with ThamesLink services crossing the Chatham Main Line to head towards Tulse Hill.*

## 1.2.43 Beckenham Junction

1.2.43.1. Bromley Council asked: “Whilst noting that the capacity issues at Beckenham Junction are not as severe as at some other stations in the region, I would urge you to consider investment in the station in CP6 rather than waiting to 2044 to support the multi-million pound regeneration of Beckenham High Street.”

1.2.43.2. Thank you for the heads up! The System Operator and South East Route Business Development teams will be seeking out this sort of development to secure third party funding to improve stations.

## 1.2.44 Kent House corridor 4-tracking (TfL proposal)

1.2.44.1. Kent County Council agreed ‘that option for 4-tracking on section through Kent House should be examined for delivery after CP6 for period to 2044’.

## 1.2.45 Move Penge East (TfL proposal)

1.2.45.1. London TravelWatch does not support the move: ‘The proposal to move Penge East station we do not think is desirable as the proposed new location would be further away from Penge town centre.’

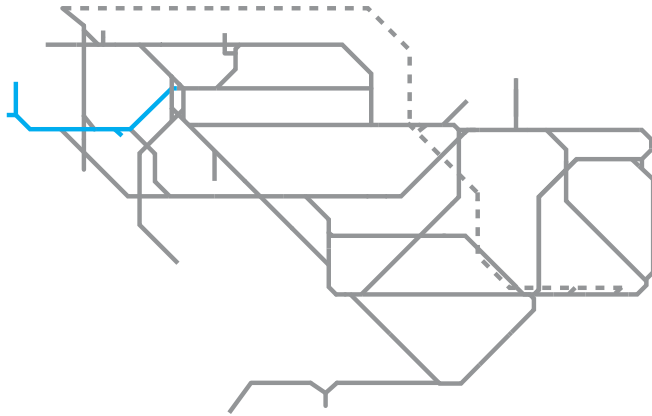
## 1.2.46 Herne Hill

1.2.46.1. Bromley Council wrote to ‘support the development of options to enhance capacity such as grade separation at Herne Hill, removal of conflicts at Shortlands Junction, Lewisham and Orpington and capacity enhancements at London termini’.

## 1.2.47 Brixton station issues

1.2.47.1. London TravelWatch would support the proposed upgrade of Brixton station exit.

## 1.2 Metro areas



## Trains via the Lewisham - Nunhead and Atlantic lines (not ThamesLink)

### 1.2.48 Nunhead passing loop

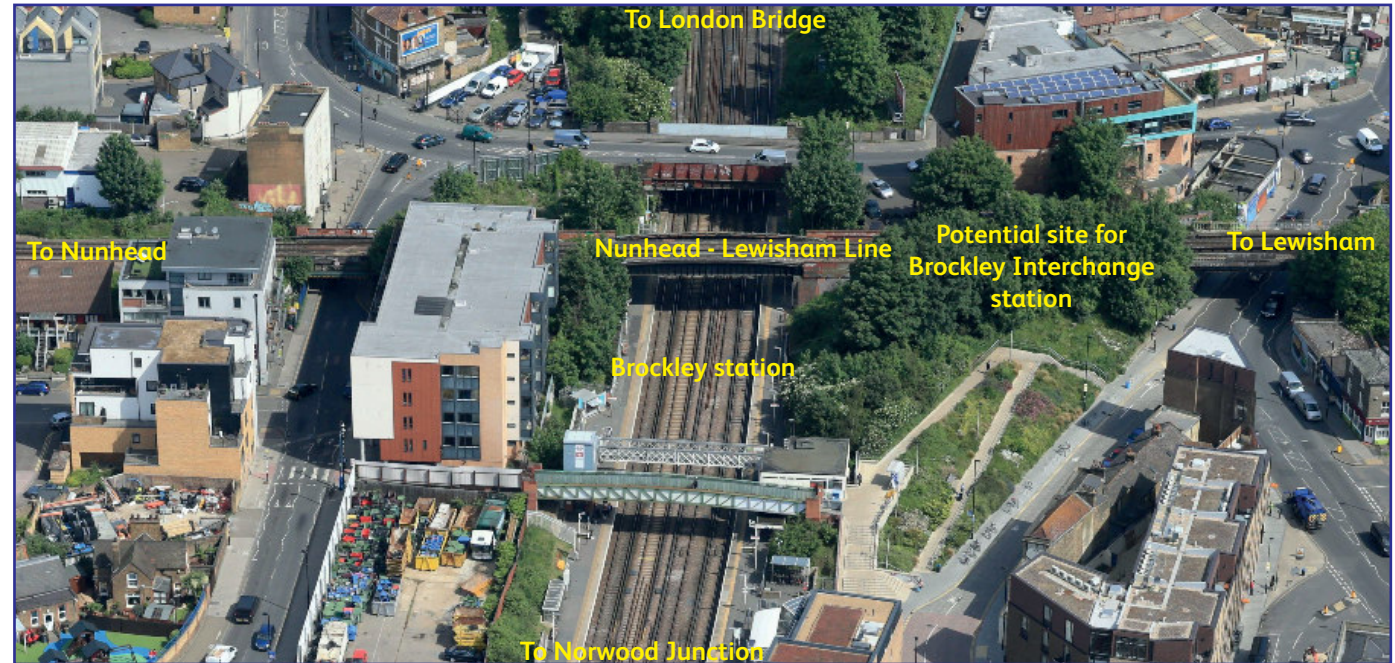
1.2.48.1. London TravelWatch would support a scheme that allowed additional passenger and freight trains to operate over the route between Denmark Hill and Nunhead.

- Roxhill Developments Limited agreed: “We would support Network Rail’s proposals for a passing loop at Nunhead”.
- Transport for London stated that, “a new passing loop in the Nunhead area could significantly benefit both passenger and freight sectors, allowing fast passenger trains to overtake Metro services, and providing a valuable location to recess freight trains before picking up their booked paths along the congested South London Line or through Lewisham”.

### 1.2.49 Brockley interchange station

1.2.49.1 London TravelWatch calls for “providing better interchange” at Brockley and the London Borough of Lewisham agreed that “the absence of an interchange at Brockley is seen as an impediment to journey opportunities as passengers are unable

Brockley station and potential interchange station site



to change from services on the Kent Route to Overground services on the East London line. Our emerging Rail Vision includes the provision of an interchange at Brockley as a key scheme and we would seek that Network Rail include facilitating this scheme in its assumptions”.

1.2.49.2. This scheme would require new platforms and an interchange between the Lewisham Line and Brockley station on the London Bridge lines. On the Lewisham line, it would be almost halfway between Nunhead and Lewisham.

1.2.49.3. The photo above shows the potential location of the interchange station. The location of the platforms, which would have to be 12-cars long, would require some expensive civil engineering work and may encroach on neighbouring property.

### 1.2.50 Peckham Rye station issues

1.2.50.1. London TravelWatch would support the proposed upgrades of Peckham Rye

### 1.2.51 Denmark Hill station issues

1.2.51.1. London TravelWatch would support the proposed upgrade of Denmark Hill.

- The Camberwell Society agreed, saying that, “Camberwell is served by train services from Denmark Hill and as mentioned in the Kent Area Route Study the station is dangerously overcrowded. Please register the Camberwell Society’s support for the urgent need for a second station entrance and exit”.
- Denmark Hill services King’s College Hospital and thus the King’s College Hospital NHS Foundation Trust wrote to support the upgrade of Denmark Hill: “The rail network is the main point of access to King’s College Hospital as the local area is not served by the London Underground. Bus services are the only other public transport option and these are under significant capacity pressure, compounded by chronic traffic congestion on key routes such as Walworth Road. In the past year, there have been



## 1.2 Metro areas

over 226,000 patient contacts at King's College Hospital, Denmark Hill with people who live in the postcodes that are directly affected by options within the South Eastern rail franchise consultation led by the Department for Transport. In light of this, we expect an exponential increase in this number along the Kent route area covered by the study. Denmark Hill station is the hub of travel to and from the hospital. The majority of patients, staff, students, volunteers and visitors use this station to access the site. Strong connectivity to this station is crucial to the delivery of healthcare at King's College Hospital".

- The Trust continued, "The refurbishment of Denmark Hill Station including lift services was welcomed by the Trust. This gave our patients the accessible station that was required and extended travel access through the introduction of the London Overground network. However there are still challenges faced locally that we have the opportunity to address through the Kent Route Study. Increased station capacity, resilience and safety – There is currently one single entrance and exit to Denmark Hill station with only five ticket gates in total. In peak times this causes a series of issues including congestion, overcrowding and delays in entering and exiting the stations. A shared single access point to enter and exit Denmark Hill station is an impractical solution and a safety risk. This is evident on a daily basis as our staff report regular delays in getting out of the station and getting onto platforms during rush hour. This is exacerbated when there are multiple train arrivals or departures at the same time and overall time spent travelling is increased. There is also an issue of safety and comfort when advertised departure platforms are changed at a very late stage and passengers must move quickly between platforms. This is reported to happen on a fairly frequent basis. The Trust is in strong favour of establishing an additional access point to the station as part of improvement plans for Denmark Hill station. An additional lift service to support the new entrance is recommended. The Trust also favours additional ticket gates at access points to further mitigate congestion and delays in entering and exiting the station".

*Brixton National Rail and London Underground stations. The stairs on Platform 1 (circled) are a cause of overcrowding, particularly in the AM Peak with passengers interchanging with the Underground. Note the Atlantic Line flyover over the Chatham Main Line and the Catford Loop line joins the main line here by a flat junction which is why the Atlantic Lines are the favoured route to/from Denmark Hill.*



### 1.2.52 New station at East Brixton

1.2.52.1. The proposal for a new station at East Brixton was greeted with cautious optimism.

- The Greenwich Line Users' Group responded that, "Of the possible new stations listed, East Brixton is an interesting one. It is stated that it would be used only by London Overground, but to improve connectivity South East services should be able to call there. Although it may mean re-pathing Victoria – Dartford services between Peckham Rye and Victoria, it would provide a useful direct link across south London from Blackheath and Lewisham to Brixton".
- Transport for Charlton agreed, expressing that, "Improving connectivity for South East services is always welcome. An additional station at East Brixton seems worth further consideration, especially if it could be easily accessed from Charlton, i.e. by re-pathing trains to Victoria via Peckham Rye".

### 1.2.53 Brixton High Level platforms

1.2.53.1. London TravelWatch calls for "providing better interchange' station at Brixton. We agree that new additional staircases are required to improve capacity and interchange with the London Underground station. However, we think that a more comprehensive approach would be to redesign the station whilst at the same time providing new high level platforms to be served by London Overground services and the Victoria – Dartford trains. This would allow interchange between all the rail and underground routes at this location, but also with the bus network, where the existing bus stops are the busiest in Europe in terms of passenger numbers. These new platforms would also reduce journey times from Brixton to other local centres such as Clapham Junction, Denmark Hill, Peckham Rye and Lewisham compared to the current road (bus or car) journey times, and would provide a realistic alternative to car use for many journeys to, from and through South London. Because of this we would actively oppose the proposed reopening of East Brixton station because of its inferior location for interchange and lack of proximity to Brixton town centre. Both of these factors were significant issues in the decision to close this station in 1971, and there have been no changes in the area in the intervening period that would necessarily dictate a rethink of this position."

1.2.53.2. The location of the new platforms would be troublesome as they would have to be constructed either side of the existing Atlantic Line Flyover and then connect down into the station to street level, several storeys below. The platforms would also have to be curved and built with gradients, both factors are against current standards for new station construction, although it could probably be argued that derogations should be sought. Perhaps a better location is on the viaduct Denmark Hill-side of the station (off the top of the adjacent picture).

## 1.2 Metro areas

### London Victoria station

#### 1.2.54 Victoria remodelling

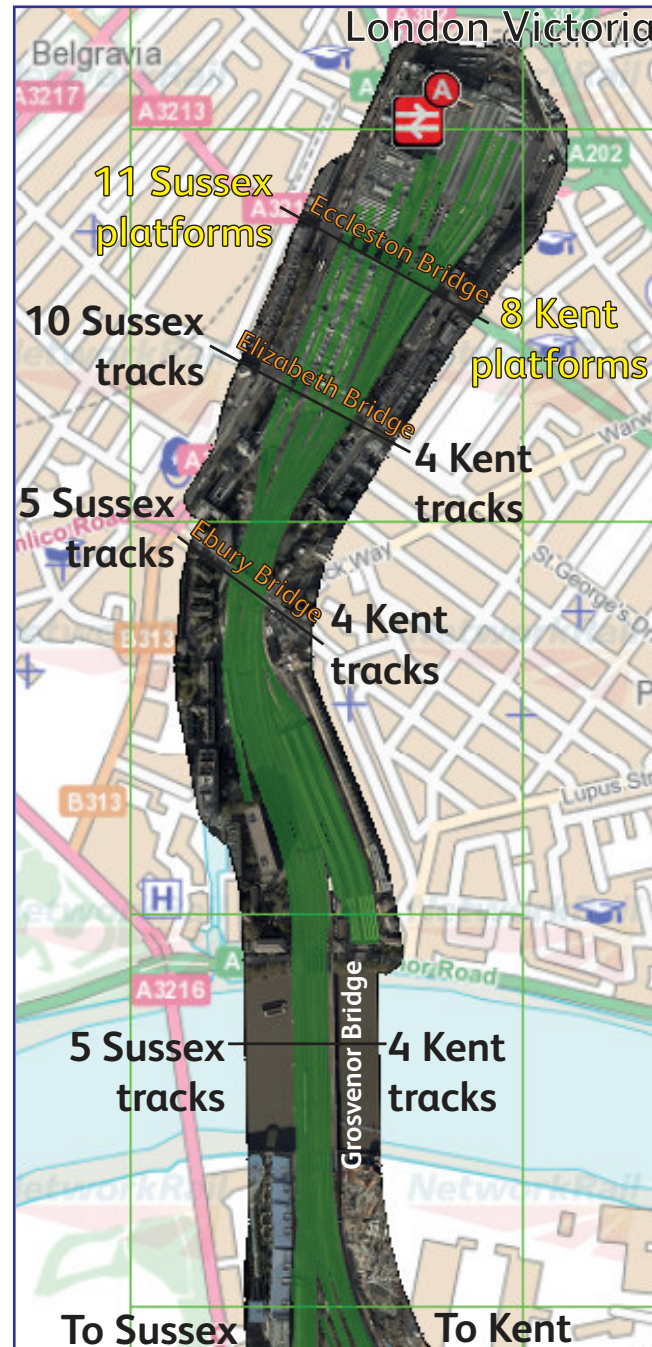
1.2.54.1. London TravelWatch stated that they would “support a new track on Grosvenor Bridge and platform lengthening” at Victoria.

- Kent County Council agreed for the “need to re-model south-eastern side of VIC, to remove restricted terminal capacity with platforms 1 to 3 serving only 8-car length trains – these need to be extended to provide flexible terminal capacity with platforms 4 to 8 which serve 12-car length trains”.
- Kent County Council also agreed with the “proposal to utilise vacant track-bed on Grosvenor Bridge, to re-instate 4-track approach to VIC on south-eastern side. Also note that current congestion between Southeastern and Thameslink services at flat junction at Herne Hill will be considerably relieved when full Thameslink service starts in December 2018, with main service operating via LB instead of Herne Hill, and Bat & Ball and Orpington services operating via Catford Loop instead of Herne Hill”.

#### 1.2.55 Victoria Metro train lengthening

1.2.55.1. London TravelWatch wrote to offer support for “proposals to lengthen trains and platforms on the Victoria – Dartford route, however, we are not convinced that increasing train length is the right solution for other services such as Victoria – Orpington. In these instances we think that an increase in train frequency would be a better option, particularly at weekends”.

- Kent County Council agreed “with options to extend all VIC Metro to 8-car operation wherever this is practicable. This would deliver additional capacity to Dartford (via Bexleyheath) and to Sheerness (via Gillingham)”.
- Transport for London agreed with KCC, stating: “We are supportive of proposals to lengthen selected Victoria Metro services to 8 car, but would suggest that all services are lengthened to consistently meet customer expectations and to better spread demand”.



The constrained approaches to London Victoria station, particularly on the Kent-side



### Blackfriars Metro

#### Trains via Catford Loop

#### 1.2.56 ThamesLink services to Sevenoaks/Orpington

1.2.56.1. Operating ThamesLink services to Sevenoaks was greeted positively as a viable solution to the additional pressure put on Kent's rail infrastructure due to housing developments. The new Maidstone East service will run fast from Swanley to London Bridge, not via the Catford Loop.

- Sevenoaks District Council responded that: “Sevenoaks District has a number of services that will benefit from the Thameslink programme, which is due to be completed December 2018. As a result, the District and its residents will benefit from increased capacity being built in from the Thameslink franchise which will propose a greater number of services from Otford (starting at either Maidstone East or Sevenoaks via Bat & Ball) to a number of destinations including connections to Cambridge and beyond. The increase in the number of services available and their frequency will increase functional rail capacity, improve reliability and punctuality in the timetable. However, the improvements that the train operators hope to achieve lie within



## 1.2 Metro areas

the future improvements to the ageing rail infrastructure that Network Rail is responsible for. It is key that Network Rail continue to liaise with all franchisees which operate in the Kent region to produce a plan that is feasible, deliverable and will enable greater capacity on the rail network. We are pleased that Network Rail is aware of the levels of house building that will be occurring over the next 20 to 30 years, and should continue to maintain an open dialogue with local planning authorities on proposals that may impact on the rail network”.

- Transport for London agreed: “The latest Thameslink timetable proposals for December 2018 deliver four trains per hour on the Catford Loop, which is a significant increase on the base case used for the Kent Route Study. We believe this uplift, alongside the use of higher capacity rolling stock, will be sufficient to meet projected demand in 2024”.

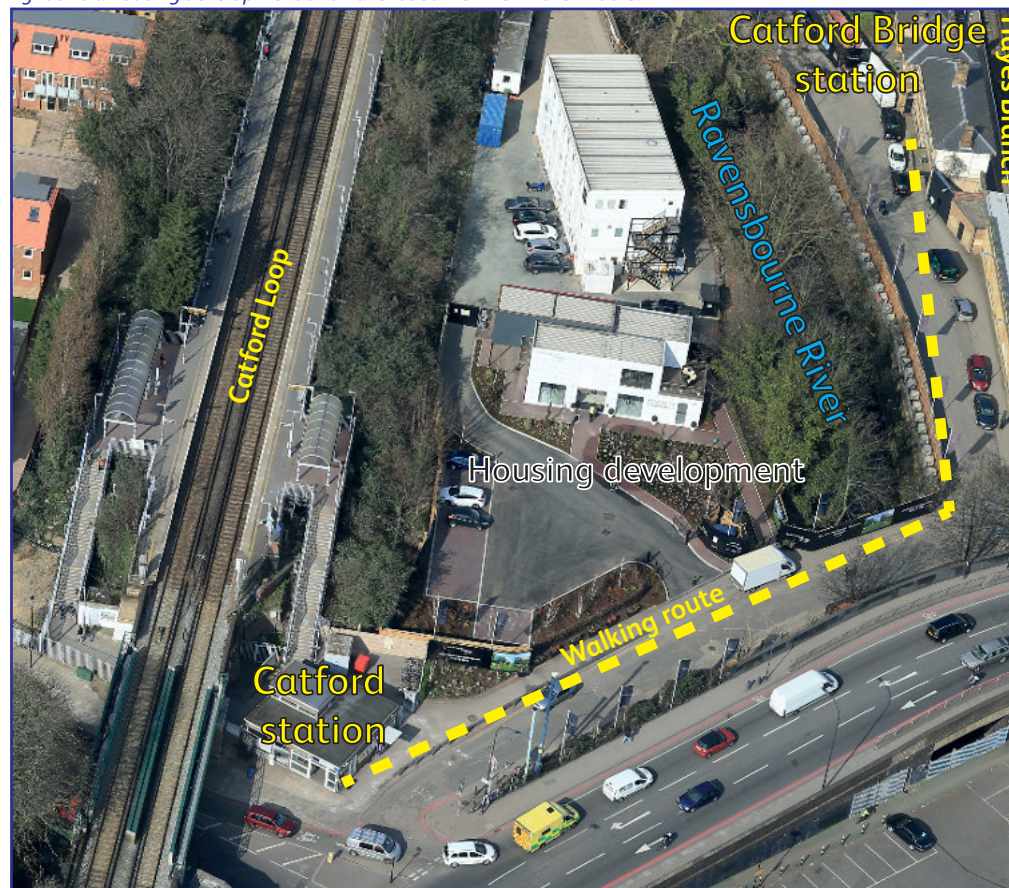
### 1.2.57 Catford Interchange improvements

1.2.57.1. The London Borough of Lewisham offered their support for an improved interchange at Catford: “The two stations serving Catford are only a few metres apart but they do not fully meet their combined role as an interchange. This is because they are two separate station facilities, operated by two separate operators. Passengers must leave one station fully, cross a road and enter the other station. With significant development and regeneration proposals for the Catford area, the Council has an ambition to change the perception of the stations to be more of a holistic interchange and a gateway to Catford Town Centre. The interchange at Catford is not step-free as there is no lift access to Catford station – it therefore only provides an interchange for those without restricted mobility. The Council believes that improving the interchange at Catford would relieve crowding on services into London Bridge by allowing passengers to change for alternative services into Blackfriars and Victoria here”.

### 1.2.58 Swanley station rebuild

1.2.58.1. Improvements to Swanley Station were supported by Kent County Council, who called for a “proposed re-build on the existing site”, and Kent and Medway Economic Partnership, who stated that Swanley “urgently requires [a] rebuild”.

*Catford interchange - Catford station on the Catford Loop is on the left, Catford Bridge on the Hayes Branch on the right and a housing development and Ravensbourne River in the middle.*



### 1.2.59 12-car ThamesLink services

1.2.59.1. London TravelWatch supported proposals for train and platform lengthening for ThamesLink services on the Catford and Wimbledon loops. However, they were less supportive of a service from Sydenham to Blackfriars: “instead, we suggest that an increase in frequency of Victoria services with good cross platform interchange at Herne Hill might be a better solution”.

1.2.59.2. The London Borough of Lewisham also offered support but highlighted a concern: [Section 6.8] “of the Route Study includes

Figure [6.5] identifying the possible requirement to provided extended carriage sidings at Bellingham to facilitate 12 car Thameslink services. While the Council understands the need for suitable operational facilities we look forward to early engagement with Network Rail with a view to minimising the impact of this project on local residents”.

1.2.59.3. Kent and Medway Economic Partnership agreed that platforms at Kent and Medway stations on the new ThamesLink routes should be extended to 8-cars in length as a minimum, and preferably to 12-cars in length.



## 1.2 Metro areas

*Panoramic view of the station forecourt area at Lewisham - the National Rail station entrance on the left and Docklands Light Railway on the right*



## Trains via Elephant & Castle

### 1.2.60 Camberwell station

1.2.60.1. The Camberwell Society offered their support for a station at Camberwell. They responded: “The area of Camberwell is very densely populated (130 persons per hectare as compared with 99.9 persons per hectare in Southwark and 52 persons per hectare in Greater London). However, as highlighted in The Bakerloo Line extension Options Assessment Report published by Transport For London in December 2015, ‘Camberwell currently lacks reliable and frequent public transport to central London and the south east region... Transport for London has suggested that improved rail access to Camberwell (which would help local residents access employment opportunities, as well as improve the traffic congestion and pollution levels in Camberwell) would be achieved by reopening Camberwell station on the Thameslink Line. I notice that this proposal is mentioned in the Kent area route study and I wish to register the Camberwell society’s support”.

## General subjects

### 1.2.61 Metroisation or single London terminal

1.2.61.1. The proposal for a London Underground-style metroisation was greeted with a mixed response. Several respondents had concerns, and most did not support that many passengers would have to change trains if metroisation and single terminal use were initiated.

1.2.61.2. London TravelWatch commented that “whilst further investment is welcome, this needs to be balanced with the need of passengers for a lengthy period of stability in service provision, both for peak period operation but also for weekends, evenings and holiday periods. We do not support significant rationalisation of service patterns, where this would limit passenger choice of through services, such as proposed under the banner of ‘TfL Metroisation’”.

- London TravelWatch did not support the proposed rationalisation of service patterns, “where this would limit passenger choice of through services to the various central

London termini that are provided at present. This type of proposal we think is premature at present. The Thameslink upgrade, the introduction of Crossrail and a resurgence of travel that has been artificially suppressed whilst major engineering work have been carried out, will change travel behaviour in South East London significantly from 2018 onwards, possibly in ways that have not been previously identified. In addition, many passengers will have made decisions about jobs, homes and education based on the existing service patterns that if changed will be disruptive to them. The proposals will also be highly dependent on upgrades to Lewisham and other stations where interchange will be required. Lewisham will require an upgrade to cope with the increased numbers of passengers who will need to change there.

- “However, we would support some elements of the proposals such as frequent, regular interval services with consistent stopping patterns, improved interchanges such as at Lewisham, Brixton (new high level platforms), Brockley (new high level platforms) and Clapham High Street (additional Chatham line



## 1.2 Metro areas

A Docklands Light Railway train at Lewisham



platforms), metro style rolling stock, additional infrastructure e.g. additional line and centralised reversing sidings at Dartford; improved station facilities and all day station staffing to improve customer service”.

1.2.61.3. Kent County Council stated that, “The term ‘Metroisation’ has been interpreted in several different ways, ranging from standardisation of headways and journey destinations on the existing franchise network to full transfer of the Metro service to Transport for London (TfL) and the London Mayor. The key drivers of Metroisation when understood in the former sense would be a new Metro fleet with additional passenger capacity, and the subsequent removal of existing constraints at London termini through extended operation of SDO at those platforms with restricted lengths”.

1.2.61.4. East Sussex County Council questioned: “Metroisation is a TfL concept which seeks to facilitate significant improvements to train length, frequency and customer experience on London’s suburban rail network.... We have concerns that the

implementation of this concept could have detrimental impacts on longer distance routes, i.e. those from East Sussex, by forcing more passengers to change trains. Although the Route Study clarifies that Metroisation does not require any changes to longer distance Kent services, there is no reassurance that there would not be any impact on East Sussex longer distance services. Therefore any proposals for Metroisation that may come forward must be subject to a full consultation with local authorities, interested parties and local communities, highlighting clearly any implications of this concept on services to/from East Sussex”.

1.2.61.5. Dartford Borough Council confirmed that it “strongly objects to any “simplification” of services that cuts the choice of destinations for existing passengers. The Franchise consultation suggests focusing some current services from Dartford station on London Cannon Street only. This is unacceptable. Careful consideration must be given to the impact of such changes on the attractiveness of Dartford as a location for investment and thereby, the impact on planned and prospective development in and around Dartford town centre. It would hit existing public transport users, creating daily inconvenience and exacerbating the current long journey times. Passengers would face new or longer parts to their journeys thereby increase rail or underground overcrowding on other parts of the network. Such change will reduce rail journey convenience and discourage the shift from car journeys which is required to achieve sustainable growth”.

- They proposed that, “rather than planning for a worsened service in the area providing less choice, the emphasis should be on a transformative solution that makes public transport more attractive, namely a prospective Crossrail extension. Moreover it would extend journey times when services from Dartford station already operate at slow speeds, typically taking 45-50 minutes (or longer during peaks). Reduction in travel times and providing a convenient service is essential to ensuring journeys are increasingly train based and eventually become more popular for regular journeys than vehicles (Borough residents are above the national average in their tendency to travel to work by private vehicle)”.

1.2.61.6. Transport for London stated: “South East London has poor accessibility to jobs within a 45 minute travelling time when comparing major town centres in this sub-region with others

A London Overground train at New Cross



elsewhere in London within the same fare zone. For example, there are c95k jobs within a 45 minute travelling time of Bexleyheath, which compares poorly to Edgware (c197k jobs within this travelling time) and Enfield Town (c244k jobs within this travelling time). Similarly there are c209k jobs within a 45 minute travelling time of Eltham, which again compares poorly to Wembley (c629k jobs within this travelling time) and Richmond (c990k jobs within this travelling time). A clear link can be drawn between these parameters and quality of transport provision, especially in the case of train frequencies. In South East London, the majority of Metro stations receive only four to six trains per hour through the day, often consisting of a number of separate half-hourly services with varying calling patterns. By contrast, other parts of the network enjoy rail services of eight, ten or twelve trains per hour. On the Underground and DLR, these figures can be as high as 15 or even 30 trains per hour”.

- “Our Metroisation proposals, which include an element of simplification of service patterns, would go some way towards delivering additional capacity in the medium term, but it is clear

## 1.2 Metro areas

that larger scale solutions will be required beyond that. We would like to see development of some such solutions undertaken for inclusion in the final document, and offer our assistance in this through future Working Groups”.

1.2.61.7. Several respondents expressed direct opposition to the proposal for services to use a single terminus.

- Kent County Council wrote: “Following the decision of the Secretary of State for Transport not to agree to any further transfer of Metro services in the Greater London Authority area to TfL, the scope of the new SERF will remain unchanged. KCC has responded to proposals for the Metro services in the DfT’s consultation for the new SERF, recognising the potential value of some realignment of London termini for some of the Metro services. The principal outcome of such a change would be relief from some of the worst congestion at several junctions in the Lewisham and St John’s area of the route network, which should lead to an increase in reliability for all services on this section of route”.
- The London Borough of Bexley stated: “I need to draw to your attention the strong and extensive opposition on the part of passengers, as well as the Council itself, to the proposition that all metro services on the North Kent (between Dartford and Charlton), Greenwich and Bexleyheath lines might operate only to London Cannon Street. Such a move would have a major negative impact on a very large number of rail users, despite theoretically improving train capacity and reliability. Current train service patterns are very important, especially in offering the range of London termini we have”.
- The Royal Borough of Greenwich agreed that, “the ‘trade off’ of the reduction in the number of London terminals served - in the case of the North Kent/Greenwich Line all services terminating at Cannon Street – is unacceptable”.
- London Resort Holdings stated: “We support proposals which provide a frequent, punctual and high-capacity railway capable of supporting economic development – which is a major benefit of the London Resort. With regard to the proposal to simplify London termini, we believe that such a scheme has merit,

Platforms 1 & 2 at Lewisham (looking towards Hither Green)



provided analysis is conducted and shared that indicates very clearly what extra capacity overall can be offered and how much performance will improve. If the capacity and performance improvement are substantial, and can only be delivered by a simplification of termini, then a detailed assessment of the implications on interchange will lead the way to a rational decision being taken”.

- Thames Gateway Kent Partnership also stated that they do not support interventions that would “limit the choice of central London terminals for rail passengers from North Kent”.

### 1.2.62 2018 ThamesLink timetable

1.2.62.1. Kent County Council responded that, “The Thameslink services in Kent operating via Blackfriars from 2018 onwards will be formed by 8-car trains. KCC supports the consultation’s options for extending platforms on the Thameslink routes in Kent wherever this is possible, although it may be necessary to operate with SDO at some stations, including Maidstone East where physical constraints preclude platform lengthening”.



## 1.2 Metro areas

### Airports

1.2.63.1. Connectivity to London airports was raised by several respondents and improvements were requested.

#### 1.2.64 Direct trains to Gatwick Airport (New Cross Gate)

1.2.64.1. It was identified that the GTR timetable proposals for December 2018 proposed that main line services did not call at New Cross Gate, this was seen as a retrograde step for connectivity as the New Cross to New Cross Gate interchange is often used by airport passengers.

#### 1.2.65 Improved connectivity to Gatwick Airport

1.2.65.1. Bromley Council requested that “further consideration is given to improving connectivity to Gatwick Airport to further reduce pressure on the motorway network in the region”.

#### 1.2.66 Direct trains to Gatwick Airport (Tonbridge - Redhill)

1.2.66.1. This is detailed in [section 1.3.44](#).

#### 1.2.67 London City airport connectivity

1.2.67.1. Thames Gateway Kent Partnership highlighted that the extension of Crossrail towards Gravesend would “improve North Kent’s direct connectivity to London City Airport, and increase the scope for improved journey times by rail”.

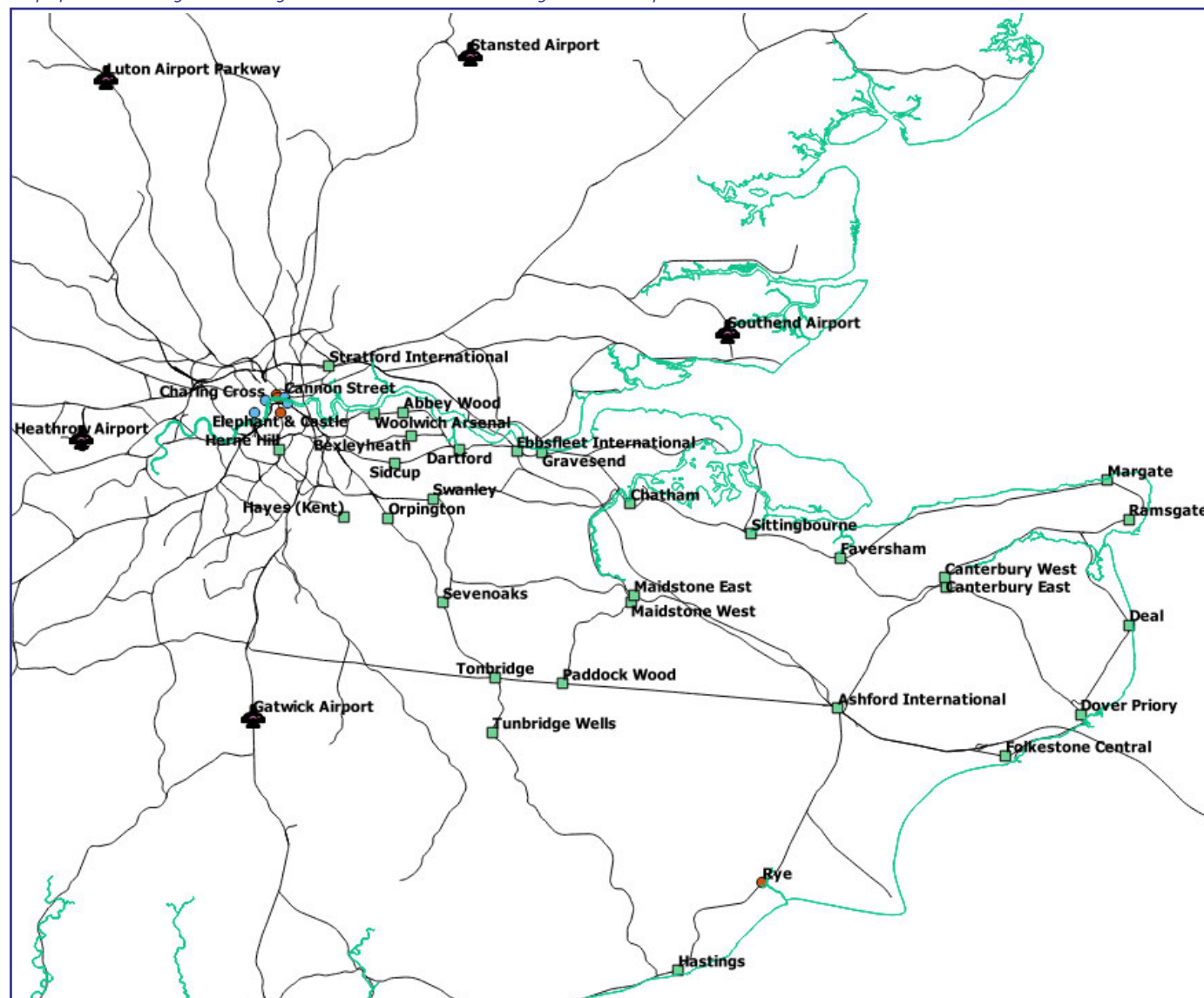
#### 1.2.68 Heathrow airport connectivity

1.2.68.1. Thames Gateway Kent Partnership also highlighted that the extension of Crossrail towards Gravesend would also “improve North Kent’s direct connectivity to Heathrow Airport and thus increase the scope both for improved journey times by rail but also, e.g. through interchange between HS1 and C2G at Ebbsfleet, enable customers across east Kent to travel to Heathrow by rail rather than car. This would in turn relieve pressure on the A2/M2, M20, M26 and M25 strategic road networks, reducing congestion and improving air quality”. The Elizabeth Line provides this connectivity at Abbey Wood and Farringdon.

#### 1.2.69 Luton airport connection

1.2.69.1. Southeastern highlighted that, “Given the connections from Kent Route to the Thameslink Core onwards to the Midland Main Line, Luton Airport should also be considered as part of airport connectivity from Kent Route”.

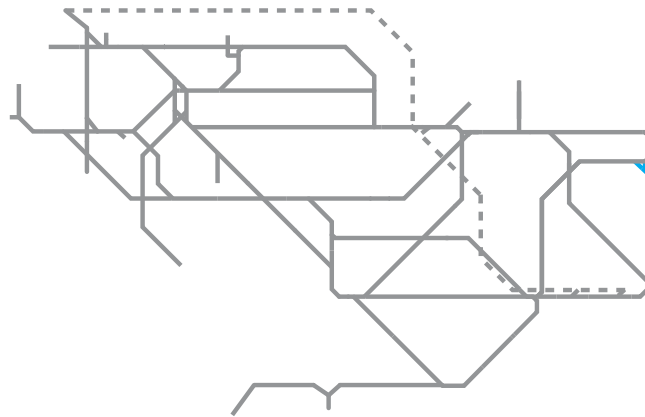
Map of South East England showing the National Rail lines connecting to London Airports



## 1.3 Main Line and branches

The Main Line & Branches area attracted 185 comments. Starting from the coast and working in to London, we will look at the responses in this order:

- Main Line
  - Sandwich Line
  - Canterbury East Line
  - Canterbury West Line
  - Kent Coast Line
  - Chatham Main Line
  - Folkestone Line
  - Tonbridge Main Line
  - Tonbridge - Orpington
  - Hastings Line
  - Maidstone East Line
  - London Terminals
  - Sheerness Branch
  - Medway Valley Line
  - North Downs Line



### Sandwich Line

#### 1.3.1 Power supply upgrade Dover to Ramsgate

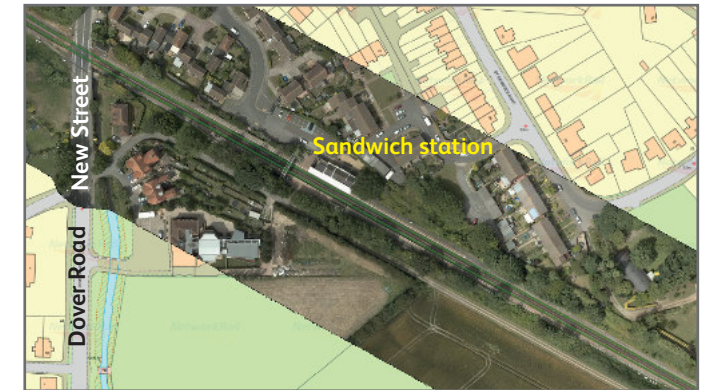
1.3.1.1. Kent County Council expressed their support for a power supply upgrade: "Dover-Ramsgate route will all require additional power supply to facilitate increased service levels, especially with the projected operation of a greater number of 12-car High Speed trains".

#### 1.3.2 Dover to Ramsgate re-signalling

1.3.2.1. Kent County Council wrote that they, "agree with longer-term re-signalling of following routes to increase resilience, capacity and reliability. ... Each of these Mainline routes is in need of these outcomes, and KCC supports the development of plans to deliver these upgrades if funders choose to support them".

- They continued, "Given the specific passenger outcomes which would accrue from these upgrades, and that two of the three routes are cross-border between two counties, these are exactly the sort of projects for which a business case could be developed for third party match-funding through the Southeast Local Enterprise Partnership (SELEP). This would, however, be dependent either on a further allocation of Local Growth Fund (LGF) (round 4), or on a bid to the new National Productivity Investment Fund".

*Sandwich station - the level crossing is at the Ramsgate-end*



#### 1.3.3 Sandwich Open Golf Tournament

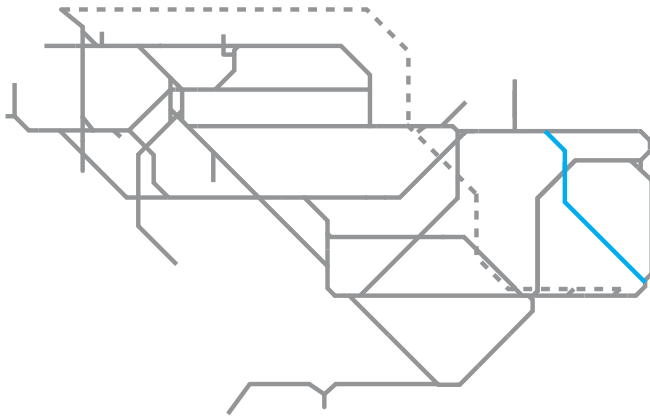
1.3.3.1. Ashford Borough Council responded that, "An additional temporary service will also be required to serve the Open Golf tournament at Sandwich in 2020. It is proposed that this event will be served by a dedicated High Speed operation to/from London St Pancras, which will need to be included as a franchise requirement. There is a planned extension of both platforms at Sandwich to facilitate 12-car High Speed operation for the duration of this event from 12-19 July 2020. These services should all stop at Ashford International, connecting services to the International Eurostar passengers as well as increasing the ability of Kent and East Sussex residents of attending the event by train".

1.3.3.2. The Kent and Medway Economic Partnership agreed: "We would wish to particularly draw attention to the need for there to be sufficient power to allow 12-car trains to call at Sandwich Station during The Open Golf Championship in July 2020. A special additional dedicated service between London St Pancras and Sandwich train station will be required during this period to accommodate the vast number of spectators expected (forecast to be in the region of 180,000 to 250,000 over the tournament)".

1.3.3.3. There are power supply issues and platform length issues (longer trains sit on the level crossing) which are being investigated. Network Rail is seeking third party funding opportunities to pay for the required work.



### 1.3 Main Line and Branches



### Canterbury East line

#### 1.3.4 Canterbury Curve

1.3.4.1. Kent County Council welcomed “the longer-term ambitions for additional connectivity such as additional resilience such as Dover to Ashford”.

1.3.4.2. Ashford Borough Council stated: “In addition, with residents and employees within the area having lived through the disruption of the closure of the line between Dover and Folkestone in 2016, the Council welcomes Network Rail’s plans to provide better resilience within the network through a Canterbury Chord linking the two Canterbury railway lines”.

1.3.4.3. Highways England also offered their support to a “means to increase the route resilience of Kent; for example to address the type of circumstances faced by the recent closure of the Dover-Folkestone line, in order to reduce the likelihood of diversion of trips to the SRN”.

1.3.4.4. Kent and Medway Economic Partnership stated that they wish “to see a spur built linking the Canterbury East and Canterbury West lines to the south-east of their present passing point. This option would not only provide resilience in the event of any future

disruption caused by extreme weather on the route between Dover and Folkestone, but would greatly benefit the county if it were to take goods and commuters off the most dangerous A-road and onto the rail network”.

1.3.4.5. The Chaucer Education Project, however, suggested an alternative proposal: “The much simpler restoration of the Canterbury Loop double track link between the London, Chatham and Dover line from Faversham to enable through running via Canterbury West station, Manston Parkway and Ramsgate, saving at least twenty-seven minutes time was not mentioned. Restoration of the Canterbury Loop at Whitehall before 5th May 2018, the centenary of the original opening of the militarily strategic line built to enable an alternative route via Minster junction to Dover and later Port Richborough, could be achieved and a fraction of the Network Rail estimated cost of £20-40 million pounds, most of which cost was stated for signalling, which has now been completed on the route and with signals at both junction entrances”.

1.3.4.6. It was felt that there would be less requirement for a direct connection between Faversham and Thanet via Canterbury, however, an interchange station would fulfill this requirement, see [paragraph 1.3.7](#).

Canterbury East station



#### 1.3.5 Faversham - Ashford Spur

1.3.5.1. Ashford Borough Council offered their support for “improvements to journeys across Kent are also welcomed where these provide better and quicker routes between other main towns and Ashford International. Although routes through Kent from London are good, routes across Kent from Ashford to Faversham, Sittingbourne and the Medway towns are difficult as they require transfer from either Canterbury East to Canterbury West, or Maidstone East to Maidstone Barracks / Maidstone West and then via Strood. The new proposal within the draft Kent Area Route Study for Control Period 6 (CP6: 2019-2024), suggesting the longer-term development of a new spur line between the Ashford and Canterbury West line would improve rail connectivity between these areas. Ashford Borough Council supports this proposal subject to the full investigation of a detailed scheme and the environmental impacts of introducing this new link within the Borough”.

1.3.5.2. Kent County Council welcomed, “the longer-term ambitions for additional connectivity such as Faversham to Ashford”.

1.3.5.3. The Campaign to Protect Rural England offered strong support for the proposal: “The Faversham-Ashford link should not only abstract traffic from the road system but also provide a better service for those who make the slow change between trains at Canterbury East and Canterbury West stations.”

### 1.3 Main Line and Branches

1.3.5.4. Harbledown & Rough Common Parish Council requested that, “The possibilities for linking the two Canterbury railway lines, by a chord at Hambrook Marshes or presumably at Tenfold. We note that the study indicates that the suggested new lines to connect the Canterbury East Line to the Canterbury West Line may take 25 years and have so far not been costed in monetary terms. Nevertheless given their large-scale impact on areas on the very edge of the Parish of Harbledown and Rough Common, the Parish in response to the consultation wish to be kept closely informed and consulted, in good time, over any proposals by Network Rail in connection with either of these potential rail chords”.

1.3.5.5. Helen Whatley MP stated that, “For this consultation, I would like to extend my support for the construction of a spur line between Faversham and Ashford, as detailed in paragraphs 5.13.20 and 5.13.21. The consultation document makes a strong case for it, such as the congestion of the A251 between Faversham and Ashford and lack of other routes between the two towns”.

- “As the Member of Parliament for Faversham and Mid Kent since 2015, I have heard countless times from constituents about their difficulties travelling to Ashford by road and rail. This is particularly stressful when Faversham residents need to get to William Harvey Hospital in Ashford at the weekend when the bus service cannot be relied upon”.

1.3.5.6. Highways England offered their support for “any plans to enable more radial/ cross country train journeys, in addition to the current bias towards spoke journeys to/from London, given that many commuting journeys in Kent are north/south rather than east/west (e.g. Medway towns to Maidstone or Sittingbourne to Ashford)”.

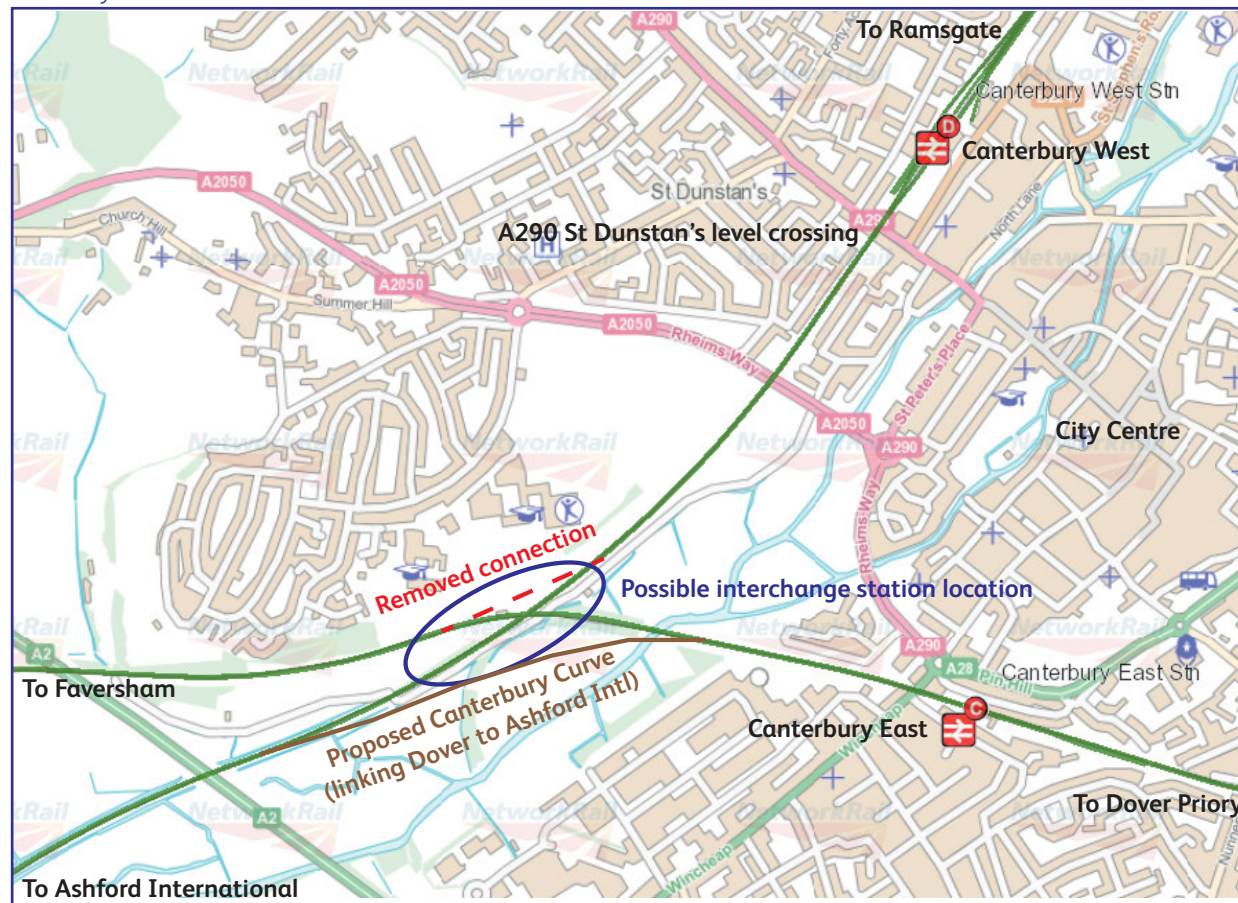
#### 1.3.6 Faversham - Canterbury West link

1.3.6.1. CPRE added, “An alternative Faversham - Ashford route for passengers (changing at Canterbury West) could be implemented by reinstating the railway chord which ran from the line from Faversham eastwards towards Canterbury West, joining in on the north side of the Canterbury West line”.

#### 1.3.7 New Canterbury Interchange station

1.3.7.1. The Campaign to Protect Rural England expressed their support for a new interchange station at Canterbury: “We understand that options for a new Canterbury station were explored many years ago, although we have been unable to find any details. We would welcome attempts to identify such a solution: the triangular area bounded by the ‘Proposed Canterbury Curve’ and the two existing railway lines [Figure 6.11] would be an appropriate area of search for such a solution. There is adequate space here for platforms which could provide

Canterbury area

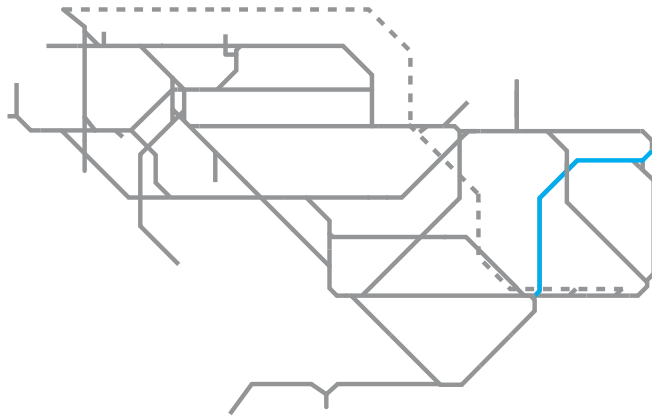


for quick interchanges between the lines. It would provide similar journey opportunities to the proposed new chords, but would require far less disruption and construction work to the permanent way. The line to Canterbury West has land on its north side to enable road connection to Rheims Way for pedestrians, cyclists, buses and cars, and, subject to Highways England approval, it would also be possible to create links to the A2. There is also plenty of space for parking.”

1.3.7.2. This could be a good solution to the problem, the height differences between the two lines has caused Network Rail’s engineers issues with the Faversham - Ashford Spur line and it has the benefit of providing Park & Ride facilities close to the existing Park & Ride car park, this could then become a proper hub station, reducing traffic into the city centre and integrating cars, buses and trains at an out of town location with journey opportunities to city centre locations by public transport.



## 1.3 Main Line and Branches



## Canterbury West line

## 1.3.8 Thanet Parkway station

1.3.8.1. Kent County Council is the lead partner for the delivery of Thanet Parkway station, and explained: “The new Parkway station will be served by all High Speed and Mainline services which currently pass the site, and the jointly funded Journey Time Improvement (JTI) scheme between KCC and Network Rail will deliver a further 3 minute reduction in journey time on the Ashford-Ramsgate route which will mitigate the additional dwell time added by the new stop at Parkway for passengers to/from Margate, Broadstairs and Ramsgate”.

1.3.8.2. Kent County Council has also highlighted the need for the new Parkway station to be included in the service specification for the new South Eastern Franchise. The Council’s response to the DfT also recognises the timetable analysis work already undertaken: “Timetable analysis undertaken by Network Rail has demonstrated that there would be no additional costs involved in terms of rolling-stock or crews, but that the round-the-loop High Speed service would need to have an adjustment to its stopping pattern to accommodate the additional station stop. With the proposal above to extend the Mainline service from Dover to Ramsgate via

Minster to Ramsgate with the proposed Thanet Parkway station and former Kent International Airport for context



Sandwich all day, this will facilitate the removal of Martin Mill from the High Speed service and its replacement with Thanet Parkway”.

1.3.8.3. The Thames Gateway Kent Partnership stated that they are “neutral about the proposals for a new station at Thanet Parkway (covered in paragraphs [6.15.8-6.15.10]) but have some concerns that any adverse impact this might have on HS1 capacity should be offset by timely upgrading and delivery of additional 12-car rolling stock”.

1.3.8.4. The Kent and Medway Economic Partnership agreed, and offered their support for “a new station at Thanet Parkway that can accommodate 12 car-trains. The Local Enterprise Partnership has been actively promoting this new station, and has secured Local Growth Funding to part fund this. We await the funding decision in response to its application to the New Stations Fund round 2 (NSF2). If successful, this final tranche of funding will complete the funding required for the project, which is currently planned for delivery by Summer 2020”.

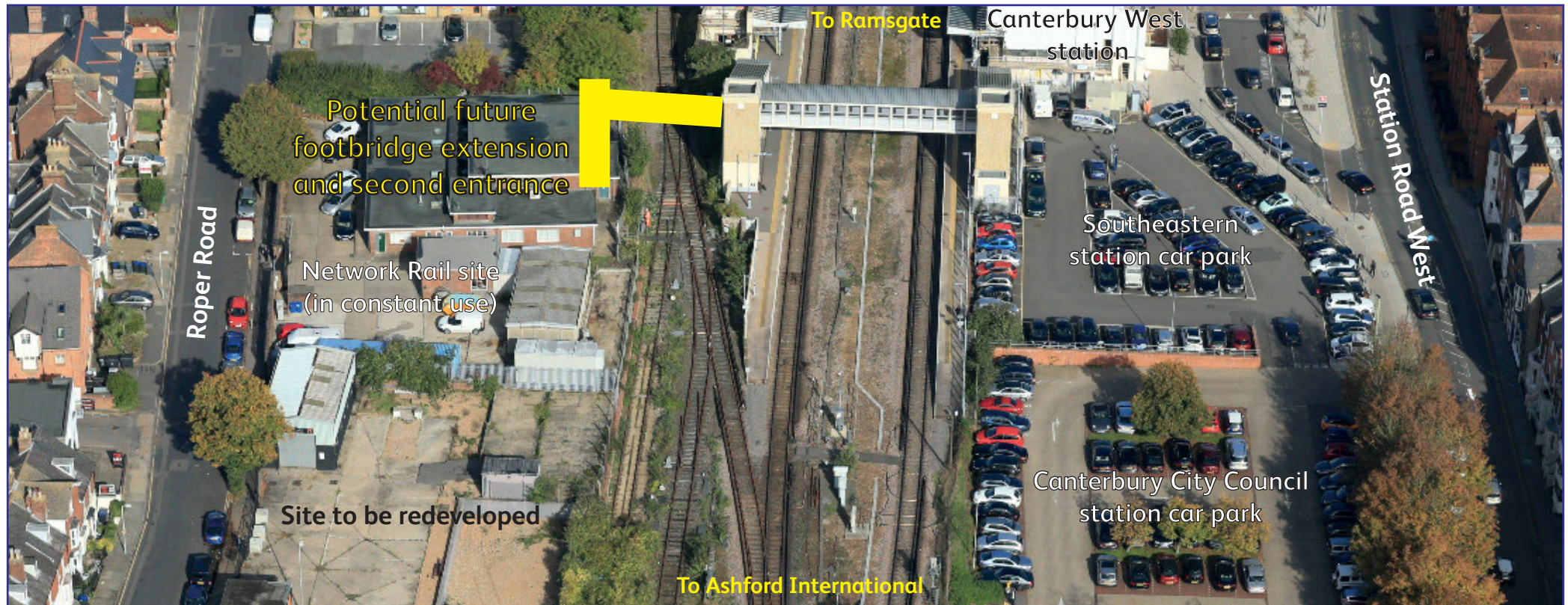
- “Thanet Parkway will greatly drive forward the economic growth in the region, given its close proximity to one of Kent’s largest business parks (Discovery Park) and nearby is Stone Hill Park, for which the developers have sought planning permission to create up to 85,000sqm of employment floorspace and 2,500 new homes”.

1.3.8.5. However, the Campaign to Protect Rural England did not support the proposal, and stated: “We note the journey time improvements to Ramsgate [Section 5.5] achieved by signalling improvements, but we further note that the third party proposal for a new Thanet Parkway Station [Section 6.15] will take away those gains because of the extra stop. In addition it is likely to abstract passengers from other stations (Ramsgate, Minster, etc.) and will also cause delays at these stations because of the extra stop. We therefore hope that Network Rail will make strong representations to the Third Party proposer against the proposed Thanet Parkway”.



## 1.3 Main Line and Branches

Canterbury West station area



### 1.3.9 Manston Airport

1.3.9.1. The current owner of the Manston Airport site are believed to be proposing the redevelopment of the site for housing.

1.3.9.2. The RiverOak Partnership responded with a detailed explanation of their proposals for the Manston Airport site as a commercial airport for air freight and passenger traffic.

1.3.9.3. Network Rail has met with RiverOak and discussed these plans and will continue to meet with them and other developers for the airport site.

### 1.3.10 Canterbury West second entrance (Roper Road)

1.3.10.1. Canterbury City Council offered support for a second entrance at Canterbury West: **“There is a great deal of public support, and an action to investigate within our transport strategy, to allow access to the north side on Canterbury West station by the provision of an extended bridge link into land owned by Network Rail on Roper Road”.**

1.3.10.2. Harbledown & Rough Common Parish Council agreed: **“The sole existing Station access, in Station Road West, is already under huge pressure of traffic whenever High Speed trains are due. Moreover, it is on the side of the Level Crossings at St Dustan’s Street and St Stephen’s Road from the University of Kent, the Hales Place**

and London Road Estates, north Canterbury, Blean and the Parish of Harbledown and Rough Common. Residents waste a lot of time while queueing to cross the Level Crossings to and from the station. Most High Speed stations have accesses both sides of the tracks and Canterbury West too needs a second access, which would be from Roper Road. The Parish Council wishes to express its strong support for a second access to Canterbury West station from Roper Road and ask for this to be included in the final version of the study. We would also ask that the Network Rail-owned land in Roper Road not be sold off for housing or any other use, pending the delivery of this much-needed second access”.



### 1.3 Main Line and Branches

A panoramic view of Canterbury West station forecourt



1.3.10.3. The Campaign to Protect Rural England also agreed, and stated, “At Canterbury West, opening the northern access from Roper Road would be of great benefit to those approaching the station from the north, including the many people associated with the University of Kent. We strongly urge Network Rail to retain all its land north of the station to enable this, and to work with Canterbury City Council to ensure its eventual completion. This access would be greatly facilitated if the siding to the north of the platform were moved to between the platforms, where there was originally a pair of ‘through’ lines (lifted some 40 years ago). This would also enable a longer northern platform to be constructed, thus avoiding the requirement for the very confusing messages about which part of the train to be in when boarding at St Pancras”.

1.3.10.4. The Chaucer Education Project further agreed: “Access at Canterbury West station from the north via Roper Road is likely to be feasible and cost effective”.

1.3.10.5. Ethnic Minority Independent Council stated that the proposal was one of “extreme importance. The existing station access in Station Road West is already under huge pressure from traffic, taxis, etc. whenever a High Speed train is due. Furthermore, increasing numbers of people are moving into new housing estates in Canterbury, many of whom are or will be London commuters. This will increase gridlock in the station forecourt and Station Road

West, unless something is done during the next franchise. Most High Speed stations have accesses on both sides of the tracks (Ashford International, Faversham, Whitstable) and this spreads the arrival and dispersal of passengers from High Speed trains. Canterbury City Council, Kent County Council and the University of Kent have identified the possibility of opening up a second access to Canterbury West, from Roper Road. This would provide more direct access from the University and areas to the north and west, and would, also, reduce the queueing at the level crossing to reach the station. Thus, it would help to reduce exhaust emissions, which are, harmful to our health and the environment”.

1.3.10.6. The Canterbury Independent Traders Alliance stated that there “is a great need to improve access to Canterbury West Station. Network Rail has almost completed a project to speed up trains between Ashford International and Canterbury West by 5 minutes, and faster trains will attract more passengers. And the rapid house-building that will occur in and around Canterbury over the next 15 years under the Local Plan will also generate more passengers. Many commuters, especially from the new, very large developments at Thanington and South Canterbury, will probably drive to the station – or be dropped off/picked up by car – because of the distance and the lack of cross-City bus services. The sole existing Station access, in Station Road West, is already under huge pressure of traffic whenever High Speed Trains are due. Waiting

vehicles overflow into the nearby car parks and into the road itself. Therefore, it is now time to implement the much-needed second access to the Station, from Roper Road. This would provide more direct access from the University of Kent and areas to the north and west, and reduce the queueing at the level crossing to reach the station. Thus it would help to reduce exhaust emissions which are harmful to human health and the environment. Canterbury City Council, Kent County Council and the University of Kent support the establishment of the second access, but the land needed for it is owned by Network Rail, so it will only happen if Network Rail delivers it. Please would the final version of the Route Study include the construction of this second access to Canterbury West, in order to meet Canterbury’s needs into the future. And, pending that happening, we implore Network Rail not to prioritise short-term gain over long-term benefits, and not to sell off any of its landholdings in the area of Canterbury West”.

1.3.10.7. The St Michael’s Road Area Residents’ Association agreed: “The area covered by our Residents’ Association is a short distance to the north of Canterbury West Station. Increasing numbers of residents in this area make use of the West Station, and new residents are moving into the area with a view to making use of the High Speed service to commute to London. At present, vehicular access to the station from this area, as from anywhere north of the station, is normally via St Dunstan’s Street and Station Road West,

## 1.3 Main Line and Branches

Network Rail's Roper Road site with Canterbury West station in the background



which involves using the St Dunstan's Street level crossing. Because of the frequency of trains, the level crossing gates are down for much of the time, and this creates severe traffic congestion in St Dunstan's Street for much of the day. Ironically, this means that residents in this area have to allow additional time to reach the station, thereby forgoing part of the advantage of the High Speed service. The proposed conversion of the car park in Station Road West to a multi-storey car park, though in itself welcome, will inevitably add to the congestion, as there will be additional traffic coming from the north to use the car park. There is therefore a clear and pressing need for a means of access to the station from the north, which means in effect from Roper Road, in order to help relieve the congestion and facilitate effective and efficient use of the station and the London train service. There is land owned by Network Rail in Roper Road which could be used for this purpose. We therefore wish to urge that the company to which the new franchise is awarded should be required to work with Network Rail to implement the provision of a second access during the period of the franchise".

1.3.10.8. The SPOKES East Kent Cycle Campaign wrote: "We urge Network Rail to explore the possibility of working with Canterbury City Council to explore ways that this land could be used which might include:

- Foot and cycle access over the railway between Roper Road and Station Road West.
- Foot and cycle access to the Station from Roper Road.
- Bus access to the north.
- A north station car park so that cars from the north do not have to drive as far into St. Dunstons or queue at the level crossing. (Any motor vehicle road access via Roper road should also be accompanied by the closure of Roper Road to through traffic, this would be to avoid rat-running - such closures are sometimes known as filtered permeability)
- With a north car park the south car park could be smaller as it would only need to serve cars from the south and east. These cars would also not have to go as far into St. Dunstons or queue at the level crossing.

- The Council might be able to fund the purchase of this land by selling land elsewhere. Or perhaps the land could be swapped?"

1.3.10.9. Feedback was passed on to Network Rail Property and they have agreed to reserve a small parcel of land to the east of the development for a future footbridge/second entrance to the station.

1.3.10.10. Rather than install the footbridge in that location because it is most convenient at this time, the adjacent electrical control room site would be a better location for a second entrance and extension to the existing foot bridge because it would enable a straight path for the footbridge rather than one that has a dog-leg curve as proposed by the many respondents.

1.3.10.11. System Operator will ensure that the second entrance site is reserved and that provision for an extension to the footbridge is included in future plans for the area.



## 1.3 Main Line and Branches



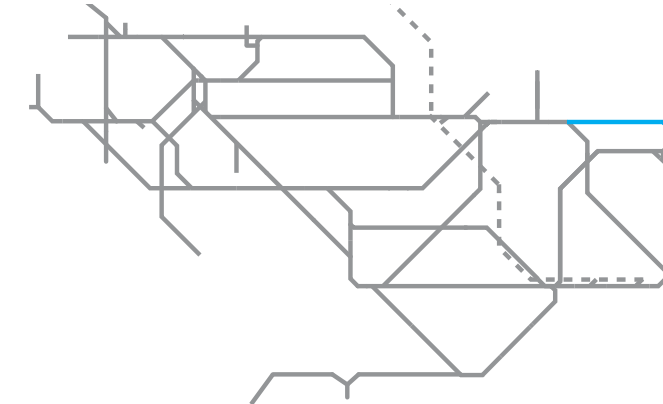
### 1.3.11 Ramsgate - Ashford International power supply upgrade

1.3.11.1. Kent County Council stated that, “Ashford-Ramsgate route will all require additional power supply to facilitate increased service levels, especially with the projected operation of a greater number of 12-car High Speed trains”.

1.3.11.2. Southeastern agreed, stating: “Electrical supply upgrade will be required if the aspirations for re-signalling are considered further”.

### 1.3.12 Ramsgate - Ashford International re-signalling

1.3.12.1. Kent County Council wrote to support the scheme, and mentioned funding opportunities: “[We] agree with longer-term re-signalling of following routes to increase resilience, capacity and reliability. Each of these Mainline routes is in need of these outcomes, and KCC supports the development of plans to deliver these upgrades if funders choose to support them. Given the specific passenger outcomes which would accrue from these upgrades, and that two of the three routes are cross-border between two counties, these are exactly the sort of projects for which a business case could be developed for third party match-funding through the Southeast Local Enterprise Partnership (SELEP). This would, however, be dependent either on a further allocation of Local Growth Fund (LGF) (round 4), or on a bid to the new National Productivity Investment Fund”.

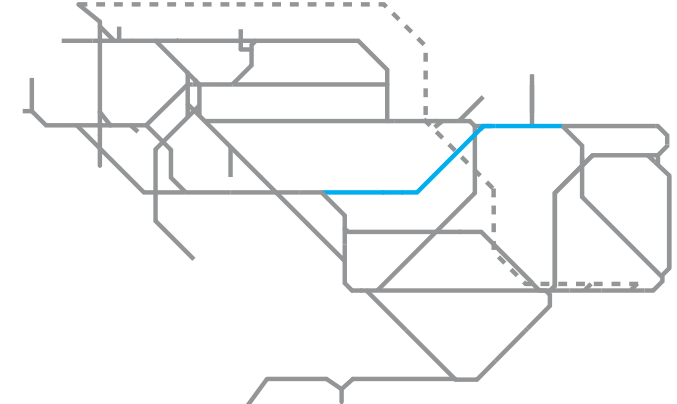


### Kent Coast line

#### 1.3.13 Ramsgate - Faversham power supply upgrade

1.3.13.1. Kent and Medway Economic Partnership called for, “power supply upgrades to the overall capacity of the Kent rail network, facilitating the operation of the longer trains proposed in this response. We understand that the Tonbridge-Hastings, Ashford-Ramsgate, and Dover-Ramsgate routes all require additional power supply to facilitate increased service levels, especially with the projected operation of a greater number of 12-car High Speed trains”.

1.3.13.2. Indeed, there are issues with the increased operation of 12-car High Speed services, this is not expected to be an issue unless such trains operated all day or more often.



### Chatham Main Line

#### 1.3.14 Swale Area

1.3.14.1. Kent Community Rail Partnership suggested improvements for the Swale metro line:

- “Car Parking – more capacity at Queenborough and Swale stations to discourage people from driving into Sittingbourne (park & ride concept).
- Metro Rail type service covering Teynham to Newington with new halts at Bapchild and Bobbing/Grove Park/The Meads and/or triangular service between Teynham, Newington and Sheerness including these new halts.
- Reinstate the closed railheads at Sheerness docks and steelworks
- Teynham & Newington require disabled access”.

1.3.14.2. Car parking is outside the scope of the Route Study but Swale is a good suggestion to reduce the number of people driving to Sittingbourne from Iwade.

- A metro-style service with extra stations would be detrimental to existing users, particularly those travelling beyond the Swale borders.
- Network Rail and the freight operators are always looking for new freight flows.
- Disabled access is generally looked at by industry partners as part of Access for All.

## 1.3 Main Line and Branches

### Medway (Rainham - Rochester)

#### 1.3.15 Gillingham Football Club station

1.3.15.1. Medway Council explained that “Gillingham Football Club’s proposal for a new, mixed-use development, including a new sports stadium and train station is at an early stage. A new train station in this location may encourage commuters to complete the ‘first mile’ of their regular journey to work on foot or bicycle, rather than by car. Moreover, this may support a metro-style service with the introduction of new trains by the new rail franchise. However, this would need to be balanced with the increased journey time of an additional stop for all or some services.”

#### 1.3.16 Chatham station improvements

1.3.16.1. Medway Council stated that, “Chatham is considered to be the central urban centre for Medway. The council therefore welcomes the identification of Chatham as a priority station for investment by 2044 to address safety issues and overall journey time”.

### Sole Street - Shortlands

1.3.17.1. Gravesham Borough Council requested, “Existing service frequency and journey time maintained on Chatham line services, with ideally reinstatement of 2 tph to Sole Street off-peak”.

#### 1.3.18 Freight via HS1 and Fawkham Jn

1.3.18.1. KCC expressed support “Of the routes identified in the KARS, KCC would particularly support greater use of the combined route of HS1 and the former Gravesend West branch alignment to Fawkham Junction, as the latter is virtually unused at present. This

Rochester Cathedral



would also prevent an excessive volume of freight being diverted from the Tonbridge/Redhill route to the Maidstone East route.”

1.3.18.2. Gravesham Borough Council cautioned: “It is noted that the freight options include clearance from Fawkham junction to Swanley presumably to allow presumably 9’ 6” containers to travel via HS1 as well as Maidstone. Rail freight needs proactive promotion across the network – use of the recently developed facilities at Northfleet being a good example. There is however a

downside because of the implications for track capacity and in timetabling terms it is necessary to provide paths in a regular interval timetable, many of which may not be used.

1.3.18.3. The Chartered Institute of Logistics and Transport explained: “Brexit is likely to result in decline in accompanied trailers coming to the UK in favour of more unaccompanied loads - 50% of which are containers. There is thus a major opportunity for rail if 9’6”palletwide (2.55/2.6m) containers can be moved through Kent. We see considerable benefit in using HS1 and the Fawkham Junction link for high gauge freight - it would avoid most of the difficult structures on the conventional line via Maidstone East and thus be cheaper and quicker to implement. HS1 pathing is at its most constrained north/west of Ebbsfleet and this section would be avoided by using the Fawkham Junction link. Further, Intermodal trains are relatively light, being generally loaded with consumer goods rather than bulk materials and the gradients on HS1 are less of a problem for such trains.”

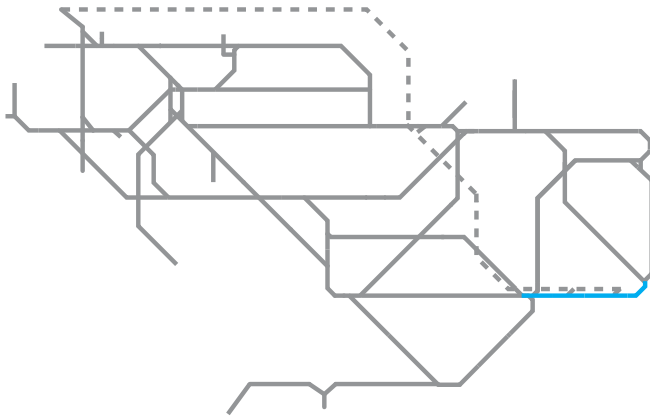
#### 1.3.19 Removal of conflicts at Shortlands Jn

1.3.19.1. Bromley Council stated their support for the “removal of conflicts at Shortlands Junction”.

1.3.19.2. Removal of the conflicts at this location would probably require grade separation which would probably prevent some trains calling at the station. There are currently no plans to further grade separate the junction.



## 1.3 Main Line and Branches



### Folkestone line

#### 1.3.20 Westenhanger station improvements

1.3.20.1. Respondents to the Draft for Consultation agreed that improvements to Westenhanger are required, and will be even more critical in the future as the station will serve the new housing development at Otterpool Park.

1.3.20.2. Kent County Council explained: "The current station at Westenhanger has a recently installed down platform of 8-car length and the original up platform of 5-car length. The platforms are staggered, with a road bridge dividing them. The station site is cramped, with no formal parking control and no station facilities.

- "The proposal by Shepway District Council (SDC) to deliver Otterpool Park Garden Town comprising up to 12,000 houses, on a site immediately to the south of the railway line, offers an ideal opportunity to develop the current station. This would require 100% developer funding through either a CIL or section 106 agreement, and would involve the construction of a new up platform of 12-car length opposite the current down platform, the extension of the down platform from 8-car to 12-car length, and a new station ticket office with other facilities and a new station car park on the south side of the new station site".

Westenhanger looking towards Folkestone



1.3.20.3. Kent County Council confirmed that it "supports the aspirations of SDC for the development of Westenhanger station, but the Council has explained in the response to the DfT's new SERF consultation that additional stops on the HS [High Speed] service would either involve an increase in overall journey times to/from Folkestone and Dover, or an alternate stopping pattern whereby HS trains omitted either Westenhanger or Folkestone West in order to retain the existing journey times'.

- The Council concluded: "It is important that the need for the expansion of Westenhanger station is recognised in the KARS for delivery during CP6, as the first stage of the Otterpool Garden Town development is delivered".

1.3.20.4. Kent and Medway Economic Partnership stated that it, "strongly supports the proposal by Shepway District Council to deliver a new garden town at Otterpool Park comprising up to 12,000 houses. The site is in very close proximity to the existing Westenhanger station, therefore KMEP would urge the examination of options to develop the current station facilities and extend the platforms to 12 cars in length to be able to cater for the future demand".

1.3.20.5. Network Rail is working with the local authority and developer on this development.

Westenhanger's former station building and car park

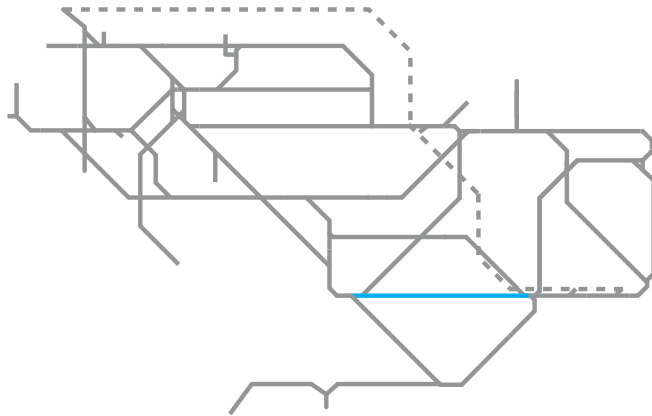


#### 1.3.21 Smeeth/Evegate station

1.3.21.1. A member of public explained that "There used to be a station on Station Road in Smeeth/Evegate. This was closed down in the 50s. Given the number of people that commute from Smeeth, Brabourne Lees, Aldington and Mersham - and the fact these villages are growing - I believe it would make sense to consider re-opening this station as part of your 30 year plan. This would significantly reduce the amount of road traffic travelling to Ashford station. I strongly urge you to consider this suggestion".

1.3.21.2. Smeeth station used to be between Ashford and Westenhanger, given the large development and plans for an improved station at Westenhanger, it may work out better to drive there to park and use the train service rather than heading into central Ashford.

## 1.3 Main Line and Branches



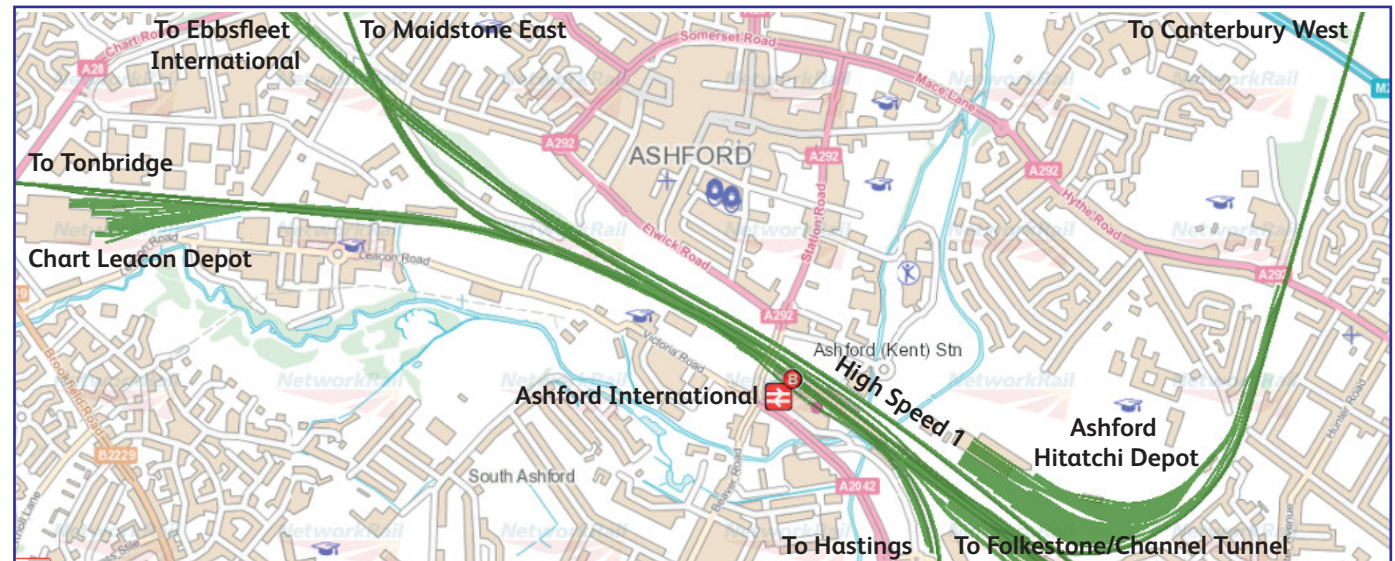
### Tonbridge Main Line

#### 1.3.22 Ashford International - Tonbridge

1.3.22.1. Ashford Borough Council stated: "The success of the introduction of High Speed Services at Ashford International in 2009 in particular has seen considerable growth in passenger numbers, which has resulted in serious and frequent overcrowding on these trains in peak and off peak periods. So even without any additional growth in population, increased capacity is essentially required to improve services for existing passengers in the Ashford area. In addition, Ashford will continue to grow with the draft Local Plan (2016) proposing the allocation of land for 14,540 new homes and 12,800 new jobs between 2011 and 2031, increasing the demand for services to and from Ashford International, other stations within the borough, and other stations that service areas of the Borough (places like Headcorn and Staplehurst)".

- Ashford Borough Council continued: "Any change in stopping patterns should maintain an equivalent level of services for stations within the borough. Local support for this approach can be demonstrated through the petition to Government "Stop Cuts To Rail Services between Tonbridge and Ashford", which gained over 11,500 signatures in three weeks before being closed due to the announcement of the General Election".

A map of Ashford. Chart Leacon Depot is currently outside railway use



- Ashford Borough Council also raised some concerns regarding stations on the Ashford-Tonbridge line: "There is a specific requirement for more ticket machines at Ashford International Station to deal with existing queuing and the increasing number of passengers in peak periods... There is a specific requirement to deliver a new masterplan and investment at Ashford International Station to ensure a more integrated and accessible station through improvements to the interchanges on both sides of the Station, and access through the Station. This project should be incorporated within the Kent Area Route Study for Control Period 6. Accessible affordable parking is currently a challenge in both some rural stations such as Pluckley, as well as at Ashford International station, where the increased passenger numbers through this station have driven up demand for parking, which is now very scarce in affordable accessible locations. The impact of not providing affordable accessible parking is that commuters will park in residential areas around the station causing issues for local residents".

#### 1.3.23 Ashford International to Reading

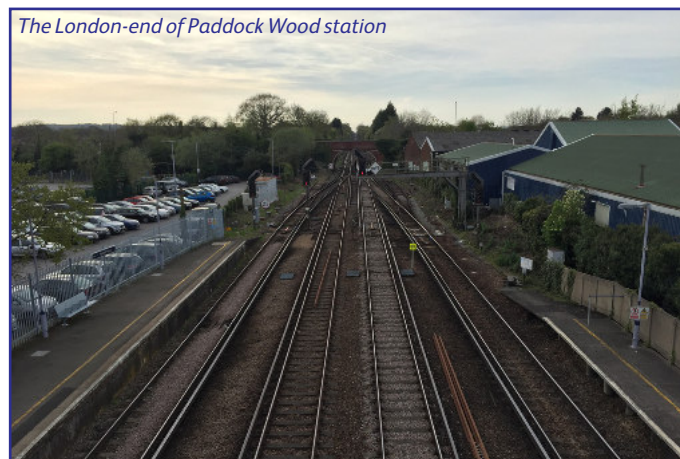
1.3.23.1. Campaign to Protect Rural England announced their support for "the introduction of a fast and frequent orbital service on the Ashford-Tonbridge line to Redhill and Reading as an alternative to the M25 and M20, provided this was not at the expense of a reduction in services to London for passengers from Staplehurst, Marden and Paddock Wood".

#### 1.3.24 New turnback at Tonbridge

1.3.24.1. The Tonbridge Line Commuters user group wrote to express their support for turn back facilities at Tonbridge: "The tracks through Tonbridge station are busy, with the conflicting movements noted above. This makes it difficult to introduce additional services at Tonbridge. Section 4.1 of the draft Route Study notes that Hildenborough is amongst the relatively small number of stations within 30 miles of London which do not have at least 3-4 off-peak trains per hour to/from central London. However, paragraph 4.2.5 of the document suggests that this "conditional output" cannot be addressed because it would "extend journey times for other passengers".

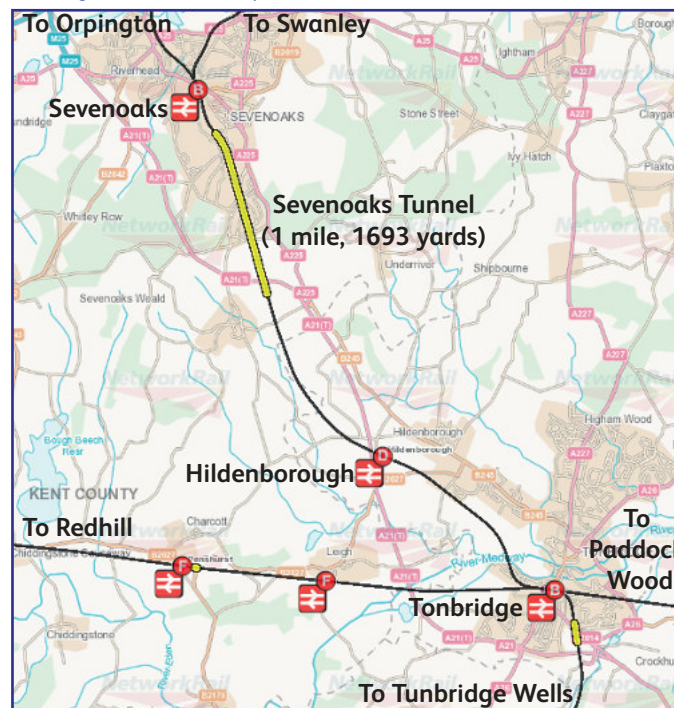


## 1.3 Main Line and Branches



- In the case of Hildenborough there is an opportunity to meet the “conditional output” without increasing journey times by extending the Thameslink services which currently terminate at Sevenoaks to Tonbridge. These services would call at Hildenborough, providing the uplift in frequency to London, and even more importantly offer a direct between link between Tonbridge and the major rail interchanges of Swanley and Bromley South. Unfortunately, it would currently be difficult to run this service due to lack of turn back facilities at Tonbridge. The obvious option would need to terminate and start from platform 4, but this would introduce more conflicting movements.
- An alternative would be to provide a turn back siding east of Tonbridge, allowing services to run down into platform 3 and the run back up into platform 2. The now unused Post Office siding east of Tonbridge could be relatively easily and cheaply adapted for this purpose. We propose that the scheme is costed and included as an option for funders. In the longer term consideration should be given to converting platform 4 at Tonbridge into a through platform to provide more capacity, particularly for Maidstone West trains which currently cross several lines to terminate in Platform 1. This would make it easier for Maidstone West trains to run into Tonbridge in the morning and evening peak periods, during which they currently terminate at Paddock Wood”.

Tonbridge to Sevenoaks map

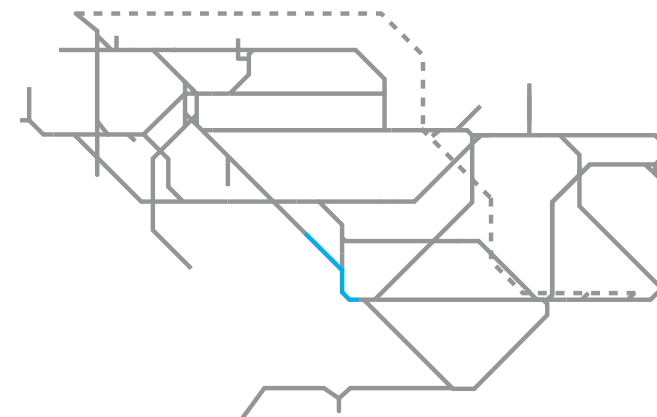


## Tonbridge - Orpington

## 1.3.25 Additional services

1.3.25.1. The Tunbridge Wells Rail Travellers' Association supported the “provision of the additional path via Tonbridge by 2024 [4.12.2] and urge that it is used for Tunbridge Wells/Hastings trains”.

- They continued, “Regarding the demand noted in [4.12.7] for 5 more paths via Tonbridge, we would like plans for providing these to be drawn up. It could be that platform loops at intermediate stations (e.g. Hildenborough, Dunton Green, Knockholt and Chelsfield) would be provided, or a third track in certain places; there is vacant land for these, so it should be identified and safeguarded”.



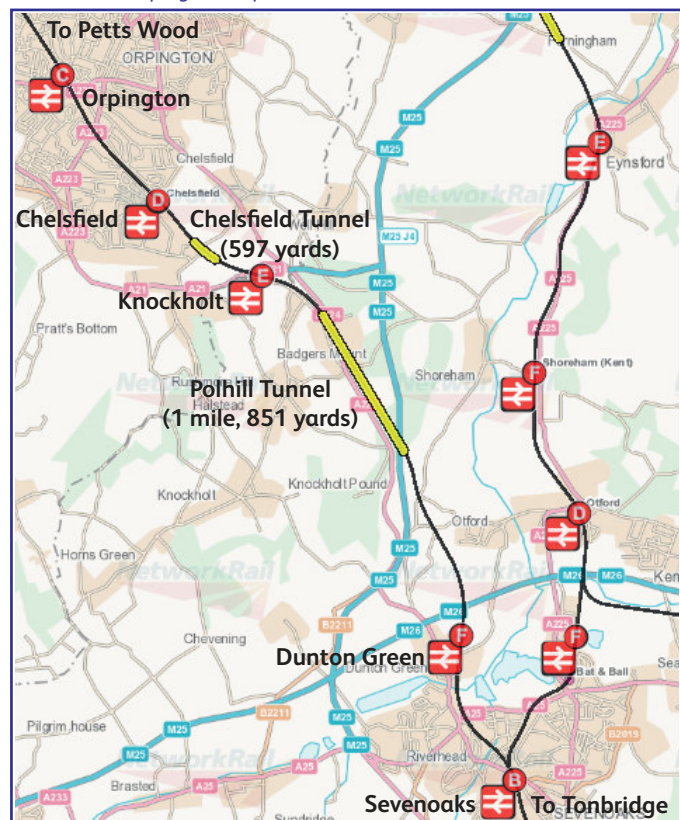
## 1.3.26 Sevenoaks - Orpington signalling upgrade

1.3.26.1. Kent County Council offered its support for the proposal by Sevenoaks Rail Traveller Association (SRTA) for a “study into signalling upgrade between Sevenoaks and Orpington to deliver headway of 24 paths per hour each way on this section (15 fast paths, 6 slow paths, and 3 paths for recovery) – this is a new proposal which would require third party funding, but could deliver significant increase in capacity on LB Mainline routes”.

1.3.26.2. Tonbridge Line Commuters group agreed that a signalling upgrade would deliver benefits: “Easing terminal capacity restrictions at Cannon Street and Charing Cross will simply move the bottleneck to other points, including the two track railway between Sevenoaks and Orpington. The mix of fast and stopping trains on this section leave little or no capacity for extra services, and at times of disruption fast services are often caught behind slow ones. It is therefore regrettable that the route study contains no proposals to address this constraint. In the short term, we support the proposal from Sevenoaks Rail Travellers Association and Kent County Council to re-signal the line between Sevenoaks and Orpington to provide greater capacity. Shorter sections between signals would improve headways though this heavily used part of the network. While the proposals for in cab signalling as part of the Digital Railway initiative are welcome, experience suggests these improvements will not be delivered sufficiently quickly to address the capacity problems which exist on the line today. Action is required now, and a conventional signalling upgrade provides the best solution”.

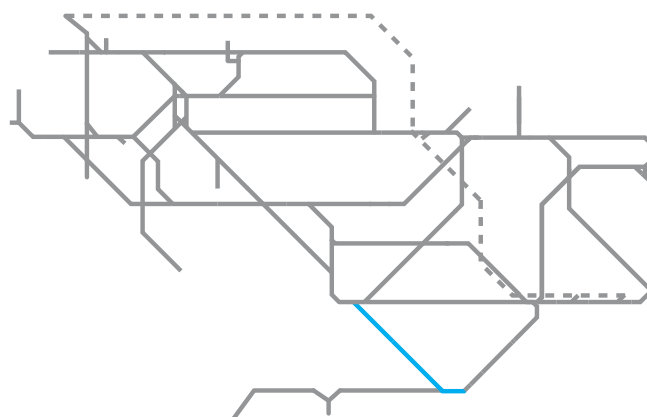
## 1.3 Main Line and Branches

Sevenoaks to Orpington map



### 1.3.27 4-tracking Sevenoaks - Orpington

1.3.27.1. Tonbridge Line Commuters stated that, “More radical action is required in the medium to longer term. The stations and tunnels on the route make full quadrupling of tracks between Sevenoaks and Orpington difficult, but consideration should be given to third or quadruple tracking at strategic points to allow trains to overtake. We recognise that this would be challenging, but an ambitious vision is needed to future proof the railway for growth. In the longer term, options such as new tunnelling should be considered. As stated in [paragraph 6.14.16], there is a long term need for gauge clearance on the Tonbridge main line, so this might bolster the case for re-tunnelling”.



## Hastings Line

### 1.3.28 Improving services

1.3.28.1. The proposals for the extension of High Speed services to Hastings appear in the next section, however, Greg Clark, MP for Tunbridge Wells, wrote of the wider benefits: “The extension of HS1 services would potentially free up much needed passenger capacity on the Kent Mainline, which would be of indirect benefit to Tunbridge Wells”.

1.3.28.2. Wealden District Council noted “the need for requirements for upgrades to the power supply and addition of additional path for the Tunbridge Wells - Hastings line to deliver 12 car trains to improve capacity. The Council supports this increase of capacity but would seek for this to be in tandem with improved journey times”.

1.3.28.3. User groups also expressed strong support for the extension of the high speed line to Hastings. Ore Transport Group responded, “The proposed Southern 2018 timetable reintroduces trains to Ore across the Marshlink route to and from Ashford International and we therefore very much welcome the lengthy section on the upgrading of the Marshlink line with the possibility of HS1 origin trains being extended via Rye to Hastings and beyond”.

1.3.28.4. However, other user groups expressed concerns, such as the Tunbridge Wells Rail Travellers’ Association, who stated: “It is

hard to avoid the impression that extension of HS1 services from Ashford to Hastings has caused proposals for improving the Tunbridge Wells to Hastings line to be deprioritised. The Marshlink upgrade would be of no direct benefit to London-bound passengers in the Association’s Line”.

1.3.28.5. The Tonbridge Line Commuters user group agreed, stating that: “While this is a legitimate aspiration, its prominence as an objective seems to reflect political influence. In particular, it is difficult to make a strong business case for investment in linking the Marshlink line to HS1 [section 6.13]. Marshlink services run to Platforms 1 and 2 at Ashford International, so the connection to HS1 would need to cross the Dover and Canterbury lines. A grade separated junction would be needed to protect performance of mainline services, and this could be prohibitively expensive”.

- “The electrification of Marshlink itself would also be expensive, especially if 25KV overhead is insisted upon, rather than more practical option of 750DC third rail. However, the suggested incremental approach without electrification [paragraph 6.13.8] yields relatively modest journey times savings. Factoring in not having to change trains, there would be an overall maximum improvement in journey time of 14 minutes in the peak. This would give an overall Hastings to St Pancras journey time of 1 hour 26 minutes. This compares poorly with 1 hour 19 minutes from Hastings to London Bridge on “Hastings Express” via Tunbridge Wells (January 2018 timetable)”.
- “An alternative approach would be to consider upgrading the existing Hastings line to improve and speed up services. In [paragraph 5.4.1] it is recognised that a significant constraint is the four single track tunnels on the route. These tunnels range in length from Wadhurst tunnel (1,205 yards) to Strawberry Hill tunnel (286 yards). However, from an operational point of view the most significant tunnel is Somerhill tunnel (410 yards), which is situated on the busy line between Tonbridge and High Brooms. Regrettably, the draft route study makes no proposal to rectify this constraint. The tunnels limit timetabling options and amplify delays at times of disruption because trains are forced to wait outside the tunnels for services in the opposite direction to pass. This is a problem which must be addressed, but Network Rail appears to have no plans to do so”.



### 1.3 Main Line and Branches

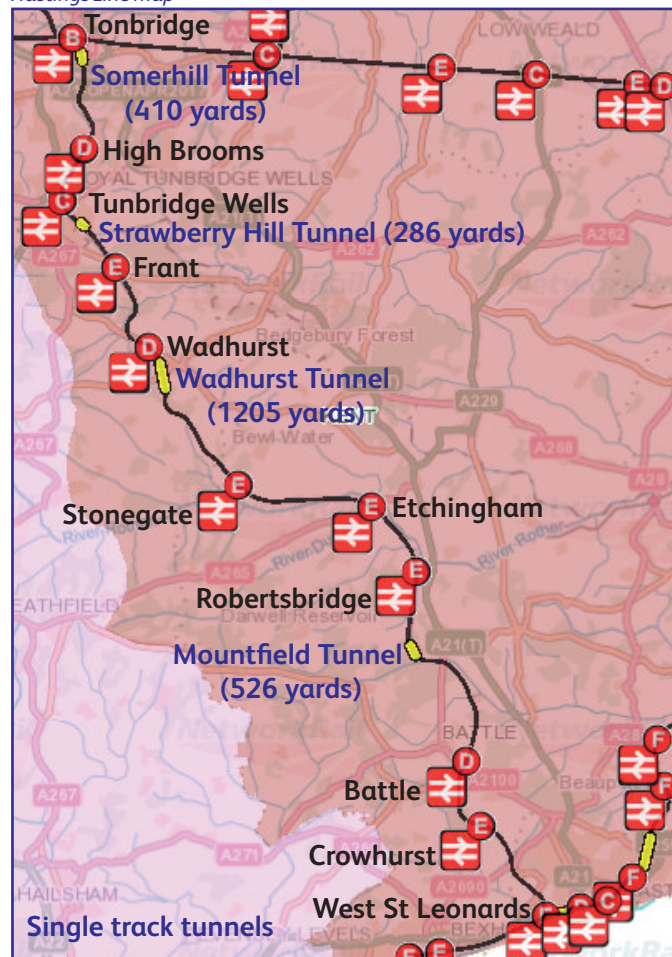
1.3.28.6. Network Rail responded to this, explaining about new machinery for re-boring tunnels, and highlighted the necessity of line closures and the expense required to achieve this. This is why Network Rail's priority for offering improved journeys into London for passengers from Hastings is the extension of HS1, and the required improvements to the Marshlink Line.

1.3.28.7. Tonbridge Line Commuters expressed their disappointment with the response and asked that "the option of redoubling the relatively short Somerhill tunnel should at least be costed and presented as an option to funders. This investment should not be made in the narrow context of journey times to Hastings, but as a way of improving the speed and reliability journey times to Tunbridge Wells, a major urban centre in its own right. We would fully support both a Marshlink upgrade and improving the existing Hastings line, but the Marshlink scheme should not be implemented at the expense of resolving the longstanding capacity problems on the classic Hastings line".

1.3.28.8. ESRA responded: "There are two particular specific issues that must be prioritised in the strategic planning: addressing the severe restriction of capacity on the two track route from Tonbridge to Orpington; and the long term vulnerability of the Hastings-Tonbridge line through substantial engineering shortcomings and its ability ever to attract sufficient funding of major works (opening up tunnels, increasing power supply, updating signalling, lengthening platforms for regular 12 car operation, etc.) against modest passenger numbers to sustain. In strategic terms it is a matter of planning in the event of catastrophic or major short term closure for remedial work, and to this end, in conjunction with the electrifying of the Ashford-Ore section, the diverting of Charing Cross services via Ashford to Hastings and west to Brighton adds to the reality of need for full electrification. This would increase the potential usage of the Ashford-Hastings electrification, add to the demand for double track throughout and ensure that standard electrically-powered stock can be distributed and used throughout the whole system".

- ESRA highlighted that it was "not in any way advocating the closure of the Hastings-Tonbridge line, merely taking a reality check, suggesting that a rural and more flexible service may have to be considered (against severe resistance by existing users), giving an all-stations connection at both ends to fast and

Hastings Line map



ultra-fast routes to the Capital. This does however highlight the shortcomings of the Tonbridge-Orpington section, both from capacity and flexibility viewpoints. First, is the need to upgrade the signal capability to add extra trains to add capacity. Second, there is a clear requirement to address the issue of providing grade separated junctions. ESRA is identifying the shortcoming and not offering particular solutions. In the intervening period, ESRA has advised the DfT consultation that more capacity is

needed on the Hastings-Tonbridge-London termini services, more limited stop trains and is now suggesting a remodelled Tonbridge interchange hub to coordinate with road services but especially to aid cross-platform interchange between services".

#### 1.3.29 Additional services

1.3.29.1. East Sussex County Council responded: "An additional service is required to meet projected capacity (up to 2024), and the strategy is that this should be a service from the Tonbridge area as this has the best BCR (3.0-4.4). A timetable rewrite would be required to provide a robust path into Cannon Street. ... Beyond 2024 (to 2044), providing additional capacity becomes more challenging. Additional paths will be required without the opportunity to lengthen trains, however, whilst there is capacity available on certain sections of routes, finding a way to connect these sections has not been possible. This is regrettable, but we would support any endeavours by Network Rail to continue reassessing this so that potential solutions can be identified".

#### 1.3.30 Power Supply Upgrade Tonbridge - Hastings

1.3.30.1. KCC wrote: "Tonbridge-Hastings route will all require additional power supply to facilitate increased service levels, especially with the projected operation of a greater number of 12-car trains".

1.3.30.2. Tunbridge Wells Rail Travellers' Association responded:

- "The power supply upgrade to support Tunbridge Wells to Hastings trains being 12 car is supported [4.12.2]. We ask that this should provide sufficient power for the 12 car trains to be formed of higher power stock than currently, for example class 387 Electrostars: current journey times from stations on this section to London are far below the aspirations described in the draft (4.3.1), so higher performance stock may be required in due course.
- "Eliminating the time to split 12 car trains at Tunbridge Wells would also give a journey time improvement for stations towards Hastings."

1.3.30.3. ESRA offered help: "We would support and wish to be involved in any work which would progress and enable a case for an additional path and a power supply upgrade on this route."

## 1.3 Main Line and Branches

1.3.30.4. Wealden District Council explained, “The route between Tonbridge and Hastings is constrained by slow line speeds and has single line sections through a number of tunnels. The constrained journey times to London result in some passengers using Marshlink to access high speed services to St Pancras International. Wealden also has evidence that commuters drive to Polegate station to access services to London Victoria. Measures to improve journey times from Hastings to London would help ease this pressure and is supported by the Council”.

### 1.3.31 Doubling of single track tunnels

1.3.31.1. TWRTA expressed that “It is disappointing that the Draft does not make any proposal to regarding these tunnels, in spite of acknowledging the limitations they impose. It is felt at the minimum Somerhill Tunnel between Tunbridge Wells and Tonbridge should be doubled in the medium term. This would provide a useful punctuality improvement, particularly in inserting trains into their paths up from Tonbridge in the morning peak. It would also allow additional paths”.

1.3.31.2. The information sheet on the right shows details of High Output Tunnel Repairs and Enlargement and details the extensive work at Farnworth where two single-bore tunnels were transformed - one tunnel was kept open for the duration of the work and the other was filled with polystyrene and concrete and then rebored using a massive tunnel boring machine. This enable the new bore to reopen as a two-track tunnel. The smaller original remaining bore is now disused. This whole project took a considerable time to complete.

1.3.31.3. Another method shown here is a tunnel widening/reboring machine which appears to show such a machine working in Germany. It widens the tunnel and lines it as it moves through the original bore, whilst a train passes through the machine. Further work would be needed on this innovation but such a machine would be an efficient way of widening the tunnels to modern design standards.


### 1.3.32 Tonbridge - Hastings resignalling

1.3.32.1. On the subject of the resignalling of the Hastings Line, respondents wrote:

#### Possible options to widen tunnels

### High Output Tunnel Repairs and Enlargement

**What is the situation?**




Access time for inspection and repair is reducing as railway passenger and freight traffic continues to rise.

The current forecast for 2030 is 34% increase in passenger traffic and 40% increase in freight traffic compared to a 2005 baseline. Reduced possession availability to accomplish tunnel remediation will result in more extensive time, cost consuming and complex repairs as assets get older.

Replacement of tunnels is uneconomical. Our current policy is to maintain the tunnels for continued serviceability. In view of this, the proactive and effective maintenance and upgrading of these structures to extend service life are seen as a major priority to facilitate the UK and Europe's rail transport ambitions.

To appropriately manage the risks associated with tunnel assets, it will be necessary to develop new repairing, strengthening and upgrading methods which cause less traffic disturbance. Fast installation is required due to short track access time.

Current repair methods and access arrangements aren't appropriate to meet predicted railway use. Furthermore, gauge constraints within tunnels prohibit line speed improvements, gauge enhancement and electrification projects; and the necessity for tunnel enlargement is growing to allow future increases in railway utilisation.



**Priority problems**

Specific priority problems	Related goals	Benefits
<ul style="list-style-type: none"> <li>Insufficient access to maintain the tunnels at a sustainable rate to maintain serviceability and safety.</li> <li>Current repair methods are becoming inadequate given high rate of degradation of tunnel assets.</li> <li>Low achievable volumes of maintenance.</li> <li>Linespeed improvements, electrification and gauge enhancement requirements for larger bores.</li> </ul>	<ul style="list-style-type: none"> <li>Equipment to maintain adjacent line open, therefore higher repair outputs can be achieved.</li> <li>More advanced repair materials delivered through mechanised means.</li> <li>High output tunnel repair methods.</li> <li>Tunnel enlargement machines that support the higher track utilisation in the future.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced railway disruption during maintenance work.</li> <li>Sustainability with maintaining tunnel condition i.e. required level of serviceability as the assets age.</li> <li>Reduced overall cost of repair per square metre.</li> <li>Reduced railway disruption during work by implementing tunnel-in-tunnel concept. Compliance with technical specifications for interoperability for Interoperability. In line with our strategy streams.</li> </ul>

**Analysis of causes**

**Scope**

Staged methods with minimum disturbance to traffic must be developed for the replacement and strengthening of tunnel linings. Additionally, a concept based on mechanisation, with whole tunnel improvement should be developed. The method should allow trains to run, following a tunnel-in-tunnel method for improvement works or adjacent line open for maintenance works. These would allow 24-hour work time, as traffic is protected from work zones. The improvement works would focus on the replacement of original lining.

**Specific research needs**

To address these challenges it is expected that R&D actions will need to address the following aspects:

- How can tunnel relining be carried out with minimum impact to rail traffic, taking into account the need for a continuous power supply to train traffic from both overhead and 3rd rail?
- What alternative method of gauge enhancement and tunnel lining replacement could be implemented to arrest condition of an ageing and degrading asset?
- How can large scale maintenance to brick lined tunnels be carried out, whilst having the minimum impact to services?

**Expected impact & benefits**

- Tunnel linings replacement can be programmed to arrest the degradation of an ageing asset.
- Allows tunnel re-lining to be carried out without the need for long blockades.
- Reduces the need for emergency access to the railway for urgent defect repairs, avoiding impact to services.
- Less water ingress that causes defects to other asset types, e.g. OLE and track.

**Farnworth Tunnel**  
Open face tunnelling, long blockade required.

**Tunnel Enlargement Machines**  
Tunnel-in-tunnel concept, maintain railway operation.

- The proposed resignalling from Tonbridge to Bo Beep is strongly supported. This would contribute both to resilience and capacity. - Tunbridge Wells Rail Travellers' Association
- As discussed in [3.6] of the Draft, that for our line is noticeably piecemeal, with the section Tonbridge to Hastings being controlled by Ashford, Tonbridge, Robertsbridge, Bo Peep and Hastings (according to [figure 3.10]). [2.7.3] acknowledges the

desirability of control by larger control areas. [6.11.15] proposes resignalling and prioritisation for this to happen before late 2020's would be appreciated. - Tunbridge Wells Rail Travellers' Association

- Agree with longer-term resignalling of following routes to increase resilience, capacity and reliability: - KCC



## 1.3 Main Line and Branches

1.3.32.2. Each of these main line routes is in need of these outcomes, and KCC supports the development of plans to deliver these upgrades if funders choose to support them.

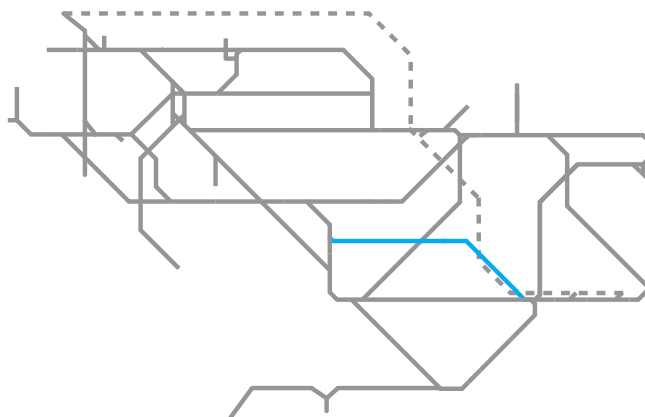
- Given the specific passenger outcomes which would accrue from these upgrades, and that two of the three routes are cross-border between two counties, these are exactly the sort of projects for which a business case could be developed for third party match-funding through the Southeast Local Enterprise Partnership (SELEP). This would, however, be dependent either on a further allocation of Local Growth Fund (LGF) (round 4), or on a bid to the new National Productivity Investment Fund.

1.3.32.3. ESCC commented on the southern-end of the line, “Bo-peep junction where the East Coastway and Hastings – Tonbridge line intersect west of St Leonards Warrior Square is one of the key routes identified as benefitting from being resigalled. Improvements to the signalisation of this junction will enable the traffic management system to operate trains over the single section lines effectively and is supported”.

### 1.3.33 Tunbridge Wells station issues

1.3.33.1. The Campaign to Protect Rural England explained, “We would like Electrostars to be able to open the doors of 11 coaches at Tunbridge Wells. This was possible before the resigalling for the Tunbridge Wells turnback, but strangely was lost at that time. As well as improving passenger convenience, it would reduce platform dwell time considerably.

- We believe that there is unmet demand for new services from Tunbridge Wells main station. The current rail infrastructure does not easily enable east/west travel from this station.



## Maidstone East Line

### 1.3.34 Bearsted station improvements

1.3.34.1. CPRE explained, “A key aspect of future schemes is ensuring that potential routes are protected, but it is also necessary that ancillary land is protected if routes are to remain viable, and in particular that land owned by Network Rail and other rail bodies is not sold off. An example is the former coal yard at Bearsted Station. Network Rail’s land at the station is plainly needed for additional parking and drop-off/pick-up facilities. The station car park is full every day; there is insufficient space for pick-up and drop-off; there is already severe pressure on parking in surrounding streets; and housing developments throughout the area are continually increasing the demand for parking still further.

- “The need for enhanced access facilities at Bearsted station has been acknowledged by Maidstone Borough Council since the last century. And now, under the new draft Local Plan to be adopted later this year, certain proposed new developments to the south-east of Maidstone, which would otherwise add yet further car trips to the station, are to be served by a new bus service to Bearsted Station, provided under a section 106

Agreement by the developers. The existing car park has inadequate space for such a bus service to be dropping off, turning around and/or picking up at the station at busy times, when commuters are also being dropped off, picked up and/or parking in the car park at the same time. Therefore, the need for a suitable bus turning area to facilitate public transport interchange adds to the reasons why the former coal yard at Bearsted Station should be put to use for station facilities, and not sold off. The next train franchisee should be required to implement the much-needed parking and drop-off improvements at Bearsted on the land currently owned by the railway”.

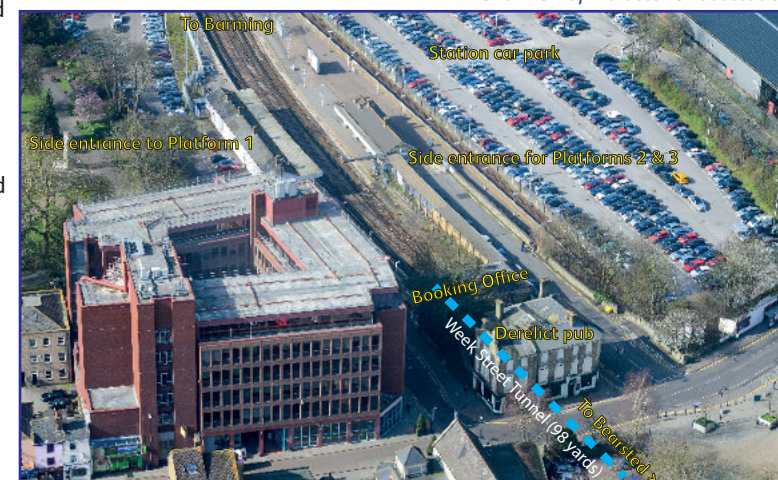
### 1.3.35 Maidstone East station rebuild

1.3.35.1. Kent County Council calls for a “proposed re-build on the existing site”

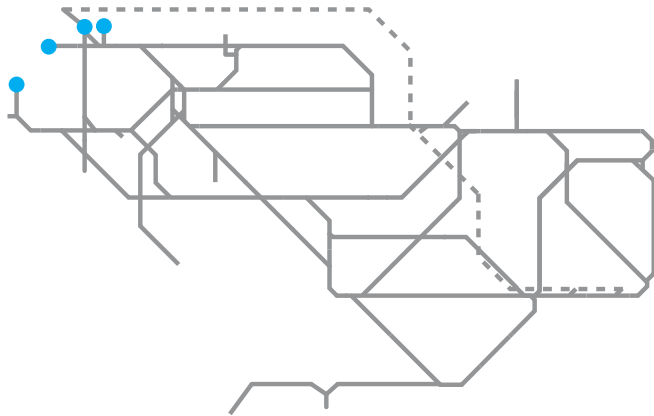
1.3.35.2. Kent CRP agreed, “We are keen to see the redevelopment of Maidstone East station as soon as possible”.

1.3.35.3. The former pub is due to be demolished to make way for a new public square. The ticket office is located on the footbridge linking the two platforms, there are also entrances directly onto the platforms.

*Aerial view of Maidstone East station*



## 1.3 Main Line and Branches

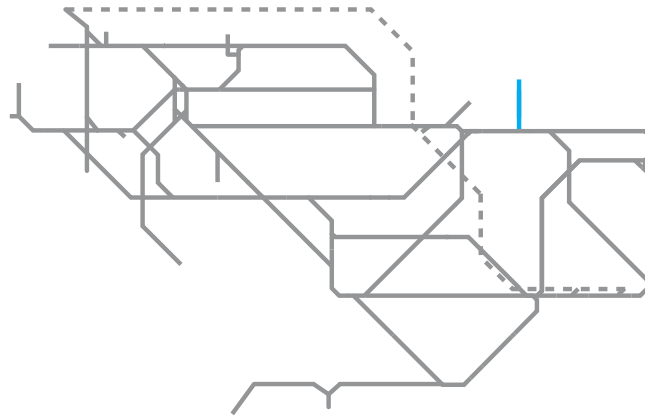


### London Terminals

#### 1.3.36 Metropolitan Reversible line

1.3.36.1. This was discussed in [section 1.2.35](#) so here are some reminders of what was submitted:

- We would however urge the retention of the Metropolitan Reversible Line and siding at Blackfriars as this provides for peak time access to and from Cannon Street for empty coaching stock movements, and is very useful in times of disruption for 'untangling' trains and crews from blockages that might occur elsewhere. - London TravelWatch
- We support proposals for the Metropolitan reversible berthing siding. Through Cannon St services are very important to our members, so any steps to increase capacity at Cannon St are welcome [6.9.3]. - Tunbridge Wells Rail Travellers' Association
- KCC supports the proposal for an additional 12-car siding on the metropolitan reversible line outside Cannon Street. This would help to mitigate the reduction in the overall number of peak paths at Cannon Street, and ensure that the current level of much needed capacity to/from the City for Kent Route commuters is maintained.



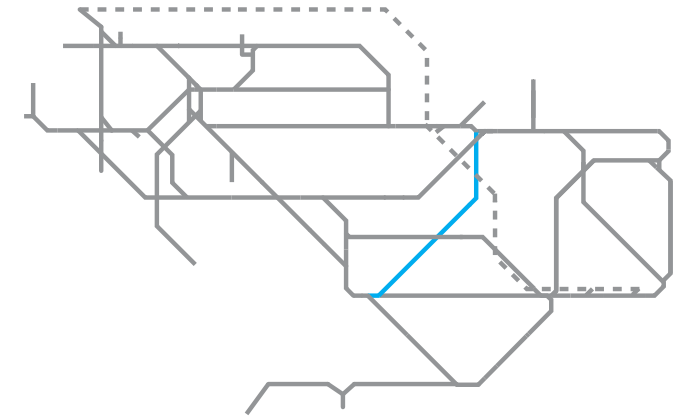
### Sheerness Branch

#### 1.3.37 Freight to Sheerness Docks

1.3.37.1. One comment was received about the use of the Sheerness Branch for freight. Currently there are no scheduled freight services operating on the branch following the closure of the steelworks at Sheerness and Queenborough.

1.3.37.2. The buildings at both steelworks have been demolished. New housing is being built on the Queenborough site and Peel Ports have alternative uses for the Sheerness site.

1.3.37.3. The Sheerness Branch and Ridham Dock branch is still open for business whenever new traffic flows are introduced.



### Medway Valley Line

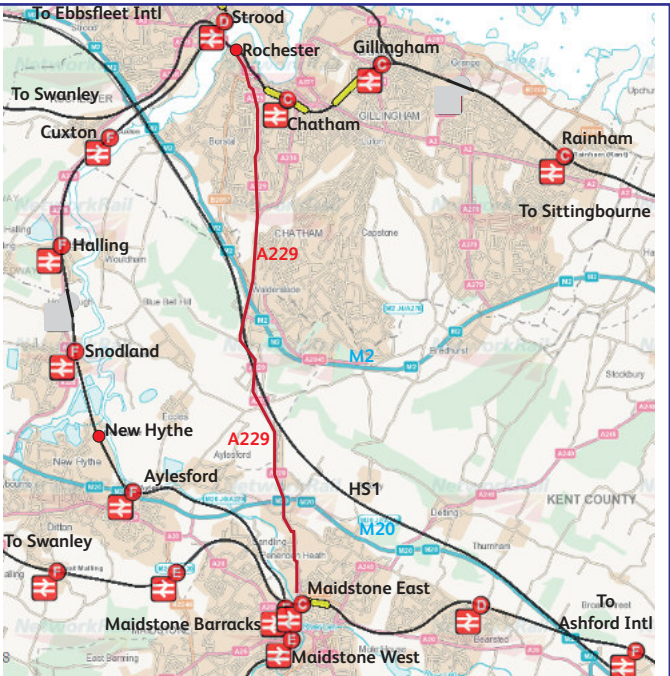
#### 1.3.38 General issues

1.3.38.1. Medway Council provided a detailed response highlighting the issues with the Medway Valley Line: "The consultation document acknowledges that connectivity between north and south Kent is poor [paragraph 5.6.3]... baseline high peak hour services on the Medway Valley Line are shorter than 8-cars. [Medway Council] would like to understand to what extent this, along with other factors, may result in suppressed demand, given the strong commuting flows between Medway and Maidstone".

- Commuting flows between Medway and the local authority districts to the south of Medway... shows that:
  - 9 out of 10 commuters travel between Medway and districts to the south by car or van.
  - Outward commuting to the south from Medway is almost double the rate of inward commuting.
  - Commuting by train represents just 3 per cent of all flows between Medway and districts to the south



1.3 Main Line and Branches



Map showing the various road and rail routes between the Medway Towns and Maidstone

- Outward commuting from Medway to Maidstone and Tonbridge & Malling represents the overwhelming majority of flows to the south, comprising 46 and 38 per cent respectively. It should be noted that 9 out of 10 of these flows are by car or van. This amounts to almost 17,500 movements by car or van when combined with the inward commuting flows from these areas, most likely via the A228 and A229. - Medway Council
- The council would therefore welcome a platform extension for longer, 12-car trains at Maidstone West. Following the lengthening of all three platforms at Strood to 12-cars, this would increase capacity on services between Medway and Maidstone. However, there may be other factors for the relatively small number of commuters travelling in this direction by train, such as affordability, the exact location of workplaces relative to train stations or the requirement to use a car/van for work purposes. Nonetheless, improved services on the Medway Valley Line could offer a real alternative to the overwhelming majority

Table 1.15 - Maidstone - Medway journey time comparisons (Sources: Google Maps and National Rail Enquiries)

Journey		Arrive by 08:30				Arrive by 12:30				Arrive by 18:30			
From	To	Train	Car	Bus/Train	Bus	Train	Car	Bus/Train	Bus	Train	Car	Bus/Train	Bus
Maidstone	Rainham	47	22-45	41-46	70	70-83	22-40	36-42	58	71-77	22-40	38-48	130
Maidstone	Gillingham	40	26-50	34	35-39	60-78	24-40	33	33	62-68	24-45	37	37-38
Maidstone	Chatham	33-37	16-40	37	22	55-74	18-35	35-36	21	55-57	16-35	34-41	22-24
Maidstone	Rochester	29-33	18-35	30-32	30-47	51-70	20-35	28	36-59	51-53	16-30	35	37-44
Maidstone	Strood	29	20-40	38	44-47	29	24-45	40	43	31	18-45	57-47	43-48
Rainham	Maidstone	78	30-70	39	58	72	24-40	34-44	44	53	24-50	36-40	60
Gillingham	Maidstone	63	30-60	35	43-46	63	26-45	30	39	44	26-55	31-33	41
Chatham	Maidstone	59	22-45	29	27	59	18-35	32-40	21	40	18-40	40-44	23
Rochester	Maidstone	43*	22-50	35	44	56	22-35	28	36-59	37	20-45	32-43*	39-42
Strood	Maidstone	32	26-90	41	50-51	32	22-45	43	42	29*-34*	24-55	39	46

\*Assumes walking between Strood and Rochester stations

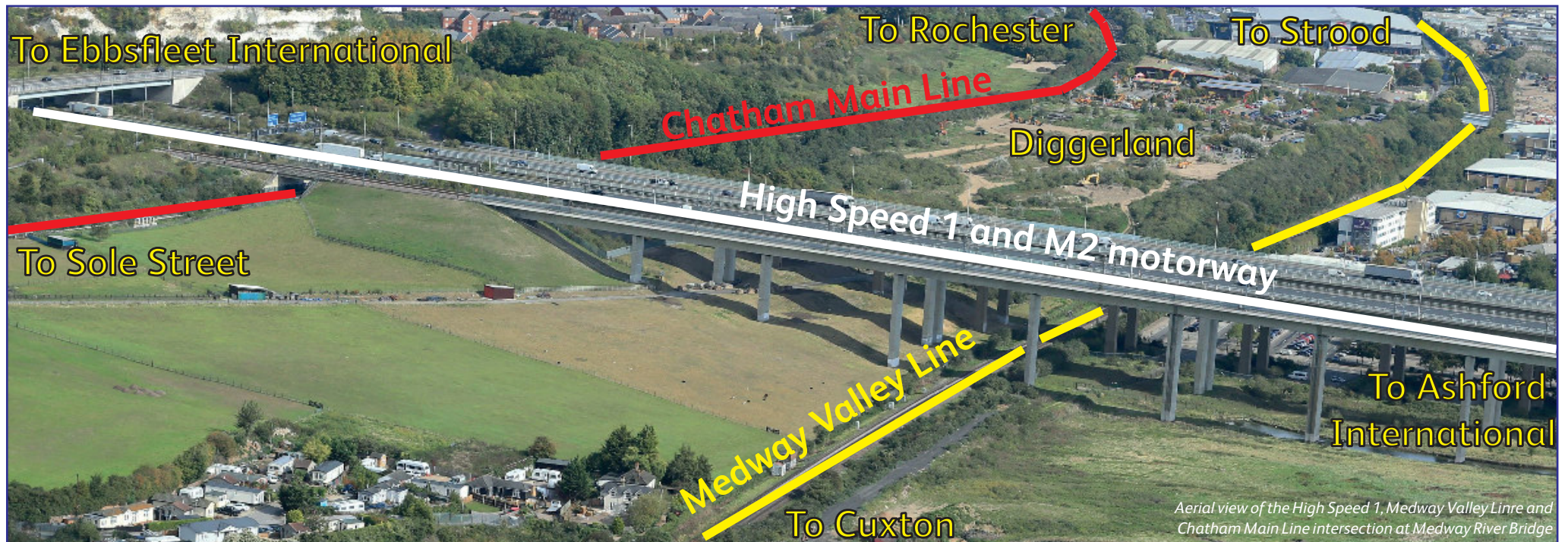
- who currently commute by car/van between Medway and local authority areas to the south. A key factor in achieving modal shift is likely to be the ease of connection between rail and bus services, especially where large employment centres (e.g. Kings Hill) are located far from rail stations. Note the demand for services is likely to increase as new developments (e.g. Peters Village and Strood Waterfront) come forward. - Medway Council
- The exact traffic impacts following the government's recent announcement of the preferred location for the Lower Thames Crossing (western southern link) need to be established through partnership working with Highways England and Kent Highways. However, it is considered likely that dispersed traffic will impact on the main routes to the south, which further underlines the need to improve services on the Medway Valley Line.

1.3.38.2. The Thames Gateway Partnership complained that "The draft Study gives relatively little attention to the Medway Valley line. At face value this would appear to have potential to play a greater role in employment-related travel between Medway and Maidstone, which is one of the most active travel-to-work zones in Kent. For example, analysis and modelling by Kent CC based on

2011 census data showed 3,900 Maidstone residents travelling to Medway for work, and 8,730 Medway residents travelling to Maidstone (this does not include journeys to and from other districts to the south of Medway). Although those figures relate to travel from any point of origin and destination within those authorities' areas, it is significant that the most direct road link between Maidstone and Medway – the A229 – suffers some of the worst peak congestion on the local network, affecting M20 Junction 7 and M2 Junction 3. As we have commented in our response to the South Eastern Rail Franchise consultation, improvements to the performance of the Medway Valley line could complement other incentives to encourage more people travelling between these centres to use rail rather than road".

- 1.3.38.3. **Table 1.15** compares the journey times by road and rail using car, train, bus and bus and train. This is based on Google Maps and National Rail data for a typical Wednesday. It shows the benefits of using both forms of public transport and a mix of the two with integrated ticketing.
- 1.3.38.4. Network Rail will continue to work with stakeholders to examine options for connectivity.





Aerial view of the High Speed 1, Medway Valley Line and Chatham Main Line intersection at Medway River Bridge

### 1.3.39 Maidstone West - Strood power supply upgrade

1.3.39.1. Southeastern point out that “Enhancements to the high speed service in terms of lengthening of trains to Maidstone West will require traction energy infrastructure upgrades that have not been considered”.

### 1.3.40 New Tovil station

1.3.40.1. The Kent CRP explained that “There is considerable local support for an additional station at Tovil Halt in Maidstone to encourage commuters to switch away from cars for local journeys in Maidstone”.

### 1.3.41 Maidstone - Medway metro service

1.3.41.1. The operation of a tram/train-style train which could diverge from the Medway Valley Line just before Strood to run on the street to Rochester, then Rochester and Chatham High Streets and on to Gillingham could be a popular option if the journey times are comparable to at least the bus service.

### 1.3.42 New Medway Valley Leisure Park station

1.3.42.1. Kent Community Rail Partnership asked if there was merit in an additional station at Medway Valley Leisure Park (between

Strood & Cuxton). A further suggestion was for an interchange station between the Medway Valley Line and the Chatham Main Line. Whilst the former would be pretty straightforward, the latter would be hampered by the distance between the two lines, elevation difference between the lines and a local road which bisects the site.

1.3.42.2. The station on the Chatham Main Line would also be concerning because it is at the bottom of a steep gradient called the ‘Sole Street Bank’ which may make it difficult for trains to stop in the downhill direction towards Rochester, or pull away in the uphill direction towards Sole Street.

1.3.42.3. The usual stipulation that a business case would have to reflect the inconvenience to existing passengers would also have to be considered.

### 1.3.43 Cuxton Chord

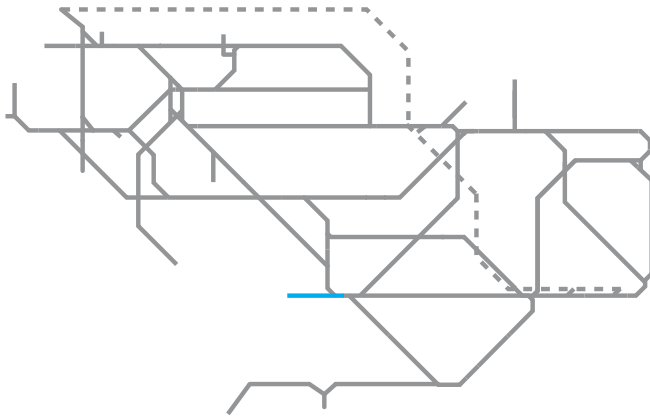
1.3.43.1. CPRE responded that “We also support the idea of a chord between Rochester and Cuxton, which would link the Medway Valley (MV) Line and the Victoria Line, south-west of Rochester (see Figure 1 below for an illustration). This would link the Medway Towns, Sittingbourne and Faversham to Maidstone and Tonbridge/Tunbridge Wells.

- This chord would remove the need for Medway Valley Line trains to run into and out of Strood, which is mainly an interchange rather than a destination in its own right. Currently, the awkward and time-consuming connection and back-tracking required makes the rail journey from Swale and Medway to Maidstone, Tonbridge and Gatwick Airport slow and unattractive.
- With a ‘Cuxton chord’ in place, trains from Swale and Medway could, after crossing Rochester Bridge on the Victoria Line, divert left and run down into Cuxton Station, and then continue direct to Maidstone West without reversing at Strood. The interchange between Medway Valley Line trains and HS1 services would then take place at Rochester, almost as conveniently as currently at Strood. Kent County Council’s Travel to Work figures show that hundreds of people from Medway and Swale work in Maidstone. This chord would therefore open significant new journey opportunities, and greatly increase patronage on the Medway Valley Line.”

1.3.43.2. As with Medway Valley Leisure Park, the gradient required to join the two lines may be too steep for conventional trains.



## 1.3 Main Line and Branches



## North Downs Line

## 1.3.44 Direct trains to Gatwick Airport (Tonbridge)

1.3.44.1. Tunbridge Wells Rail Travellers' Association stated "We disagree that there is "no specific connectivity gap between Kent and Gatwick Airport" [5.7.3]. The service from Tunbridge Wells requires two changes so is effectively useless. Doubling Somerhill Tunnel would give more options for accommodating this flow, by extending Tonbridge - Redhill services back to Tunbridge Wells, or by reinstating the through service to Gatwick Airport, for instance.

1.3.44.2. Tonbridge Line Commuters agreed: "[Paragraph 5.7.3] states that 'though the level of the level of connectivity from Kent is lower than that from central London, the analysis undertaken as part of the Kent Area Route Study has concluded that there is no specific connectivity gap between Kent and Gatwick Airport'. This is a truly astonishing claim. Since the loss of direct trains between Tonbridge and Gatwick Airport in 2008 Kent is now the only county



in the South East apart from Essex which has no through train service to and from Gatwick. This is in spite of the close proximity of West Kent to Gatwick and the fact that the M25 and M23 are frequently congested. The operator of Gatwick Airport estimates that there are about 3 million passengers a year from Kent, and yet their only option for travelling by train is an hourly service from Tonbridge to Redhill where they must change platforms via a subway to board a train to Gatwick. The lack of frequency discourages travelling to the airport by train due to the fear of missing the flight, with the change at Redhill making the prospect even less inviting for those with luggage.

- "We were keen to see the "analysis conducted as part of the Kent Area Route Study" which justifies the claim that there is "no specific connectivity gap". As a result, on 29 May 2017 we submitted a Freedom of Information request to Network Rail to see a copy of the analysis.

- Network Rail finally responded to this on request on 26 June as follows: I can advise that the development of the Kent Route Study has been an industry wide collaborative effort. The connectivity between Kent and Gatwick airport was discussed in early meetings and we decided that we could not justify undertaking further analysis and commissioning reports at the taxpayers' expense to tell us what we already know: the public prefers other modes of travel to reach Gatwick airport. In consequence, I can confirm that we do not hold the information requested. To explain in more detail, it was decided to use corporate knowledge and past experience to determine if there was a connectivity gap. There are already a lot of trains which go from Kent to London Bridge, Victoria or Blackfriars where there is a simple connecting service to Gatwick Airport. We are aware that a service from Kent to Gatwick Airport via Tonbridge was previously introduced but it had to be cancelled due to low

### 1.3 Main Line and Branches

Map showing the North Downs Line between Redhill and Tonbridge



passenger numbers. Kent County Council commissioned a report which found that demand for a through service was low. In addition to this, a previous rail service was discontinued because it was not being used and now connects Tonbridge to Victoria/ London Bridge providing additional London services. Gatwick Airport also funded a National Express coach service from Ashford to Gatwick Airport last year which was unsuccessful. Based on the above, we concluded that the majority of air passengers from Kent will drive to either the airport or the Gatwick area as the route is easier by road than rail and much more convenient. Furthermore, there are rail services in place but they are just not necessarily direct. 6 Response to Freedom of Information request (answered under the Environmental Information Regulations 2004) by Anisha Pandya on behalf of Network Rail on 26 June 2017

1.3.44.3. Greg Clark MP explained that “The current service to Kent is infrequent and requires multiple transfers over what is a relatively short distance. The re-introduction of direct Gatwick services from Tunbridge Wells and Tonbridge would certainly be welcomed”.

1.3.44.4. The Tonbridge – Reigate CRP, which is also outside the scope of the Kent Route Study, links Kent with Surrey but is administered by Sussex CRP, “This route offers an innovative opportunity for the development of the southeast regional rail

network. Consideration should be given to a future option of providing a through Ashford – Tonbridge – Redhill – Gatwick – Redhill - Guildford – Reading service, potentially as a joint operation between the Greater Western Railway (GWR) and South Eastern franchises”.

1.3.44.5. Ashford Borough Council commented that “This could provide an option to link up Ashford International Eurostar services with International travellers at Gatwick Airport”.

1.3.44.6. Kent CRP felt that there is “Gatwick Service - consistent demand from customers and businesses for a service from Ashford and/or Maidstone.

1.3.44.7. Edenbridge Rail Travellers concluded that they “Would wish to see a statement in the final document to the effect that the LTPP will continue to work with interested parties to keep the Kent-Gatwick position under review. Casual observation suggests that there has recently been an increase in patronage using the Tonbridge- Redhill link to the Airport, despite poor connections at Tonbridge. Such deterrents to use of rail could be mitigated by increased frequency on Tonbridge- Redhill and/or Tonbridge- Ashford, or, ideally, a direct service to Gatwick, which could be reconsidered now that the Tonbridge-Victoria service is proposed, from 2018, to revert to terminating at Redhill”.

1.3.44.8. Large housing developments have been proposed close to this line so Network Rail will be working closely with developers and local authorities to ensure that the stations are improved to reflect the growth in demand.

1.3.44.9. Following the GTR timetable review and consultation, trains on this line now only operate a shuttle between Tonbridge and Redhill outside the peaks. If the service continues to operate as a shuttle, there is an option, that was developed several years ago, to provide a new platform at Redhill dedicated to these services and separate to the main line, this would reduce congestion at the station and enable the shuttle service to be increased to reflect demand in the future, should the developments provide sufficient passengers.

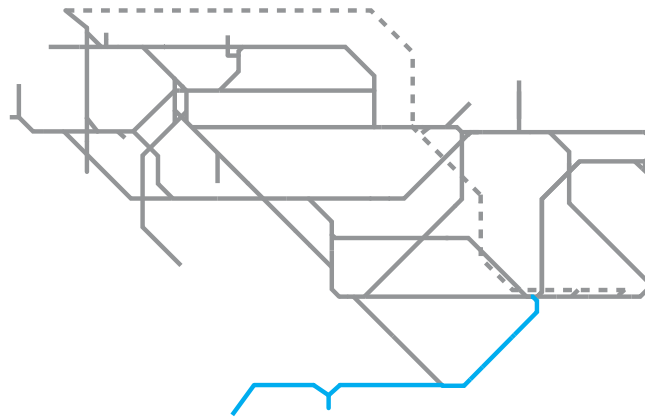
1.3.44.10. Extension of the Great Western services to Ashford International would require more rolling stock than is currently provided for the existing services and would also have pretty long journey times as, presumably, the trains would run Reading - Redhill - Gatwick Airport - Redhill - Tonbridge - Ashford International. This may not be quicker than changing trains at Redhill, travelling via London or driving the entire way. In this case it is probably better to timetable a robust connection at Redhill and Tonbridge. Interchange between services could be improved by providing platform interchange footbridges at Redhill and Tonbridge.



## 1.4 High Speed & Marshlink

The High Speed & Marshlink area attracted 201 comments. Starting from the coast and working in to London, we will look at the responses in this order:

- Marshlink
  - South Coast Main Line
  - High Speed to Hastings
  - High Speed to Bexhill
  - High Speed to Eastbourne
  - Marshlink electrification
  - Bi-mode High Speed rolling stock
  - Linespeed Improvements
  - Ashford International - Hastings resignalling
  - Marshlink High Speed phasing
  - Marshlink High Speed funding
  - Reintroduction of passenger services to Lydd and Dungeness
  - Park Farm station
- High Speed via Ashford International
  - Ashford International station
  - 12-car 395s via Ashford International
- High Speed via Medway Towns
  - 12-car 395s to Maidstone West
- Ebbsfleet International to London St Pancras International
  - Ebbsfleet Southern Link
  - Ebbsfleet Garden City
  - London St Pancras International
  - High Speed 2/Crossrail 2
  - London Resort Theme Park



1.4.1. Highways England “supports the plans to increase the capacity of the High Speed Network Services through Kent”.

### Marshlink

#### 1.4.2 South Coast Main Line

1.4.2.1. “East Sussex Rail Alliance is concerned that the rail network and system serving the South Coast is positively inhibiting its contribution to relieving the pressure on Greater London, for commuters, residential and commercial development, and therefore regeneration of a region that could have much improved resolution of underemployment and deprivation.

- ESRA therefore presses for the whole of the South Coast from Ashford to Southampton (East and West Coastal) to be treated as a through-route which provides optimum connectivity between Coastal communities and the Brighton Main Line, Hastings-Tonbridge and Hastings-Ashford rail accesses to the Capital and HS1 Brighton - Ashford service”.

#### 1.4.3 High Speed to Hastings

1.4.3.1. Hastings Borough Council stated that, “We support these conditional outputs relating to improving capacity of the railway and reducing journey times between Brighton and Ashford and reducing journey times between Hastings and London. Improving the infrastructure measures on the Marshlink between Hastings and Ashford as well as at Ashford International, along with the necessary rolling stock delivered as part of the new South Eastern franchise, will enable the extension of high speed rail services from Ashford to Hastings and Bexhill and, possibly, Eastbourne”.

- Hastings Borough Council further stated that it, “very strongly supports the extension of High Speed services from London to Hastings, Bexhill and Eastbourne, alongside East Sussex, Rother, and Eastbourne Councils, local MPs, the Local Enterprise Partnerships and the local business communities”. This initiative also has the support of Kent County Council.
- Hastings Borough Council concluded by saying that Network Rail’s initial work in 2013 identified “that there was potentially a good business case for electrifying the Marshlink line between Hastings and Ashford and running high speed rail services to Bexhill and Hastings. It would provide significant journey time savings with the fastest journey between St Pancras and Hastings via the High Speed 1 rail link being reduced from 91 minutes to 68 minutes; many current journeys, including most peak journeys, are 100+ minutes”.

## 1.4 High Speed & Marshlink

- East Sussex, Hastings and Rother on behalf of the Hastings & Rother Taskforce appointed consultants Mott MacDonald to undertake a study to identify whether a strategic economic case existed for extending the high speed services to run between London St Pancras (HS1) and Hastings and Bexhill. The report, published in 2015, identified that running high speed rail services would be “a real game changer for the Bexhill/Hastings area and has the potential to ‘super charge’ the local economy, generating £354m of economic and regenerative benefits to the local area by 2044. In addition, it would support the delivery of the over 7000 new homes and 160 000sqm of employment space set out in the Hastings and Rother Local Plans”.

### 1.4.3.2. East Sussex County Council responded:

- Travel between London and East Sussex currently takes far too long relative to the distance. Quicker and easier connections between some of our towns – Hastings, Bexhill and Rye in particular – and major centres in London as well as potential trip attractors such as Ebbsfleet Garden City and the proposed Paramount Park – will boost the appeal of our communities as places to live, to invest in, work and to visit. This will be key to tackling the social problems and deprivation issues which are common in coastal towns in the county. In addition, it will improve the opportunities to residents and support the significant investment that has been made in regenerating our coastal communities over the last 10 – 15 years and we would recommend needs further investment and support in a post Brexit environment and in support of the Governments proposed Industrial Strategy.
- As a means of delivering improved journey times to London – one of the Route Studies conditional outputs - as well as supporting growth and regeneration in East Sussex and beyond our boundaries, the County Council strongly supports the extension of High Speed services from London to Hastings, Bexhill and Eastbourne, alongside Rother, Hastings and Eastbourne Councils, the local Mps, the Local Enterprise Partnerships and the local business communities. This project also has the support of Kent County Council.
- Network Rail undertook an in-house review in 2013 on how the rail service to Bexhill and Hastings could be improved. This initial

A Class 395 unit at Hastings - this time on a UK Railtour's excursion



work identified that there was potentially a good business case for electrifying the Marshlink line between Hastings and Ashford and running high speed rail services to Bexhill and Hastings. It would provide significant journey time savings with the journey between St Pancras and Hastings via the High Speed 1 rail link being reduced from 91 minutes to 68 minutes

- To support this technical work, East Sussex, Hastings and Rother on behalf of the Hastings & Rother Taskforce appointed consultants Mott MacDonald to undertake a study to identify whether a strategic economic case existed for extending the high speed rail Javelin services from London St Pancras (HS1) to Hastings and Bexhill.
- The report was published in October 2015 and identified that running high speed rail services will be a real game changer for

the Bexhill/Hastings area and has the potential to ‘super charge’ the local economy and generate £354m of economic and regenerative benefits to the local area by 2044. In addition, it would support the delivery of the over 7,000 new homes and 160,000sqm of employment space set out in the Hastings and Rother Local Plans. It also identified that increased business investment and growth in Hastings and Bexhill will improve the image and perception of the area as a business location and increase the attractiveness of the area as a place to live and work. A copy of the report has been previously provided to Network Rail and is also available on the County Council website at: <https://www.eastsussex.gov.uk/roadsandtransport/roads/roadschemes/bexhill-hastings-high-speed-rail/>

- Along with Hastings Borough Council, Rother District Council, and Eastbourne Borough Council, we are the process of updating



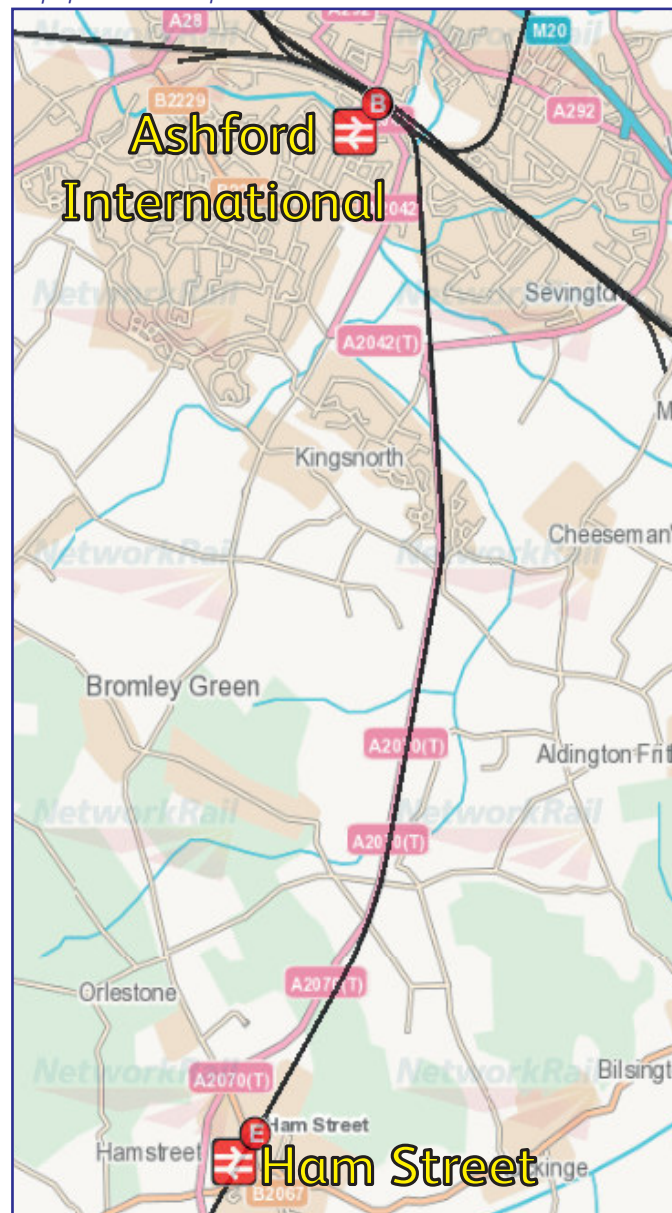
## 1.4 High Speed & Marshlink

this study which will also take into account the wider economic benefits of running high speed rail services into Eastbourne, which is one of the options identified in the Kent Route Study.

- Therefore we are pleased that in [sections 32 and 33] of the Route Study's Executive Summary note the stakeholder ambitions for upgrades to the Marshlink line between Ashford and Hastings, and that the benefits that HS1 connections to Hastings could bring – reduced journey times and additional capacity between Hastings and London – have been recognised. However, we would want the final Route study to also recognise the reduced journey time and capacity improvements that high speed rail in East Sussex would also have to Bexhill, which would equally see a significant reduction in journey times to London compared to existing journey times either via the Marshlink or the East Coastway/Brighton mainline, and Eastbourne.
- We are also supportive of the option to run high speed trains into Platform 2 at Ashford International Rail Station and the provision of crossovers (at an estimated cost of £15 – 35m) which would provide access from the Marshlink to the high speed line. Of the options put forward, this would be the most cost effective and deliverable solution.
- Turning to the East Sussex County/Rother District and Hastings Borough Councils sponsored-study undertaken by Mott McDonald, this in 2015 proved the Business Case. However this is perceived to have been based on a particularly conservative remit, when extension of the London St Pancras High Speed services via Ashford (HS1) through from Hastings to Bexhill and to Eastbourne promise improved potential operations and the prospect of the Javelin High Speed effect benefits that have been transforming those services into and out of Kent to the Capital.

1.4.3.3. Beaming responded: "I wish to express my support for the proposal to extend HS1 via Ashford along the Marshlink line to Hastings, where I live and run a company. High speed trains to Hastings will support the economic regeneration of the area and enhance the lives of those who live in the area, and also those who may wish to visit. As a business owner for a company that delivers services across the UK, it will allow staff to travel to meet customers

Map of Marshlink -Ashford International to Ham Street



and for customers to visit our offices in a more comfortable and efficient way, which will help our growth and with it the numbers of people we employ. We will also be able to attract qualified staff from further afield. It will also benefit those in Hastings culturally by extending the opportunities to visit the capital."

1.4.3.4. St Leonards & Hastings Rail Improvement (SHRIMP) pointed out that "The most important point is our total support for the extension of HS1 services from St Pancras Int'l (via Ashford Int'l) to Rye, Hastings, Bexhill. It could potentially continue to Eastbourne for ease of operation and lack of extra infrastructure requirements.

- This faster connectivity would be highly beneficial to the regeneration of the area, notably Hastings which is one of the poorest towns in England (reportedly only second behind Blackpool).
- A reduction in journey time of 30mins (from an existing 2hr journey) is clearly something to be encouraged.

1.4.3.5. The Marshlink Action Group (MLAG) explained that "Rye, and its surrounding communities, is a socially deprived area, with local jobs largely dependent on the season, particularly tourism and farming. We will leave it to other respondents with more detailed data to enlarge on the socio-economic aspects of this corner of the UK. It is worthy of note that there has been a noticeable increase in commuter numbers in Rye since the introduction of the Javelin service."

- The road transport system of East Sussex is predominantly radial, directed towards London: but from Rye the train service is, effectively, east-west. The current Javelin service from Ashford has already improved the speed of travel to and from London by train and weaned some travellers away from cars and rail-heading. However, with the railway operating on single track for most of the Ashford – Hastings section of the line only an hourly service on the MarshLink is possible and a major cause of complaint by passengers. It also means that the timing of connections is fraught with problems when trains run late.
- A direct Javelin service to London (particularly to St. Pancras with its many onward connections) would improve travel for these passengers and, potentially, induce inward investment.

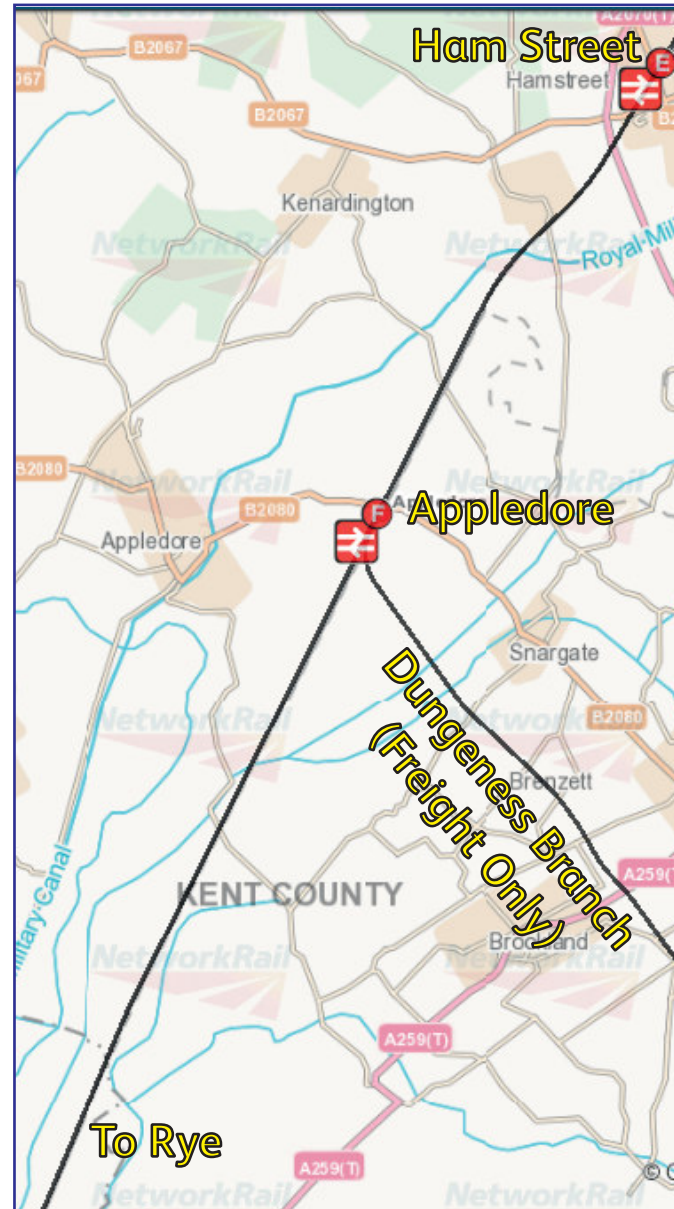
## 1.4 High Speed & Marshlink

- Two of MLAG's Objectives are:
  - to obtain a direct train service to London
  - to obtain two trains per hour along the line.
- The investment in the MarshLink High Speed infrastructure as presented in the Study and the Technical Appendix would bring these Objectives within reach. - MLAG
- MLAG is wholly supportive of the issues described in the Study, in particular:
  - to increase line speeds along the MarshLink;
  - to create a path from the MarshLink to HS1; and
  - to introduce a Javelin service, extending the London St. Pancras to Ashford service to Rye, Hastings and Bexhill (and, indeed, Eastbourne if feasible). This repeats our support given in our response to the South Eastern Franchise Public Consultation.
- MLAG also strongly commends the proposed "incremental approach" referred to in [\[section 9.1.7\]](#) of the Study's Technical Appendix. We trust the line speed improvements along the MarshLink can be undertaken at the earliest opportunity to enable the MarshLink line to develop even before any Javelin service can be introduced. In this regard we would point out that the current track only permits one train per hour but the infrastructure improvements would permit two trains per hour.

1.4.3.6. The East Sussex Rail Alliance "totally supports the extension of the proposal for High Speed services to and from St Pancras to the South Coast – and the major upgrade of track and signalling that is required at and from Ashford to Hastings and onwards." The reasons for support are:

- 1. Need to uplift time performance of trains serving the East Coastway out of the Victorian era to match the increasing demands for improved productivity. The Capital is just linear 70 miles from the Coast. A one-hour journey time seems a reasonable goal

Map of Marshlink -Ham Street to Appledore



- 2. More efficient and reliable Coast to Capital services will encourage the relief of the overstressed commercial and residential housing by encouraging the Capital workforce to consider the improved life-style value of the attractions of the Coastal environment
- 3. Faster services will give confidence that the South Coast is a serious development area for regeneration, enabling the developing employment prospects and tackling areas of deprivation
- 4. Crucial alternative access to the Capital from the Coast in the event of partial or total closure of either of the two current main routes – Brighton-London or Hastings-London
- 5. This rail development must be delivered earlier than projected in its entirety and by mid 2020s at the latest – to ensure that the next major projects (Victoria, East Croydon, Clapham Junction) do not compete with the current London Bridge mega scheme for the title of the most disruptive of the lives of the commuters and other passengers. While the funding has to be raised outside the Network Rail remit, ESRA presses that organisation to give immediate assurance of the earliest start to planning of the MarshLink upgrade will follow on from the start already made on the track and signalling capacity works at Ashford International
- 6. The London St Pancras via Ashford services to the South Coast through Hastings should initially reverse at Eastbourne to ensure optimum operability and to cope with Javelin effect growth.

1.4.3.7. Highways England "would be supportive of plans that facilitated the removal of level crossings on the A259 between Rye and Brenzett. It is possible that the realignment of the A259 could remove the need for the Crossings, but it should be noted that Highways England have no current plans or resources to lead on such proposals".

1.4.3.8. Hastings Borough Council "support Network Rail's aspiration to close as many level crossings as possible and are happy to work with the rail industry to achieve this wherever possible. Closing level crossings would improve both road and rail safety, as well as reducing journey times".



## 1.4 High Speed & Marshlink

1.4.3.9. Ashford Borough Council “strongly supports the proposed extension of High Speed services to Hastings and Bexhill via Ashford and Rye.” The principal reasons for this strong support are:

- To generate growth in East Kent and East Sussex (as part of a wider increase in High Speed service levels across the network)
- To deliver additional High Speed capacity to Ashford, as well as to Rye, Hastings and Bexhill in East Sussex
- To relieve capacity constraints on the Tonbridge – Hastings route

1.4.3.10. Ashford Borough Council continued: “Improving connectivity to destinations within and beyond the county, including partnership working to support connectivity to International Services through Ashford International, and delivery of the proposed extension of High Speed services to Hastings and Bexhill via Ashford International and Rye.”

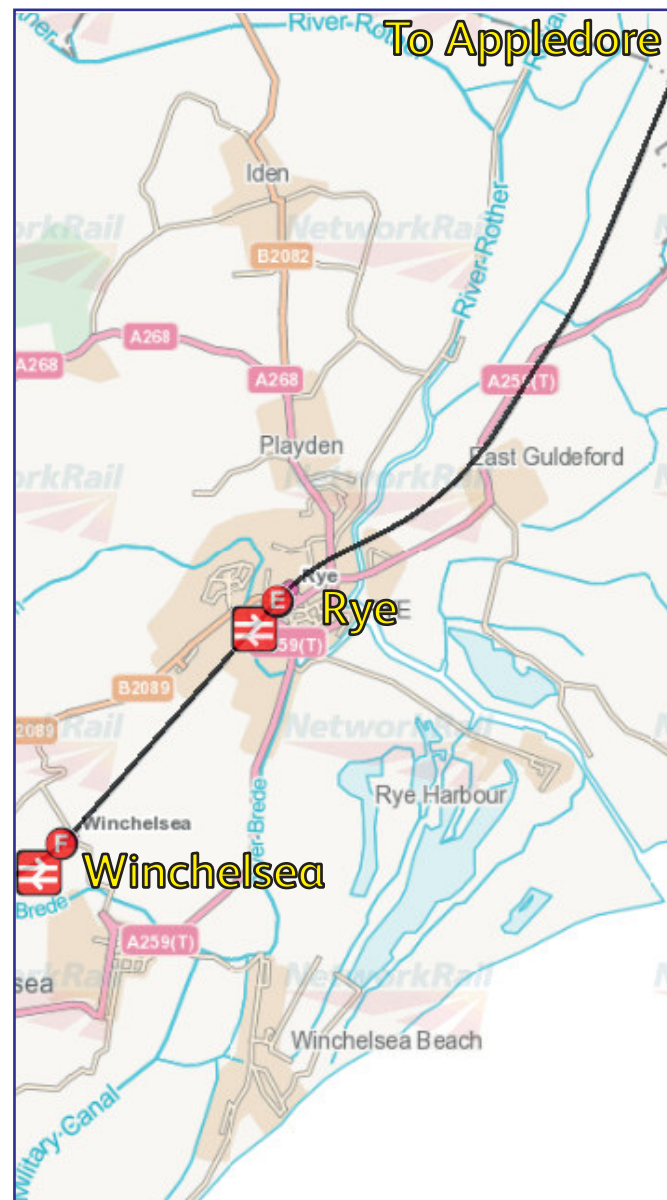
- The Council therefore fully supports the proposals set out in the draft Kent Route Study for Control Period 6 (CP6: 2019-2024), with the prioritisation of the Marshlink improvements to include:
  - i. New connection at Ashford International that allows trains from HS1 to access the Marshlink line
  - ii. Electrification of the MarshLink line from Ashford to Ore
  - iii. Journey time improvements and/or redoubling of the route

1.4.3.11. Wealden District Council also offered their support.

### 1.4.4 High Speed to Bexhill

1.4.4.1. The head of Beaming explained: “As a resident of Hastings, and if the high speed line were to be extended to Bexhill, there would be huge benefit to the tourism industry locally and knowing that Hastings already has a vibrant culture, I will be cheeky enough to say that it will benefit the rest of the UK as people will be able to visit the cultural attractions in Hastings and Bexhill and the wonderful coastal environment, which I get to enjoy every day. With the poor air quality in London, it would not be too much of a leap to say that the health of Londoners will benefit from having quicker access to Hastings so that they can take day trips or enjoy longer stays for the clean air. I have friends visiting for this reason already. Whatever the reason for the visit, I really do believe that it would be beneficial for people to be able to arrive in Hastings from

Map of Marshlink -Appledore to Winchelsea



London, and vice versa, via a comfortable and efficient direct high speed railway service. For this reason, I fully support the proposal to extend HS1 from Ashford.”

1.4.4.2. BRAG “strongly supports the project, but notes with some concern from the Strategy document that the timescale may now have slipped as far back as 2044. This is far too long, and effectively meaningless if so. The project should be delivered within the next 10 years at the outside.”

- BRAG supports all necessary infrastructure upgrades to enable the project to be delivered.

1.4.4.3. Kent and Medway Economic Partnership stated: “We call for the extension of High Speed services from London to Hastings, Bexhill and Rye via Ashford. Our view is that there should be 1 train per hour High Speed Service to Rye and Hastings (via Ashford) subject to infrastructure availability.”

1.4.4.4. Wealden District Council also offered their support.

### 1.4.5 High Speed to Eastbourne

1.4.5.1. East Sussex County Council explained that “There are positives and negatives for each option, such as compatible infrastructure, number of passengers served, timetabling issues, carriage requirements etc. In terms of terminating services at Bexhill, this is not a practical option due to the infrastructure constraints and timetabling impacts of terminating services there. Whilst Hastings is a termini for existing services and has the necessary infrastructure to enable high speed services to terminate there, to do so would result in such services not running to St Leonards and Bexhill. Therefore, on balance, we would want to see high speed rail services terminating at Eastbourne – which is a natural termini for rail services and has level access for interchange with other onward services - and thereby provide a service that stops at Rye, Hastings, St Leonards and Bexhill.”

1.4.5.2. Eastbourne Chamber of Commerce stated that it “would like it to be known that we fully support a fast train service from London to Bexhill via Ashford and Hastings. We would also like this fast train extended to Eastbourne to speed up travel between Ashford and Eastbourne in order to improve access to the continent.”

## 1.4 High Speed & Marshlink

- Coastal communities like Eastbourne rely on tourism so any development that speeds up travel and encourages visitors from across Europe will benefit the economy of our town. Eastbourne has twice the number of tourism beds to fill than Hastings and so our economy depends on foreign visitors. Please extend the fast Ashford train to Eastbourne to help improve our visitor economy.

1.4.5.3. BRAG explained “Hitherto, the business case for extension of High-speed services has centred on running through to Bexhill, but BRAG entirely accepts that Eastbourne may prove a more practical operational terminal. This, in conjunction with journey time improvements, could draw additional traffic as well as contributing to operational efficiencies.”

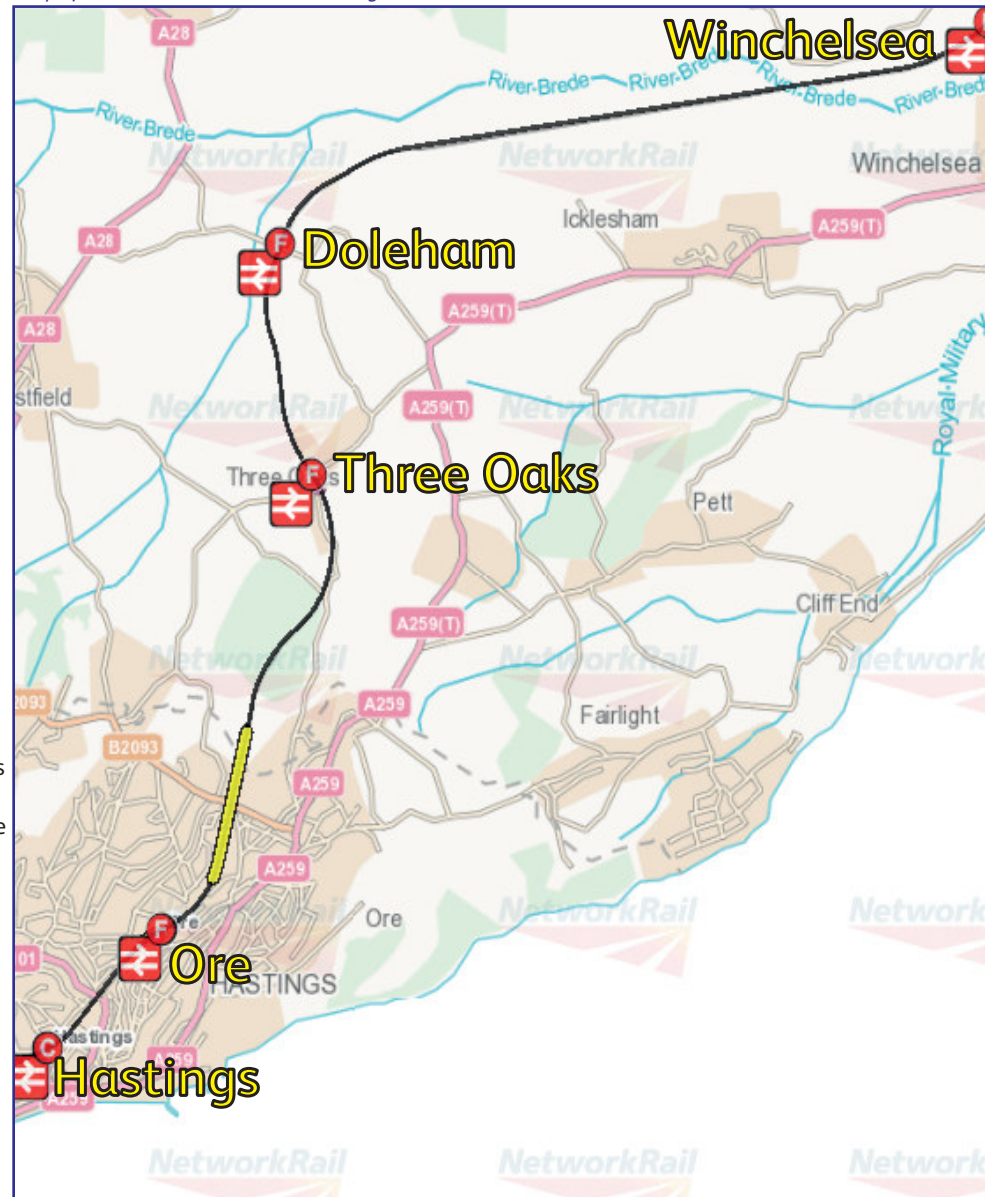
1.4.5.4. London TravelWatch “supports proposals to provide High Speed services to and from Hastings, Bexhill or Eastbourne, as this would provide capacity relief to existing services from these areas to London, and therefore also to areas closer into London such as Orpington, Sevenoaks and Tonbridge.”

### 1.4.6 Marshlink electrification

1.4.6.1. East Sussex County Council explained “The Route Study identifies that the cost of electrification is significant - £250-500m for 25KV AC overhead or £100-250m for 750V DC third rail. The Study therefore identifies that a key decision for funders is whether electrification is pursued or bidders opt for a ‘hybrid’ (electric/self-powered) train and an incremental programme of improvements. This is considered to be the most cost effective way forward”.

- Whilst we recognise that the third rail electrification of the Marshlink line is unlikely to be deliverable in the foreseeable future as a means of enabling high speed rail to run to Rye, Hastings, Bexhill and Eastbourne, we would support any initiatives which would support the further progression of electrification of this route

Map of Marshlink -Winchelsea to Hastings



- Therefore, in the absence of the realistic delivery of Marshlink electrification, we strongly support the provision of bi-mode (electric/diesel or electric/battery) rolling stock to enable high speed rail services to run into East Sussex. The specification (vehicle design, gauge and emissions data) for any electric/diesel high speed rolling stock should meet the necessary health and safety requirements for the standard vehicle introduction and certification process to enable the trains to run through the tunnels in East London on the approaches to St Pancras International station
- The introduction of new bi-mode rolling stock would need to be coupled with the improvements to the infrastructure on the Marshlink to increase line speeds and improvements at Ashford International station to enable trains to access the High Speed 1 rail link from the Marshlink line
- The Route Study highlights that there is a long term aspiration to convert the 750V DC third rail system to 25kV OLE but this has not been analysed further as it is ‘outside the scope of the route study’. This is regrettable as we do believe that a more definitive consideration of the electrification of the rail network has a place in this Route Study. Recognition should be made, to where this has been or will be assessed, and why it is not an option for consideration at this stage.

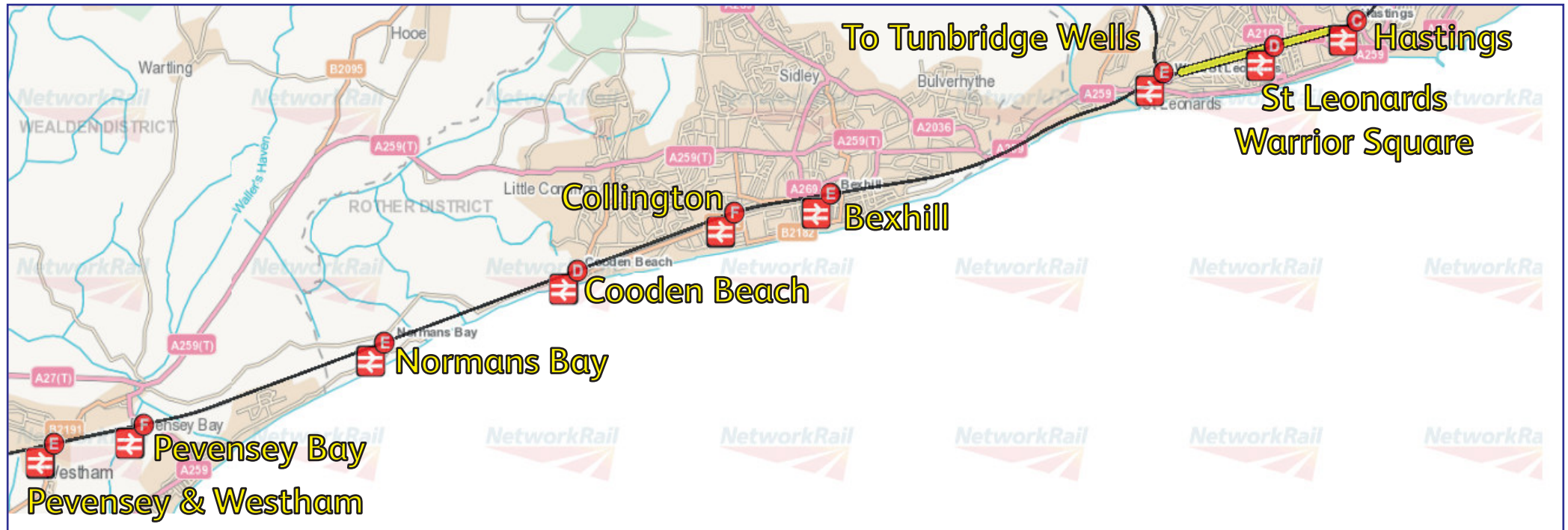
1.4.6.2. The Campaign to Protect Rural England noted that “The diversity of both electrical and signalling systems is clearly an issue, and we recognise that the appropriate upgrading should be carried out whenever possible, and especially as part of maintenance or other upgrading work.”

1.4.6.3. Smart Property Solutions highlighted that “There is a huge need for improvements to infrastructure in and around Hastings. We have quite simply felt left out by previous Governments and Companies that have made promises before to reduce



## 1.4 High Speed & Marshlink

Map of East Sussex Coastway - Hastings to Pevensey & Westham



the 65 mile journey from 100 -110 minutes, (an average 24-31 miles per hour). We still face overcrowding, delays, strikes, leaves on the line and goodness knows what else and commuters are questioning whether they are getting good value for money.

- I am sure that a quicker route would cost more, but a more reliable and faster service would benefit everyone on so many levels. I welcome the proposals and fully support this much needed venture.

1.4.6.4. BRAG's "preferred mode of power is either 750V DC Third Rail, or 25KV AC overhead electric power. One is cheaper and faster to deliver, while the latter may prove more congruent with national strategy in the longer term. BRAG is open-minded, but nevertheless sceptical, about suggestions of bi-mode or battery power being used for a number of reasons, but principally the need for a separate sub-fleet which could make the new service less than

robust. Our preference would be for the extended service to be operated by a standard and inter-operable fleet on the whole of the greater Southeastern High-speed network."

- Electrification would also enable standard Class 377 stock to be used on local services between Ashford and East Coastway destinations.

1.4.6.5. London TravelWatch "supports the proposal to provide direct services from Hastings to London via Ashford (Kent), including the electrification of the route between Ashford (Kent) and Ore, as this would provide significant passenger benefit (including in the London area)."

1.4.6.6. Kent Country Council "Agree with longer term aspiration to electrify Ashford to Ore, but accept this is now a longer-term strategic goal which is unlikely to be funded in CP6."

1.4.6.7. East Sussex Rail Alliance explained "The challenge is to consider this routing on two levels – first as a commuter route serving the Capital; and second taking account of trans-Region travelling needs along the South Coast to serve the Southern and South East, from Dover/Folkestone to Brighton, Portsmouth and Southampton."

- Of the options offered the only really acceptable is the upgrading the Ashford-Hastings line for 100 miles/hour operation and to complete the original British Rail plan for electrification. While AC overhead line electrification is estimated in the Study to cost more on installation than DC Third rail, the former is the safer option. However, looking long term and using life time costing formula infers that there will be less expensive maintenance (machine track maintenance rather than large labour resources) – and most important of all there will be no concern to use any current dual electric stock – which are less expensive to run,

## 1.4 High Speed & Marshlink

maintain and to deliver impressive reliability – as demonstrated by the Hitachi support on the main High Speed lines operated by SouthEastern. So far, ESRA is unconvinced about the suitability, reliability and flexibility of dedicated bi mode traction on such an intensively used system.

1.4.6.8. Ashford Borough Council stated that “The new plans also look to introduce High Speed services from Hastings via Ashford, which is very much welcomed. As part of these proposals, the Council support the full electrification of this line between Ashford and Ore, which would also have the benefit of reducing the use of diesel trains on the network, improving air quality within the Borough. Through this new delivery, Ashford Borough Council would like to see a similar level of service maintained both in terms of frequency and quality for stations such as Ham Street and Appledore which will not be covered by these new High Speed routes.”

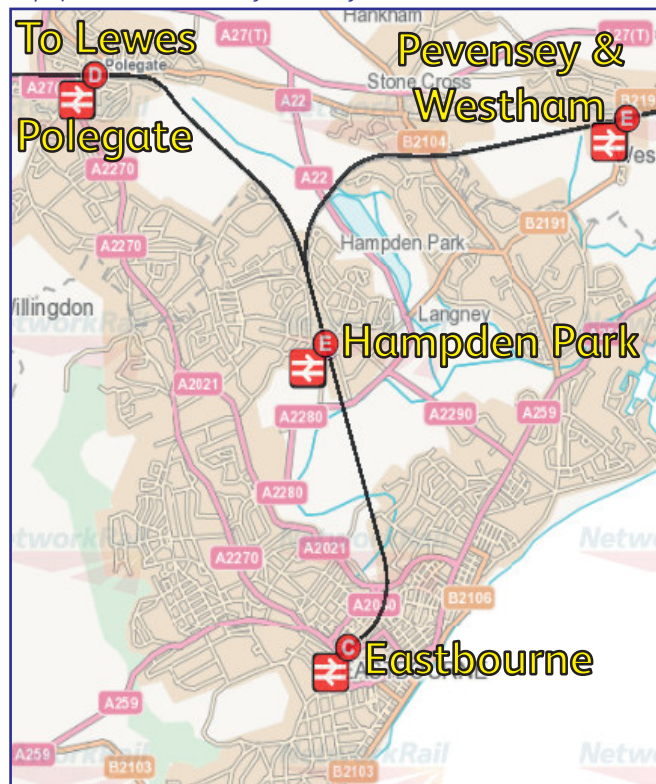
1.4.6.9. The Kent and Medway Economic Partnership “supports the establishment of a new connection at Ashford International that allows trains from High Speed 1 to access the Marshlink line. We also agree the MarshLink line from Ashford to Ore should be electrified”.

1.4.6.10. However, the Thames Gateway Kent Partnership was more cautious: “Given rolling stock and performance constraints, extending the HS1 network to cover this route could exacerbate capacity problems and service reliability further up the line. We would not be opposed to the upgrade provided this did not impact negatively on HS1 services in North Kent; but chapter 5 seems to indicate that other incremental measures might be more cost-effective”.

### 1.4.7 Bi-mode High Speed rolling stock

1.4.7.1. Wealden District Council explained that “In the absence of the realistic delivery of Marshlink electrification, we strongly support the provision of bi-mode (electric/diesel or electric/battery) rolling stock to enable high speed rail services to run into East Sussex. The introduction of new bi-mode rolling stock would need to be coupled with the need for improvements to the infrastructure on the Marshlink to increase line speeds and improvements at Ashford International station to enable trains to access the High Speed 1 rail link from the Marshlink line.”

Map of East Sussex Coastway - Pevensey & Westham to Eastbourne



### 1.4.8 Linespeed Improvements - Marshlink

1.4.8.1. Southeastern explained that “This line of route must be electrified. Bi-mode vehicles are unable to operate on the HS1 network, specifically at the London Tunnels.”

- Network Rail High Speed has confirmed that bi-mode trains would be able to run into St Pancras International, this would be authorised as part of the formal introduction of new rolling stock to the line.

1.4.8.2. East Sussex County Council are “pleased to note that further work is proposed to assess raising the line speed between Ashford and Appledore to 90mph from around 60mph.”

- Undertaking works to upgrade the line to enable raising the ‘plain line’ section of track between Appledore Jcn and Rye to 90mph from 20-60mph is fully supported. An alternative scheme to double track this section of the line is also supported and is our preferred option, although we recognise the additional costs associated with this proposal.
- We would support the proposal to increase platform length at Rye Station to accommodate 6-car trains.
- [9.5.20] discusses the need for the level crossing issue at Winchelsea to be addressed. Redoubling of the line between Rye and Winchelsea would require the upgrade of the level crossing at Winchelsea. This proposal is supported.
- There are two options for the Doleham-Ore section of the line - redoubling and/or line speed improvements. The route study highlights the need for further work to assess these options and we would support any efforts to progress this work.

1.4.8.3. Ore Transport Group “would request that the line speed improvement works between Ore and Doleham be carried out as soon as possible since this would lead to shorter journey times at very little cost.”

1.4.8.4. The Campaign to Protect Rural England “support the proposed option to improve line speeds to give incremental improvements at an earlier date than for a complete refit, while ensuring that all improvements and changes work towards the ultimate destination of high speed operation. We note that the incremental improvements would further reduce the total travel time and thus support Hastings connectivity to London as well as all the rural stations en route.”

### 1.4.9 Ashford - Hastings resignalling

1.4.9.1. Kent County Council, East Sussex County Council, East Sussex Rail Alliance, East Sussex Strategic Partnership and the South East Local Enterprise Partnership support the resignalling of the line between Ashford International and Bo-peep Jn. This may be inevitable if one or more single line sections were to be doubled.



## 1.4 High Speed & Marshlink

A view of Ashford International - a Marshlink service waits in Platform 1 on the left, Eurostar's Platforms 3 & 4 and Platforms 5 & 6 on the far right. High Speed services can only access HS1 from Platforms 5 & 6.



### 1.4.10 Marshlink High Speed phasing

1.4.10.1. East Sussex County Council pointed out that “Within the Route Study, there is conflicting information on the timetables for the implementation of high speed rail. The text gives the impression that HS1 services may progress before 2024, with [table 6.6] (option table) in its ‘prioritisation assessment’ stating that ‘additional crossovers to connect St Pancras high speed services to Hastings (including allowing for a 6-car operation of class 395 rolling stock between Hastings and Ashford) should be considered for delivery by 2024’.

- However, table [6.14] seems to contradict this. The table shows that whilst line speed improvement are down as choices for funders by 2024, and power supply enhancements are options for both 2024 and between 2024 and 2044, it will not be until between 2024 and 2044 that more trains, longer trains and platform extension, significant infrastructure enhancement, and berthing siding improvements will be available as ‘choices for funders’
- In ‘next steps’ in the Technical Appendix, [paragraph 9.7.6] states that ‘even if Marshlink High Speed services do not form part of the next South Eastern franchise, the line speed

improvements would still enable the existing service to be improved, allowing house building etc. to be carried out in the meantime, ahead of the next South Eastern franchise, making the business and social case stronger’. This gives the impression that HS1 could come forward before 2024

- We are strongly supportive of the early delivery of the infrastructure (i.e. by 2024) to enable high speed rail services to run in East Sussex however clarity on these apparent contradictions in issue would be appreciated.

1.4.10.2. Given that the ‘options for funders’ are just that, the timeline for phasing is in the hands of the funders. Since the consultation closed, significant progress has been made on the development of the Ashford International Platform 2 to HS1 ladder crossovers.

### 1.4.11 Marshlink High Speed funding

1.4.11.1. East Sussex County Council explained that “There is a significant gap in the funding required to deliver the infrastructure needs in East Sussex and if this infrastructure cannot come forward, then the county cannot grow. From a rail perspective in East Sussex, investment is required to enhance the infrastructure on the Marshlink line and at Ashford International station to enable the

delivery of one of our priorities for supporting economic growth in the county and run high speed trains between St Pancras via the High Speed 1 line and Ashford to Rye, Hastings, Bexhill and Eastbourne.”

- In East Sussex, we have been successful in securing additional funding for transport infrastructure through the Local Growth Fund and will continue to lobby for further Government funding to enable more strategic interventions to be delivered. However, other funding sources such as development contributions (Community Infrastructure Levy/s106 agreements) cannot be expected and will not be able to bridge the funding gap to meet the county’s infrastructure needs. Therefore, greater certainty around longer term levels of funding and enabling innovative funding solutions in the appropriate circumstances would improve the delivery of infrastructure to support growth
- There is recognition that the public sector does not have all the capital funding to provide the required infrastructure. Therefore, private sector investment would be of most benefit in enhancing the infrastructure on the railway albeit the private sector will want to be clear on their return on investment

## 1.4 High Speed & Marshlink

- There are examples of infrastructure investment taking place using slightly different methods. For example, Chiltern Railways were able to upgrade their London to Oxford route as Network Rail provided the capital for the upgrade and they will recover the costs via a facility charge from the current and any subsequent franchises
- In addition, we are aware that the new Department for International Trade (DiT) is, post Brexit, raising the profile of Britain and very much welcome the opportunities for major financial investment from overseas investors and countries in enhancing our rail infrastructure. This must continue to be encouraged to provide the right materials to sell our opportunities to draw in this potential inward investment to support the delivery of infrastructure needs.
- Opportunities for private sector investment in commercial space at rail stations to support the unlocking of homes and jobs, which then enhance the wider economic benefits and lever in Government investment in rail infrastructure, should also be considered.

### 1.4.12 Reintroduction of passenger services to Lydd and Dungeness

1.4.12.1. A member of public suggested “Some modest investment would also make possible the re-introduction of passenger services to Lydd and Dungeness. These could be shuttles to/from Appledore or more extensive. Rail travel opportunities would add to the available labour market in Ashford, Rye and Hastings especially in catering, retail and other zero hours type sectors.”

- Easier access to the area around Dungeness and Lydd would also attract significant visitor numbers to a strange, unique environment.

1.4.12.2. Significant expense would be required to bring the line up to passenger use:

- There are 34 level crossings on the 10-mile line. Almost all of these level crossings are not suitable to passenger trains
- The line speed is very low, particularly over some of the level crossings

- The only station on the line, Lydd Town, has not been served by passenger trains for decades.

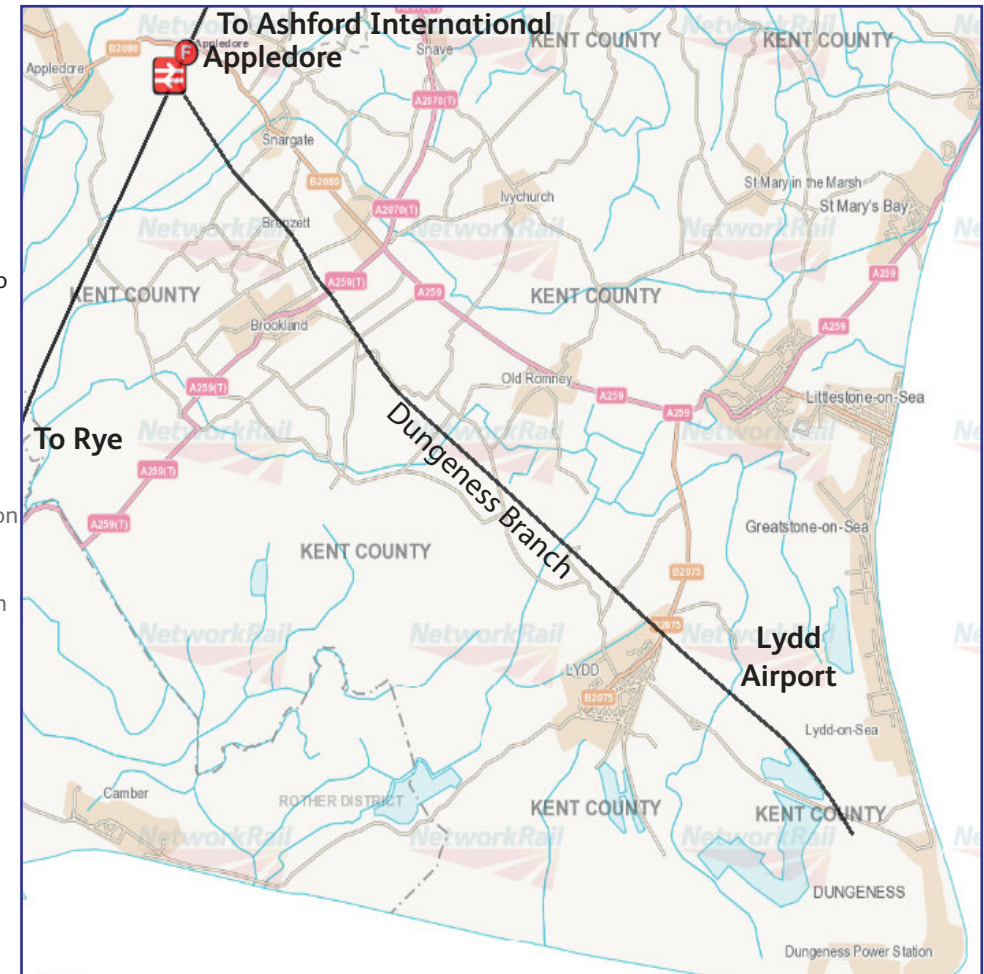
### 1.4.13 Park Farm station

1.4.13.1. Ashford Borough Council called for “The inclusion of a new Park Farm Station on the Marshlink line, subject to the conclusions of the current report into the economic viability of this project.”

1.4.13.2. This new station would be between Ham Street and Ashford International (quite close to the latter).

1.4.13.3. Promoters of the scheme have suggested it could be built as a ‘halt’, however, that would not be acceptable on today’s network and should be constructed as a normal passenger station with a bridge or subway between platforms etc.

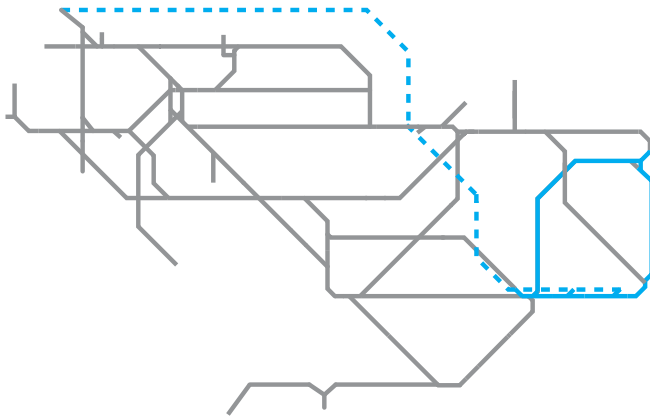
1.4.13.4. Network Rail will continue to work with Ashford Borough Council on options for this location.



Map of the Dungeness Branch



## 1.4 High Speed & Marshlink



## High Speed via Ashford International

### 1.4.14 Ashford International station

1.4.14.1. Ashford Borough Council called for a “Significant upgrade of Ashford International Station and its transport interchanges, providing better integration of this domestic and International station, which facilitates over 3.7million passenger movements a year.”

1.4.14.2. Construction of the ladder crossover to enable High Speed services to use Platform 2 at Ashford International will make the station more flexible and provide the ability to spread the load of departures and arrivals across more platforms.

1.4.14.3. By spreading the load between platforms, this may increase the use of the subway for some passengers whilst reducing it for others. Short connection times increase the risk of passengers running between platforms, particularly between Marshlink and High Speed services in the peak.

1.4.14.4. This would also enable Folkestone High Speed services to cross to the correct lines before arriving at Ashford International, crossing three tracks instead of four at the country-end.



Ashford International subway between Platforms 5 & 6 and 1 & 2.

Platforms 3 & 4 are accessed by a footbridge from the International Terminal at the far end of this subway.

### 1.4.15 12-car 395s via Ashford International

1.4.15.1. Kent County Council explained that: Lengthening existing 6-car to 12-car will not meet the capacity gap alone. KCC has submitted the following plan for an increase in the HS fleet as part of the response to the DfT for the new SERF:

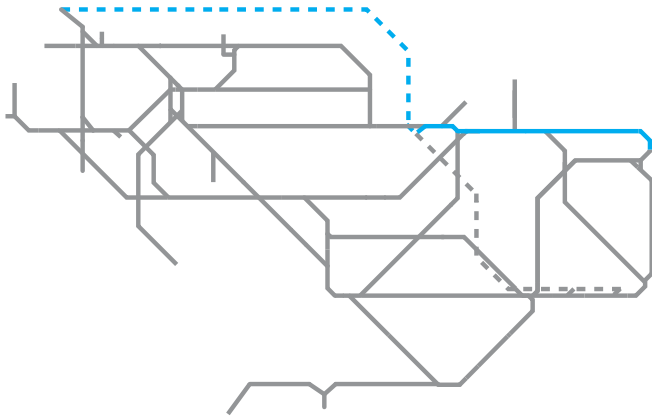
- 12 new 6-car sets for uplift to Ashford / Canterbury / Dover / Maidstone West service
- 3 new 6-car sets for new Ashford / Rye / Hastings service
- 5 new 6-car sets for uplift to Ebbsfleet service\*
- \* this requirement reflects the need for a dedicated service to provide the additional capacity required for the planned housing development at Ebbsfleet Garden City and the proposed leisure park on the Swanscombe peninsula. Both of these developments could also be served by the proposed extension of Crossrail (Elizabeth Line) to Ebbsfleet.
- Total: 20 new 6-car sets (includes operational spares)

- This is substantially greater than the 6 sets proposed in the draft KARS, as the KCC response envisages a strategic increase in both peak (all 6-car to 12-car) and off-peak (doubling existing headways) HS services. The total also responds to planned growth in demand at Ebbsfleet as indicated above.

1.4.15.2. Ashford Borough Council called for “The provision of greater capacity (on both the High Speed and Mainline services), to cater for increasing demand and the growth of the town, as well as dealing with current poorer standards of satisfaction through passengers standing for unacceptably long periods of journeys.”

- Delivering higher quality and additional rolling stock (on both the High Speed and mainline services) will help to provide a better quality, more reliable service, and help deliver greater capacity.

## 1.4 High Speed & Marshlink

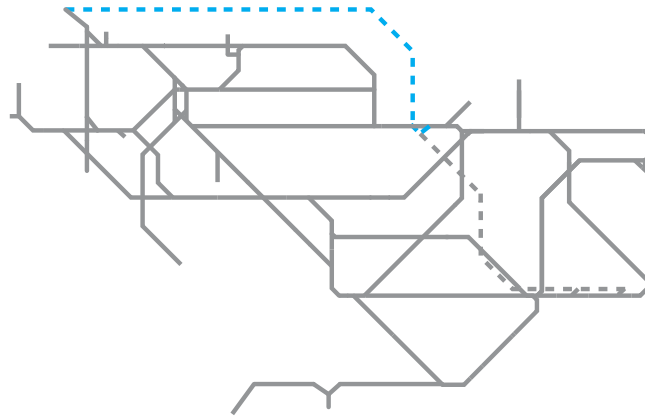


### High Speed via Medway Towns

#### 1.4.16 12-car 395s to Maidstone West

1.4.16.1. Kent County Council confirmed that “The consultation correctly identifies the current and future projected growth rate of 5% pa in passenger journeys on all the High Speed services operating on the Kent Route. KCC has already recognised the need for a significant increase in the High Speed fleet [KCC response to Q3 in DfT consultation on new SERF], and supports the proposed enhancement in platform capacity at Maidstone West which would permit 12-car operation of High Speed trains on that route.”

1.4.16.2. Kent and Medway Economic Partnership “would ask that all [platforms] on the High Speed Network are extended so they can accommodate the 12-car trains. In particular, we ask for the platforms at Maidstone West to be extended.”



### Ebbsfleet International to London St Pancras International

#### 1.4.17 Ebbsfleet Southern Link

1.4.17.1. Bean Residents Association and Southfleet Parish Council were concerned that the scheme about to start, whereas, it was just a suggestion in the Draft for Consultation without detailed development. Network Rail has since been working with partners involved with the Ebbsfleet Garden City and the London Resort Theme Park but the scheme is very much ‘just an idea’.

1.4.17.2. London TravelWatch “would support any proposal to reuse the rail link from Farningham Road to Ebbsfleet International.”

1.4.17.3. Dartford Borough Council “supports further exploration of the “Ebbsfleet Southern Link” option to promote connectivity in the Borough, as addition to work in support of potential Crossrail extension (both schemes will review improve interchange in the Ebbsfleet or Northfleet area).”

1.4.17.4. Kent County Council “supports a new link between South London and Ebbsfleet utilising the former Gravesend West branch line (formerly used by Eurostar services to/from Waterloo). This would be an intelligent use of existing resources and railway alignment, and could potentially deliver much needed additional

capacity to serve the emerging Ebbsfleet Garden City and the proposed London Resort Theme Park.”

1.4.17.5. London Resort Holdings “are supportive of further work to examine the role that the proposed Ebbsfleet southern link might have. It will provide access into the London Resort from parts of south London, and has the potential to provide improved access from Gatwick.”

- It is clearly important to ensure that the infrastructure proposals at Ebbsfleet International do not conflict with the station operations and proposed developments to support either the EDC or the London Resort around the station. There are a multitude of options and we would be pleased to discuss these in more detail in the coming months and years, as our plans are committed.

1.4.17.6. Kent and Medway Economic Partnership “supports the development of an Ebbsfleet Southern Link, and would call for this to be delivered in the near future, rather than to the longer timeframe of 2044. This would provide an essential link between South London and the developing Ebbsfleet Garden City and the proposed London Resort Theme Park on Swanscombe peninsula. Ebbsfleet Garden City is being built out now, and the Theme Park is due to announce a stakeholder consultation in September, and hence more immediate delivery is required.”



## 1.4 High Speed & Marshlink

A marketing suite at Ebbsfleet Garden City



1.4.17.7. Ebbsfleet Investment General Partners “is fully supportive of the proposals to create a new Ebbsfleet Southern Link, which will assist in the future growth of the Ebbsfleet Garden City. – Ebbsfleet Investment General Partners”

- It is understood that Option 1 would comprise an at-grade connection with new platforms at the location of an existing car park alongside the existing lines. It is understood that Option 2 would comprise an underground link into the existing subterranean High Speed 1 station and platforms. EIGP wishes to raise concerns regarding both of these options and the significant associated disruption which would be caused by the

land take required. This would have significant implications in relation to the developable area within EIGP’s land and therefore the ability for EIGP to deliver the extant planning permission. This would therefore have the effect of frustrating and potentially limiting the delivery of housing and employment growth at this key site within the Garden City. In addition to the above, Network Rail will be aware of proposals for the Nationally Significant Infrastructure Project on the Swanscombe Peninsular, a Development Consent Order for which is expected to be submitted in November 2017. This will introduce significant development, largely comprising a new theme park and

associated supporting uses, such as hotels, retail and leisure, as well as a new access road, which may potentially run parallel and adjacent to the existing High Speed 1 line. This obviously has implications for land take and interactions with Ebbsfleet International station, which may make a new high speed connection with Ebbsfleet International unfeasible.

1.4.17.8. Whilst the London Borough of Bexley responded that “The Council would oppose this proposal if it resulted in any conflict at Ebbsfleet with provision for C2G. We would not wish to see this proposal promoted and funded at the expense of successfully delivering C2G [Crossrail towards Gravesend]”.



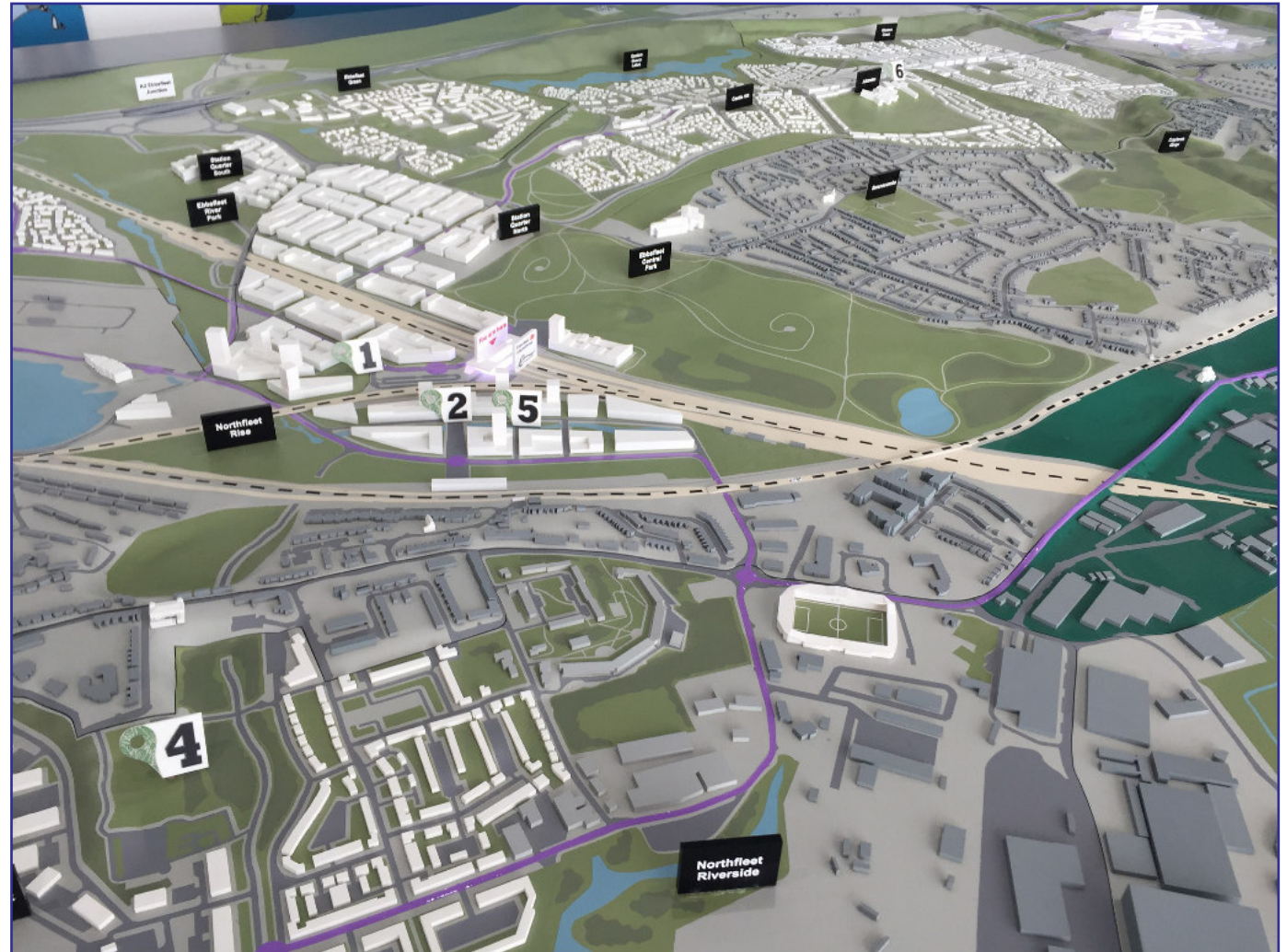
## 1.4 High Speed & Marshlink

### 1.4.18 Ebbsfleet Garden City

1.4.18.1. Dartford Borough Council explained that: The EDC [Ebbsfleet Development Corporation] held a well-attended (Spring) 2017 Rail Summit, whereby we highlighted priorities within three overarching themes with respect to improving rail infrastructure that would be fit for purpose and better able to support future housing and employment growth across Kent Thameside. These comprise:

- 1) Capacity... addressing the challenge of passenger demand and supply via:
  - Adding additional carriages to lengthen trains and provide urgently needed capacity
  - Encouraging Network Rail to drive forward projects to deliver the capacity required after 2024
  - Offering strong support for the Crossrail extension to Ebbsfleet to provide additional capacity
  - The need to take account of the full build out of the Garden City in the Network Rail work.
- 2) Connectivity... how new routes might support Ebbsfleet Garden City whilst simultaneously improving frequency of existing services via:
  - Strong support by The EDC for the extension of Crossrail to Ebbsfleet to provide additional capacity
  - Supporting Network Rail's vision of a new route from London Victoria to Ebbsfleet International - subject to a future master-planning exercise with the Ebbsfleet Central development and NSIP Theme Park development."
- 3) Interchange... Improving the travel experience and facilitating a seamless journey experience via:
  - Network Rail to engage with the EDC to develop the potential of Ebbsfleet International Station as a Regional Transport Interchange;
  - Supporting wider proposals on services and stations in the vicinity of Ebbsfleet to ensure that these remain attractive propositions for commuters e.g. Dartford."

*Ebbsfleet International houses a great model of the area and planned development - the station itself is above numbers 2 & 5, Northfleet is below*



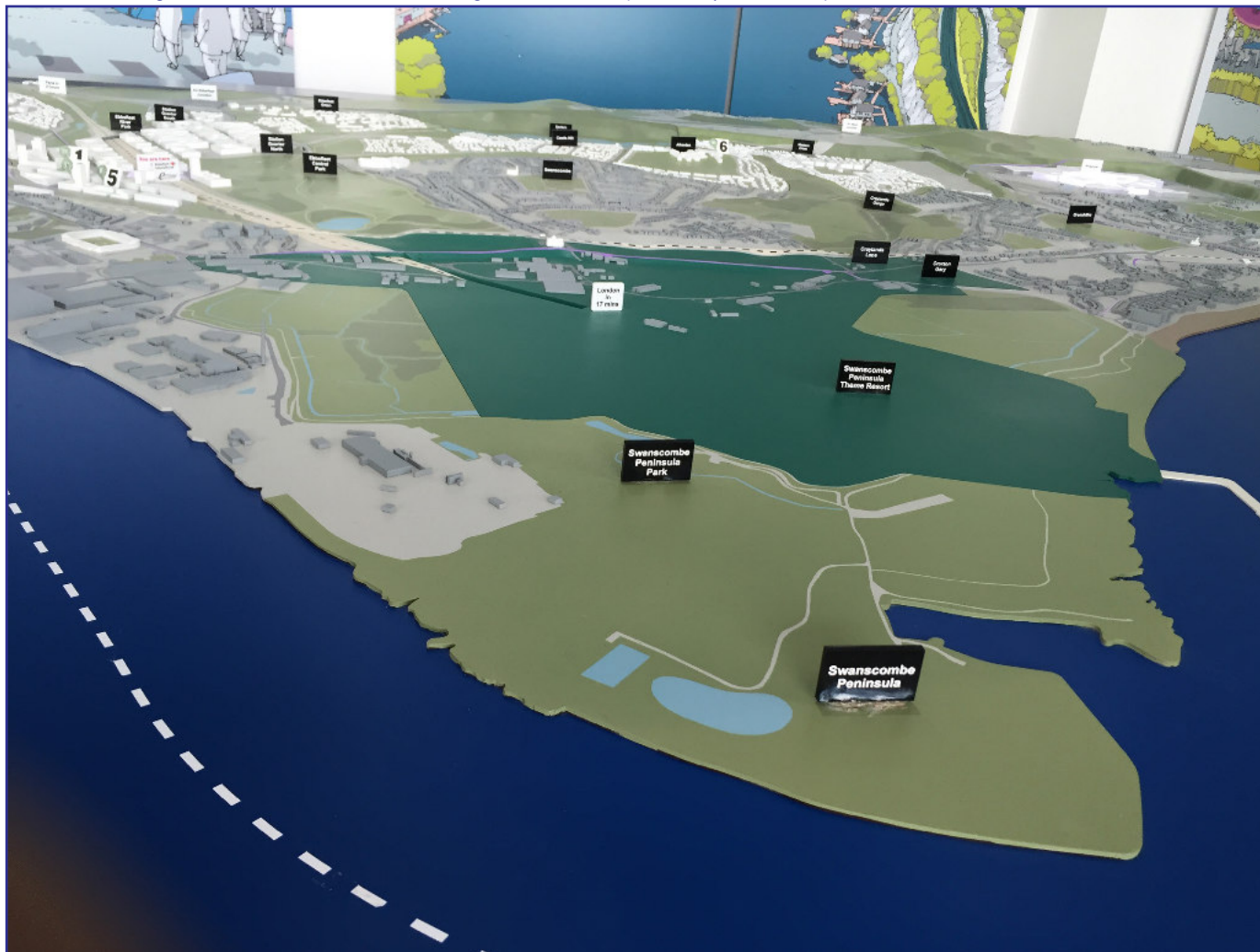
- Only the third of the scenarios briefly outlined for Ebbsfleet [4.10.16] is considered tenable, resulting in increased demand for travel to London. Ebbsfleet residents will not all work locally, not least given the profile of local job provision and the price of the brand new homes been provided. It is equally unreasonable to

assume Ebbsfleet jobs all be of a type that they will be wholly filled by people in Kent substituting employment there for their current London job.



### 1.4 High Speed & Marshlink

*The model showing the Swanscombe Peninsula - the dark green area is identified as the potential site for the London Resort Theme Park*



1.4.18.2. London Resort Holdings “support the introduction of more high speed domestic services. Our view is that the service has exceeded all expectations since its opening nearly a decade ago, but that High Speed 1 is an underutilised asset, both by international and domestic services.”

- Accommodating the level of rail demand to Ebbsfleet International described above benefits greatly from the fact that it is not coincident with peak period demand and direction; in other words, the peak demand to the London Resort is from London from 0930, and the evening peak is back to London from

about 2000. Such demand will enable the operator to grow its off-peak revenues substantially by filling what would otherwise likely be unused capacity on the trains, and supporting the overall provision of additional rolling stock whose prime purpose would be to accommodate the very substantially-loaded London peak services

- The peak days of the year – not represented in the graph above - at the London Resort are all at weekends or bank holidays, when the railway primarily serves a leisure and not a commuter function
- We recognise that the current train service between Ebbsfleet International and St Pancras however does not have the capacity to transport this number of additional people, even in the off-peak period. Some trains may therefore need to be double-formed to provide 12 cars instead of 6, and additional services will be necessary at some times of the day
- Indeed, the development of Ebbsfleet Garden City and the proposals for Southeastern high-speed services to operate to and from Hastings, along with the substantial increases in demand across the franchise which High Speed 1 services are probably best placed to address, are highly likely to generate the need for additional rolling stock of a similar or identical design to the existing Class 395 units. In any order for new trains (or options for a subsequent order), we would urge that the implications of demand to and from the London Resort are taken into account so that the most cost-effective solution for the entire franchise can be identified and delivered
- We see the proposals for additional High Speed 1 services to Maidstone, Hastings, and the strengthening required between Ebbsfleet International and London to support the London Resort and the Ebbsfleet Development Corporation as entirely complementary
- We submit however that the presence of the London Resort will be of benefit to the railway's sustainability as a whole, for it will allow the deployment of trains which might otherwise only operate a few peak-hour trains in each direction per day.

## 1.4 High Speed & Marshlink

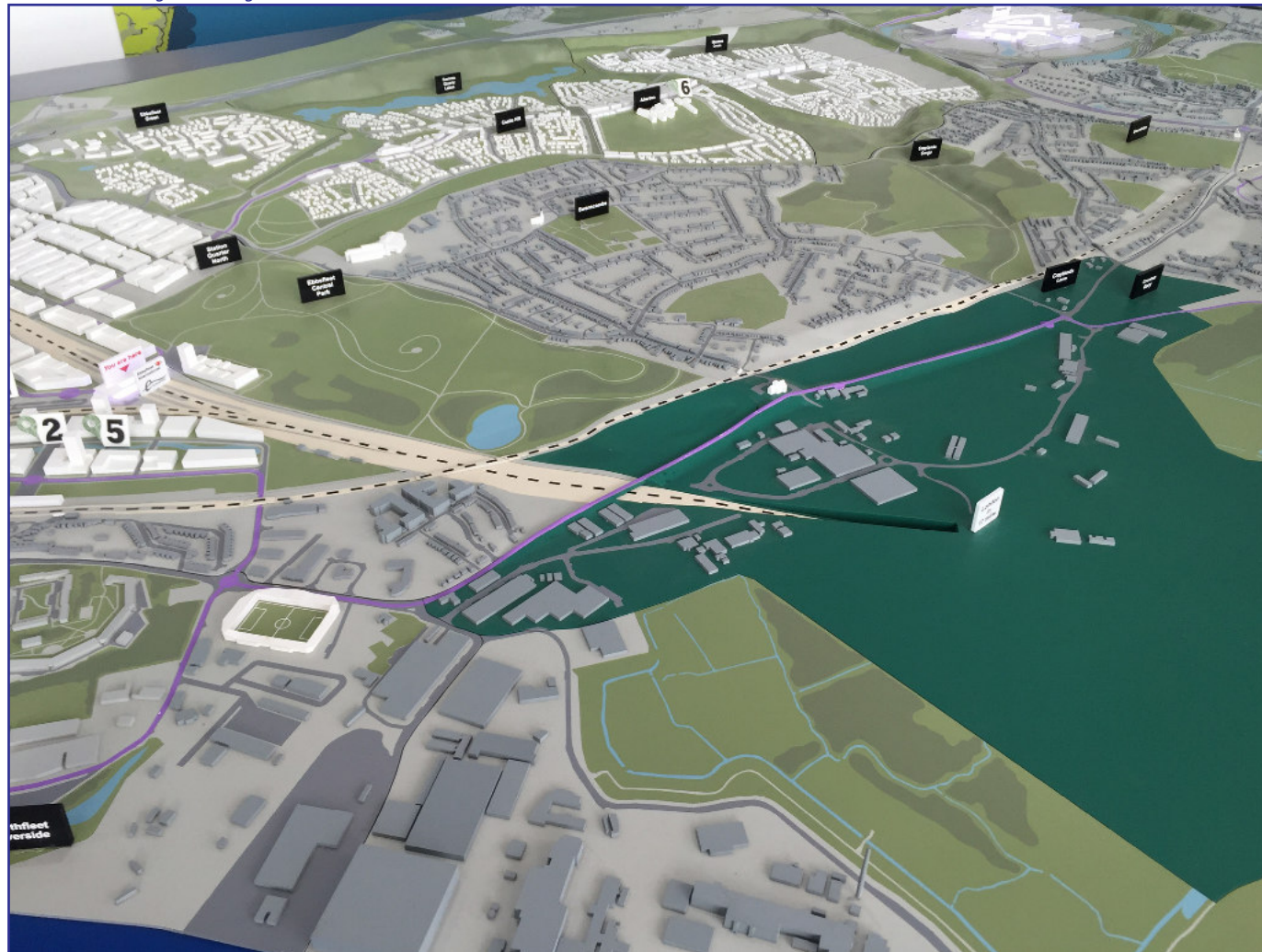
1.4.18.3. CBRE explained that it “acts as planning agent to Land Securities, part of (EIGP), which has significant land holding around Ebbsfleet International Railway Station. Associated with this land holding is extant planning permission for approximately 800,000sq m of mixed-use development, including up to 3,384 new homes and associated community and social infrastructure. EIGP is committed to the ongoing delivery of mixed use development in this location, working with the Ebbsfleet Development Corporation (EDC) to realise the aspirations of the Ebbsfleet Garden City in this location. EIGP endorses the proactive measures being undertaken by Network Rail to set out the strategic vision for the future of this vital part of the rail network over the next 30 years. As noted on Page 4 of the consultation document: “The Kent Route Study, presented here in draft for consultation, seeks to identify the capacity requirements in the medium and long term to allow the railway to play its part in delivering economic growth, in addition to improving the connections between people and jobs, and between business and markets.” EIGP’s landholdings represent a significant part of the Ebbsfleet Garden City. The EDC, with the backing of Central Government, is pursuing a ‘High Growth Strategy’ to deliver 15,400 new homes over a circa 10-12 year period in addition to new commercial opportunities to support the new community. In the short-medium term, the land at EIGP therefore represents one of the key sources for housing and employment growth within the Garden City and thus it is essential that discussions around the future of the strategic rail network in this location seek to further integrate with the significant development pipeline envisaged for this area.”

### 1.4.19 London St Pancras International

1.4.19.1. High Speed One commented that “The Route Study has not identified any of the HS1 stations to require increases in capacity. We are currently working with the relevant parties to develop a masterplan for St Pancras International to ensure that it remains a high performing terminus station with sufficient capacity for all TOCs, both domestic and international.”

1.4.19.2. This is not strictly true, it is expected that Ebbsfleet International station, in particular, would require significant remodelling to cope with the expected passenger numbers. This will be looked at in greater detail as part of the Modular Strategic Planning Process.

The model showing HS1 diving into the Thames Tunnel within the London Resort Theme Park site



### 1.4.20 High Speed 2/Crossrail 2

1.4.20.1. A member of public praised the proposed connection between London St. Pancras International and London Euston stations via the Crossrail 2 station.

1.4.20.2. Another member of public suggested that the street level walk between the two London terminals will be improved through regeneration caused by HS2.



An aerial view of the Swanscombe Peninsula with the London Resort Theme Park in the foreground and Northfleet and Ebbsfleet International stations in the mid-ground



#### 1.4.21 London Resort Theme Park

1.4.21.1. London Resort Holdings explained that “The London Resort will be a world class, large-scale multi-activity complex located on the Swanscombe Peninsula, just north of Northfleet, Ebbsfleet International (Ebbsfleet) and Swanscombe stations and is due to open in 2022. At the time of opening the London Resort will be in the world’s top 10 theme parks in terms of number of visits.”

- We expect that the Highways England improvement works at the A2 (T) Bean & Ebbsfleet junctions will also be completed by this date
- There is no comparable global-scale resort in the UK, but the predicted maturity visitor numbers place the scheme alongside Disneyland Paris for comparison at around 15 million visits per year. The headline forecast visits on a Design Day reach as many as 66,000 with up to 25% mode share by rail. This equates to potentially 16,000 visitors travelling to the site by rail on each day. On certain Peak Days, largely confined to bank holidays or school holidays, the number of visitors is expected to be approaching 80,000
- The London Resort proposal has been granted the status of a Nationally Significant Infrastructure Project (NSIP), meaning its planning process will follow the Development Consent Order (DCO) route, which is evaluated directly by the Planning Inspectorate (PINS) on behalf of the Secretary of State for Communities & Local Government. We anticipate the London Resort DCO will be submitted in [September 2018]. This means that by the anticipated start of the next rail franchise in November 2018, a final decision on the London Resort’s construction will not be known, and all parties involved will subsequently need to incorporate the decision in their planning of the new train service, the impact on stations and other areas



## 1.4 High Speed & Marshlink

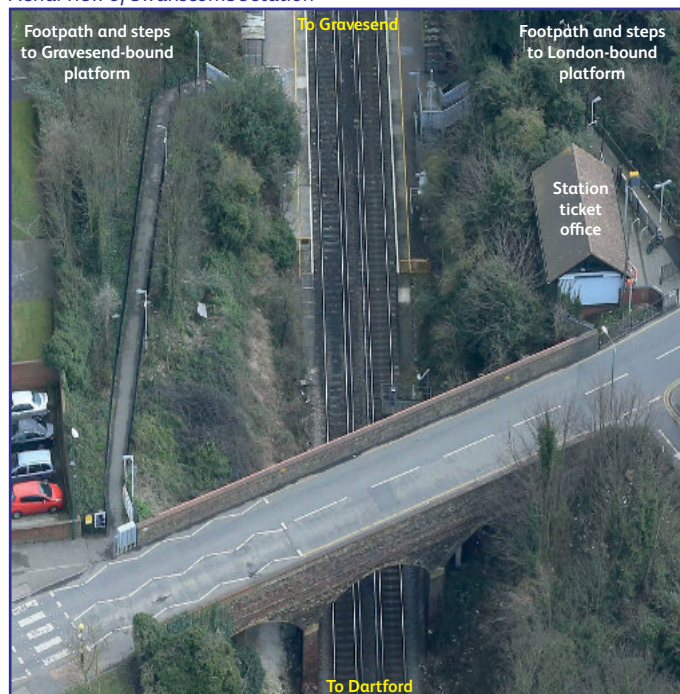


- In the run up to this consultation we have engaged with numerous stakeholders about the London Resort proposals including, but not limited to, the Department for Transport, Southeastern, Network Rail, Eurostar (UK), High Speed 1 and the Ebbsfleet Development Corporation (EDC). The consensus has been very clear: the London Resort proposals have the potential to drive significant economic growth in the region and create over 25,000 jobs, deliver an economic dividend to the UK economy and is an opportunity that stakeholders wish to harness. The development has the potential to drive local, regional, national and international connectivity to and from the Ebbsfleet area and enhance community engagement
- The London Resort project has broad support from Dartford BC, Gravesham BC, Kent CC and the EDC. Indeed, the EDC has very recently published its Implementation Framework (masterplan) for the Garden City and the land at Swanscombe Peninsula is allocated for the global entertainment resort. Beyond these immediate local authorities there is also regular dialogue with the London Borough of Bexley, Medway Council and Thurrock Council which all recognise the considerable benefits the London Resort will bring
- We are working closely with the EDC, in particular on the Single Integration Development (SID) programme to help deliver the EDC's aspiration of a regional transport hub at Ebbsfleet
- The details of the emerging London Resort are under discussion with statutory organisations beyond the transport workstream, and include the Environment Agency, Historic England and Natural England, all of whom are making significant inputs into the scheme
- The above comments demonstrate the substantial amount of support for the London Resort as the details of the scheme are brought together for the formal DCO submission later this year. In the light of this level of activity it is important that the rail franchise reletting process properly includes the London Resort
- The proposals have been developed in detail with a strong technical background. With input from Leisure Development Partners, ReThink and the ProFun Management Group, all of whom have extensive experience of the management and operation of global theme parks, we have made predictions of visitor numbers which can be translated into forecasts of rail patronage. We have worked with High Speed One and Southeastern to validate these and assess the feasibility of accommodating these on the three components of capacity: line capacity, on-train capacity and station concourse capacity
- The forecast HS1 domestic passenger numbers and the visitor arrival and departures profiles are constantly being reviewed and updated, but the figures shown in the graph below represent the anticipated scale of rail patronage. We would be pleased to discuss the demand profile in more detail with both the DfT and shortlisted bidders, once known
- The graph below gives an indication of the expected flow of people using rail into and out of LPER by day of the week
- This graph shows that rail arrivals and departures in the highest peak hour reach a maximum approaching 2,000
- In addition to people travelling from different parts of the UK, a proportion is expected to come from abroad, either through one of the London airports, or on Eurostar. It is expected that these international visitors will generally not come solely to visit the London Resort, but will combine their visit to the UK with a stay in London or elsewhere.



## 1.4 High Speed & Marshlink

Aerial view of Swanscombe station



1.4.21.2. Dartford Borough Council pointed out that the “London Resort Theme Park [4.10.18- 4.10.22]: it cannot be presumed trips by employees (or visitors) will neatly avoid peak times or travel contraflow. Moreover, the Route Study needs to take on board the direct implications for the nearest station (Swanscombe – see below).

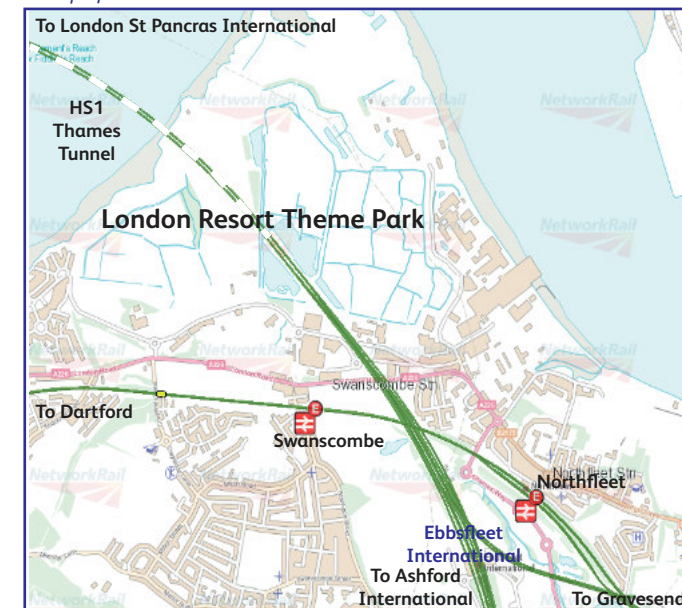
- Dartford Borough Council also objects that no other stations in the Borough are identified at all, despite the Theme Park due to open by 2022 and the scale of existing issues at Swanscombe, where platforms are only accessed by long steep sets of steps. At Stone Crossing are a number of issues to do with the current station and its location. These matters are particularly concerning given that it does not appear that full account has been taken of the particular scale of growth job/ housing growth anticipated in and around these locations. For example, Swanscombe will be the closest station to the proposed leisure

resort, projected to open in 2022. Whilst it is likely that Ebbsfleet Station will be marketed as the main arrival point for visitors, local employees and visitors that know the area will, undoubtedly use Swanscombe station as the more convenient point of arrival. Swanscombe Station in its current form and location simply does not meet the requirements of a safe, modern public transport facility.

1.4.21.3. HS1 responded that “The Route Study acknowledges the potential impact of forthcoming developments in the Ebbsfleet area, however at this point in time does not go on to quantify the effect these might have. Whilst we understand that the London Resort theme park is not yet a committed scheme and that data is limited on the scale and nature of these developments, we must stress the importance of building some flexibility into the funding arrangements to adequately respond to the potential step change in demand. Given the expected magnitude of the London Resort theme park development, the resultant traffic on HS1 (effectively added overnight) would be hugely detrimental to the High Speed services and the overall passenger experience, without prior intervention. The Garden City also has the potential to rapidly increase the demand for High Speed services across the day, but particularly during peak. Given this, an approach needs to be adopted that allows flexibility outside of the Periodic Review and South Eastern franchise to fund the necessary changes to accommodate the extra demand from these developments.”

- Obviously the addition of services to accommodate forecast demand relies on sufficient capacity being available on the HS1 network. The Route Study currently asserts that “A maximum of nine paths to St Pancras International in an hour can be achieved based on the existing morning peak Eurostar services and maintaining the Eurostar fixed paths”. We have had external technical advice which shows that HS1 infrastructure has a maximum usable line capacity of 15 trains per hour in the peak period (domestic and international), with St Pancras International limited to 12 domestic trains per hour and 5 international trains per hour. This is clearly higher than what is stated in the consultation, but we note that the Route Study assumes that current International paths are fixed in the timetable. Whilst under our ‘Declaration of Specialised Infrastructure’ international services have priority over domestic

A map of the London Resort Theme Park area



services in the allocation of train paths, we seek to optimise the use of the infrastructure for all TOCs through appropriate amendments to the timetable and necessary improvements to platform utilisation/service turnaround. As a result we conclude that this maximum usable line / platform capacity is achievable

- In addition we will develop a masterplan for Ebbsfleet International in due course once we have a greater understanding of the requirements from the station – notably the potential step change in demand (and change in type of users) expected from the London Resort Theme Park.

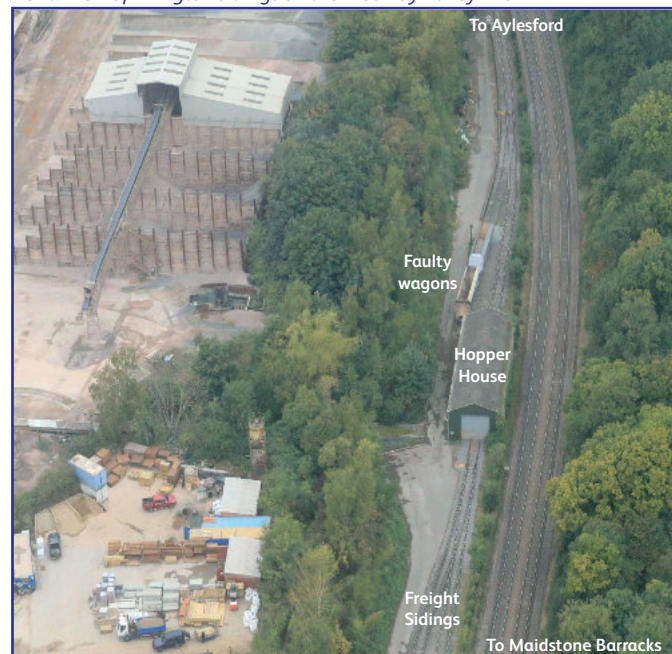
1.4.21.4. Network Rail will continue to be involved with development of Ebbsfleet Garden City and the London Resort Theme Park. There will be numerous issues from crowding to track maintenance and renewal practices. We completely understand Dartford Borough Council’s concerns about passengers using Swanscombe station to access the theme park. The photo and map on this page show the station entrance and its proximity to the theme park site.

## 1.5 Freight

1.5.1. Aggregate Industries UK Ltd is a rail freight customer, they wrote in to respond to the Draft for Consultation:

- We understand the need for improvements in both the capacity and quality of the passenger services, however the importance and benefit derived from Freight traffic's use of the Network in this region must be provided similar emphasis. Such initiatives as the Digital Railway and in-cab signalling which may provide additional capacity for all users would be one such example
- We are unclear to what extent the Route Study takes into account freight growth particularly in construction traffic but focuses solely on Channel Tunnel freight. Rail construction traffic has exhibited continuous growth over many years and is focussed on London and South East (where there is no naturally occurring hard rock and local sources of sand and gravel are being exhausted) additionally a new market of construction waste being exported by rail is growing, driven by increasing road congestion and nearer disposal tips being filled. These traffics compete on non-Channel Tunnel routes for access with passenger services, they are already pathed away from peak passenger periods and towards night operations, but it remains essential that daytime paths are retained and increased in order to allow for trains to complete their cycles
- Although not specifically consulted upon, the devolution of Network Rail to regional routes and proposals to deepen alliancing with the principal Passenger Franchise could have a negative impact upon freight. We have concerns to express on two levels, firstly the passenger franchise and Network Rail route avoid, favouring passenger traffic to the harm of freight traffic and secondly because freight traffic will typically be undertaken across multiple routes, neighbouring routes work effectively together and regional focus does not become the sole driver
- In order to protect the interests of freight traffic in this region, we would wish for the performance and promotion of freight services to be identified as part of the key metrics for Network Rail's route to achieve. In addition for Network Rail's, System Operator and freight and national passenger route roles to be clearly defined and capable of influencing the local decision making.

Aerial view of Allington sidings on the Medway Valley line



1.5.2. Kent County Council responded 'While the consultation recognises the important role that rail freight provides, there is a need to identify the risk of disruption to passenger services on the Kent route network which could arise from any further increase in freight train operation. As a minimum, all rail freight movements should be prohibited throughout the entire Kent Route network in the peak periods, as there are too many occasions when rail freight failures or derailments cause disproportionate delays to passenger services. This is an issue of wider national importance which needs to be highlighted in the national rail freight strategy.'

- The proposals in the KARS for gauge clearance assessments and potential delivery are balanced and reasonable. The provision of gauge clearance for WR12 gauge containers on freight routes currently limited to WR8 gauge clearance through the provision of pocket wagons which hold the higher containers between the bogies would represent a worthwhile investment, provided that there were no insurmountable obstacles to its delivery

- The subsequent provision of a range of freight routes through Kent for WR12 clearance containers would enhance the quantum of rail freight through the county, which KCC would strongly support provided that it did not have a negative impact on passenger services
- Of the routes identified in the KARS, KCC would particularly support greater use of the combined route of HS1 and the former Gravesend West branch alignment to Fawkham Junction, as the latter is virtually unused at present. This would also prevent an excessive volume of freight being diverted from the Tonbridge/Redhill route to the Maidstone East route.

1.5.3. East Sussex County Council advocates the transference of freight from the road to the rail network wherever possible and supports any proposals which would help to achieve this.

1.5.4. East Sussex Rail Alliance commented that 'The Route study only marginally touches on the rail freight facilities and dedicated routes to the standard WA box traffic in a Channel Tunnel- East London (for the North) and Tonbridge axis for the West. We raise the concern that lorry traffic continues to rise not only on motorways but also on wholly inappropriate County roads (East Sussex has just 12 miles of dual carriageway) and the impact, measured by TRL on road surfaces proved to be some 10 times per axle greater than that of an average car, is causing mammoth road repair and maintenance costs, and increasing deadlock across Kent'.

- Privately promoted schemes, which have the tacit approval of Network Rail (subject to external funding approval), have previously included Channel Tunnel-Glasgow over 400 miles of essentially disused or underused rail infrastructure with just 10 miles of new route, mostly in tunnel. Such a scheme which is partially in operation from Folkestone to Bow would extend the distance away from Folkestone a sufficient distance as to take considerable pressure off the trans-Kent road and rail capacities by increasing the competitive advantage of mass goods transit by train load. However, such a dedicated provision needs to be sufficiently extended to be completely viable
- ESRA considers that, long term, an upgraded line across from Ashford (Kent) to Southampton, via Hastings, Eastbourne and west to Brighton or north to Gatwick would in time bring massive



## 1.5 Freight

regeneration benefits to the Southern and South East regions and might in time justify the upgrading for passenger use of the Ashford-Dungeness Power stations route of serving the expanding Lydd Airport (London Ashford International, no less)

- However, present and future work on the South Coastal Line should ensure application of the maximum permitted dynamic loading gauge to future proof the route for passenger and freight traffic development, connecting the major rail and air travel hubs of the Southern Regions.

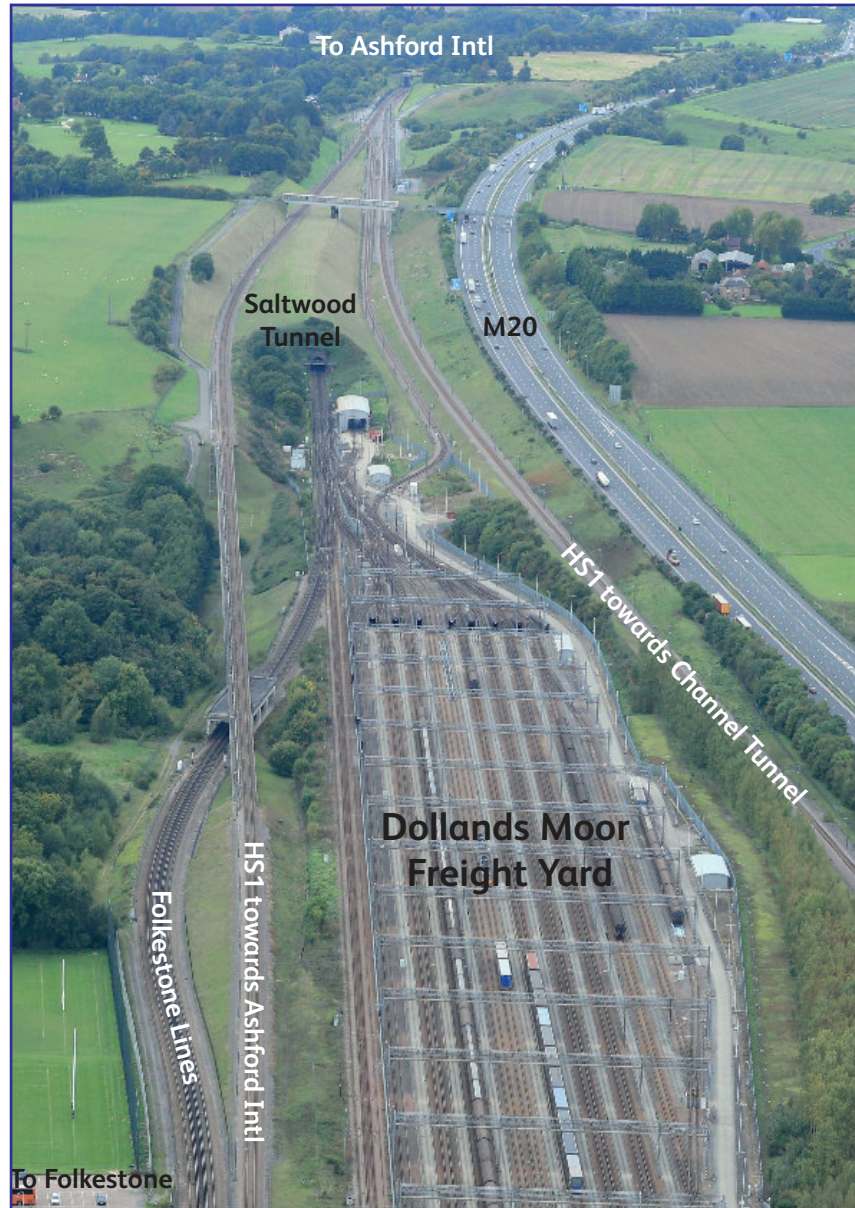
1.5.5. Highways England suggested that 'It would greatly assist the future of the Kent Strategic Road Network, and improve the UK's economic and physical resilience, if Eurotunnel freight could also be loaded further upstream.'

1.5.6. Roxhill Developments are developing the new Howbury Park Freight Terminal adjacent to Slade Green Depot. They said 'We agree that Channel Tunnel freight has been identified as a market that has potential for growth, and welcome the statement that "the infrastructure is in place to accommodate growth when the market conditions improve". We would support "gauge clearance of key routes to allow larger containers to operate without restriction, to allow rail to become more attractive to freight customers.'

- We welcome and endorse comments made in this section regarding the need to protect freight capacity to support future growth
- We acknowledge the challenge of balancing out the aspiration to increase off-peak passenger services on the South London Line against the number of assumed freight paths. We will continue to work constructively with Network Rail to develop pathing opportunities spread across the intra-peak daytime and night-time periods to achieve a mutually-acceptable position with other freight and passenger services.

1.5.7. Westwell Parish Council asked 'Please safeguard and where possible expand the freight routes that connect Kent

*Aerial view of Dollands Moor freight yard, close to the Eurotunnel terminal at Folkestone*



to the rest of the country. In this parish we have an inland wharf aggregate terminal run by Tarmac, that gets all aggregate material in by rail: from the Mendips and Derbyshire and elsewhere. Train paths through London are essential and often difficult. The parish also has a great deal of road freight through the parish on the M20 (over 3 million HGV's / year) that spills out onto other roads in the parish for overnight stops with associated noise and air pollution from movement and diesel chillers running when stationary. Moving more of this freight onto rail should, please, be a priority objective in the study.'

1.5.8. Thames Gateway Kent Partnership added 'Whilst recognising the complexities involved in securing the quantum of freight pathways to meet national and international obligations in the face of demand for increased passenger movements, the draft Study conveys a passive rather than proactive approach towards maximising the potential for rail freight. We suggest Network Rail and Department for Transport should be doing more to incentivise and enable more modal shift of freight from road to rail, and to review the prioritisation given to freight system enhancements that could ease capacity constraints on the passenger network.'

1.5.9. Tunbridge Wells Borough Council 'supports the transfer of freight from road to the rail network where possible.'

1.5.10. Campaign to Protect Rural England 'strongly support all actions to increase freight on rail. Improving gauge clearance as soon as possible, as noted in 3.15.6 (page 40), would also provide alternative routes for freight and release some capacity for passenger services.'

1.5.11. The Chaucer Education Project commented that 'Freight capacity requirements in 2024, notably shows no traffic movements to Thanet, or mention of Manston Airport or Ramsgate Harbour. However, these are long known underserved rail destinations. That contrasts with Paramount Park's passenger usage mentioned even though that scheme is not confirmed and is outside detailed analysis for the purposes of Kent Route Study costing now.'

## 1.6 Rail user and community groups

**Rail user and community groups that responded to consultation or were involved in the Wider Stakeholder Group (in alphabetical order).**

### Bexhill Rail Action Group

This group campaigns for the improvement of stations and rail services between Hastings and Eastbourne, and also promotes the same for services towards Ashford, Brighton and London.

<http://www.bexhillrailaction.org.uk/>

### The Camberwell Society

This society was formed in 1970 and provides a forum for residents and those working in Camberwell. The society aims to preserve and promote Camberwell, and does not focus solely on transport.

<http://www.camberwellsociety.org.uk/>

### Campaign for Better Transport

This national group promotes improvements for all modes of transport, and influences national and local government. It campaigns for sustainable transport and also supports local groups.

<http://www.bettertransport.org.uk/>

### Campaign to Protect Rural England

This group campaigns to protect the countryside, and to enhance both the countryside and towns. It promotes the use of rail as a more environmentally friendly option than road or air. It also encourages the reopening of rural lines and the consideration of the environment when infrastructure works take place.

<https://www.cpre.org.uk/>

### East Sussex Rail Alliance

This group is an umbrella group and consists of user groups explained further here, including Bexhill Rail Action Group and St Leonards and Hastings Rail Improvement Programme.

<http://www.eastsussexrail.org.uk/>

### Greenwich Line Users' Group

This group was created in 2012 and covers the stations at Westcombe Park, Maze Hill, Greenwich and Deptford. It has particularly focussed on maintaining a regular train service to London Bridge and Charing Cross whilst London Bridge station has been rebuilt.

<https://greenwichline.org.uk/>

### Kent Community Rail Partnership

This group brings groups together, including Southeastern, to promote benefits to areas served by rural train services. It focusses on the branch line between Sittingbourne and Sheerness, and the Medway Valley line.

<http://kentcrp.org/>

### London TravelWatch

Funded by the London Assembly, this independent watchdog was formed in 2000, and promotes improvements for all transport modes in London. It represents all London users.

<http://www.londontravelwatch.org.uk/home/>

### MarshLink Action Group

This group campaigns to improve the link between Hastings and Ashford. Its objectives include the electrification of the MarshLink line and better, more frequent services.

<http://www.mlag.org.uk/>

### Ore Transport Group

This group promotes improvements at Ore station and to its train services. Its train operator is Southern, but as Ore is on the Marshlink line, it may be impacted by the proposals to electrify this line and extend High Speed services.

This group does not have a website.

### Sevenoaks Rail Travellers Association

This group represents the users of stations at Sevenoaks, Bat and Ball, Dunton Green, Eynsford, Kemsing, Otford and Shoreham. It campaigns for improvements to the main lines through Sevenoaks to Hastings and Ashford.

<https://srta.org.uk/>

### SPOKES East Kent Cycle Campaign

This group aims to encourage cycling and tie it in with the overall transport system. It also promotes a safe and clean environment for cyclists, giving it an interest in the railway and its impact on local areas.

<http://www.spokeseastkent.org.uk/>



### 1.6 Rail user and community groups

#### St Leonards and Hastings Rail Improvement Programme

This group promotes the improvement of access to St Leonards and Hastings. It also wishes to see High Speed services in Sussex, providing better connectivity to London and Ashford.

<http://www.1066shrimprail.org.uk/>

#### Tonbridge Line Commuters

This group was created in 1959, and promotes improvements to Tonbridge, Hildenborough and Paddock Wood stations and the rail service. It works with local government and also promotes improvements to connectivity to stations via other transport modes.

<http://tonbridgecommuters.org.uk/cms/>

#### Transport for Charlton

This group aims to improve transport to and around Charlton. It promotes a better train service and acts as a forum for all users of Charlton station.

<https://transportforcharlton.wordpress.com/>

#### Tunbridge Wells Rail Travellers' Association

This group represents users of the Hastings line up to Tunbridge Wells, and users of Tunbridge Wells and High Brooms stations. It campaigns for a more reliable train service and other relevant improvements.

<https://www.tunbridge-wells-commuters.org.uk/>

#### The Westcombe Society

This group focusses on the local community and the environment, to improve the area and its amenities for residents and employees. It covers the area between Maze Hill, Blackheath and Greenwich.

<http://www.westcombesociety.org/>

## 2 Conditional Outputs

**\*\*Please note that these Conditional Outputs are aspirations for the industry to deliver in the long term subject to value for money, deliverability and affordability. Equally the conditional outputs needs to be deliverable - technologically, operationally and physically\*\***

Capacity	
C01	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>London Bridge Metro services</b>
C02	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>London Victoria Metro services</b>
C03	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>High Speed to London St Pancras International</b>
C04	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>London Blackfriars Metro services</b>
C05	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>London Bridge &amp; Victoria Main Line services</b>
C06	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2024</b> peak demand - <b>London Orbital services (East &amp; South London Lines)</b>
C07	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>London Bridge Metro services</b>
C08	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>London Victoria Metro services</b>
C09	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>High Speed to London St Pancras International</b>
C10	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>London Blackfriars Metro services</b>
C11	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>London Bridge &amp; Victoria Main Line services</b>
C12	Provide sufficient passenger capacity for passengers travelling into Central London to accommodate <b>2044</b> peak demand - <b>London Orbital services (East &amp; South London Lines)</b>
C13	Provide sufficient passenger capacity for passengers travelling between Brighton and Ashford International to accomdate all day demand
Connectivity	
C014	Provide a minimum of 3-4tph to/from central London during peak off hours from stations within 30 miles of London
C015	Provide a Generalised Journey Time (GJT) of 40-100 minutes to significant centres of population over 30 miles from central London: <b>Hastings</b>
C016	Provide a Generalised Journey Time (GJT) of 40-100 minutes to significant centres of population over 30 miles from central London: <b>Ramsgate</b>
C017	Provide a Journey Time (JT) of less than 60 minutes within Kent or significantly less than 100 minutes within South East Route (connectivity between urban centres): <b>Brighton - Ashford International</b>
C018	Provide a Journey Time (JT) of less than 60 minutes within Kent or significantly less than 100 minutes within South East Route (connectivity between urban centres): <b>North Kent - South Kent</b>
Capability	
C019	Test the capability of the network to accommodate forecast passenger demand
C020	Test the capability of the network to accommodate forecast freight demand
Other Conditional Outputs	
C021	Provide sufficient capacity to accommodate passenger circulation at stations within the Kent Area
C022	To accommodate demand during week day evenings and on weekends
C023	To provide connectivity to International Gateways: <b>Airports</b>
C024	To provide connectivity to International Gateways: <b>Dover Port</b>
C025	To provide connectivity to HS2
C026	To provide connectivity to Crossrail
C027	To provide connectivity to social infrastructure such as hospitals, educational establishments etc.
C028	To provide network resilience



### 3 London Bridge Metro (C01 & C07)

### 3.1 Capability and Capacity Analysis

3.1.1. The Capability and Capacity Analysis Team have analysed and tested the timetable and capacity options to assess the feasibility of each option.

- Via Orpington
- Via Bexleyheath
- Via Sidcup
- From Hayes

3.1.2. **2024:** The Individual Option Assessments considered the vehicle gaps identified by the Route Study with the options to either lengthen services or operate additional paths to fill the gaps. [Table 3.1](#) shows the number of additional paths required for each individual route depending on the lengthening option.

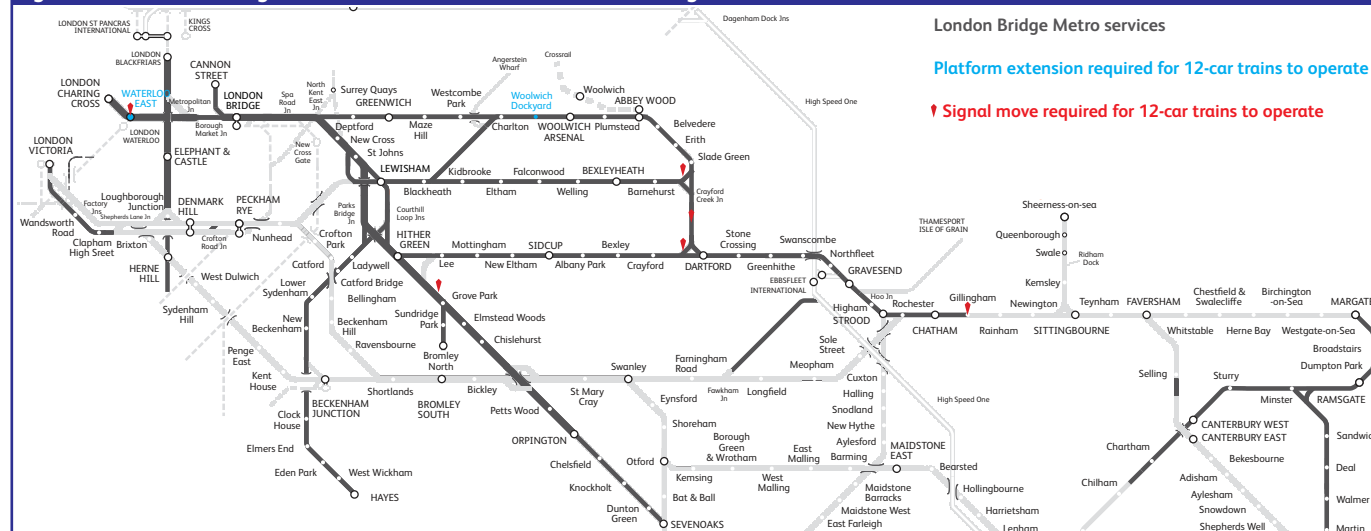
### Table 3.1 - 2024 additional pathways

Route	Number of additional paths required without lengthening	Number of additional paths required with lengthening to 10-car	Number of additional paths required with lengthening to 12-car
Via Orpington	2	1	0
Via Bexleyheath	1	0	0
Via Sidcup	2	1	0
From Hayes	1	0	0
Total	6	2	0

**3.1.3. 2044:** The Individual Option Assessments analysed the maximum possible number of paths required. This is assessed against the 2044 vehicle gaps to identify if the longer term forecasts can be achieved, and what constraints exists if the gaps cannot be filled.

3.1.4. **Table 3.2** shows the total number of paths required for each individual route for both 10-car and 12-car operations to fulfil the 2044 requirements, when combining the base vehicle and vehicle gap figures.

**Figure 3.1 - London Bridge Metro area with choices for funders (Figure 6.2 in the main document)**



### Table 3.2 - 2044 vehicles and pathways

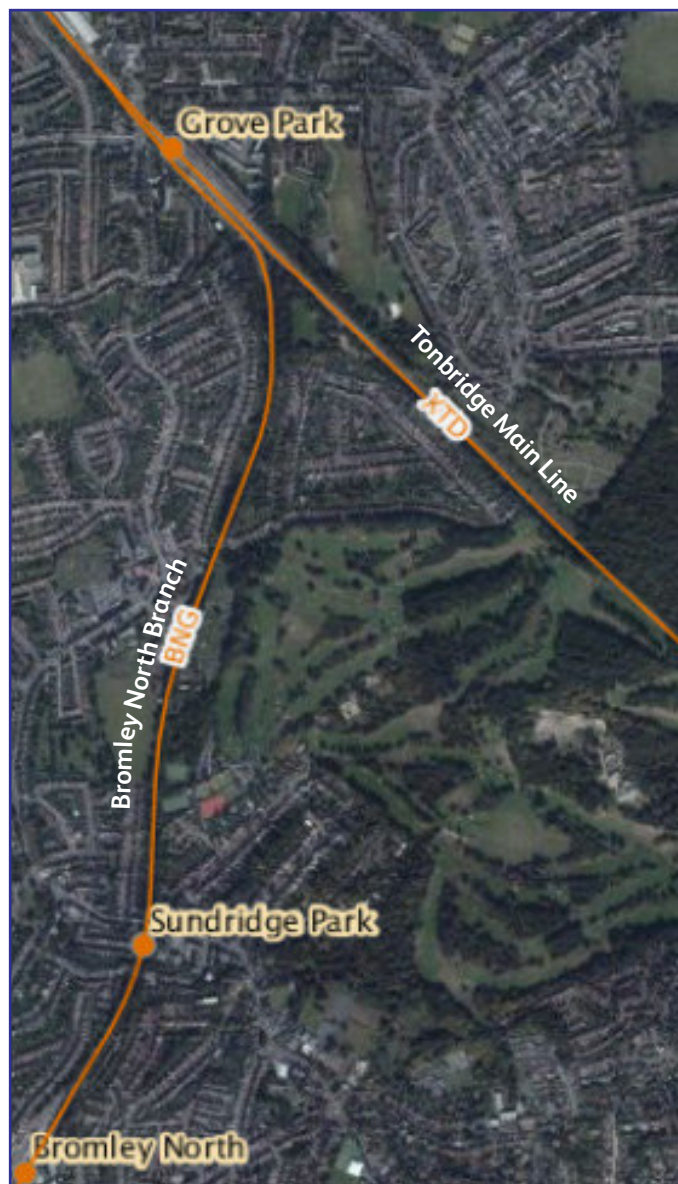
Route	Base vehicles	Vehicle gap	Total vehicles (Base+ Gap)	Max. paths required in 2044	
				10-car	12-car
Via Orpington	72	34	106	11	9
Via Bexleyheath	76	22	98	10	9
Via Sidcup	78	36	114	12	10
From Hayes	52	22	74	8	7
<b>Total</b>	<b>278</b>	<b>114</b>	<b>392</b>	<b>41</b>	<b>35</b>

Figures are Total Vehicles divided by the number of cars (10 or 12).  
All figures are rounded up to the nearest whole.

### Table 3.3 - Pathways current vs 2044

Route	Current no. of paths		Max. paths required by 2044		Additional paths required by 2044	
	10-car	12-car	10-car	12-car	10-car	12-car
Via Orpington	8	6	11	9	3	3
Via Bexleyheath	8	7	10	9	2	2
Via Sidcup	8	7	12	10	4	3
From Hayes	6	5	8	7	2	2
<b>Total</b>	<b>30</b>	<b>25</b>	<b>41</b>	<b>35</b>	<b>11</b>	<b>10</b>

Figures are Base Vehicles divided by the number of cars (10 or 12).  
All figures are rounded up to the nearest whole.



3.1.5. Table 3.3 shows the current number of paths for 10- and 12-car operations compared against the maximum paths required for 2044:

3.1.6. An issue with operating 12-car trains between Dartford and London Bridge are the triangle junctions which enable trains to run from Dartford to all three routes or to avoid Dartford by turning on to one of the other routes back to London. The Cannon Street - Bexleyheath - Woolwich Arsenal - Greenwich - Cannon Street service is an example of such a service.

3.1.7. The position of signals on all sides of the Erith triangle means that a 12-car train stopped at a signal blocks the junction behind the train. This can lead to a log jam if trains on opposing tracks block each other in.

3.1.8. The Crayford triangle is not as restrictive as only the Dartford avoiding lines are not long enough for a 12-car train to stop between the signal and the junction.

3.1.9. Options have been developed for these conflicts. Solutions can be as simple as lowering the linespeed to enable the signal to be moved closer to the junction or complicated like extending the loop lines so they run parallel to the main lines before joining them at a junction once the lines are long enough for 12-car trains.

### Bromley North Branch

3.1.10. In 2024 there is projected to be a vehicle gap of four vehicles. The options reviewed were:

- Lengthen services to 3-car
- Operate a 4tph service pattern.

3.1.11. In 2044 there is projected to be a vehicle gap of six vehicles.

3.1.12. With current train planning rules values and running times between stations, only 3tph (trains per hour) are achievable as a single shuttle service. 4tph in each direction to be achieved as a single shuttle service would require a service every 15 minutes. This would require a saving of five minutes per service (15 minutes in the hour) and is not achievable with current train planning rules, including the minimum turnaround required at both Bromley North and Grove Park.

3.1.13. An alternative way forward, which is being operated by Southeastern for one hour of the day, operating a 4tph service with two train drivers, one in each cab. This means the turnaround time at each terminus can be reduced to around two minutes.



### 3.2 London Bridge Metro Service Train Lengthening Pre-GRIP study

3.2.1. The aim of the study was to identify infrastructure that limits the ability to operate 12-car Class 465 services on the London Bridge Metro Service Route. The study was to support plans to provide additional capacity for projected growth on the London Bridge Metro Service, to meet future demands by extending existing services to 12-car operation. The study focused on identifying constraints restricting 12-car operation on this route, which were identified at Woolwich Dockyard Station (Platforms 1 and 2), Grove Park Station (Platform 3), Waterloo East Station (Platforms B and D), Gillingham Station (Platforms 2 and 3) and the Erith Loop. Charing Cross has been excluded as this has been looked at before, currently there is a restriction on 12-car Class 465 trains in certain platforms. Depots and Stabling must not be overlooked, see [Chapter 8](#) for more information.

#### Woolwich Dockyard:

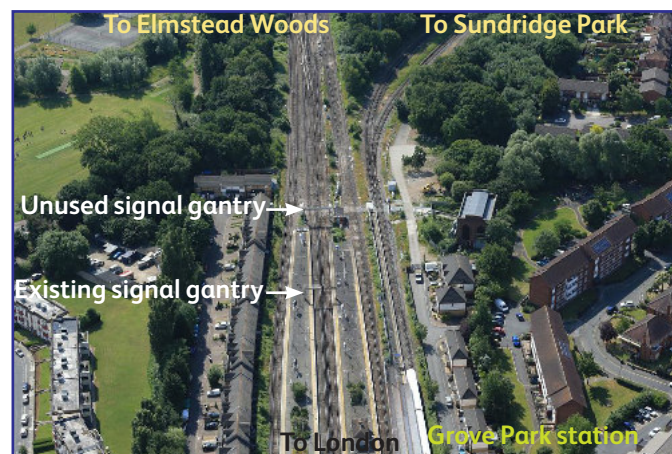
3.2.2. It has been identified that Woolwich Dockyard station requires platform extensions to be able to cater for 12-car services. The Platforms (Platform 1 and Platform 2) can both only currently accommodate up to 10-car service lengths. The station is located within a cutting and has tunnels at either ends.

3.2.3. Two options have been developed for the scheme, but Option 1, which is to extend platforms towards the country end (Kingsman Street), is preferred.

#### Grove Park:

3.2.4. Platform 3 at Grove Park has been identified to be sufficient for 12-car services to call but has signalling and DDO restrictions that would need resolving to bring the platform into 12-car operation.

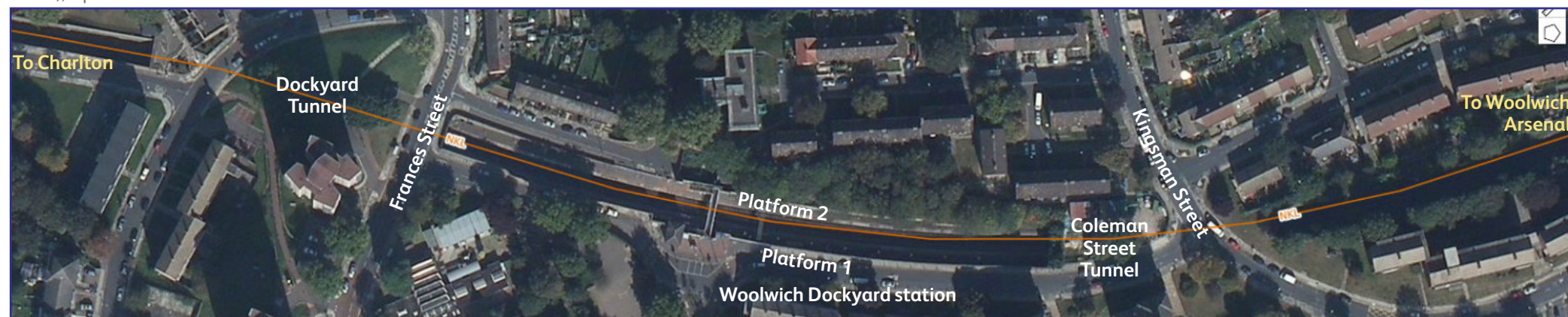
3.2.5. A signal relocation and installation of screens within the existing DDO monitor bank is recommended to provide 12-car service provision.



#### Erith Loop:

3.2.6. The Erith Loop has both track and signal related restrictions to accommodate 12-car services, before they enter Barnehurst Station. 12-car services would fall foul of the trailing points and block main line operations.

3.2.7. Two options have been developed for the scheme, but Option 1, relocating signal NK262 approximately 25m towards Perry Street Fork Junction to allow 255m standage and allowance for stopping accuracy and stand-back from the signal, is recommended.





**Waterloo East:**

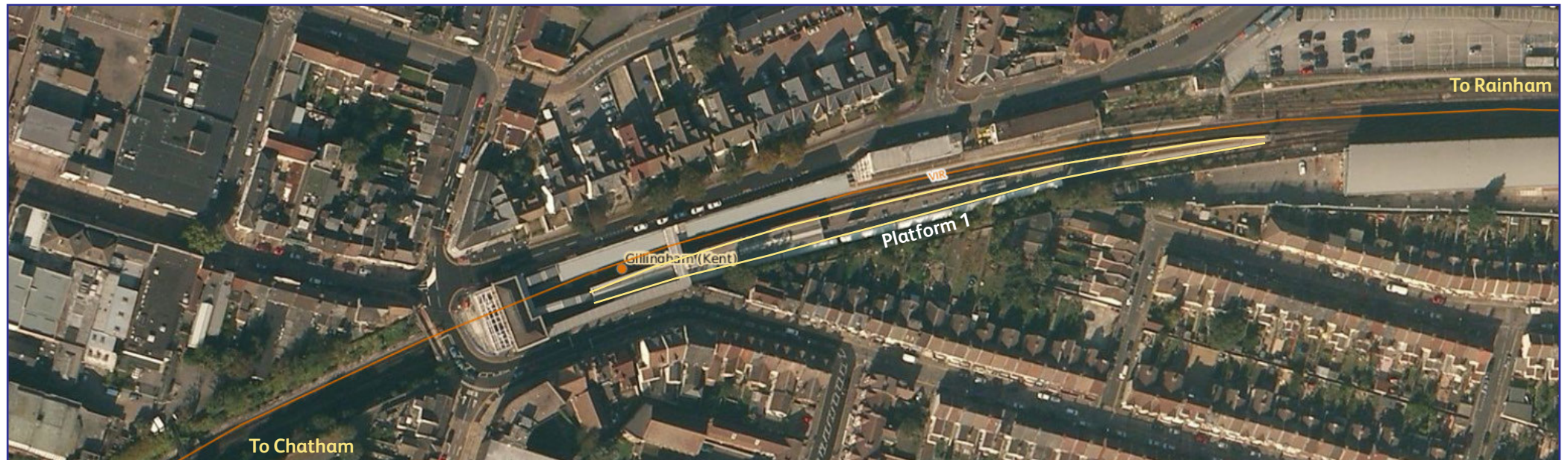
3.2.8. It was identified that both Platforms B and D currently have limitations that impact on 12-car operations at the station. Platform B is able to stand 12-car Class 375 services, but has reduced stand-back on signals for 12-car Class 465 services. Platform D is very narrow at the country-end, impacting on access and egress from 12-car services.

3.2.9. On Platform B, it is possible to extend the platform towards Signal TL2009 at the country-end. On platform D, it is recommended that the platform be widened to provide a minimum 3m width at the country-end.

**Gillingham:**

3.2.10. There is a known turn-back restriction on Platform 2 at Gillingham Station. Platforms 2 and 3 at Gillingham have been recorded to take 12-car Class 375 services without significant issues. However, it is understood that Platform 2 is not able to compliantly accommodate 12-car Class 465 trains (note: it is identified that there is an approximately 3m difference in lengths between the 12-car Class 375 and 12-car 465 services).

3.2.11. It is recommended that either, signals on Platform 2 are relocated to provide the minimum stand-back required, or agree with the TOC a stand-back of less than the standard minimum, but ensuring that all passenger and staff crew doors are still located on the platforms.





3.2.12. **Table 3.4** details the options that were appraised for the business case ratio table below, **Table 3.5**. Generally, the DfT class a Quantified BCR of 2.0 or higher as a strong business case.

3.2.13. Realistically, it is likely that Woolwich Dockyard platform extensions will be omitted as this is an extremely expensive scheme. Future rolling stock is likely to be fitted with Selective Door Opening (SDO) so station calls will be possible with longer trains as the doors on the rear coaches will be locked.

**Table 3.5: Train lengthening - London Bridge Metro (all routes) business case**

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	132.78	74.62
Non user benefits	87.24	47.83
Other Government Impacts (indirect taxation)	-14.07	-11.30
<b>Total benefits</b>	<b>205.95</b>	<b>111.15</b>
<b>Costs (Present Value)</b>		
Investment Cost	67.07	67.07
Operating Cost	150.79	106.94
Revenue	-44.89	-31.25
Other road operating costs	-0.10	-0.06
<b>Total costs</b>	<b>172.85</b>	<b>142.70</b>
<b>Net Present Value (NPV)</b>		
	<b>33.09</b>	<b>-31.55</b>
<b>Benefit Cost Ratio (BCR)</b>		
	<b>1.19</b>	<b>0.78</b>

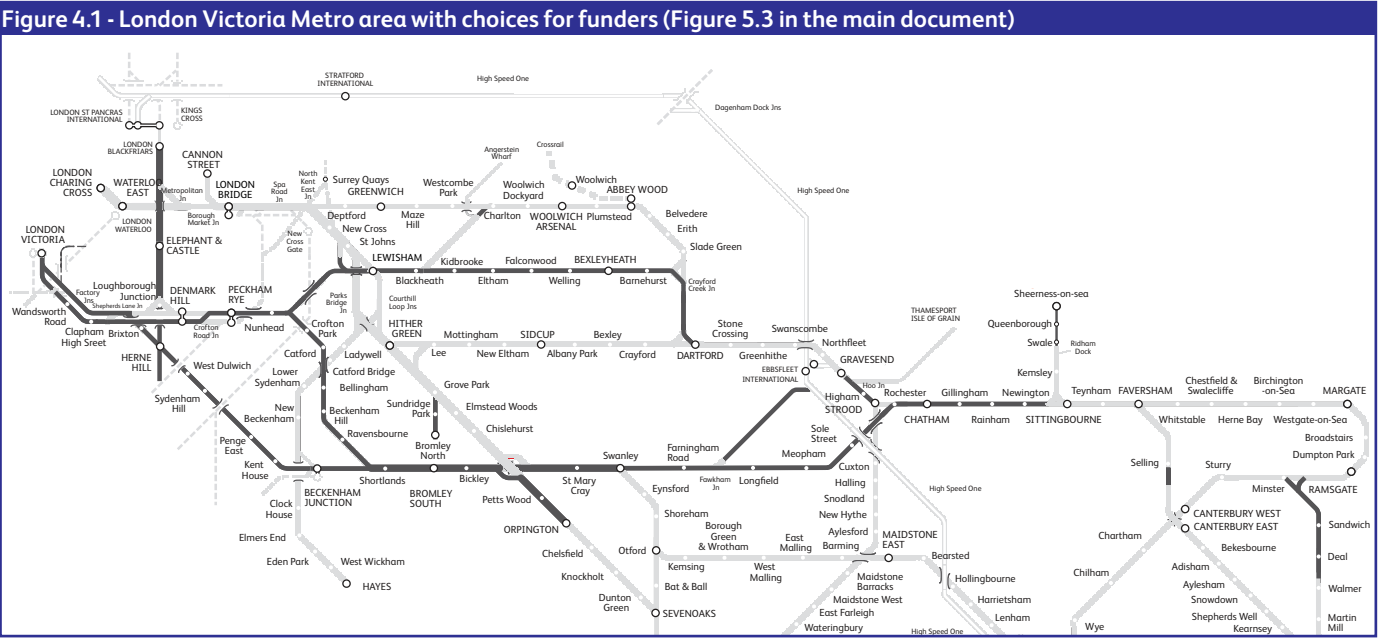
**Table 3.4: Train lengthening - London Bridge Metro Services (all routes) option table**

<b>Option</b>	1.01
<b>Conditional Output</b>	Contributes towards CO1 to provide sufficient capacity for passengers travelling into London Bridge during the high peak hour in 2023/24 in the London Bridge metro area
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	<p>Lengthen three of the existing Bexleyheath services by two cars to a maximum length of 12 cars in the high peak hour</p> <p>Lengthen four of the existing services via Sidcup by two cars to a maximum length of 12 cars in the high peak hour</p> <p>Lengthen four of the existing services via Orpington by two cars each, and one by four case, to a maximum length of 12 cars in the high peak hour</p> <p>Lengthen five of the existing services via Hayes by two cars each, and one by four cars, to a maximum length of 12 cars in the high peak hour</p>
<b>Infrastructure requirement</b>	<ul style="list-style-type: none"> <li>Platform extensions and lineside infrastructure equipment enhancements to provide 12-car capability at: <ul style="list-style-type: none"> <li>Woolwich Dockyard (platform extensions from 10-car to 12-car)</li> <li>Erith Loop (signalling alterations)</li> <li>Waterloo East (signal move and platform extensions)</li> <li>Gillingham (signalling alterations)</li> <li>Grove Park (signalling alterations)</li> <li>Up and Down North Kent Lines (signalling &amp; track circuit alterations)</li> <li>Up Crayford Loop Line (track circuit alterations)</li> </ul> </li> </ul> <p>Depots and stabling costs are not included in this appraisal but must be considered</p>
<b>Operational requirement</b>	It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 1.17% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	This option sums of Options 1.01a, 1.01b, 1.01c, 10.1d, 1.01e
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	

# 4 Victoria Metro (CO2 & CO8)

4.1 **Table 4.1** shows the total number of paths required for each individual route for 8-, 10- and 12 car operations to fulfil the 2044 requirements, when combining the base vehicle and vehicle gap figures.

4.2. **Table 4.2** shows the current number of paths for 8-, 10- and 12-car operations compared against the maximum paths required for 2044.



**Table 4.1 - 2044 vehicles and pathways**

Route	Base vehicles	Vehicle gap	Total vehicles (Base+ Gap)	Max. paths required in 2044		
				8-car	10-car	12-car
Via Herne Hill	36	14	50	7	5	5
Via Catford Loop	14	2	16	2	2	2
Via Lewisham	22	6	28	4	3	3
Total	72	22	94	13	10	10

Figures are Total Vehicles divided by the number of cars (8, 10 or 12).  
All figures are rounded up to the nearest whole.

**Table 4.2 - Pathways current vs 2044**

Route	Current no. of paths			Max. paths required by 2044			Additional paths required by 2044		
	8-car	10-car	12-car	8-car	10-car	12-car	8-car	10-car	12-car
Via Herne Hill	5	4	3	7	5	5	2	1	2
Via Catford Loop	2	2	2	2	2	2	0	0	0
Via Lewisham	3	3	2	4	3	3	1	0	1
Total	10	5	7	13	10	10	3	0	3

Figures are Base Vehicles divided by the number of cars (8, 10 or 12).  
All figures are rounded up to the nearest whole.



Table 4.4: Train lengthening - Victoria Metro via Lewisham business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	2.27	1.20
Non user benefits	1.42	0.74
Other Government Impacts (indirect taxation)	-0.16	-0.11
<b>Total benefits</b>	<b>3.53</b>	<b>1.83</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	9.11	6.46
Revenue	-0.84	-0.55
Other road operating costs	0.00	0.00
<b>Total costs</b>	<b>8.27</b>	<b>5.90</b>
<b>Net Present Value</b>		
	<b>-4.74</b>	<b>-4.07</b>
<b>Benefit Cost Ratio</b>	<b>0.43</b>	<b>0.31</b>

Table 4.3: Train lengthening - Victoria Metro Services via Lewisham option table

<b>Option</b>	1.02
<b>Conditional Output</b>	Contributes towards CO2 to provide sufficient capacity for passengers travelling into London Victoria during the high peak hour via Dartford and Lewisham in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Lengthen one of the existing services by two cars to 8-cars in the high peak hour
<b>Infrastructure requirement</b>	Depots and stabling costs are not included in this appraisal but must be considered Power supply upgrades may also be required
<b>Operational requirement</b>	Two additional vehicles to lengthen services. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 1.17 % p.a to 2023 and 1.23 % to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	No
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	

Table 4.6: Train lengthening - Victoria Metro via Herne Hill business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	2.99	1.62
Non user benefits	2.11	1.10
Other Government Impacts (indirect taxation)	-0.21	-0.14
<b>Total benefits</b>	<b>4.88</b>	<b>2.58</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	8.50	6.02
Revenue	-1.07	-0.72
Other road operating costs	0.00	0.00
<b>Total costs</b>	<b>7.42</b>	<b>5.31</b>
<b>Net Present Value</b>	<b>-2.54</b>	<b>-2.72</b>
<b>Benefit Cost Ratio</b>	<b>0.66</b>	<b>0.49</b>

Table 4.5: Train lengthening - Victoria Metro Services via Herne Hill option table

<b>Option</b>	1.02
<b>Conditional Output</b>	Contributes towards CO2 to provide sufficient capacity for passengers travelling into London Victoria during the high peak hour via Herne Hill in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Lengthen one of the existing services from Orpington by 2-cars to 8-cars each in the high peak hour
<b>Infrastructure requirement</b>	No infrastructure work required
<b>Operational requirement</b>	Four additional vehicles to lengthen services. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 1.17% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	No
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	



## 5.1 Capability and Capacity Analysis

5.1.1. **2024 vehicle gaps:** 24 vehicles via Ashford International, six vehicles via Faversham, and six vehicles from Maidstone West. Options to meet the gap:

- Lengthen Maidstone West/Faversham services to 12-car (Ashford International services already operate as 12-car)
- Operate two additional paths from Ashford International
- Operate one additional path from Maidstone West
- Extend the Ebbsfleet International starter to Ashford International
- Extend the Ebbsfleet International starter to Faversham or Rainham
- Attach a 6-car from Sandwich/Ramsgate to a 6-car from Dover in the Folkestone area.

5.1.2. **2044 vehicle gap:** 30 vehicles via Ashford International /six vehicles from Maidstone West.

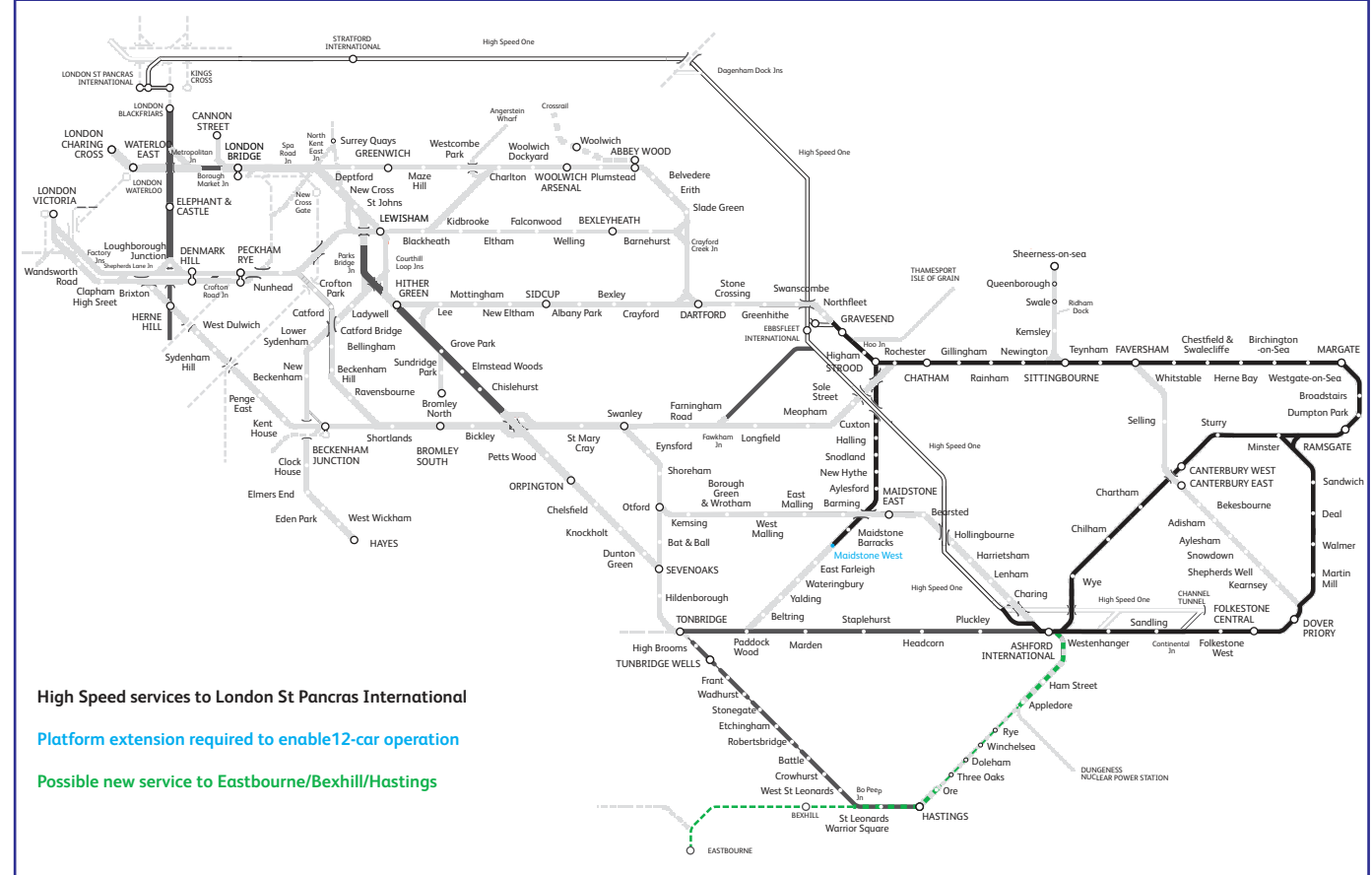
### Additional Paths from Ashford - 2024:

5.1.3. With the assumption of maintaining all current Eurostar services as fixed paths, two additional paths from Ashford International to St Pancras International is not achievable. Capacity is available at Ashford International but becomes more constrained from Ebbsfleet International and further constrained at Stratford International.

5.1.4. Allowing for the minor retiming of Eurostar services (between Stratford International and St Pancras International) an additional path departing Ashford International at 07:55 arriving at St Pancras International at 08:31 was achievable within the current timetable.

5.1.5. An earlier path (before the peak) was available departing Ashford at 06:54 arriving St Pancras at 07:30 with no retiming to other services required.

Figure 5.1 - High Speed services with choices for funders (Figure 5.3 in the main document)



5.1.6. During the morning peak other paths were available from Ashford but with capacity constrained between Ebbsfleet International and St Pancras International. The key challenges and constraints were as follows:

- Compliance around Eurostar services and the avoidance of Eurostar flexing
- Headway compliance at Ebbsfleet West Junction and Stratford International West Junction

- Junction margin and platform reoccupation compliance at St Pancras International
- Platform capacity and availability at St Pancras International: three platforms for domestic use and Class 395 12-car requiring a minimum nine minute turnround time
- Operating any additional paths from Ashford International to St Pancras International did not consider an increase in other services joining the route at Ebbsfleet International.

**Additional path from Maidstone West – 2024:**

5.1.7. An additional path departing Maidstone West at 08:20 but arriving St Pancras International outside the peak (at 09:14) was available within the current timetable which would fill the vehicle gap for 2024.

5.1.8. This was the clearest path from Maidstone West to Strood as earlier paths would require retiming of multiple services. This path can operate from Strood to St Pancras without any retiming to other services as it does not reach Ebbsfleet West Junction to interact with the main HS1 route until 08:56.

5.1.9. Earlier paths from Maidstone West face the same challenges as the Ashford paths once joining the HS1 route at Ebbsfleet.

5.1.10. The key challenges and constraints between Maidstone West and Ebbsfleet International are as follows:

- Headway compliance between Maidstone West and Cuxton (just south of Strood). This section is controlled by Absolute Block signalling requiring high headway spacing between trains and therefore limiting capacity
- Headway and platform reoccupation compliance at Strood.

**Extend Ebbsfleet International starter to Ashford International – 2024:**

5.1.11. The Ebbsfleet starter can be extended to originate from Ashford with a 07:48 departure time which retains the 08:08 departure from Ebbsfleet International and the same path onwards to St Pancras International.

5.1.12. The path between Ashford and Ebbsfleet was clear and compliant without retiming to other services, despite including the additional Ashford path created in stage 2 of the assessment.

**Extend Ebbsfleet International starter to Faversham or Rainham – 2024:**

5.1.13. Extending the service to Faversham or Rainham whilst retaining the departure time of 08:08 from Ebbsfleet would require the retiming of other services as the extended paths are not naturally TPR compliant.

5.1.14. The key challenges and constraints are as follows:

- Headway compliance between Faversham and Rochester Bridge Jn/Strood.
- Lack of spare capacity between Gillingham (Kent) and Rochester Bridge Jn/Strood.
- Junction margin and conflicting crossing move at Rochester Bridge Jn.
- Headway compliance and platform reoccupation at Strood and Gravesend.

5.1.15. The alternative option of changing departure times from Faversham or Rainham and retiming to find available paths causes problems with compliant paths on the subsequent routes.

5.1.16. The key constraint is with arriving/departing Ebbsfleet International at different times as available capacity is scarce on the HS1 route between Ebbsfleet and St Pancras during the morning peak. Continuing a Faversham or Rainham path from Ebbsfleet International would likely require retiming to other services.

**Attach 6-car from Sandwich/Ramsgate with 6-car from Dover in Folkestone Area – 2024:**

5.1.17. Folkestone Central and Folkestone West stations can both accommodate 12-car services from a platform length perspective. Although the existing signalling layout does not allow permissive working (platform sharing), and therefore is a constraint to this option.

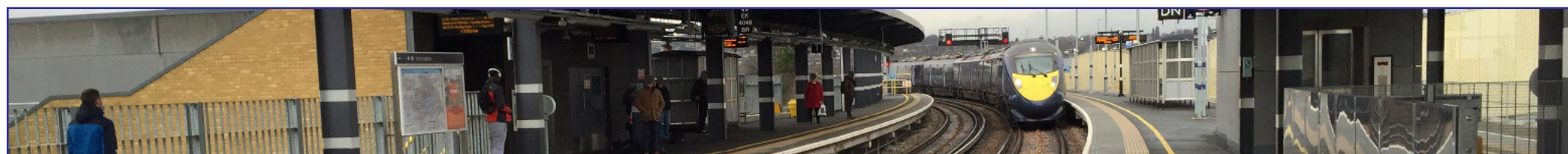
5.1.18. There are no location specific TPRs which influence the attaching operation.

5.1.19. The TPR requirement is 4 minutes for the attachment of the Class 395 units and a minimum of ½ minute added to the schedule of the rear portion when approaching to attach.

5.1.20. Considering headway between the front and rear portions, minimum dwell time on both portions for passenger movements and the attachment time, a total of 9 minutes is required from when the front portion arrives to the departure of the 12-car service.

5.1.21. Available opportunities for the attaching operation at Folkestone Central during the morning peak are currently restrictive. This is due to repeated empty stock moves into the northbound Platform 1 for the formation of departing services. The most readily available opportunity is at approximately 08:15 or early in the morning (before the peak at approximately 06:15). However there is sufficient capacity with some retiming to the existing timetable.

5.1.22. Opportunities at Folkestone West are partly restricted due to the available gaps between existing services, although less restricted than Folkestone Central. The overall capacity would allow for the attachment with some retiming to the existing timetable.





5.1.23. In the current timetable the most obvious gap is for the front portion to arrive into Folkestone West at 06:48, resulting in a 06:01 departure from Ramsgate, and a 07:49 arrival at St Pancras International for the full 12-cars. The rear portion subsequently has a 06:39 departure from Dover, arriving into Folkestone West at 06:52.

5.1.24. The paths for the front and rear portions based on the above timings are mostly clear and compliant, including from Ashford to St Pancras. The single biggest constraint is on the front portion between Minster South Junction and Sandwich which is controlled by Absolute Block signalling.

5.1.25. There are also issues with the power supply between Ramsgate and Dover Priory which prevents 12-car High Speed services.

#### Maximum Number of Paths with Eurostar patterns – 2044:

##### New Ashford International services

5.1.26. A maximum of nine paths to St Pancras International in an hour can be achieved based on the existing morning peak Eurostar services and maintaining the Eurostar fixed paths. This is no greater than the number of paths operated in the current timetable and therefore indicates that the domestic services are constrained by the Eurostar paths.

5.1.27. The number of domestic paths is based on the minimum headway/platform reoccupation between trains applied and all trains stopping for the minimum allowed duration at each specified station as stated in TPR.

5.1.28. The required TPR headway on the route between Ashford and St Pancras is 3 minutes or 2½ minutes if a stopping service follows a non-stop service.

5.1.29. The standard minimum dwell required for a Class 395 at Ashford and Ebbsfleet is 1½ minutes, and 1 minute at Stratford.

##### New Maidstone West services

5.1.30. A maximum of six paths from Maidstone West in an hour can be achieved (including existing services).

5.1.31. This is based on the minimum headway/platform reoccupation between trains applied and all trains stopping for the minimum allowed duration at each specified station as stated in TPR.

5.1.32. The required TPR headway between Maidstone West and Cuxton is based on Absolute Block signalling, between Cuxton and Strood the headway is 5 minutes.

5.1.33. The standard minimum dwell required for Kent Route is ½ minute. At Maidstone West, Strood and Gravesend 1 minute is required.

5.1.34. The standard minimum dwell required for a Class 395 at Ashford International and Ebbsfleet International is 1½ minutes, and 1 minute at Stratford International.

5.1.35. The pattern of six trains does not consider other services on the route from Ebbsfleet International. It does demonstrate that six paths are achievable from Maidstone West.

##### New Ashford and Maidstone West services combined

5.1.36. The Ashford services assessment determined that a maximum of nine paths is achievable on the HS1 route based on the morning peak Eurostar service pattern. Subsequently trains originating from Maidstone West are required to pick up one of the nine available paths when joining at Ebbsfleet International.

5.1.37. Operating both Ashford International and Maidstone West services would require an offset as to how many originate from either location, fulfilling the nine paths available from Ebbsfleet International where the services converge.



Aerial view of Kings Cross and St Pancras International

### Key Conclusions

- Maidstone West and Snodland cannot currently accommodate 12-cars. All other stations/platforms for the domestic high speed services can
- Additional paths on the HS1 route are constrained by the fixed Eurostar paths
- The Ebbsfleet International starter can easily be extended to start from Ashford International retaining its current path from Ebbsfleet. Extending to Faversham or Rainham is not feasible without a large timetable rewrite
- Attaching two 6-cars at Folkestone would require a signalling upgrade.

### 5.2 High Speed to Maidstone West Train Lengthening Pre-GRIP study

5.2.1. The aim of the study was to identify infrastructure options that would provide 12-car Class 395 service provision at Maidstone West Station. The study was to support plans to provide additional capacity for the predicted growth on High Speed Services, to meet future demands by enabling 12-car Class 395 services to start and terminate at this station.

5.2.2. Three infrastructure options were investigated to enable this; 12-car with no platform lengthening and utilising Selective Door Opening (SDO), Turnback Platform 2 (extension of Platform 2), Turnback Platform 1 (extension of Platform 1).

5.2.3. Of the options, the turnback in Platform 2 is preferred.

### 12-car with no platform lengthening and utilising Selective Door opening (SDO):

5.2.4. This option was considered, but discounted.

5.2.5. Rail Group Standard GE/GN8577, suggests this method of operation is not acceptable as the Class 395 multiple unit trains do not have interconnecting gangways. This could result in passengers in one unit being unable to move to a part of the train where doors were available for egress. Response of passengers in this situation cannot be assured.

5.2.6. In terms of impact, not only is this operationally complex but dwell times could also be increased as stated in GE/GN8577, Section 2.6.

5.2.7. The biggest issue, however, is that the train does not fit in either platform at Maidstone West so the rear of the train would not be in the platform. When this becomes the front of the train, for the return working, it would be the wrong side of the start back signal if the train were not moved forward or to the opposite platform when the arriving passengers had egressed the train.

### Turnback Platform 2 (extension of Platform 2):

5.2.8. It is understood that there is sufficient space within Network Rail boundaries to accommodate the Platform 2 extension required to operate a 12 car Class 395 service at Maidstone West Station.

5.2.9. A deviation from Rail Group Standards will be required as the platform extension will be adjacent to a track radius less than 500m. It should be noted that the existing platform is on the same radius and it is not possible to significantly change the geometry at this site due to physical constraints.



5.2.10. The construction of the platform extension would require the removal of the Up and Down Bay sidings. There is scope for partial retention of the Up siding (to be assessed at later stages of scheme development).

5.2.11. Alterations to the existing signalling will be required. Movement of signals do not require a review of braking calculations as they are within an Absolute Block Section. Signal sighting and dispatch assessment would be required at further design stages. OFF indicators may be required.

### Turnback Platform 1 (extension of Platform 1):

5.2.12. It is understood that there is sufficient space within Network Rail boundaries to accommodate the Platform 2 extension required to operate a 12 car Class 395 service at Maidstone West Station.

5.2.13. A deviation from Rail Group Standards will be required as the platform extension will be adjacent to a track radius less than 500m. It should be noted that the existing platform is on the same radius and it is not possible to significantly change the geometry at this site due to physical constraints.

5.2.14. It is possible to achieve the required platform extension and also provide the required loop overlap. However the existing crossover (located towards the Strood-end of the station) would need to be relocated. There are two possible locations, but a full track survey would be required at later design stages to confirm and depending on the location, an alteration to the current speed profile may be required.

5.2.15. The construction of the platform extension would require the removal of the carriage sidings.

5.2.16. Alterations to the existing platform end signals will be required. Movement of signals do not require a review of braking calculations as they are within an Absolute Block Section. Signal sighting and dispatch assessment would be required at further design stages. OFF indicators may be required.

5.2.17. Dependant on the chosen position for the replacement crossover (Paddock Wood-end), there may or may not be the requirement for signalling alterations. Repositioning the crossover in a position close to the existing would likely require no signalling alterations. Repositioning the crossover further south would have a wider impact on the signalling further south.



Tables 5.1 and 5.2 detail the option of an additional 12-car service formed of 6-car from Ramsgate and 6-car from Dover Priory via Ashford International to St Pancras International

Table 5.1: Additional 12-car High Speed Service option table

Option	1.03 12-cars
Conditional Output	Contributes towards CO3 to provide sufficient capacity for passengers travelling into London St Pancras during the high peak hour via Ashford International in 2023/24
Timeframe	To meet the forecast demand to 2023/24
Description	Business case appraisal for 12 additional vehicles as a new path from Ashford (of which 6 from Ramsgate and 6 from Dover Priory).
Infrastructure requirement	Depots and stabling costs are not included in this appraisal but must be considered
Operational requirement	12 additional vehicles to lengthen services. It is assumed that these will also be used to operate the corresponding return evening peak service.
Passenger Growth	Background passenger growth of 5% p.a to 2023 and 1.23% to 2043
Passenger impact	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
Freight impact	No impact on freight
Relates to other options	Yes
Rail industry financial categorisation	Scheme increases operating subsidies
Note	High HS1 track access charges, Class 395 vehicle leasing charges, may not be able to run 10tph into London St. Pancras International.

Table 5.2: Additional 12-car High Speed Service business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	23.18	13.08
Non user benefits	27.49	15.09
Other Government Impacts (indirect taxation)	-4.94	-3.42
<b>Total benefits</b>	<b>45.73</b>	<b>24.75</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	151.24	151.24
Revenue	-23.30	-16.25
Other road operating costs	-0.07	-0.04
<b>Total costs</b>	<b>127.87</b>	<b>134.95</b>
<b>Net Present Value</b>		
	<b>-82.15</b>	<b>-110.20</b>
<b>Benefit Case Ratio</b>		
	<b>0.36</b>	<b>0.18</b>

Tables 5.3 and 5.4 detail the option of extending the existing 6-car Ebbsfleet International to St Pancras International service to start from Ashford International. A large capacity gap was identified at the beginning of the Route Study process. Since then an additional 18 vehicles are provided in the High Peak Hour from Ashford International; therefore this option has a very poor business case.

Table 5.4: Extending the Ebbsfleet Shuttle 6-car High Speed Service from Ashford International business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	4.27	2.30
Non user benefits	5.79	3.10
Other Government Impacts (indirect taxation)	-1.02	-0.69
<b>Total benefits</b>	<b>9.04</b>	<b>4.71</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	67.98	67.98
Revenue	-4.81	-3.28
Other road operating costs	-0.01	-0.01
<b>Total costs</b>	<b>63.16</b>	<b>64.69</b>
<b>Net Present Value</b>		
	<b>-54.12</b>	<b>-59.99</b>
<b>Benefit Case Ratio</b>		
	<b>0.14</b>	<b>0.07</b>

Table 5.3: Extending the Ebbsfleet Shuttle 6-car High Speed Service from Ashford International option table

<b>Option</b>	1.03 6-cars
<b>Conditional Output</b>	Contributes towards CO3 to provide sufficient capacity for passengers travelling into London St Pancras during the high peak hour via Ashford International in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Business case appraisal for 6 additional vehicles to extend the Ebbsfleet International starter to Ashford International.
<b>Infrastructure requirement</b>	None
<b>Operational requirement</b>	6 additional vehicles to provide an additional service. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 5% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	Yes
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	High HS1 track access charges, Class 395 vehicle leasing charges, may not be able to run 5tph high peak from Ashford International.



Tables 5.5 and 5.6 detail the option of an extending existing service to 12-cars.

Table 5.5: High Speed Service train lengthening on one service from Maidstone West option table	
<b>Option</b>	1.03 12-cars
<b>Conditional Output</b>	Contributes towards CO3 to provide sufficient capacity for passengers travelling into London St Pancras International during the high peak hour from Maidstone West, Strood and Gravesend in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Business case appraisal for 6 additional vehicles joined to an existing path from Maidstone West.
<b>Infrastructure requirement</b>	Lengthen either platform 1 or platform 2. Both will enable 12 car operation at the station. Depots and stabling costs and power supply upgrades are not included in this appraisal but must be considered
<b>Operational requirement</b>	6 additional vehicles to provide an longer service. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 5% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	Yes
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	High HS1 track access charges, Class 395 vehicle leasing charges, overcrowding is from Strood and Gravesend, not from Maidstone West or Snodland.

Table 5.6: High Speed Service train lengthening on one service from Maidstone West business case		
	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	10.69	5.97
Non user benefits	9.91	5.52
Other Government Impacts (indirect taxation)	-2.51	-1.97
<b>Total benefits</b>	<b>18.09</b>	<b>9.52</b>
<b>Costs (Present Value)</b>		
Investment Cost	9.36	9.36
Operating Cost	48.05	48.05
Revenue	-8.50	-6.00
Other road operating costs	-0.03	-0.01
<b>Total costs</b>	<b>48.88</b>	<b>51.39</b>
<b>Net Present Value</b>		
	<b>-30.79</b>	<b>-41.87</b>
<b>Benefit Case Ratio</b>		
	<b>0.37</b>	<b>0.19</b>

Tables 5.7 and 5.8 detail the option of an additional trains from Ramsgate and Dover via Ashford International to St Pancras International and the lengthening of Maidstone West services to 12-car.

Table 5.7: High Speed Services - additional 12-car from Ashford International and lengthening of the Maidstone West service to 12-car option table	
Option	1.03 12-cars
Conditional Output	Contributes towards CO3 to provide sufficient capacity for passengers travelling into London St Pancras during the high peak hour via Ashford International in 2023/24
Timeframe	To meet the forecast demand to 2023/24
Description	Business case appraisal for 12 additional vehicles as a new path from Ashford (of which 6 from Ramsgate and 6 from Dover Priory), and 6 additional vehicles joined to an existing path from Maidstone West.
Infrastructure requirement	Lengthen either platform 1 or platform 2 at Maidstone West. Both will enable 12 car operation at the station. Depots and stabling costs and power supply upgrades are not included in this appraisal but must be considered
Operational requirement	6 additional vehicles to lengthen services and 12 additional vehicles to provide a new service. It is assumed that these will also be used to operate the corresponding return evening peak service.
Passenger Growth	Background passenger growth of 5% p.a to 2023 and 1.23% to 2043
Passenger impact	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
Freight impact	No impact on freight
Relates to other options	Yes
Rail industry financial categorisation	Scheme increases operating subsidies
Note	High HS1 track access charges, Class 395 vehicle leasing charges, may not be able to run 10tph into London St. Pancras International.

Table 5.8: High Speed Service - additional 12-car from Ashford International and lengthening of the Maidstone West service to 12-car business case		
	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	39.61	21.93
Non user benefits	48.43	26.21
Other Government Impacts (indirect taxation)	-9.30	-6.58
<b>Total benefits</b>	<b>78.74</b>	<b>41.56</b>
<b>Costs (Present Value)</b>		
Investment Cost	9.36	9.36
Operating Cost	283.23	199.29
Revenue	-40.59	-27.96
Other road operating costs	-0.12	-0.07
<b>Total costs</b>	<b>251.88</b>	<b>180.63</b>
<b>Net Present Value</b>		
	<b>-173.14</b>	<b>-139.07</b>
<b>Benefit Case Ratio</b>	<b>0.31</b>	<b>0.23</b>



Tables 5.9 and 5.10 detail the option of extending the Ebbsfleet shuttle service to start from Ashford International and the lengthening of Maidstone West services to 12-car.

Table 5.9: High Speed Service extending the Ebbsfleet Shuttle to Ashford International and train lengthening on services from Maidstone West option table

<b>Option</b>	1.03 12-cars
<b>Conditional Output</b>	Contributes towards CO3 to provide sufficient capacity for passengers travelling into London St Pancras during the high peak hour via Ashford International in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Business case appraisal for 12 additional vehicles: six to extend to Maidstone West and six to extend to Ebbsfleet International
<b>Infrastructure requirement</b>	Lengthen either Platform 1 or Platform 2 at Maidstone West. Both will enable 12-car operation at the station. Depots and stabling costs and power supply upgrades are not included in this appraisal but must be considered
<b>Operational requirement</b>	Business case appraisal for 6 additional vehicles to extend the Ebbsfleet International starter to Ashford International, and six additional vehicles joined to an existing path from Maidstone West.
<b>Passenger Growth</b>	Background passenger growth of 5% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	Yes
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	High HS1 track access charges, Class 395 vehicle leasing charges, may not be able to run 10tph into London St. Pancras International.

Table 5.10: High Speed Service extending the Ebbsfleet Shuttle to Ashford International and train lengthening on services from Maidstone West business case		
	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	19.17	10.56
Non user benefits	24.70	13.10
Other Government Impacts (indirect taxation)	-4.32	-2.90
<b>Total benefits</b>	<b>39.56</b>	<b>20.76</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	113.59	113.59
Revenue	-20.38	-13.78
Other road operating costs	-0.06	-0.03
<b>Total costs</b>	<b>93.15</b>	<b>99.77</b>
<b>Net Present Value</b>		
	<b>-53.59</b>	<b>-79.01</b>
<b>Benefit Case Ratio</b>		
	<b>0.42</b>	<b>0.21</b>

# 6 London Blackfriars (CO4 & CO10)

May 2018

South East Route: Kent Area Route Study - Technical Appendix 108

6.0.1. In 2024 there is no vehicle gap for this service group due to the forecast low growth rates and the introduction of high capacity Class 700 rolling stock. In 2044 there is a gap of eight vehicles.

6.0.2. **Tables 6.1 and 6.2** illustrates which platforms along the route can accommodate 12-car services:

## 6.1 London Blackfriars Service Route Train Lengthening Pre-GRIP study

6.1.1. This aim of the study was to identify infrastructure that limits the ability to operate and stop 12-car Class 700 services at stations on the Kent ThamesLink Service Route. The study investigated platform lengths and operational equipment which would support train lengthening to 12-car on this service route, allow 12-car trains to serve Brent Cross, and help mitigate the current capacity issues exhibited north of the River Thames.

6.1.2. The study focussed on identifying constraints restricting 12-car services stopping at stations on this route. A total of 35 stations are served by these services, however, seven of these are already 12-car capable so no further work was required for those. Similarly, of the six berthing sidings in the study area, just one needs lengthening for 12-car operations.

6.1.3. Of the 28 stations, the work required to cater for 12-car trains ranges from simple platform extensions to major station and network alterations. Six have been highlighted as requiring significant work:

**Herne Hill\*** – Options included a grade separated station and new intersection bridge with an alternative option proposing major remodelling of the junctions either side of the station.

**Beckenham Junction\*** – Options include loss of operational routes or reconstruction of overline bridge and major station redevelopment.

**Kent House\*** – Options include track slues, land purchase and installation of retaining walls with one option proposing reduction of platforms from four to three.

**Elephant and Castle** – Option requires installation of a new viaduct extension, in a highly constrained area, to accommodate track slues for island platform extensions.

\* these stations will no longer be served by ThamesLink services from May 2018

Line of route	Photo	Station	12-car?	Proposal	Cost range
Maidstone East line	1	Maidstone East	No	Extend all/some platforms towards London or provide a new turnback siding between Maidstone East and Bearsted	
	2	Barming	No	Extend all platforms at either end or Selective Door Opening	
	3	East Malling	No	Extend all platforms towards Country or Selective Door Opening	
	4	West Malling	No	Extend all platforms at either end or Selective Door Opening	
	5	Borough Green & Wrotham	No	Extend all platforms at both ends or Selective Door Opening	
	6	Kemsing	No	Extend all platforms towards London or Selective Door Opening	
Sevenoaks via Catford Loop		Sevenoaks	Yes		Do maximum: £250-500m  Do minimum: £175-375m
	7	Bat & Ball	No	Extend all platforms towards London or Selective Door Opening	
	8	Otford	No	Extend all platforms at either end or Selective Door Opening	
	9	Shoreham	No	Extend all platforms at either end or Selective Door Opening	
	10	Eynsford	No	Extend all platforms towards Country or Selective Door Opening	
		Swanley	Yes		
		St Mary Cray	Yes		
	11	Bickley	No	Extend all platforms towards London or Selective Door Opening	
		Bromley South	Yes		
	12	Shortlands	No	Extend all platforms towards Country	
	13	Ravensbourne	No	Extend all platforms towards London	
	14	Beckenham Hill	No	Extend all platforms towards London or Country	
	15	Bellingham	No	Extend all platforms towards London	
	16	Catford	No	Extend all platforms towards London	
	17	Crofton Park	No	Extend all platforms towards Country	
	18	Nunhead	No	Extend all platforms towards London	
	19	Peckham Rye	No	Extend Platforms 3 & 4 towards Denmark Hill	
	20	Denmark Hill	No	Extend all platforms towards Country	

**Shortlands** – Options include track slues, land purchase and installation of retaining walls encroaching close to a listed building.

**Maidstone East** – Options include track slues, track removal, siding removal, signalling alterations and construction of several complex underline bridge structures.

6.1.4. Each station has been considered on an individual basis assessing options to extend all platforms to 12-car capacity following an interdisciplinary review of existing engineering, operational and implementation factors. Selective Door Opening should also be considered for some locations. Further consideration is required of signalling sections.



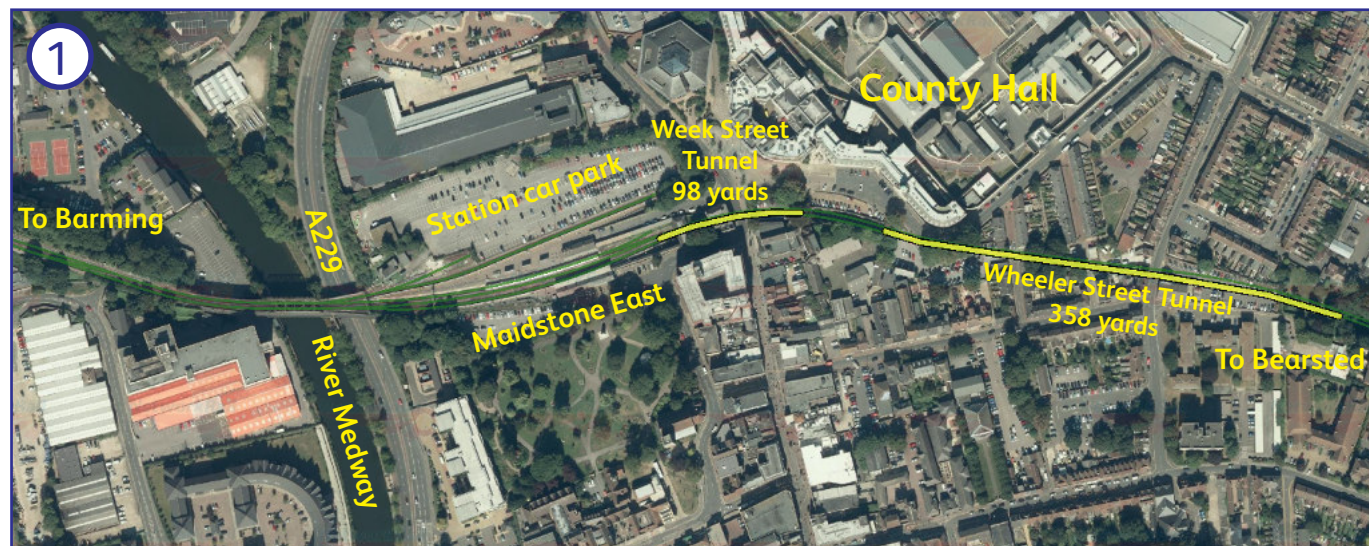


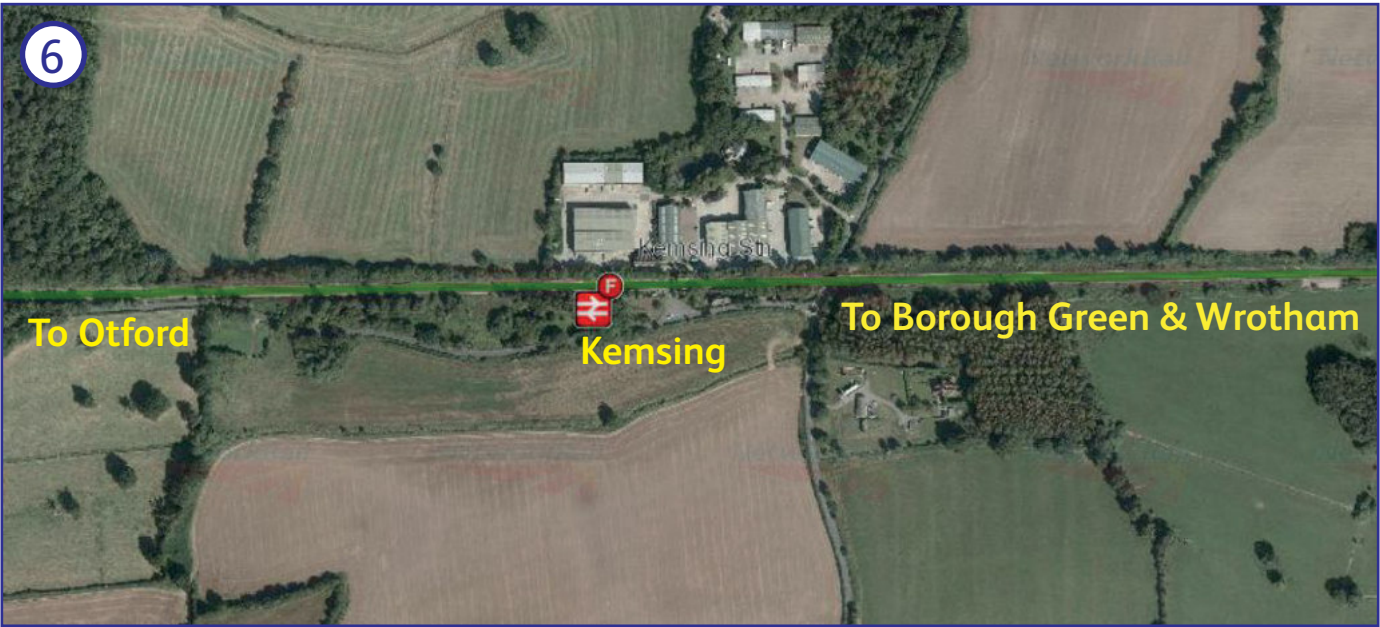
Table 6.2 - 12-car platforms by ThamesLink service corridor - Orpington to Loughborough Junction via Herne Hill and Thameslink Corridor

Line of route	Photo	Station	12-car?	Proposal	Cost range
Orpington via Herne Hill (via Herne Hill is not a ThamesLink route from May 2018)		Orpington	Yes		Do maximum: £500m  Do minimum: £250m
		Petts Wood	Yes		
	21	Beckenham Junction	No	Extend Platforms 2 & 3 towards Country or modify the sidings adjacent to the station and extend Platforms 3 & 4	
	22	Kent House	No	Extend Platforms 1, 3 & 4 to 10-car and Platform 2 to 12-car towards London or extend all platforms towards Country or remodel the station to three platforms only	
	23	Penge East	No	Extend all platforms towards London or Country	
	24	Sydenham Hill	No	Extend all platforms towards London	
	25	West Dulwich	No	Extend all platforms towards London or Country	
	26	Herne Hill	No	Extend all platforms to 10-car and utilise Selective Door Opening or provide a grade separated or segregated platform solution with 12-car platforms	
	27	Loughborough Junction	No	Extend Platform 1 towards Country and Platform 2 in both directions	
Thameslink Corridor	28	Elephant & Castle	No	Extend all platforms towards London	£75-175m
		London Blackfriars	Yes		

The photographs shown on this and the following pages show the stations referred to in [Tables 6.1 and 6.2](#) and are shown in numeric order for ease of reference. The photographs seek to highlight the issues that may be encountered to extend the platforms to 12-car.







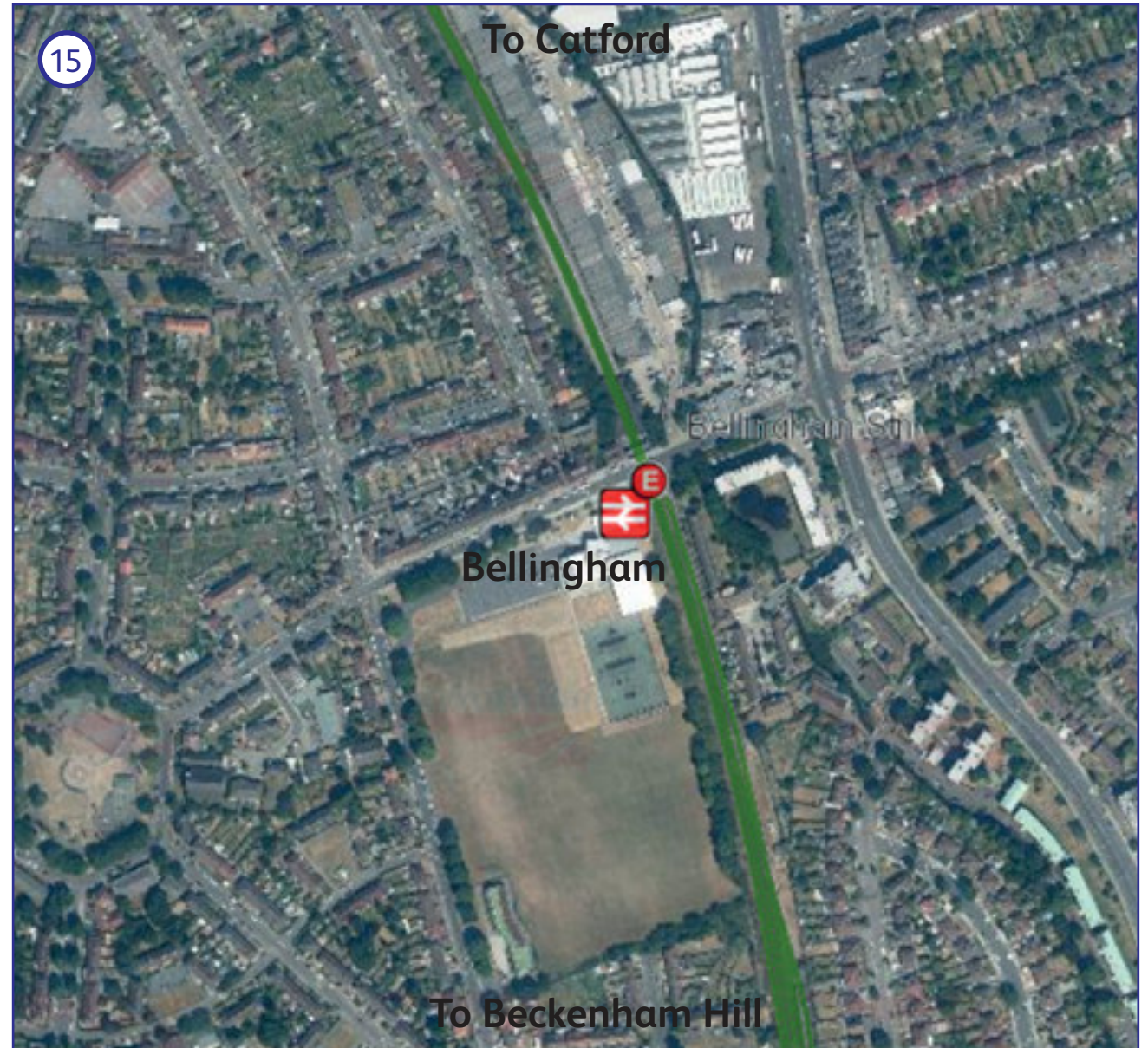
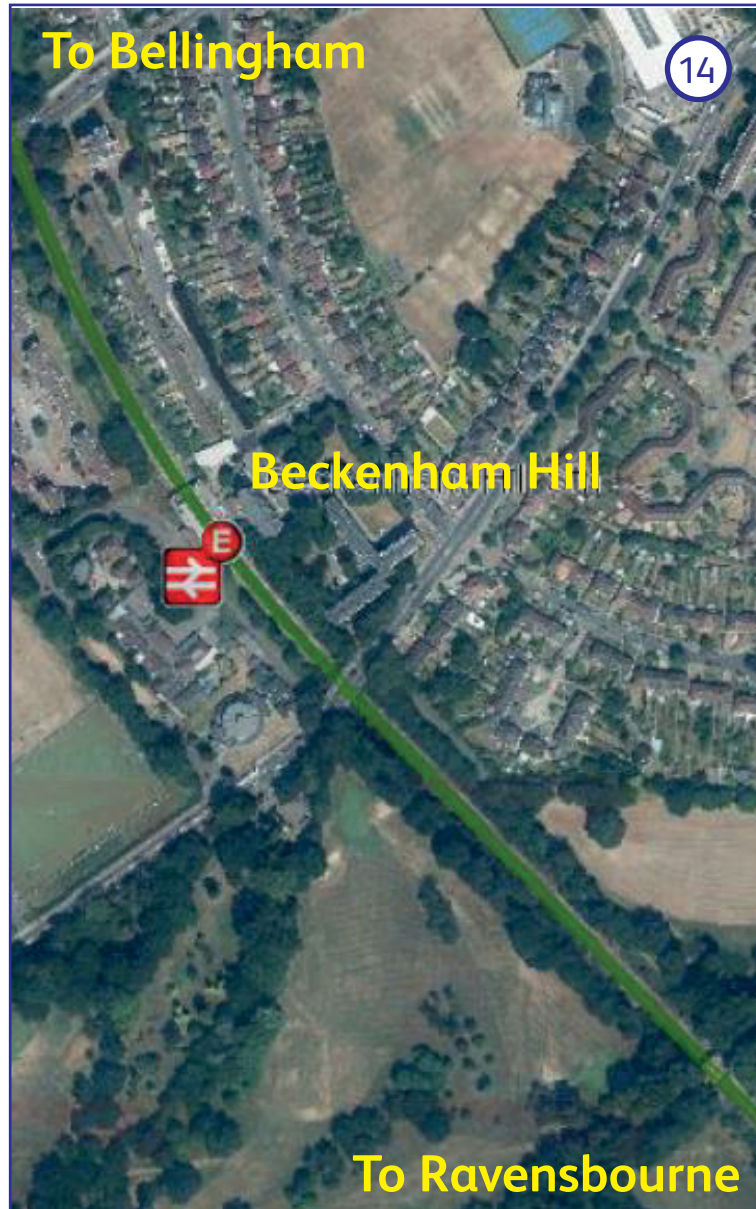












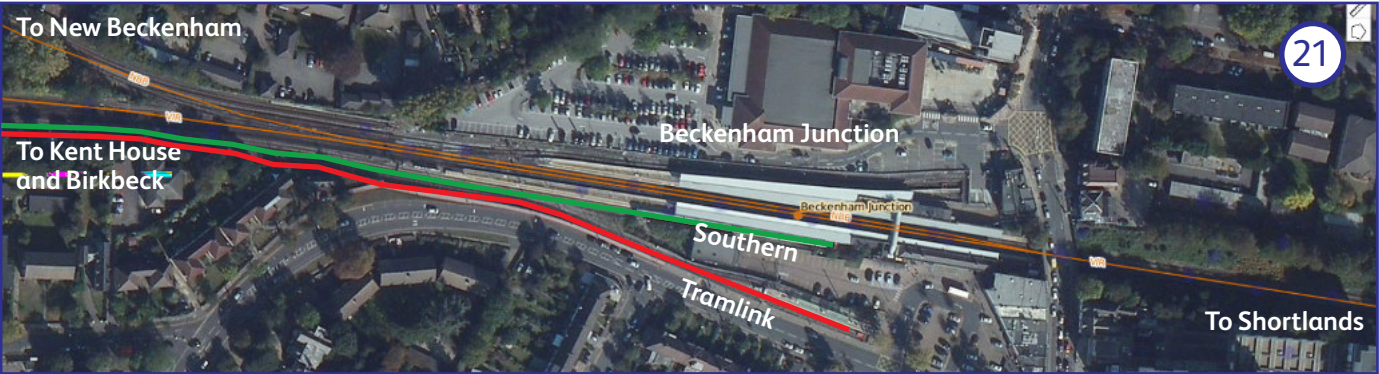




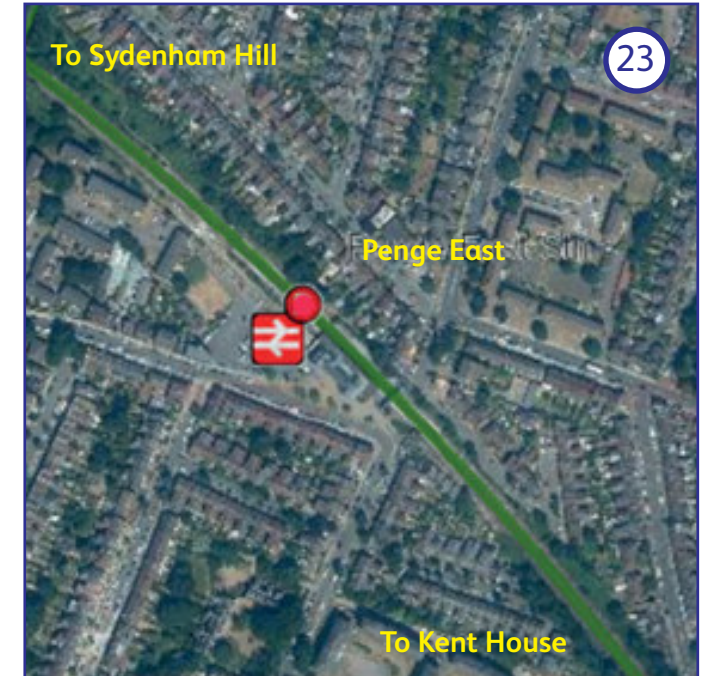
















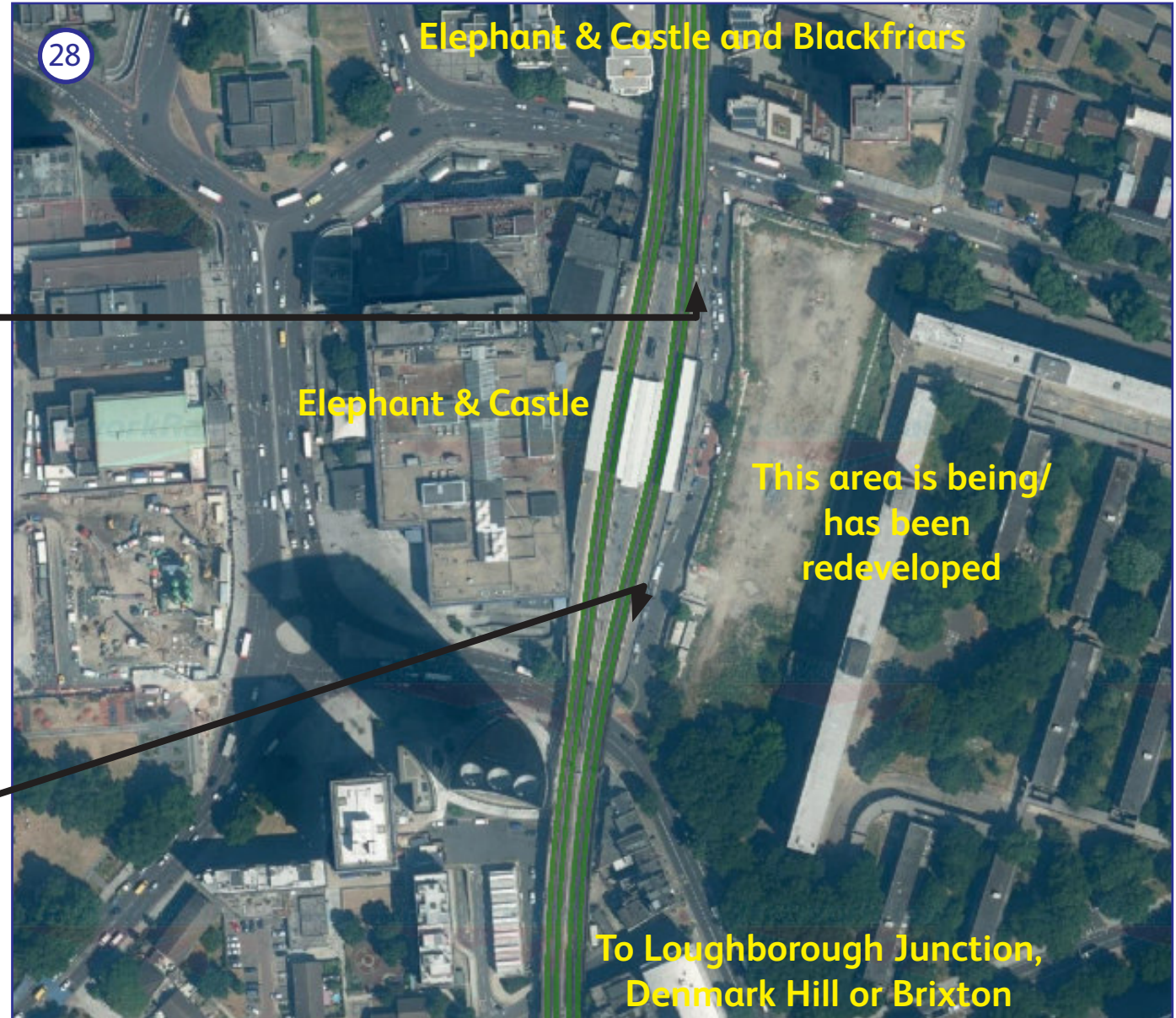
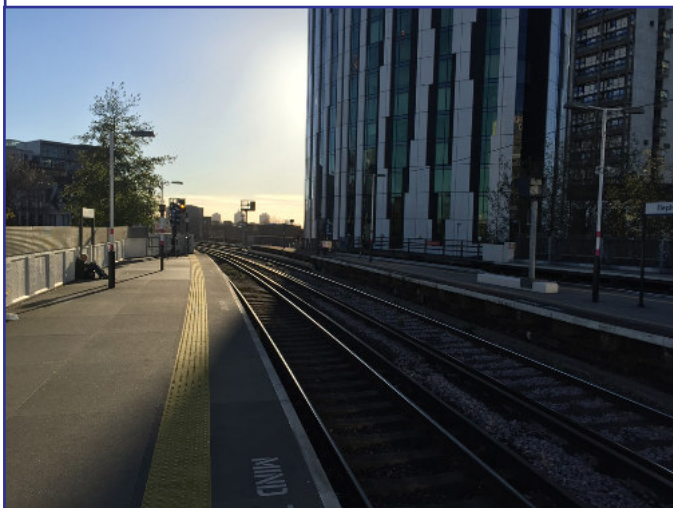








Above is the view towards London Blackfriars at Elephant & Castle station and below is towards Loughborough Junction/Denmark Hill.





Tables 6.3 and 6.4 detail the option of an additional train from Orpington to London Blackfriars via Kent House.

Table 6.4: Blackfriars services - additional 8-car Orpington to Blackfriars via Kent House service business case		
	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	26.25	15.19
Non user benefits	16.43	9.22
Other Government Impacts (indirect taxation)	-1.68	-1.19
<b>Total benefits</b>	<b>40.99</b>	<b>23.22</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	29.26	20.37
Revenue	-8.42	-5.99
Other road operating costs	-0.02	-0.01
<b>Total costs</b>	<b>20.83</b>	<b>14.37</b>
<b>Net Present Value</b>		
	<b>20.17</b>	<b>8.85</b>
<b>Benefit Case Ratio</b>		
	<b>1.97</b>	<b>1.62</b>

Table 6.3: Blackfriars services - additional 8-car Orpington to Blackfriars via Kent House service option table

<b>Option</b>	1.04 8-cars
<b>Conditional Output</b>	Contributes towards CO4 to provide sufficient capacity for passengers travelling into London Blackfriars in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Business case appraisal for an additional 8-car train from Orpington to London Blackfriars via Kent House.
<b>Infrastructure requirement</b>	None
<b>Operational requirement</b>	Eight additional vehicles to provide an additional train. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 0.87% p.a to 2023 and 0.44% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	No
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	

Tables 6.5 and 6.6 detail the option to extend 4tph ThamesLink services via Catford to 12-car

Table 6.5: Blackfriars services - additional 16 vehicles to extend 4tph ThamesLink services via Catford to 12-car option table	
<b>Option</b>	1.04 16-cars
<b>Conditional Output</b>	Contributes towards CO4 to provide sufficient capacity for passengers travelling into London Blackfriars in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Business case appraisal for 16 additional vehicles to extend 4tph to 12-car via Catford Loop
<b>Infrastructure requirement</b>	None
<b>Operational requirement</b>	Sixteen additional vehicles to lengthen 4tph services from 8- to 12-cars. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 0.87% p.a to 2023 and 0.44% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	No
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	Does not include costs or benefits of crowding relief north of London Blackfriars

Table 6.6: Blackfriars services - additional 16 vehicles to extend 4tph ThamesLink services via Catford to 12-car business case		
	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	62.34	36.20
Non user benefits	33.43	18.49
Other Government Impacts (indirect taxation)	-3.37	-2.36
<b>Total benefits</b>	<b>92.40</b>	<b>52.33</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	68.99	48.91
Revenue	-16.90	-11.88
Other road operating costs	-0.04	-0.02
<b>Total costs</b>	<b>52.05</b>	<b>37.00</b>
<b>Net Present Value</b>		
	<b>40.35</b>	<b>15.32</b>
<b>Benefit Case Ratio</b>		
	<b>1.78</b>	<b>1.41</b>



# 7 London Bridge & London Victoria Main Line (CO5 & CO11)

May 2018

South East Route: Kent Area Route Study - Technical Appendix 123

## 7.1 London Bridge Main Line

7.1.1. **Table 7.1** shows the total number of paths required for each individual route for 8-, 10- and 12-car operations to fulfil the 2044 requirements, when combining the base vehicle and vehicle gap figures. 8 and 10 car lengths are not applicable to all routes.

7.1.2. **Table 7.2** shows the current number of paths for 8-, 10- and 12-car operations compared against the maximum paths required for 2044.

**Table 7.1 - London Bridge services 2044 vehicles and pathways**

Route	Base vehicles	Vehicle gap	Total vehicles (Base+ Gap)	Max. paths required in 2044		
				8-car	10-car	12-car
Via Chatham/ Swanley	59	8	67	n/a	n/a	6
Via Maidstone East/Swanley	18	8	26	4	3	3
Via Tonbridge	135	59	194	n/a	20	17
<b>Total</b>	<b>212</b>	<b>75</b>	<b>287</b>	<b>4</b>	<b>23</b>	<b>26</b>

Figures are Total Vehicles divided by the number of cars (8, 10 or 12).

All figures are rounded up to the nearest whole.

**Table 7.2 - London Bridge services pathways current vs 2044**

Route	Current no. of paths			Max. paths required by 2044			Additional paths required by 2044		
	8-car	10-car	12-car	8-car	10-car	12-car	8-car	10-car	12-car
Via Chatham/ Swanley	n/a	n/a	5	n/a	n/a	6	n/a	n/a	1
Via Maidstone East/Swanley	3	2	2	4	3	3	1	1	1
Via Tonbridge	n/a	14	12	n/a	20	17	n/a	6	5
<b>Total</b>	<b>3</b>	<b>16</b>	<b>19</b>	<b>4</b>	<b>23</b>	<b>26</b>	<b>1</b>	<b>7</b>	<b>7</b>

Figures are Base Vehicles divided by the number of cars (8, 10 or 12).

All figures are rounded up to the nearest whole.

## 7.2 London Victoria Main Line

2024: Vehicle gap of 1 vehicle.

2044: Vehicle gap of 8 vehicles.

7.2.1. **Table 7.3** shows the total number of paths required for each individual route for 8-, 10- and 12-car operations to fulfil the 2044 requirements, when combining the base vehicle and vehicle gap figures. 8- and 10-car lengths are not applicable to all routes

**Table 7.3 - Victoria services 2044 vehicles and pathways**

Route	Base vehicles	Vehicle gap	Total vehicles (Base+ Gap)	Max. paths required in 2044		
				8-car	10-car	12-car
Via Chatham/ Swanley	59	8	67	n/a	n/a	6
Via Maidstone East/Swanley	18	8	26	4	3	3
Via Tonbridge	135	59	194	n/a	20	17
<b>Total</b>	<b>212</b>	<b>75</b>	<b>287</b>	<b>4</b>	<b>23</b>	<b>26</b>

Figures are Total Vehicles divided by the number of cars (8, 10 or 12).

All figures are rounded up to the nearest whole.

**Table 7.4 - Victoria services pathways current vs 2044**

Route	Current no. of paths			Max. paths required by 2044			Additional paths required by 2044		
	8-car	10-car	12-car	8-car	10-car	12-car	8-car	10-car	12-car
Via Chatham/ Swanley	n/a	n/a	5	n/a	n/a	6	n/a	n/a	1
Via Maidstone East/Swanley	3	2	2	4	3	3	1	1	1
Via Tonbridge	n/a	14	12	n/a	20	17	n/a	6	5
<b>Total</b>	<b>3</b>	<b>16</b>	<b>19</b>	<b>4</b>	<b>23</b>	<b>26</b>	<b>1</b>	<b>7</b>	<b>7</b>

Figures are Base Vehicles divided by the number of cars (8, 10 or 12).

All figures are rounded up to the nearest whole.

### 7.3 Provision of new 12-car siding on the Metropolitan Reversible Line (Cannon Street) Pre-GRIP study

7.3.1. This aim of the study was to identify infrastructure options for providing one or two 12-car sidings to serve Cannon Street Station to replace the soon to be redundant Metropolitan Reversible Line.

#### Single 12-car Siding:

7.3.2. To implement this option, the Reversible Metropolitan Line can be converted into a siding complete with buffer stop at the Metropolitan Junction end, therefore requiring the abandonment of the Metropolitan Junction connection.

7.3.3. An alternative was considered whereby the connection could remain. However, a protecting signal and trap point would probably reduce the potential standage to less than 12 coaches. This should be reconsidered if remodelling of Cannon Street is looked at in the future.

7.3.4. The siding has been designed on a 150m curve which drives the need for gauge widening and continuous checking throughout. It must be noted 150m radius is the normal minimum design value for sidings. The line-speed of the siding would effectively remain at 15mph.

7.3.5. A drivers walkways would be required, and there is sufficient space for this. Consideration would need to be given to lighting and access points onto the walkway in future design stages, but it is likely that the walkway would extend back to Cannon Street station. The existing sidings are understood to be abandoned, and as such, there should be no issue with accommodating the driver's walkway through this area.

7.3.6. The scissors layout connecting the Cannon Street Reversible Line to what is currently the Metropolitan Reversible Line can also be retained, providing all existing connectivity into the station. The new siding would commence beyond the clearance point of the scissors layout. The new siding would also still be accessible from Platforms 4 to 7 inclusive despite the track layout in this area to accommodate the new siding.

#### Two 12-car Sidings:

7.3.7. This option was considered, but discounted. Due to the current leasing arrangements of the viaduct structure supporting the Metropolitan Reversible Line, and future development proposals in the area, modifications to the existing substructure, in order to support two 12-car sidings and associated walkways, is not possible until 2030 without remodelling the tracks at Cannon Street.

7.3.8. As with the single siding option, in order to provide standage length for a 12-car train, it is considered that the connection to Metropolitan Junction cannot be retained.

7.3.9. This option provides a buffer stop arrangement at the termination of both sidings, a full risk assessment would be required as part of the future design phases, however at this stage fixed buffer stops have been considered a suitable solution.

7.3.10. The radii of both sidings has been kept to the minimum siding design value of 150m and they are therefore not parallel along the length of the viaduct but a compliant minimum interval between the sidings of 2150mm has been provided. Continuous checking and gauge widening would be required throughout.

7.3.11. Siding 1 retains the connectivity discussed in the single siding option and is largely unchanged, commencing clear of the existing scissors layout. Siding 2 can only be connected to Platform 7 unless significant remodelling is undertaken on the approaches to Cannon Street

7.3.12. A driver's walkway would be required to facilitate both sidings and would be accessible so that sufficient space can be provided at the Cannon Street end to enable access between two stabled trains, thus keeping drivers away from the running lines, particularly the Cannon Street Reversible which runs adjacent to the proposed siding 1.

7.3.13. The viaduct would need to be widened for a length of approximately 100m to enable this solution to be feasible. The width of the required widening hasn't been assessed at this stage.



A train passing through London Bridge from Cannon Street. These services will stop at London Bridge from 2018

Diagrams of the single 12-car siding can be found in the Kent Route Study - **Figure 5.6** - whilst a diagram of the two siding option can be found in the Metroisation Concept chapter of this document - **Figure 12.1**



Tables 7.5 and 7.6 detail the option to extend all Charing Cross and Cannon Street services via Tonbridge to 12-cars - this equates to nine additional vehicles.

Table 7.6: London Bridge & Victoria Main Line - Tonbridge services train lengthening business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	20.54	11.47
Non user benefits	16.82	9.16
Other Government Impacts (indirect taxation)	-2.74	-1.89
<b>Total benefits</b>	<b>34.62</b>	<b>18.75</b>
<b>Costs (Present Value)</b>		
Investment Cost	0.00	0.00
Operating Cost	30.16	21.41
Revenue	-13.26	-9.18
Other road operating costs	-0.03	-0.02
<b>Total costs</b>	<b>16.87</b>	<b>12.21</b>
<b>Net Present Value</b>		
	<b>17.75</b>	<b>6.53</b>
<b>Benefit Case Ratio</b>		
	<b>2.05</b>	<b>1.53</b>

Table 7.5: London Bridge & Victoria Main Line - Tonbridge services train lengthening option table

<b>Option</b>	1.05 9-cars
<b>Conditional Output</b>	Contributes towards CO5 to provide sufficient capacity for passengers travelling into London on the mainline during the high peak hour via Tonbridge in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Lengthen three of the existing services to 12-cars
<b>Infrastructure requirement</b>	None
<b>Operational requirement</b>	Six additional vehicles to lengthen services. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 1.17% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	Alternative to 1.05 21-cars
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	

Tables 7.7 and 7.8 detail the additional option to operate an additional 12-car service - this equates to 12 additional vehicles.

Table 7.8: London Bridge & Victoria Main Line - Additional 12-car service via Tonbridge train lengthening business case

	£m (2010 PV 60 years)	£m (2010 PV 30 years)
<b>Benefits (Present Value)</b>		
Rail user benefits	30.67	16.84
Non user benefits	28.66	15.45
Other Government Impacts (indirect taxation)	-5.37	-3.90
<b>Total benefits</b>	<b>53.95</b>	<b>28.39</b>
<b>Costs (Present Value)</b>		
Investment Cost	9.86	9.86
Operating Cost	60.32	42.82
Revenue	-22.42	-15.38
Other road operating costs	-0.06	-0.03
<b>Total costs</b>	<b>47.72</b>	<b>37.27</b>
<b>Net Present Value</b>		
	<b>6.24</b>	<b>-8.88</b>
<b>Benefit Case Ratio</b>		
	<b>1.13</b>	<b>0.76</b>

Table 7.7: London Bridge & Victoria Main Line - Additional 12-car service via Tonbridge train lengthening option table

<b>Option</b>	1.05 21-cars
<b>Conditional Output</b>	Contributes towards CO5 to provide sufficient capacity for passengers travelling into London on the mainline during the high peak hour via Tonbridge in 2023/24
<b>Timeframe</b>	To meet the forecast demand to 2023/24
<b>Description</b>	Providing 12 additional vehicles as a new train from the Tonbridge route by using the Metropolitan Reversible Line, assuming that 6 additional vehicles have already been provided to lengthen trains under the constraints of the existing infrastructure.
<b>Infrastructure requirement</b>	Metropolitan reversible berthing siding.
<b>Operational requirement</b>	Nine additional vehicles to lengthen services and 12 additional vehicles to operate the new service. It is assumed that these will also be used to operate the corresponding return evening peak service.
<b>Passenger Growth</b>	Background passenger growth of 1.17% p.a to 2023 and 1.23% to 2043
<b>Passenger impact</b>	To reduce crowding on these services through train lengthening to accommodate the 2023/24 demand forecast.
<b>Freight impact</b>	No impact on freight
<b>Relates to other options</b>	Alternative to 1.05 9-cars
<b>Rail industry financial categorisation</b>	Scheme increases operating subsidies
<b>Note</b>	The cost of adapting the Metropolitan Reversible line to a siding has been included in this appraisal.



# 8 Depots & stabling

May 2018

South East Route: Kent Area Route Study - Technical Appendix 127

8.1. Depots and stabling have not traditionally formed part of Route Studies, however, this section looks at the current state of the facilities and the capacity provided.

8.2. Total vehicle capacity should not be used as a benchmark for capacity as trains are formed of fixed length units.

8.3. It should be noted that completely filling a depot full of trains does not necessarily help as you need to get them out again.

8.4. **Figure 8.1** is the same as the Depots and Stabling map in the main Route Study document as it shows the location of the depots and stabling sidings.

8.5. Depots are locations where trains are maintained and stabled between workings. Stabling sidings may provide cleaning and toilet emptying systems but are essentially used to hold trains off the main line between services.

8.6. Overnight some trains are berthed in station platforms which enables them to be cleaned and prepared for the morning trains. A number of platforms will be allocated for this to happen, although it may not necessarily be specific platforms.

8.7. As can be seen in **Figure 8.1**, multiple operators may use the sidings. Depot workings will be developed alongside the timetable so that capacity is used efficiently.

8.8. Not all trains are available to be used at all times, a small number of units will be allocated to maintenance so the total fleet size will be reduced slightly by maintenance programmes.

8.9. **Tables 8.1 and 8.2** detail the depots & sidings and platform berthing respectively, showing the number and length of sidings by 20m vehicles and fixed formation units.

8.10. **Table 8.3** shows the total depots, siding and berthing lines and how the length of the unit affects the capacity that could be used. Southeastern operate trains that are 2-, 3-, 4-, 5- or 6-car lengths whereas ThamesLink units are either 8- or 12-cars long.

8.11. The former Rochester station platforms are flexible as they can be used for looping trains (holding for another to pass) or for berthing trains, usually overnight.

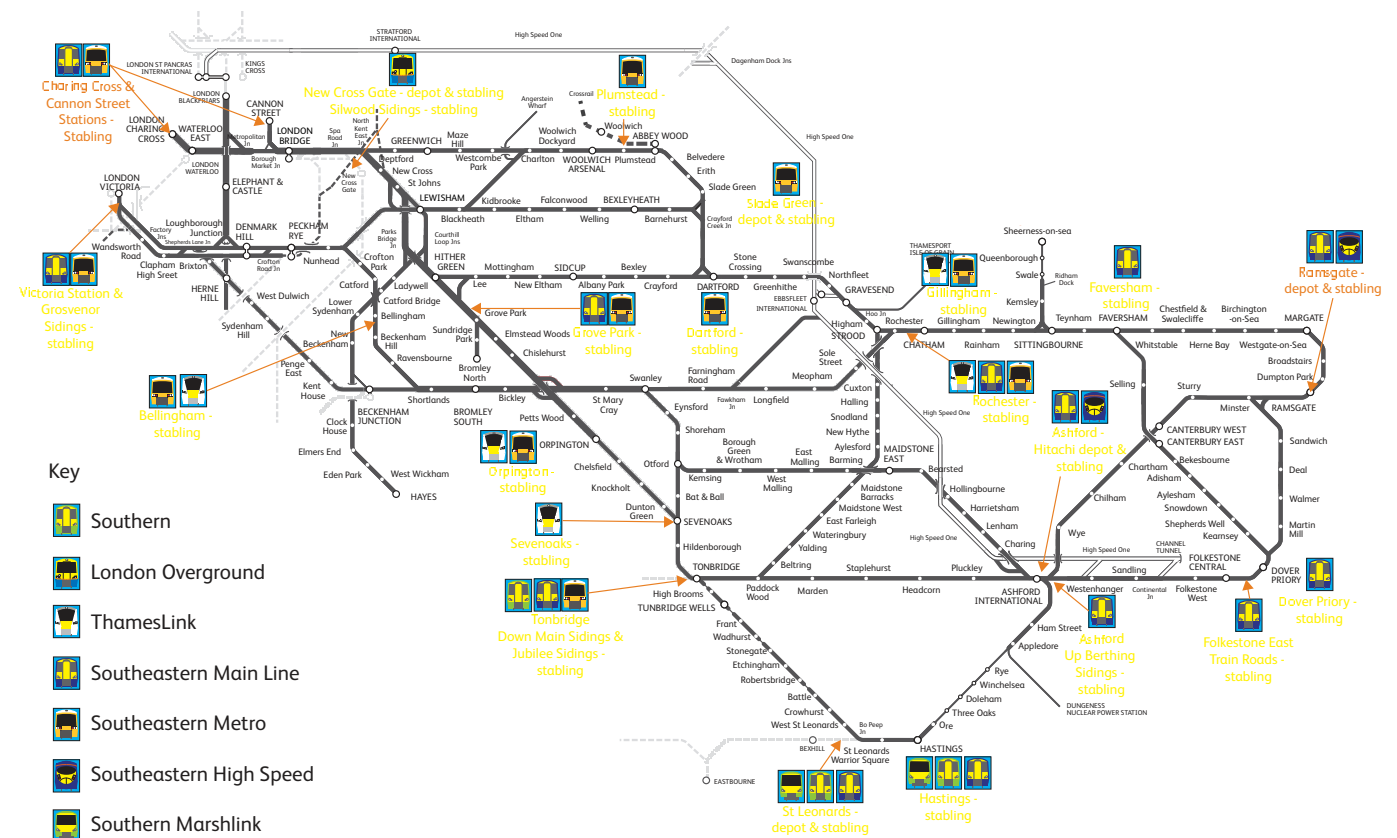


Table 8.1 - Depots and stabling locations and capacity

Location	Sub-location	No. of sidings by length (20m vehicles)												Total no. of sidings	Total no. of vehicles	Total no. of fixed formation units by length (vehicles)										Total no. of vehicles by unit length (vehicles)					
		4	6	8	9	10	11	12	14	16	18	20	2			3	4	5	6	8	10	12	4	5	6	8	10	12			
Ashford	Down Sidings		6	1				3		6			16	176	88	46	41	31	25	16	9	9	164	155	150	128	90	81			
	East Sidings							2					2	24	12	8	6	4	4	2	2	2	24	20	24	16	20	18			
	Up Sidings			2									2	16	8	4	4	2	2	2	0	0	16	10	12	16	0	0			
Bellingham	Sidings			4									4	32	16	8	8	4	4	4	0	0	32	20	24	32	0	0			
Dartford	Down Sidings					1							1	10	5	3	2	2	1	1	1	0	8	10	6	8	10	0			
	Up Sidings			2					1	1			4	46	23	13	11	7	6	5	2	2	44	35	36	40	20	18			
Dover Priory	Sidings			3									3	24	12	6	6	3	3	3	0	0	24	15	18	24	0	0			
Faversham	Sidings	1		4						1			6	52	26	14	13	7	6	6	1	1	52	35	36	48	10	9			
Folkestone East	East Sidings							3					3	36	18	12	9	6	6	3	3	3	36	30	36	24	30	27			
Gillingham	Depot			1		6	4						11	112	54	32	22	21	11	11	10	0	88	105	66	88	100	0			
	Up Sidings			1									1	8	4	2	2	1	1	1	0	0	8	5	6	8	0	0			
Grove Park	Shed							9					9	108	54	36	27	18	18	9	9	9	108	90	108	72	90	81			
	Down Sidings							8					8	96	48	32	24	16	16	8	8	8	96	80	96	64	80	72			
	Up Sidings							8					8	96	48	32	24	16	16	8	8	8	96	80	96	64	80	72			
Hastings	Park Sidings							2					2	24	12	8	6	4	4	2	2	2	24	20	24	16	20	18			
Orpington	Sidings							4					4	48	24	16	12	8	8	4	4	4	48	40	48	32	40	36			
Plumstead	Sidings			2		1							3	26	13	7	6	4	3	3	1	0	24	20	18	24	10	0			
Ramsgate	Sidings		4	2				14					20	208	104	68	50	34	34	16	14	14	200	170	204	128	140	126			
Sevenoaks	Sidings		1							1			2	22	11	7	5	4	3	2	1	1	20	20	18	16	10	9			
Slade Green	Depot							3			3	2	8	130	65	42	31	23	16	13	10	8	124	115	96	104	100	72			
	Up Sidings			3		2							5	44	22	12	10	7	5	5	2	0	40	35	30	40	20	0			
St Leonards	Depot							5					5	60	30	20	15	10	10	5	5	5	60	50	60	40	50	45			
Tonbridge	Jubilee Sidings						1	2		1			4	51	25	16	12	8	7	5	4	3	48	40	42	40	40	27			
	Down Sidings			2									2	16	8	4	4	2	2	2	0	0	16	10	12	16	0	0			
Victoria	Sidings			1				7	2				10	120	60	38	29	19	19	10	9	9	116	95	114	80	90	81			
Ramsgate	Sidings		4	2				14					20	208	104	68	50	34	34	16	14	14	200	170	204	128	140	126			
Sevenoaks	Sidings		1							1			2	22	11	7	5	4	3	2	1	1	20	20	18	16	10	9			
Slade Green	Depot							3			3	2	8	130	65	42	31	23	16	13	10	8	124	115	96	104	100	72			
	Up Sidings			3		2							5	44	22	12	10	7	5	5	2	0	40	35	30	40	20	0			
St Leonards	Depot							5					5	60	30	20	15	10	10	5	5	5	60	50	60	40	50	45			
Tonbridge	Jubilee Sidings						1	2		1			4	51	25	16	12	8	7	5	4	3	48	40	42	40	40	27			
	Down Sidings			2									2	16	8	4	4	2	2	2	0	0	16	10	12	16	0	0			
Victoria	Sidings			1				7	2				10	120	60	38	29	19	19	10	9	9	116	95	114	80	90	81			



Table 8.2 - Station berthing locations and capacity

Location	Sub-location	No. of sidings by length (20m vehicles)												Total no. of sidings	Total no. of vehicles	Total no. of fixed formation units by length (vehicles)										Total no. of vehicles by unit length (vehicles)					
		4	6	8	9	10	11	12	14	16	18	20	2			3	4	5	6	8	10	12	4	5	6	8	10	12			
Cannon Street	Platforms							3					3	36	18	12	9	6	6	3	3	3	36	30	36	24	30	27			
Charing Cross	Platforms					3							3	30	15	9	6	6	3	3	3	0	24	30	18	24	30	0			
Dartford	Platform 1					1							1	10	5	3	2	2	1	1	1	0	8	10	6	8	10	0			
Dover Priory	Platform 3			1									1	8	4	2	2	1	1	1	0	0	8	5	6	8	0	0			
Faversham	Platforms 1 & 4							2					2	24	12	8	6	4	4	2	2	2	24	20	24	16	20	18			
Gillingham	Platform 1					1							1	10	5	3	2	2	1	1	1	0	8	10	6	8	10	0			
Hastings	Platforms 1 & 4			1				1					2	20	10	6	5	3	3	2	1	1	20	15	18	16	10	9			
Orpington	Platforms 1 & 6-8							4					4	48	24	16	12	8	8	4	4	4	48	40	48	32	40	36			
Rochester	Old Station							2					2	24	12	8	6	4	4	2	2	2	24	20	24	16	20	18			
Rochester	Platform 3							1					1	12	6	4	3	2	2	1	1	1	12	10	12	8	10	9			
Ramsgate	Platforms 1 & 4							2					2	24	12	8	6	4	4	2	2	2	24	20	24	16	20	18			
Tonbridge	Platform 4			1									1	8	4	2	2	1	1	1	0	0	8	5	6	8	0	0			
Victoria	Platforms			1				2					3	32	16	10	8	5	5	3	2	2	32	25	30	24	20	18			

Table 8.3 - Total berthing capacity and utilisation by unit length

Sub-location	Total no. of sidings	Total no. of vehicles	Total no. of fixed formation units by length (vehicles)								Total no. of vehicles by unit length (vehicles)					
			2	3	4	5	6	8	10	12	4	5	6	8	10	12
Totals	169	1871	933	577	448	309	273	172	127	105	1792	1545	1638	1376	1270	945
Unused space											79	326	233	495	601	926
Percentage of capacity utilisation:											96%	83%	88%	74%	68%	51%

# 9 Marshlink High Speed (CO13)

May 2018

South East Route: Kent Area Route Study - Technical Appendix 130

## 9.1 Background

9.1.1. From the outset of the Route Study development, the Department for Transport instructed that High Speed services to Hastings and Bexhill should be incorporated in the Kent Route Study. The route coloured by linespeed is shown in **Figure 9.1**.

9.1.2. This scheme is seen as vital to the prosperity and future growth of the coastal towns of Hastings and Bexhill as it could reduce the journey time to London, making the area attractive to City workers, following on from the success of Margate's regeneration.

9.1.3. A number of parties have been calling for the upgrade of the Marshlink line for many years. The 1963 Beeching Report originally proposed closing the line completely due to low passenger numbers and high running costs. However it was argued that the parallel A259 road route was too poor to operate replacement bus services.

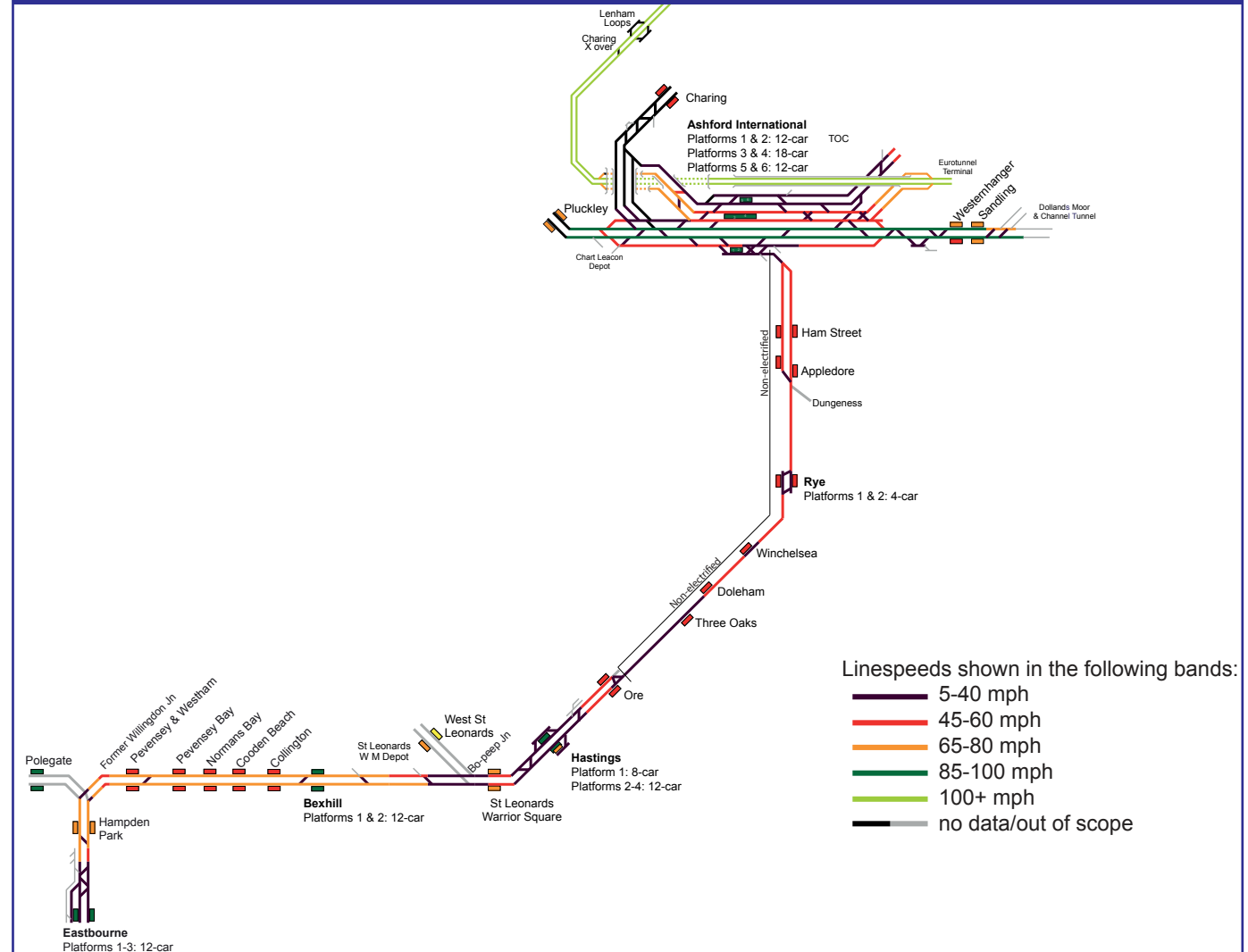
9.1.4. Sections of the line were reduced to single track in 1979. This was to reduce the maintenance and operations costs to allow the railway to remain operational. To achieve this, British Rail removed sections of track between very slow crossovers. The linespeed was also reduced to 60 mph from 85 mph. This has led to slow journey times and does not make best use of the modern diesel rolling stock currently operating the line, which has a top speed of 100 mph.

9.1.5. In June 2011, URS Scott Wilson prepared a Journey Time Improvement feasibility report for Network Rail and this was subsequently supplemented by the Kent LTPP Route Study Hastings and Bexhill High Speed Services Pre-GRIP Feasibility Report published in June 2015 for the Kent Route Study process.

9.1.6. The following pages summarise the report and the choices for funders going forward. The flowchart in **Figure 9.9**, shows that the linespeed improvement schemes can go ahead with or without electrification or High Speed services and would deliver journey time improvements.

9.1.7. At the regular meetings with Amber Rudd MP (for Hastings) and Huw Merriman MP (for Bexhill), an incremental approach to the line upgrade and High Speed services has been discussed and is also explained in this section.

Figure 9.1 - Marshlink line speeds - Eastbourne to Ashford International





9.1.8. **Figure 9.1** shows a detailed map of the line from Eastbourne through to Ashford International. Line colours represent the line speeds and there is an indication of the non-electrified section of line.

9.1.9. Projecting the future demand is essential to calculating the business case. **Table 9.1** shows the assumptions and outputs of the model and how passenger demand changes dramatically for Bexhill, which currently suffers a slow service to London directly or indirectly via St. Leonard's Warrior Square or Hastings, with a 54 per cent increase in passengers. .

9.1.10. The wider economic impacts are also demonstrable in the model and show £123.7m over 60 years, this is based on the work carried out by Mott MacDonald for East Sussex County Council, Rother District Council and Hastings Borough Council

**Table 9.1 - Projecting future demand for High Speed Marshlink services**

Stage	Key assumptions	Key outputs
Service pattern	<ul style="list-style-type: none"> <li>69 minutes between St Pancras International and Hastings, calling Stratford International, Ebbsfleet International, Ashford International, Rye, Hastings, St Leonards Warrior Square, Bexhill and Eastbourne</li> <li>5 minutes time splitting and joining at Ashford International. Anticipated to join to the 'rounder' service via Dover, Sandwich and Ramsgate.</li> <li>Assumed that remaining services are 5 minutes faster.</li> </ul>	
Demand modelling - journeys to London	<ul style="list-style-type: none"> <li>Single-ended gravity model: % of demand commuting to London a function of GJT to London.</li> <li>Relationship calibrated against 2011 census and GJTs from timetable of same year for stations in the NR South East route, between 30-100km from London.</li> <li>Does not model population increase.</li> <li>Uses MOIRA to generate GJTs between stations and London; but not demand change.</li> <li>Overwrites MOIRA's MV and MT files for selected flows.</li> </ul>	Demand change to London: <ul style="list-style-type: none"> <li>Hastings 25%</li> <li>Bexhill 54%</li> <li>Eastbourne 6%</li> </ul>
Demand modelling - other flows	Standard MOIRA elasticity approach	
Wider economic impacts	<ul style="list-style-type: none"> <li>Calculated by Mott MacDonald</li> <li>WebTAG compliant, using DfT WITA software</li> <li>Assuming 1:09 journey time</li> </ul>	£123.7m (PV, 2010 prices, 60 years)
Capital costs	<ul style="list-style-type: none"> <li>£210.4-269.3m</li> <li>From Kent LTPP Route Study Hastings and Bexhill high Speed Services Pre-GRIP Feasibility Report.               <ul style="list-style-type: none"> <li>Ashford Platform 2</li> <li>Electrification – 3rd Rail</li> <li>Level crossing modification / closures</li> <li>Appledore Junction improvements.</li> </ul> </li> <li>Assumed included 60% contingency.</li> </ul>	
Running costs	3 additional units required	

## 9.2 Electrification options

9.2.1. The majority of the Kent Area is electrified with just a few freight lines, sidings and the Marshlink line being the exceptions. There are three options for the electrification of the line:

- **Option 1** - 750V DC conductor/third rail
- **Option 2** - 25kV AC overhead line (wires)
- **Option 3** - no electrification.

9.2.2. Third rail electrification is the most widespread form of electrification in the Kent Area. The maximum speed for third rail equipment is 100 mph.

9.2.3. Overhead line electrification is the typical modern installation and allows for higher line speeds than third rail. It is used on High Speed 1 and is provided in Platforms 3-6 at Ashford International. It requires a significant amount of physical equipment, such as masts and cables, but is less 'lossy' in the transmission of power so requires fewer sub-stations than third rail. Operating practices, repairs and maintenance would be impacted by the use of a new power supply system that current staff are unused to.

9.2.4. Safety is essential so third rail electrification is often cited as dangerous as it involves an uninsulated conductor being placed close to ground level and is dangerous to touch or come in contact with. DC electrification contracts muscles so if you touch it you will grab it and not let go. AC electrification however, uses higher voltages and has the ability to jump several metres to make the circuit back to ground, this means that you do not have to touch it to be electrocuted, it can strike you down if you are too close.

9.2.5. The third option maintains the status quo and would require rolling stock capable of working from the overhead line as well as on non-electrified lines such as a bi-mode train.

9.2.6. The options are expected to cost:

- **Option 1** - DC electrification £100-250M
- **Option 2** - AC electrification £250-500M
- **Option 3** - no direct cost.

**Table 9.2 - Marshlink electrification options - 750V DC third rail**

Proposed Work Element	Construction Discipline	Details / measurables
Provide new 3rd rail Conductor Rail	Track / E&P	54517m of existing track miles to be 3rd Rail electrified.
Amend Bridge Parapets.	Civils	10No. overbridges require the parapets reviewing and potentially amending to provide a combination of solid and steeply sloped profiles to be compliant with 3rd DC electrification.
Rye Signalling Immunisation	Signalling	The Signalling at Rye will require replacing or immunising as part of the 3rd rail installation works. 4No. Signal posts and 1No. Banner repeater.
Trackside 33kV feeder cable	Civils / E&P	Install a trackside 33kV feeder cable along the length of the currently non-electrified length of railway within troughing or buried. 40500m total length of route.
Upgrade Grid Supply Points	E&P	Ashford and Hastings Grid supply points may require upgrading due to the limit of harmonic distortion levels. To be confirmed at the later grip stages

9.2.7. [Tables 9.2 and 9.3](#) show the proposed work for third rail and overhead line electrification respectively.







Table 9.3 - Marshlink electrification options - 25kV AC overhead line

Proposed Work Element	Construction Discipline	Details / measurables
New Overhead Line Electrification	E&P	54517m of existing track miles to be overhead electrified with 25kV AC.
Rye Signalling Immunisation	Signalling	The Signalling at Rye will require replacing or immunising as part of the Overhead Electrification installation works. 4No. Signal posts and 1No. Banner repeater.
3rd Rail electrification requirements	E&P	Install 3rd rail electrification at the Ashford end of the line to both running lines and to the single line section of line at Ore. Assume 2.5km required in total to allow the proposed high speed and stopping services to change power source on the move.
Amend Bridge Parapets.	Civils	14No. overbridges require the parapets reviewing and potentially amending to provide a combination of solid and steeple coper profiles to be compliant with 25kV AC electrification.
Increase Bridge Clearances	Civils	9No. overbridges will require the headroom clearance checking to ensure that there is sufficient clearance for Overhead Electrification. Assume 4 No. overbridges require replacing or the tracks track lowering.
3 New 25kV Feeder Stations	E&P	Provide a new feeder station in the region where the high voltage transmission line from Dungeness power station passes over the railway to the north east of Rye. There may be a further requirement for feeder stations at both Ashford and Hastings to provide sufficient power in event of failure. There is currently a feeder at Ashford used for HS1, and at future GRIP stages it may be deemed possible to use or upgrade this rather than provide an additional feeder.
AC / DC interfaces	E&P	Upgrade the AC/DC interface at Ashford and provide new interface at Hastings (Ore) to prevent DC stray current immunisation issues.

## WHAT IS... AN IPEMU?

In 2015, industry partners worked together to investigate battery-electric traction and this culminated with a practical demonstration of the Independently Powered Electric Multiple Unit IPEMU concept on the Harwich Branch line in Anglia Route. At the industry launch event, the train manufacturers explained that battery technology is being developed to enable trains to run further, at line speeds, on battery power, indeed, some tram lines use this technology in the city centres and many London buses are completely electric powered.

The IPEMU project looked at the feasibility of battery power on the Marshlink service and found that battery was sufficient for the train to run from Brighton to Ashford International and back but there was insufficient charge to return to Ashford International on a second round trip. A solution to this could be that the unit arrives from Ashford International at Brighton and forms a service to Seaford and back before returning to Ashford International with a charged battery.

The IPEMU demonstration train was a Class 379, a similar type to the Class 377 units currently operated by Southern, it was found that the best use of the battery power was to restrict the acceleration rate to that of a modern diesel multiple unit, such as a Class 171 (the current unit type operating the line) when in battery mode and normal acceleration on electrified lines.



## 9.3 Rolling stock options

9.3.1. There are a few options for rolling stock (trains) depending on whether or not the line has been electrified. The Route Study has focussed on the following:

- **Class 171** - the current 2-car 100 mph diesel units operated by Southern
- **Class 395** - the current 140 mph High Speed 6-car electric units operated by Southeastern
- **Class 375/377** - the current 'main line' 100 mph 4-car electric units operated by Southeastern and Southern
- **Class 802** - the new 140 mph bi-mode (electro-diesel) units currently being built for Great Western, Hull Trains and Trans Pennine Express.

9.3.2. The choice of rolling stock will be influenced by potential journey time improvement. Two services were modelled in the RouteRunner tool using the current infrastructure and then with each linespeed improvement option and a mix of options to provide an incremental approach combined option. The whole length of the route from Eastbourne to Ashford International and vice-versa was modelled.

9.3.3. The baseline services were designated:

- **Fast** - calling Eastbourne, Bexhill, St Leonard's Warrior Square, Hastings, Rye & Ashford International
- **Slow** - calling at all station between Eastbourne and Ashford International.

9.3.4. Class 171s are also used to represent Independently Powered Electric Multiple Unit (IPEMU) trains.

9.3.5. Class 802 bi-mode units are powered from the overhead line and diesel when 'off the wires' but the model shows some journey time improvement in diesel mode. These units are based on the Intercity Express Programme units currently being tested on the Great Western Main Line.

9.3.6. The choice of rolling stock will be made by the Department for Transport and the winning South Eastern Franchise bidder.

## WHAT IS... A CLASS 802?

In the main Kent Route Study document there is an explanation of rolling stock used in the Kent Area, however, these trains are currently on order for Great Western's London to Devon & Cornwall services, Transpennine Express and Hull Trains..

They are based on Hitachi's 'A Train' family of trains so have more than a passing similarity to the Class 395 High Speed units.

The biggest difference though, is in vehicle length -

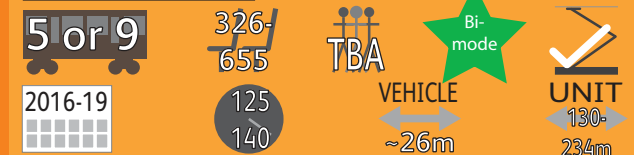
Class 395s have 20m vehicles

Class 171s have 23m vehicles

Class 802s have 26m vehicles.

Further work could be required to develop a 6-car, 20m vehicle length, bi-mode train capable of 140 mph.

## WHAT IS... A CLASS 802?



**Train family:** A-Train (Hitachi)  
**Train type:** Intercity Express  
**Train operator:** Various

These units are currently being built



## 9.4 Connecting HS1 to Marshlink

9.4.1. A number of options were developed by Network Rail's Infrastructure Projects team. **Figure 9.2** shows the existing track layout at Ashford International and the connections to HS1 on the Maidstone-side of the station. It also shows the electrification supplies throughout the Ashford International area.

9.4.2. Currently, Marshlink services terminate in Platforms 1 or 2, Eurostar services serve Platforms 3 & 4 and Southeastern services use Platforms 5 & 6 - all High Speed services have to use these platforms to access HS1. Therefore, High Speed services from Dover and Folkestone cross to Platforms 5 and then HS1.

### HS1 to Platform 2

9.4.3. **Figure 9.3** show that this option provides a new connection from Platform 2 and the Up & Down Fast lines. The report assumes that the overhead electrification is extended through Platform 2 and the new crossovers have dual power supplies.

9.4.4. Although this seems a fairly simple proposal, the technicalities of installing the crossovers, power supplies and signalling enhancements add significantly to the challenges of the scheme, which would cost in the region of £15-35M.

### HS1 to Marshlink via Platform 3

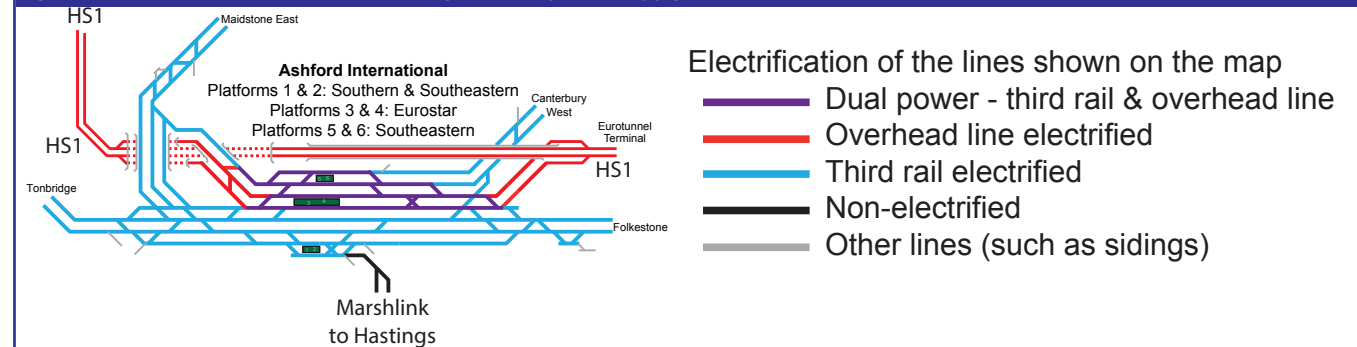
9.4.5. This option looks to repurpose Platform 3 for domestic services rather than international services, leaving just Platform 4 for international trains.

9.4.6. International passengers use a bridges access to the platforms rather than the domestic platforms access subway. This enables the passenger to pass through passport control, customs and security before descending to the platforms.

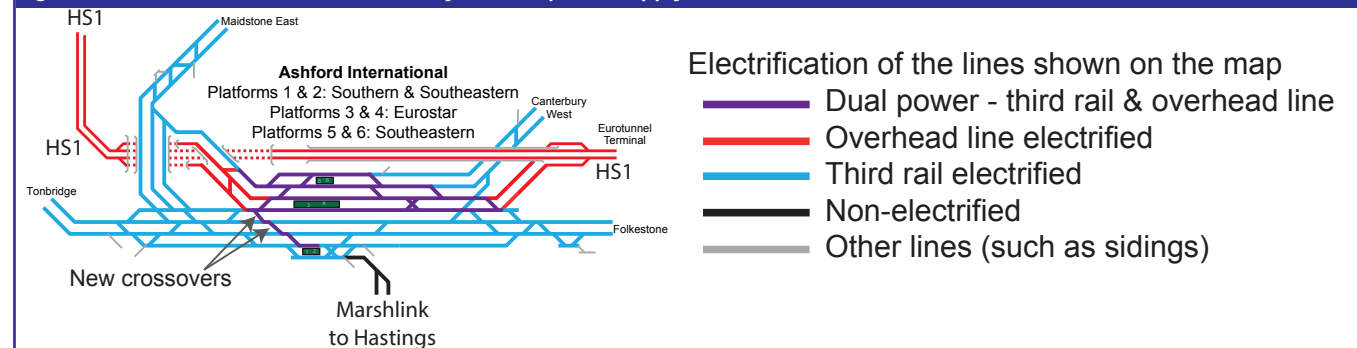
9.4.7. To utilise Platform 3 a new solid security fence/barrier would be required to segregate the two platforms, a new lift from the platform to the subway, amended fire exit door location, footbridge alterations, track gauge clearance changes and new rail access from Marshlink. **Figure 9.4** shows the reconfiguration of the junction from Marshlink into Ashford International station.

9.4.8. This scheme could cost £20-50M but is likely to be not favoured by other stakeholders due to operational constraints.

**Figure 9.2 - Ashford International track layout with power supply formats - baseline (2017)**



**Figure 9.3 - Ashford International track layout with power supply formats - HS1 to Platform 2 connection**



**Figure 9.4 - Ashford International track layout with power supply formats - HS1 to Marshlink via Platform 3**

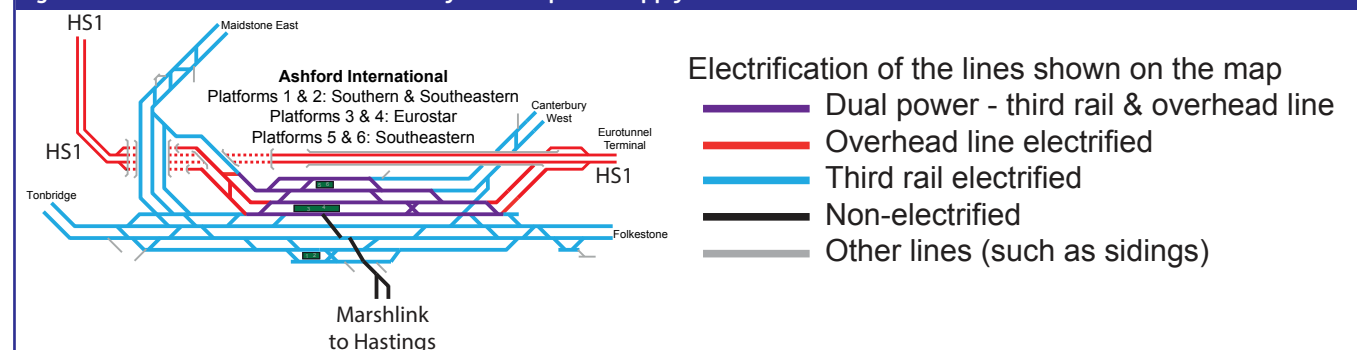


Table 9.4 - Proposed work elements - Ashford International Platform 2 option

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
New Switch & Crossing Equipment to Ashford C Junction.	Track	1	Remove 2No. existing S&C units (4 No. turnouts) Provide 2No. turnouts, 1 No. diamond crossover unit and 1 No. Single Slip Crossover unit within Ashford C Junction to enable trains from platform 2 to access the HS1 connecting line.
		2	As above with an additional 2No. point ends.
Land Purchase Required			Approx area required 170m <sup>2</sup> approx adjacent to the up side of the alignment to allow the new portal structure foundation bases to be constructed away from existing buried services.
Convert 5 No. OLE cantilever structures into Portal Structures.	Civils		Construct 5 no. foundation bases within the up cess and install steelwork columns and portal structures which either connect onto the adjacent cantilever steelwork or replaces the cantilever steelwork as a single portal frame.
Provide 12 No. new OLE portal structures.			12No. new OLE portal structures to be constructed within Ashford Station, 7No. to span 4No. running lines and 5No. to span 6No. running lines
Provide OLE wire tensioning structures.			Construct 2No. OLE tension support structures / columns, 1 at either end of the newly electrified section.
Install OLE above the required line into Platform 2	E&P		Install and connect approximately 400m length of OLE wires and the necessary bonding to allow the running line into platform 2 to be energised.
Signalling requirements to the revised Ashford C Junction	Signalling		Interlocking modification strategy is preferred over an interlocking renewal. Assessment required to determine the required intervention at the later GRIP stages.

Table 9.5 - Proposed work elements - Ashford International Platform 2 option - potential Platform 1 overhead electrification works

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
Install OLE into Platform 1	Civils / E&P		Install OLE equipment into Platform 1 to allow the existing stopper service from Brighton to Ashford to operate into the platform if the route to Hastings is electrified with OLE.
			7No. cantilever supports to be installed on the platform canopy roof as per platform 3 and 4.
3rd Rail electrify the route towards Hastings	E&P		Install a length of 3rd rail onto the lines to and from Hastings to allow the existing stopper service between Brighton and Ashford to Change power source on the move which removes the requirement to install OLE in platform 1. Assume 2kM of 3rd rail.



Table 9.6 - Proposed work elements - Ashford International Platform 3 option

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
Install solid security fence / barrier along the centre of platforms 3 and 4.	Civils / Building		Provide a solid security fence / barrier along the centre of platforms 3 and 4 extending approximately 50m beyond the platform ends. Access doors onto the platform to provide a secure entrance point which can be locked to segregate passengers from the platforms at the required time
Provide a lift from subway to platform level.			Install a new lift from the existing domestic passenger subway upto platform 3 and 4 with secured access doors onto the platform. Provision for the future installation of a lift appears to have been constructed into the subway construction.
Amend Platform 3 / 4 Fire exit into Subway			Amend the existing Fire Exit doors from platforms 3 and 4 into the subway to cater for the new passenger usage of the platform.
Hastings Line to Platform 3 connection	Track	1	Amend Ashford D Junction, Relocate 4no. point ends towards Ashford E junction, remove 3No. point ends within the D Junction area and move 1No. point end into the sidings. Provide 6No. new point ends within the straight section of track. Provide 1No. new single slip and 1No. new Diamond Crossing.
		2	Amend Ashford D Junction, Relocate 4 No. Point ends towards Ashford E Junction, remove 2No. Point ends. Provide 1No. new Diamond Crossing. Provide 6No. New point ends.
Amend Footbridge Support Column	Civils	1 only	Amend the configuration of the existing footbridge to allow the stair support column to be removed, therefore creating space to allow an additional running line to be laid.

Table 9.7 - Proposed work elements - Ashford International Platform 3 option

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
3rd Rail electrification to revised Ashford D Junction.	E&P / Track		Install 3rd Rail electrification across the revised Ashford D Junction to ensure that the new S&C equipment can be utilised by all existing 3rd rail powered trains regardless of the electrification type chosen for the Hastings line.
Provide OLE from Platform 3 to the Hastings Line.	Civils and E&P		Provide foundations and OLE Portal structures spanning all 5 no. running lines across the Ashford D junction area. OLE on the line towards Hastings will continue as standard single track cantilever support structures.
Install OLE into Platforms 1 and 2.	Civils / E&P		Install OLE equipment into Platform 1 and 2 to allow the existing stopper service from Brighton to Ashford to operate into the platforms if the route to Hastings is electrified with OLE.
			7No. cantilever supports to be installed on the platform canopy roof as per platform 3 and 4.
3rd Rail electrify the route towards Hastings	E&P		Install approximately a 2km total length of 3rd rail onto the lines to and from Hastings to allow the existing stopper service between Brighton and Ashford to Change power source on the move which removes the requirement to install OLE in platforms 1 & 2.

9.5 Linespeed Improvements

- 9.5.1. Irrespective of the High Speed services, line speed improvements can reduce journey times. In this section the line is split into sections and the options detailed, [Figure 9.5](#) shows this graphically.
- 9.5.2. [Table 9.8](#) shows all of the 45 level crossings (foot and road crossings) between Ashford International and Ore, many of which will have to be enhanced, merged or closed for higher linespeeds.
- 9.5.3. Network Rail would like to work with local stakeholders on the closure and diversion of footpaths and roads at level crossings, particularly between Star and East Guldeford where the A259 road crosses the line, only to cross back again about three-quarters of a mile further on. The more level crossings that are closed, the cheaper the Marshlink High Speed scheme will be and the safer the railway will be.
- 9.5.4. There are some footcrossings that are close together, it could be that one crossing is closed and the footpaths connected by a new path running parallel to the track on Network Rail land. Others could be diverted via a nearby bridge or underpass.
- 9.5.5. [Table 9.9](#) lists all of the 31 structures between Ashford International and Ore that would need to be assessed for linespeed improvements and electrification works. This list does not include the structures that would need to be assessed for the linespeed improvements between St Leonards Warrior Square and Pevensey & Westham.
- 9.5.6. The structures shown in green require no further work for redoubling or an increase in linespeed, leaving 13 where enhancements may be required.

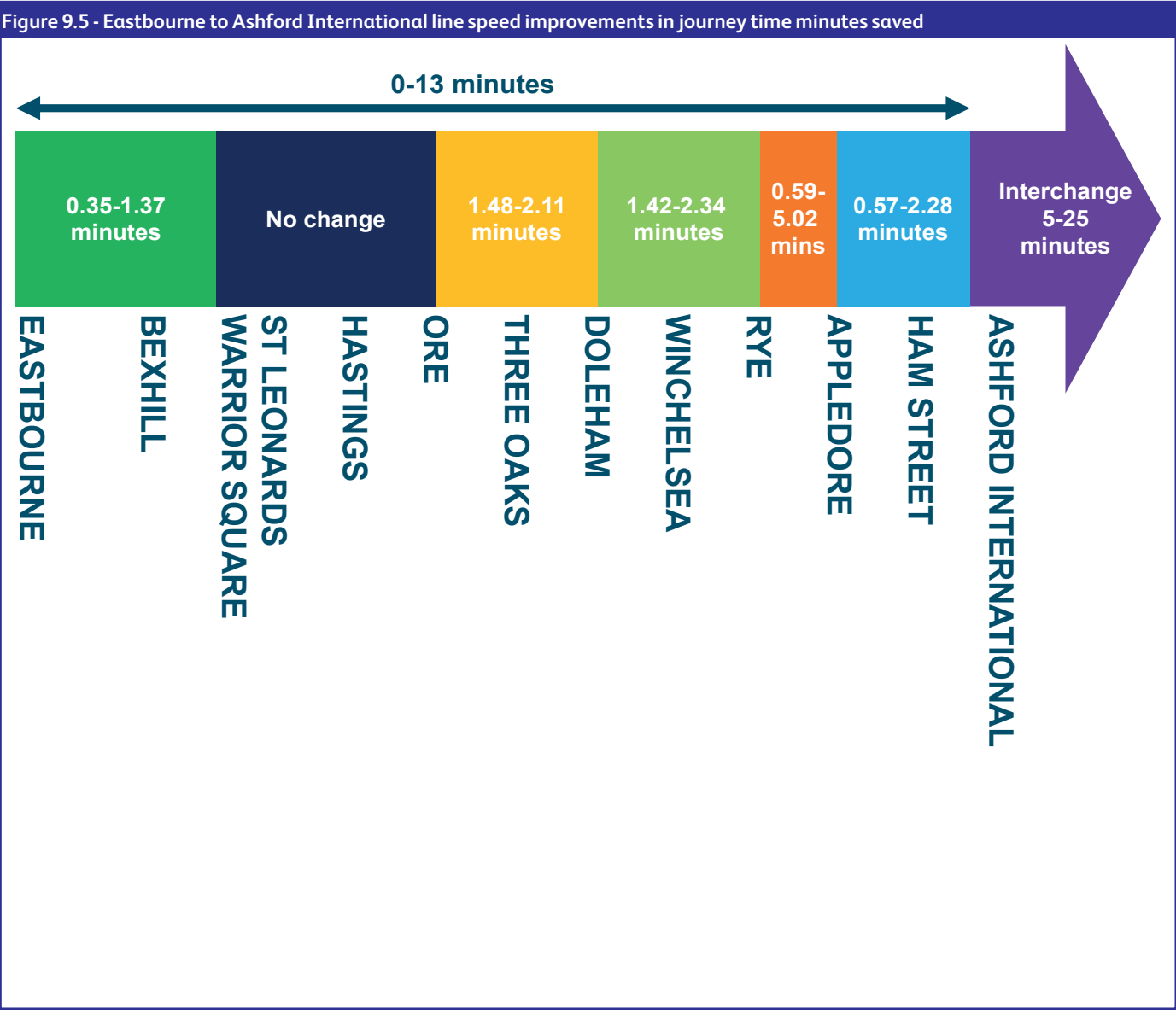




Table 9.8 - Marshlink level crossings (all types)

Section	Level Crossing Name	Type	Mileage	Distance between crossings (chains)	Distance between crossings (feet)	Current Linespeed	Potential Mitigation Measure(s)
Ashford International - Ham Street	Ashford UDC1	Accommodation	56m 77ch			60	
Ashford International - Ham Street	East Stour	Footpath	57m 58ch	61	4026	60	
Ashford International - Ham Street	Steeds Lane	Accommodation	58m 77ch	99	6534	60	
Ashford International - Ham Street	Golden Wood	Footpath	59m 35ch	38	2508	60	
Ashford International - Ham Street	Hardings Bridge	Accommodation	59m 70ch	35	2310	60	
Ham Street - Appledore	Packing Wood	Footpath	61m 35ch	125	8250	60	
Ham Street - Appledore	Ham Street	Footpath	61m 51ch	16	1056	60	
Ham Street - Appledore	Moore's	Accommodation	62m 28ch	57	3762	60	
Ham Street - Appledore	Warehorne	AHBC	62m 60ch	32	2112	60	
Ham Street - Appledore	Goodmans	Accommodation	62m 78ch	18	1188	60	Incorporate in the new Block House & Military Canal bridge and close crossing
Ham Street - Appledore	Kenardington	AHBC	63m 73ch	75	4950	60	
Appledore - Rye	Appledore	AHBC	64m 54ch	61	4026	60	
Appledore - Rye	Wilsons	Accommodation	64m 70ch	16	1056	60	
Appledore - Rye	Fleet	Accommodation	65m 11ch	21	1386	60	
Appledore - Rye	Bodys	Accommodation	65m 23ch	12	792	60	
Appledore - Rye	Waterhouse	Footpath	65m 36ch	13	858	60	
Appledore - Rye	Cats Tail	Accommodation	65m 78ch	42	2772	60	
Appledore - Rye	Swallow Tail Bridge	Accommodation	66m 20ch	22	1452	60	
Appledore - Rye	Becketts	AHBC	66m 47ch	27	1782	60	
Appledore - Rye	Becketts	Footpath	67m 07ch	40	2640	60	
Appledore - Rye	Willow House	Accommodation	67m 61ch	54	3564	60	
Appledore - Rye	Barts	Accommodation	68m 77ch	96	6336	60	
Appledore - Rye	Dartnall	Accommodation	69m 29ch	32	2112	60	
Appledore - Rye	Bakers	Accommodation	69m 33ch	4	264	60	
Appledore - Rye	Star	AHBC	69m 40ch	7	462	60	Divert road to East Guldeford and close this crossing
Appledore - Rye	Pear Tree	Accommodation	69m 77ch	37	2442	60	Combine with East Guldeford?
Appledore - Rye	East Guldeford	AHBC	70m 19ch	22	1452	60	Divert road to Star and keep this level crossing
Appledore - Rye	Cookes	Accommodation	70m 39ch	20	1320	60	
Appledore - Rye	Middle Salts	Footpath	71m 05ch	46	3036	60	
Appledore - Rye	Grove Road	CCTV	71m 24ch	19	1254	60	
Rye - Winchelsea	Ferry Road	CCTV	71m 46ch	22	1452	60	
Rye - Winchelsea	Mill Bridge No.1	Footpath	71m 53ch	7	462	60	
Rye - Winchelsea	Mill Bridge No.2	Footpath	71m 54ch	1	66	60	
Rye - Winchelsea	Selmes	Accommodation	72m 17ch	43	2838	60	
Rye - Winchelsea	Cadborough Farm	Accommodation	72m 44ch	27	1782	60	
Rye - Winchelsea	Winchelsea	AOCL+B	73m 16ch	52	3432	25	
Winchelsea - Doleham	Mair No.2	Accommodation	73m 73ch	57	3762	60	
Winchelsea - Doleham	Channel Bridge	Footpath	74m 35ch	42	2772	60	
Winchelsea - Doleham	Jury's No.1	Footpath	74m 40ch	5	330	60	
Winchelsea - Doleham	Corke	Accommodation	74m 52ch	12	792	60	
Winchelsea - Doleham	Merrick No.2	Accommodation	75m 21ch	49	3234	60	
Winchelsea - Doleham	Merrick No.3	Accommodation	75m 44ch	23	1518	60	
Winchelsea - Doleham	Snailham	Accommodation	75m 71ch	27	1782	60	
Winchelsea - Doleham	Coopers Crossing		76m 47ch	56	3696	60	
Doleham - Three Oaks	Doleham Crossing	Footpath	77m 60ch	93	6138	40	Divert footpath to bridge or underpass

AHBC = Automatic Half Barrier Crossing CCTV = Closed Circuit Television monitored crossing AOCL+B = Automatic Open Crossing Locally monitored with Barriers

This table details the 45 level crossings between Ashford International and Ore (25 miles 22 chains (there are 80 chains to a mile)).

The distance between crossings is detailed in both chains and feet.

Table 9.9 - Marshlink structures (bridges, culverts etc)

Section	Structure Number	Mileage / Name	RA Rating / Speed	Potential Mitigation Measure(s)
Ashford International - Ham Street	1825	56m 36ch, New Town Road	RA10 / 125mph	None required. New underbridge structure with CPB's installed
Ashford International - Ham Street	1824	56m 68ch, Water Bridge and Footpath	RA10 / 60mph	Confirm Assessment Capacity for higher line speed.
Ashford International - Ham Street	1823	57m 13ch, East Stour	RA10 / 60mph	Confirm Assessment capacity for higher line speed. Currently in work bank to be refurbished and strengthened.
Ashford International - Ham Street	1816A	58m 65ch, 6' Brick Arch Culvert	RA10 / Arch	None Required.
Ashford International - Ham Street	1816	59m 13ch, Flat Top A (7' 6" Arch)	RA10 / Arch	None Required.
Ashford International - Ham Street	1813A	59m 73ch, Hardings Culvert	RA10 / Arch	None Required.
Ashford International - Ham Street	1808	61m 25ch, Lower Crossing	Infilled Arch	None Required.
Ham Street - Appledore	1805	61m 57ch, Ham Street	RA6 / 60mph	Provide CPB's to the elevations and provide strengthening measures to the girders or reconstruct with standard Design U-Type structures providing ballasted track.
Ham Street - Appledore	1804	61m 66ch, Orchard	RA10 / 60mph	Arch Structure, None Required.
Ham Street - Appledore	1802	61m 76ch, Warehorne.	RA10 / 60mph	Arch Structure, None Required.
Ham Street - Appledore	1800B	62m 77ch, Block House	RA3 / 60mph	Steelwork strengthening required to meet the line speed aspirations. Currently in work bank to be refurbished, consider adding strengthening aspects to the works or reconstruct with a concrete portal structure with ballasted track.
Ham Street - Appledore	1800	62m 78ch, Military Canal.	RA2 / 60mph	Steelwork strengthening required to meet the line speed aspirations. Currently in work bank to be refurbished and strengthened. Confirm capacity following the strengthening works. Consider replacing with a concrete portal structure in conjunction Block House and the closure of the adjacent Goodmans UWC.
Ham Street - Appledore	1800A	63m 01ch, Military Culvert	RA10 / 60mph	Arch Structure, None Required, consider infilling in conjunction with structure 1800 proposal.
Ham Street - Appledore	1799	63m 20ch, Sheeps Dyke	RA9 / 60mph	None Required, consider providing a ballasted track structure in place of the proposed painting works within the existing work bank.
Ham Street - Appledore	1798	63m 54ch, Springbrook Watering	RA10 / 60mph	None Required.

Section	Structure Number	Mileage / Name	RA Rating / Speed	Potential Mitigation Measure(s)
Ham Street - Appledore	1797	63m 67ch, Kennardington	RA7 / 60mph	Over slab to provide a thicker section with increased capacity or consider installing a midspan support within the structure to half the span length.
Ham Street - Appledore	1796	64m 44ch, Appledore	RA7 / 60mph	Over slab to provide a thicker section with increased capacity or consider installing a midspan support within the structure to half the span length.
Appledore - Rye	1795	65m 05ch, Fleet	RA7 / 60mph	Over slab to provide a thicker section with increased capacity.
Appledore - Rye	1793	66m 15ch, Swallowtail	RA7 / 60mph	Install a mid span support or replace the concrete deck elements with new pre-stressed concrete beam sections to increase the RA capacity only.
Appledore - Rye	1790	69m 30ch, Star Bridge	RA15 / 60mph	None required, consider providing a ballasted track structure in the long term.
Appledore - Rye	1789	70m 40ch, 5' Armco Barrel Culvert	RA10	None Required.
Appledore - Rye	1788	71m 00ch, Rye Bridge	RA0 / 60mph	Confirm Revised Assessed capacity, potentially no works required.
Rye - Winchelsea	1783	71m 53ch, Mill Bridge	RA10 / 60mph	None Required.
Rye - Winchelsea	1771	73m 20ch, Winchelsea Culvert	RA10 / 60mph	Arch Structure, None Required.
Winchelsea - Doleham	1768	73m 76ch, White Water Sewer	RA10 / 60mph	Arch Structure, None Required.
Winchelsea - Doleham	1767	74m 32ch, Brede Channel	RA10 / 60mph	Confirm assessed capacity of the bridge and strengthen where necessary. Consider undertaking any strengthening works as part of the repainting and steelwork repairs within the current work bank. Consider providing ballasted track structure in the long term.
Winchelsea - Doleham	1765	74m 54ch, Meericks Culvert	RA10 / 60mph	Arch Structure, None Required.
Winchelsea - Doleham	1763	75m 22ch, Bell Marsh Culvert	RA10 / 60mph	Arch Structure, None Required.
Winchelsea - Doleham	1747	77m 27ch, Lidham	RA10 / 60mph	Arch Structure, None Required.
Three Oaks - Ore	1737	79m 13ch, Coghurst	RA10 / 60mph	Arch Structure, None Required.
Three Oaks - Ore	1736	79m 37ch, Rock Bridge	RA10	Line speed improvements currently being undertaken, confirm proposed works to the structure. Provide CPB's to both elevations of the structure to reduce the impact force of vehicle collisions. Consider providing a ballasted track deck with the track slewed to the other side of the alignment space as this will maximise the available headroom clearance.

Structures shown in green require no further work for redoubling or an increase in linespeed, leaving 13 where enhancements may be required.



### Ashford International to Appledore (approx. 7 miles)

9.5.7. Apart from the junction onto the main line at Ashford International, this section of line is double-track and currently has a line speed of 60 mph. In recent years, some speed restrictions have been removed, giving a standard 60 mph throughout.

9.5.8. It is proposed that this linespeed is raised to 90 mph. Further work will be required to risk assess the track, signalling, geotechnical and structures on the line to enable the linespeed to be raised.

### Appledore Junction to Rye (approx. 7 miles)

9.5.9. At the Rye-end of Appledore station, there is a junction where the two-track railway merges to become a single track to just before Rye station. The single line section has a top speed of 60 mph whilst the points from the single line into Platform 1 have a restriction of just 20 mph, as mentioned in [Section 9.1](#).

9.5.10. It is proposed that the 'plain line' section is raised to 90 mph. The points should be upgraded to enable a higher speed, the report suggests a 60-75 mph turnout but the length of this would prevent freight trains to come off the Dungeness Branch so an additional crossover would be required at the Ashford-end of the station to enable the freight trains to regain the 'right line'. The cost for the scheme is £10-20M and also requires the moving of a telecoms mast and some land purchase.

9.5.11. An alternative scheme would be to double-track the entire line, between Appledore and Rye, for 90 mph running and upgrade the 20 mph points to a crossover (this would be for freight access from the Dungeness Branch). This could cost £35-75M.

9.5.12. [Figure 9.6](#) compares the options visually.

Figure 9.6 - Comparison of track layouts Appledore to Rye

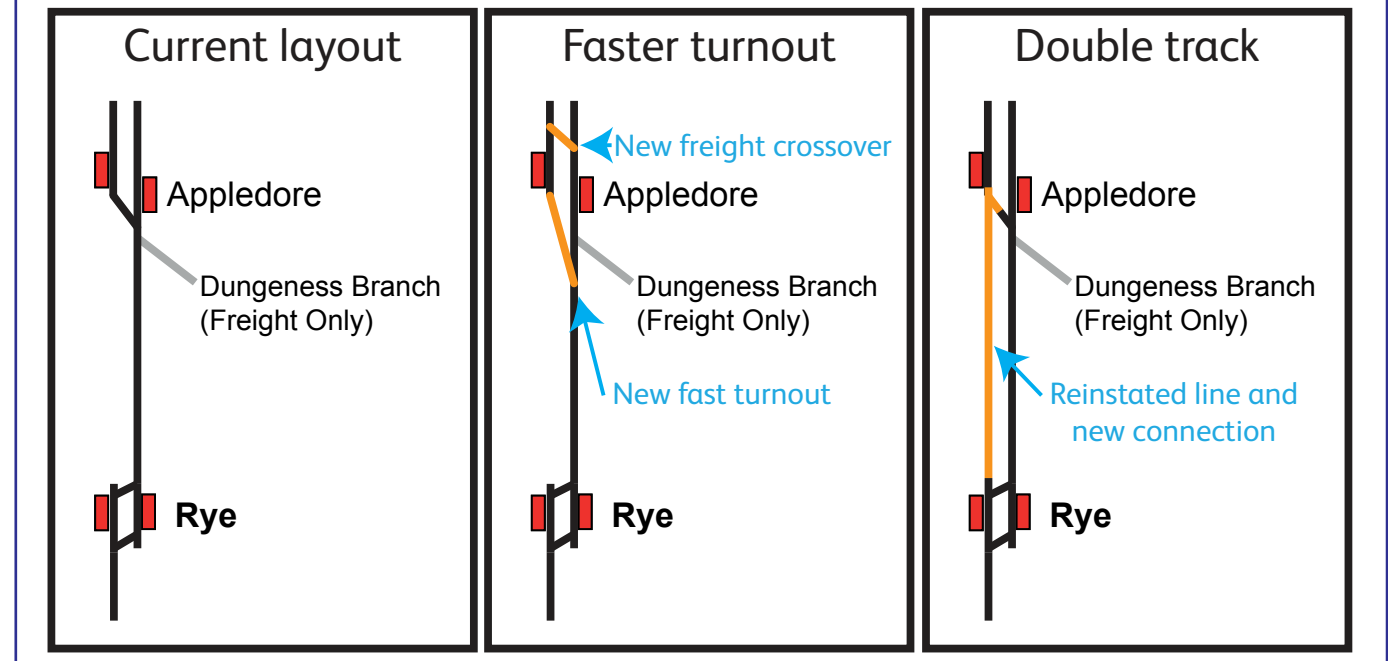


Table 9.10 - Proposed work elements - Appledore Junction renewal/alterations

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
Relocate GSM-R mast.	Civils / Signalling		Relocate the existing GSM-R mast from within the former up line formation to the south of Appledore Junction to allow a revised junction arrangement to be provided. The relocated mast should be positioned sufficient distance away from the former Up alignment.
Renew existing Appledore Junction S&C	Track		Replace the existing S&C equipment at Appledore Junction and provide 1 no. trailing point to the Up line.
Provide 60mph or 75mph Turnout.			Provide a new turnout from the Rye Single line onto the Up line which is capable of either 60mph or 75mph operating speed.
Land Purchase Required			Approx 70m x 3m of land will require purchasing to allow the new up line to be reinstated.



Table 9.11 - Proposed work elements - infrastructure enhancements - Rye double-tracking to Appledore

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
Divert Station Footpath	Civils		Divert the existing station access footpath from The Grove to allow the up line to be reinstated.
Reconfigure The Grove / Rope Walk Level Crossing	Civils / Signalling		Reposition the crossing barriers to the required distance away from the proposed running line location at the north side of the crossing. New foundations will be required for the barriers.
Amend 3 no. AHB level crossings			Star, East Guldeford and Becketts AHB level crossings will require the signage and barrier supports relocating to allow the additional up line to be reinstated. Consider replacing the AHB with bridges as part of a wider programme to close level crossings and user worked crossings along the length of the railway.
Additional Electrification	E&P		Approximately 10700m of additional 3rd rail or Overhead line electrification will require installing along the length of reinstated track.
Reposition Signal	Signalling		Signal RY4 is located within the Down line formation where the track alignment passes from the up to the down side. The signal will require relocating into cess to allow the up line to be reinstated and the track alignments slewed.
New Signalling			Provide the required track signalling to allow the up line to be reinstated to Appledore.
Remove S&C unit	Track		The existing S&C unit at the east end of Rye station will require removal and plain line reinstating within the down line formation.
New plain line track			Provide approximately 10700m of plain line track to connect the limit of the up line in Rye to the limit of the up line at Appledore.
Alignment formation works	Track / Civils		Clear the former alignment space and re-grade to enable the up line to be reinstated. 10700m of minor vegetation clearance and formation re-grading.



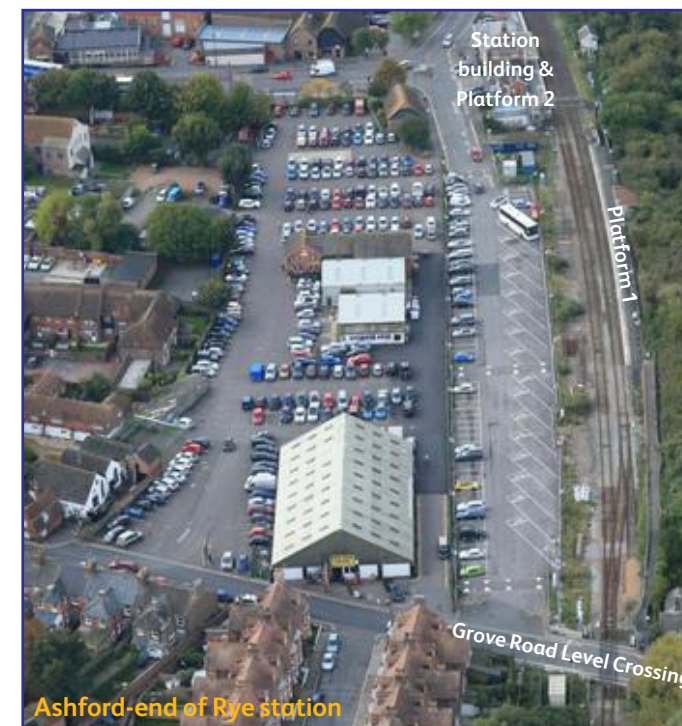
### Rye station

9.5.13. The platforms at Rye are currently four coaches long so may need to be extended to fit 6-car trains, although selective door opening may be deemed acceptable for this station.

9.5.14. The station site is restricted at either end by level crossings which are controlled by Rye Signal Box:

- Grove Road at the Ashford-end
- Ferry Road at the Hastings-end

9.5.15. The crossings are single line so may require some work to move barrier equipment to make room for the additional line.



**Table 9.12 - Proposed work elements - infrastructure enhancements - Rye double-tracking to Appledore**

Proposed Work Element	Construction Discipline	Sub-option	Details / measurables
Amend Crystal Place Road alignment	Civils		Revise the road junction alignment between Crystal Place and Ferry Road to enable the down line to be reinstated.
Reconfigure Ferry Road Level Crossing	Civils / Signalling		Reposition the crossing barriers to the required distance away from the proposed running line location at the south side of the crossing. New foundations will be required for the barriers.
Relocate CCTV	E&P		Construct new pad foundation and relocate the existing CCTV camera and column to the opposite side of the railway alignment.
Additional Electrification			Approximately 900m of additional 3rd rail or Overhead line electrification will require installing along the length of reinstated track.
Reposition Signal	Signalling		Signal RY27 appears to be in the process of being relocated into the footprint of the down line formation. The signal will require relocating back into its original position to allow the down line to be reinstated.
New Signalling			Provide the required track signalling to allow the down line to be extended by ½ mile. Relocate signal RY5 to the required limit of the new down line.
Remove S&C unit	Track		The existing S&C unit at the west end of Rye station will require removal and plain line reinstating within the up line formation.
New plain line track			Provide approximately 900m of plain line track to connect the new point end to the end of the down line within the confines of Rye station.
Install new 60-75mph point end.			1 No. point end capable of 60-75mph located on the straight section of track approximately ½ mile to the west of Rye Station.
Alignment formation works	Track / Civils		Clear the former alignment space and re-grade to enable the up line to be reinstated. 900m of vegetation clearance and formation re- grading.

9.5.16. The double track layout allows for train to pass as the lines on both sides are single track. This causes timetable restrictions and operational pressures as a delayed train will have a knock-on effect on the train travelling in the opposite direction.

9.5.17. Double tracking between Appledore and Rye is detailed in [Paragraph 9.5.11](#).

9.5.18. An alternative solution, detailed in the report, would be to extend the platform lines to become 'dynamic loops' so trains can leave the station and clear the level crossings quicker than today. This would require an extra half-mile of track in either direction to extend and the new pointwork to complete the loops.

**Rye - Winchelsea (approx. 2 miles)**

9.5.19. Double-tracking between Rye and Winchelsea has also been investigated in the Report at a cost of around £5-15M. This requires an upgrade of the level crossing at Winchelsea (which would be a substantial benefit as the line speed is currently restricted to 25 mph over the level crossing). and could reduce the 'down time' of Ferry Road Level Crossing.

9.5.20. Even if the line is not redoubled, the level crossing issue at Winchelsea needs to be addressed. The traffic levels are insufficient for the level crossing to be more than is currently provided. It is an automatic level crossing that is locally monitored, by the driver observing an indicator on approach to the station. In recent years, barriers have been added to the crossing but this has only allowed the linespeed to be raised to 25 mph.

9.5.21. The upgrading of Winchelsea Level Crossing to CCTV or obstacle detection will be an expensive part of the scheme.

9.5.22. An additional platform would be required on the reinstated line at Winchelsea. The former platform and station building is now a private residence so a new location would have to be found for the new platform, possibly Rye-side of the level crossing.





### Winchelsea - Doleham (approx. 4 miles)

9.5.23. The former trackbed is still extant all the way to Doleham apart from the bridge over the River Brede which would require a new deck structure.

9.5.24. Redoubling at Doleham would require a new platform to be built or the line reduced to single track on the Winchelsea side of the platform.

9.5.25. The platform at Doleham station is just one vehicle long and is used by 6,496 passengers (2015-16 entries & exits) per year.

### Doleham - Ore (approx. 4 miles)

9.5.26. There are two options for this section of the line:

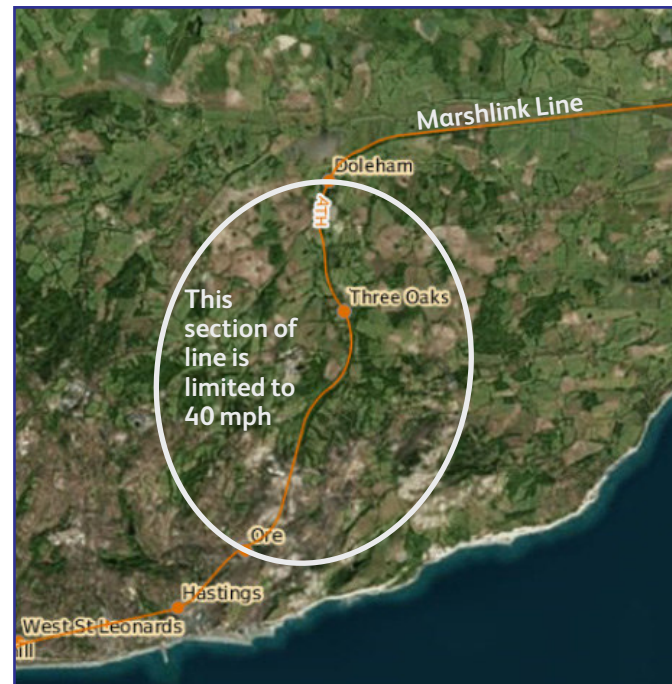
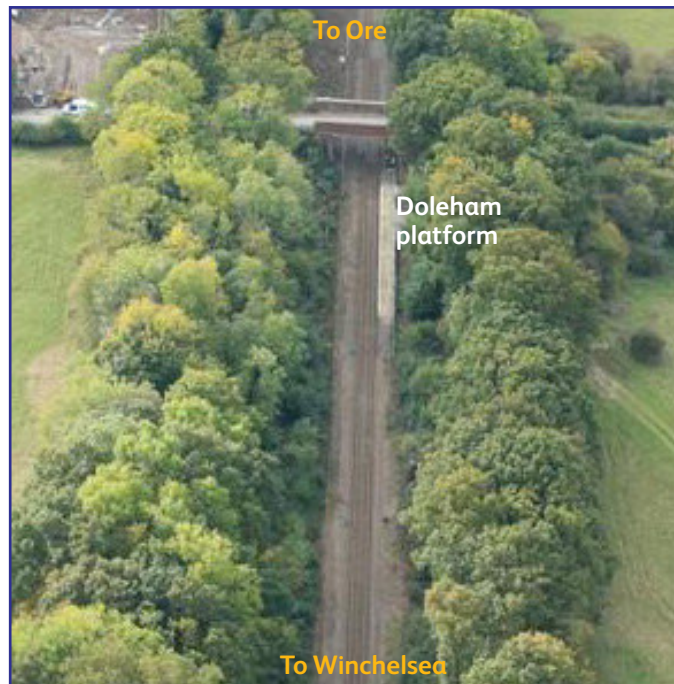
- Redoubling
- Line speed improvement.

9.5.27. The issue with this section is that it is curvy with a low linespeed of 40 mph, as can be seen from the aerial view in the photograph below. Doubling the track will remove the pinch-point of the single line section but the 40 mph linespeed would remain.

9.5.28. The linespeed could be raised to 60 mph by realigning the single track to make full use of the former double-track trackbed. Work has been carried out on early stage development but further work is needed, it is thought that it will cost £1-10M.

9.5.29. Previous work has shown that trees and bushes will need to be cut back on the approaches to Doleham foot crossing to provide improved sight lines for 60 mph linespeed.

9.5.30. Digital Railway solutions such as the Traffic Management System should help resolve/manage issues with the single line section, prioritising the London-bound train as it has to arrive at Ashford International on time to utilise the booked path on HS1.



## 9.6 Destination stations

9.6.1. This section looks at the merits of terminating trains at the three key stations of:

- Hastings
- Bexhill
- Eastbourne.

### Hastings

9.6.2. Terminating the High Speed services at Hastings would have the benefit of not requiring a pathway between Hastings and Bo-peep Jn where all Southern and Southeastern services to Hastings and Ore share a two-track railway with some severe speed restrictions through two tunnels.

9.6.3. The Report highlighted the benefits of terminating in Platform 1 as it provides a cross-platform interchange for trains departing the west end of the station.

9.6.4. Another advantage is that it will require minimal signalling or track enhancements although the buffer stop may need renewing.

9.6.5. It may be possible to terminate in one of the other platforms to provide cross-platform interchange but this would need to be timetabled correctly due to the dwell time of the train, which effectively blocks the platform until departure time.

9.6.6. The dwell time for the train is likely to be 25-30 minutes which provides resilience in the timetable as the train may be able to return on time despite a late arrival.

9.6.7. The disadvantage of turning back at Hastings is that the trains will not directly serve Bexhill.





**Bexhill**

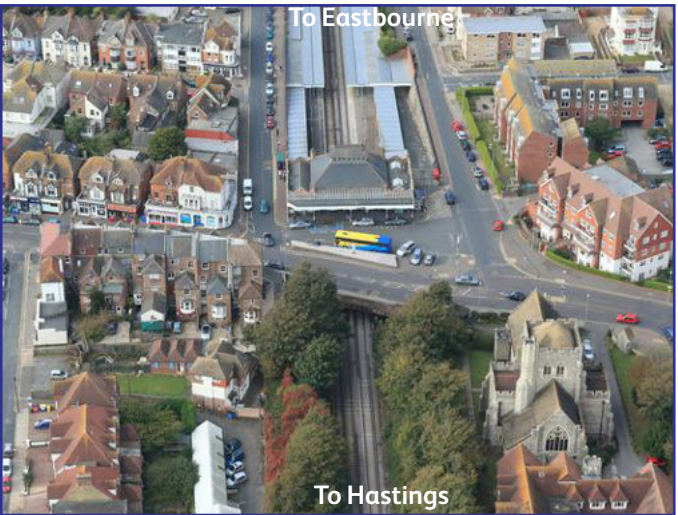
9.6.8. Stakeholders would like the High Speed service to run to Bexhill so the Infrastructure Projects report investigated this.

9.6.9. There are two options for turning trains back at this station:

- Terminate in Platform 1 and start back from Platform 2
- Terminate and turn back in Platform 2.

9.6.10. The picture on the right shows the station, Hastings reached from the tracks under the station building and road bridge and Eastbourne uses the tracks off the bottom of the picture. The picture below shows the Hastings-end approach to the station and the drawing bottom right, shows the signalling arrangement at Bexhill. **Figure 9.7** shows the current track and signalling layout.

9.6.11. After arriving in Platform 1 the train would terminate (A in **Figure 9.8**) and shunt forward until it is clear of 718 points (B), the driver would then change ends and await for 1435 shunt signal across 718 points in Platform 2. The train would be held either at 1435 shunt signal or in Platform 2 (C) for its pathway. Either way, it is blocking a running line.



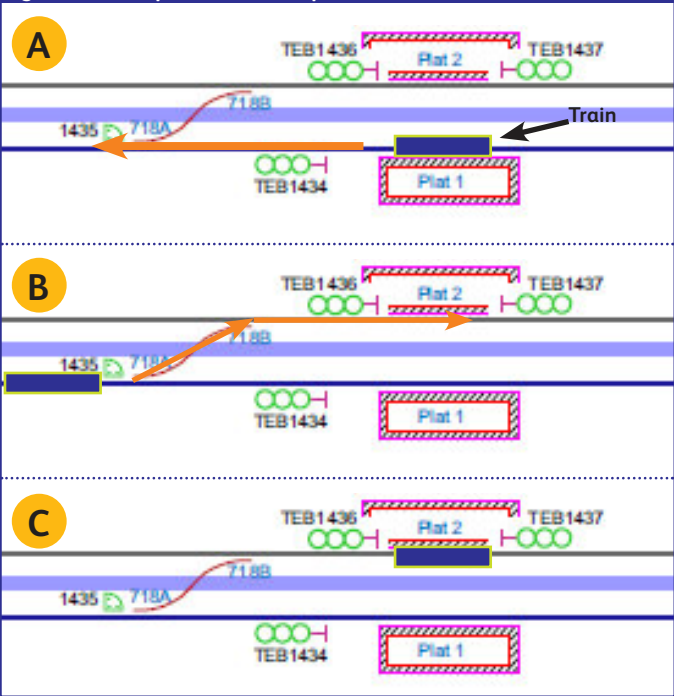
9.6.12. It is expected that 7-10 minutes would be required for the whole process at Bexhill. Therefore, when trains are running even a few minutes late, it is likely that the train would be turned back at Hastings instead.

9.6.13. None of the above operation requires additional infrastructure so would be a timetable issue.

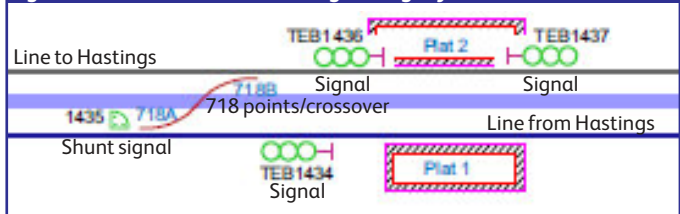
9.6.14. However, with some additional infrastructure such as a crossover or even a scissors crossover and associated signals, trains could arrive and depart from the same platform but this comes with a platform occupation penalty whilst the driver changes ends and the passengers unload and load.

9.6.15. As with the shunting move, any delay is likely to see the train curtailed at Hastings with the return trip starting from there.

**Figure 9.8 - Proposed Bexhill operations**



**Figure 9.7 - Current track and signalling layout at Bexhill**



### Eastbourne

9.6.16. An alternative to the short turn round at Bexhill could be to run the train to Eastbourne where it would probably have 20-25 minutes dwell time, reducing the chances of it being terminated short at Hastings.

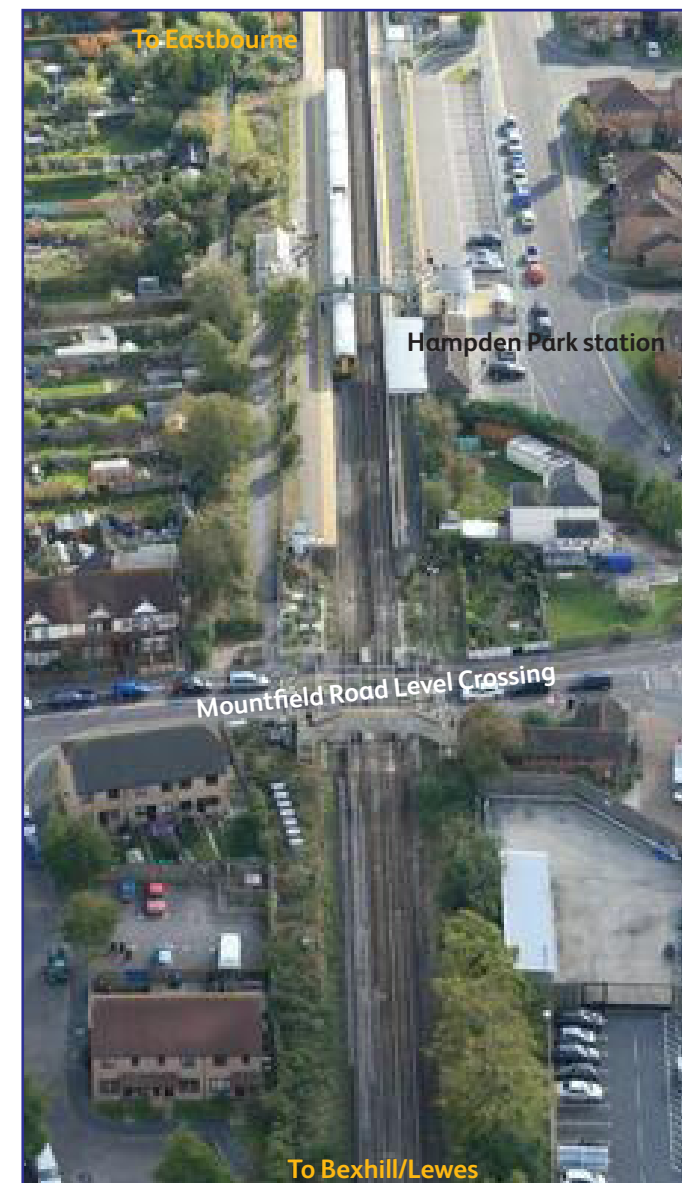
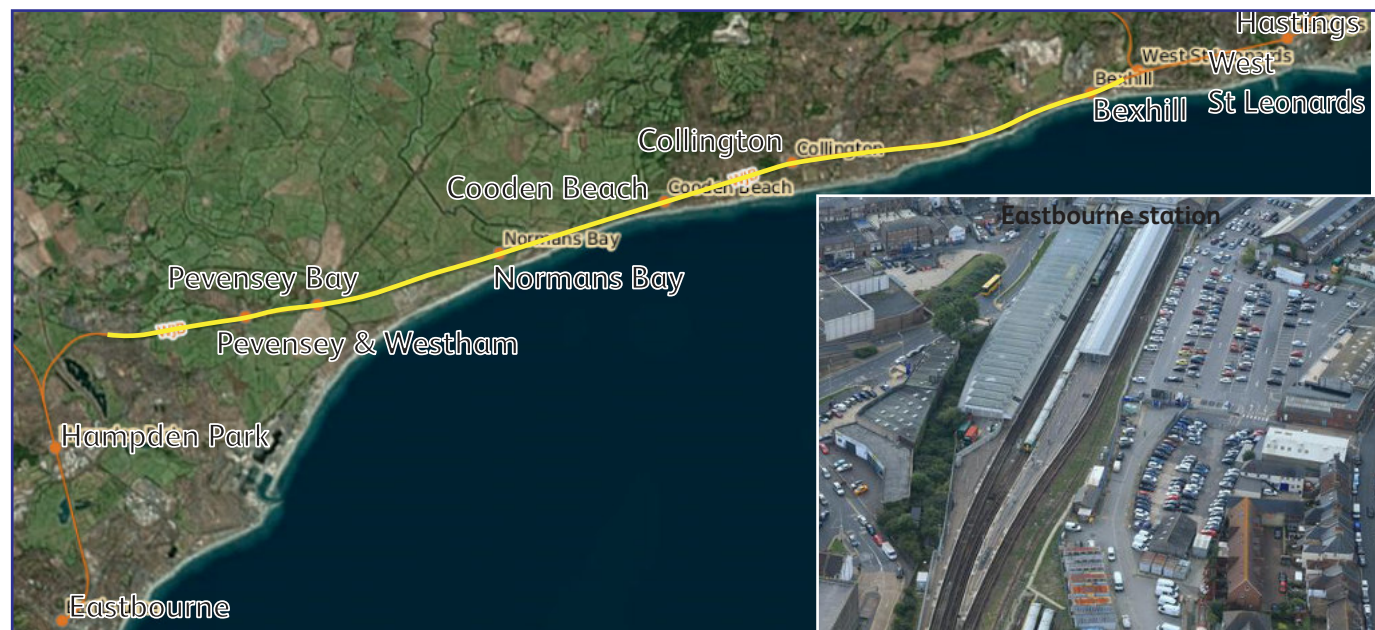
9.6.17. The timetable would have to be looked at to operate these trains but at six coaches they would provide significant additional capacity between Hastings, Bexhill and Eastbourne which would be a big benefit as this is the busiest section of the Brighton - Ashford International service.

9.6.18. The whole line between Bexhill and Eastbourne was resigalled in 2015 with provision for 90 mph operations between Bo-Peep Jn and the former Stonecross Jn (between Pevensey & Westham and Hampden Park). The current linespeed is 70 mph. Further work is required to ensure the track, structures and embankments/cuttings are able to withstand the higher linespeed.

9.6.19. The improved journey time will probably not be sufficient to woo passengers from existing services to London but may provide a useful alternative at times of perturbation.

9.6.20. This option will, however, require an additional 6-car unit to operate the extended service.

9.6.21. In the longer term, to provide faster links to Gatwick Airport and Brighton it could be possible to reconstruct Hampden Park station with modern facilities and a central platform to enable cross-platform interchange to be timetabled.





### 9.7 Next steps

9.7.1. As mentioned in this chapter, between the publication of the Draft for Consultation and Final Route Study documents, Network Rail will be looking at the timetabling permutations of the outputs.

9.7.2. **Figure 9.9** is a flowchart of how the options can be taken forward.

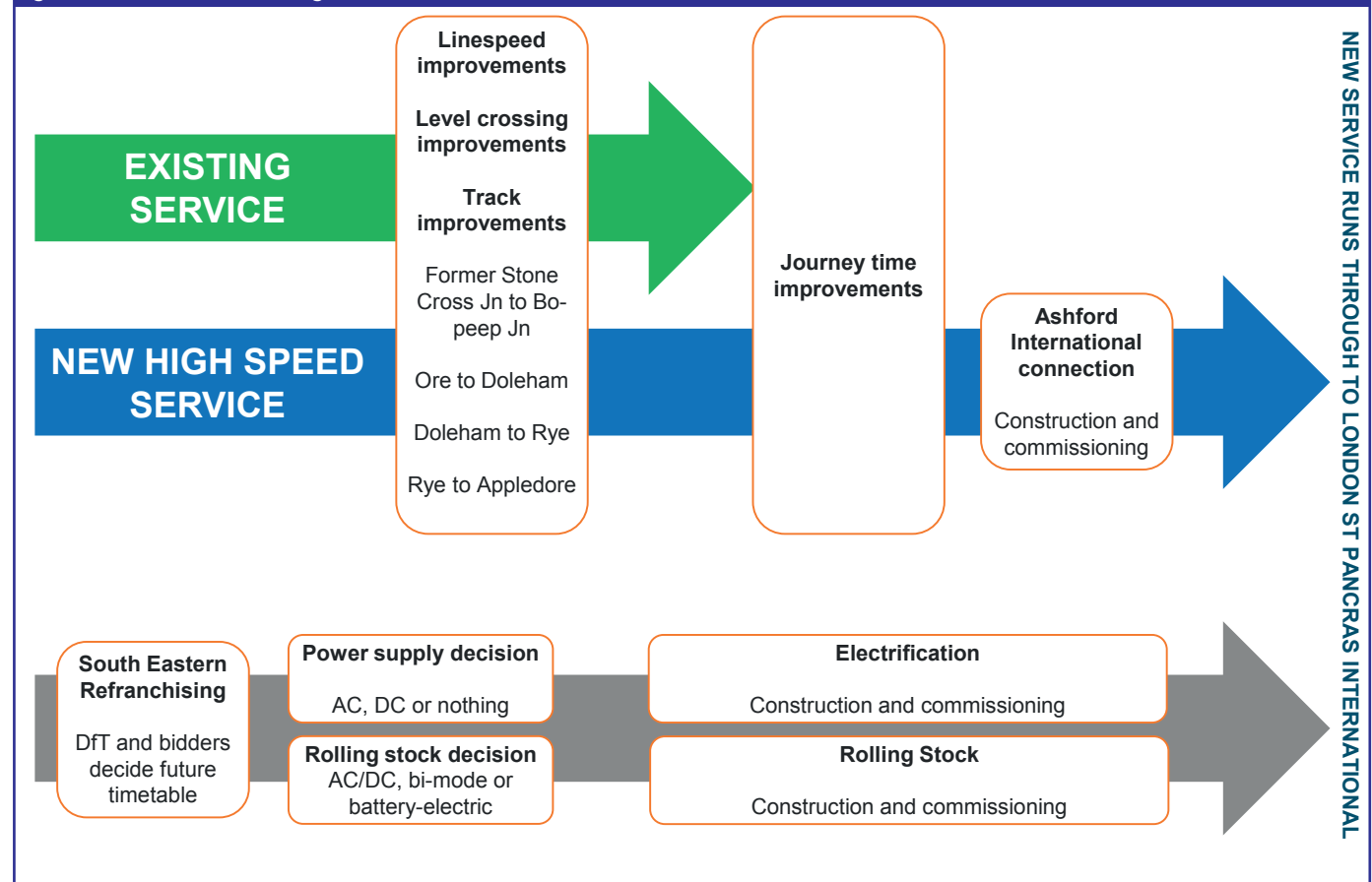
9.7.3. The Department for Transport and bidders for the South Eastern Franchise will be looking at the responses to the Route Study Draft for Consultation and those to the Refranchising Consultation document.

9.7.4. The linespeed improvements can be delivered through level crossing and track improvements independently of the electrification and rolling stock decisions although adding electrification at the same time as improving the infrastructure could reduce the overall cost of the scheme.

9.7.5. The cost of the 'do everything' option is very high so there is an incremental approach that may make the cost more palatable although third party funding may be essential for some schemes

9.7.6. Even if Marshlink High Speed services do not form part of the next South Eastern franchise, the linespeed improvements would still enable the existing service to be improved, allowing house building etc to be carried out in the meantime, ahead of the next South Eastern franchise, making the business and social case stronger.

**Figure 9.9 - Flowchart showing how the choices for funders can be taken forward**



Tables 9.13 and 9.14 detail the option to upgrade and operate High Speed services between Eastbourne, Ashford International and London St Pancras International - this equates to 24 additional vehicles.

This high level business case assumes electrification to third rail based on the costs detailed in the preceding pages.

Table 9.13: Hourly Marshlink High Speed services operating on third rail business case

	Central	No Rolling Stock Lease Costs	Sen: 5% Growth	Sen: Central with WEIs	Sen: 5% Growth with WEIs
<b>Benefits (Present Value)</b>					
Rail user benefits	164.76	164.76	195.16	164.76	195.16
Non user benefits	85.19	85.19	99.06	85.19	99.06
Other Government Impacts (indirect taxation)	-54.96	-54.96	-61.65	-54.96	-61.65
Wider economic benefits	0.00	0.00	0.00	123.70	123.70
<b>Total benefits</b>	<b>194.99</b>	<b>194.99</b>	<b>232.57</b>	<b>318.69</b>	<b>356.27</b>
<b>Costs (Present Value)</b>					
Investment Cost	189.54	189.54	189.54	189.54	189.54
Operating Cost	365.96	131.00	365.96	360.21	360.21
Revenue	-188.86	-188.86	-223.14	-188.86	-223.14
Other road operating costs	-0.51	-0.51	-0.60	-0.51	-0.60
<b>Total costs</b>	<b>369.63</b>	<b>134.67</b>	<b>335.25</b>	<b>363.88</b>	<b>329.51</b>
<b>Net Present Value</b>	<b>-174.64</b>	<b>60.32</b>	<b>-102.68</b>	<b>-45.19</b>	<b>26.76</b>
<b>Benefit Case Ratio</b>	<b>0.53</b>	<b>1.45</b>	<b>0.69</b>	<b>0.88</b>	<b>1.08</b>

Table 9.14: Hourly Marshlink High Speed services operating on third rail option table

Option	
Conditional Output	Various
Timeframe	
Description	Operate 1tph high speed service between London St Pancras and Eastbourne via Ashford
Infrastructure requirement	Lots
Operational requirement	24 additional vehicles (four 6 car trains) to operate 1tph between London St Pancras and Eastbourne all day.
Passenger Growth	Background passenger growth of 1.17% p.a to 2023 and 1.23% to 2043
Passenger impact	Improved journey times between East Sussex and London
Freight impact	No impact on freight
Relates to other options	No
Rail industry financial categorisation	Scheme increases operating subsidies
Note	Crowding not assessed; may require 4 units.



# 10 Ebbsfleet Southern Link

May 2018

South East Route: Kent Area Route Study - Technical Appendix 151

10.1. This aim of the Pre-GRIP study is to identify infrastructure requirements to provide a new connection between Swanley and Ebbsfleet International to provide 12-car services from South London to support predicted passenger uplift demands due to the proposed Ebbsfleet Garden City and London Resort Theme Park developments.

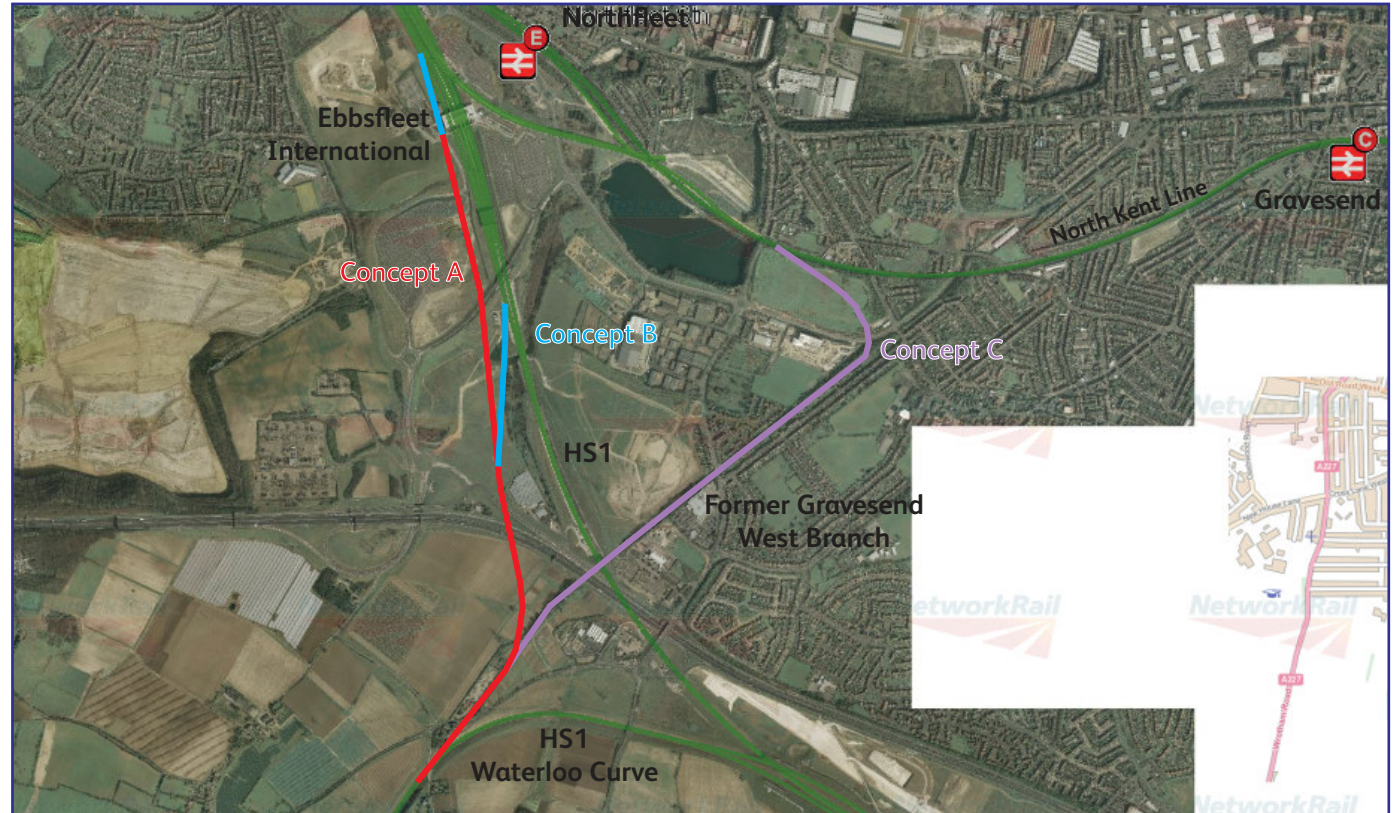
10.2. The Waterloo Connection between HS1 and Fawkham Jn is no longer in regular use, although it is a strategic freight route.

10.3. The study, undertaken by Arup, investigated infrastructure requirements for a new rail link and associated platform infrastructure. Three infrastructure options were investigated to enable this:

- **Concept Option A:** a twin track chord with two new terminus platforms adjacent to and integrated with the existing Ebbsfleet Station
- **Concept Option B:** a twin track chord with northbound and southbound track connections directly to HS1 at Ebbsfleet International Station. The option would involve both new platforms and more utilisation of the central HS1 Domestic Platforms by modifications to the track layout on the southern approach.
- **Concept Option C:** a twin track railway (not so much a chord) that runs partly along the disused rail corridor and connects directly to the North Kent Lines facilitating the use of Ebbsfleet High Level station.

10.4. There are a number of key constraints along the length of the route corridor between the existing HS1 Spur and Ebbsfleet Station:

- The design needs to consider the existing track geometry at the tie in points for any new junctions
- The existing A2 Highway (a major dual carriageway) traverses the route. There also a number of other highways crossing the proposed corridor
- The HS1 electrified railway traverses the route
- Ebbsfleet International station
- There are multiple power lines and pylons traversing the route



- The River Fleet runs across the site
- The area is a former substantial quarry site. This leads to complexities with the ground conditions and ground water regime due to the presence of backfilled quarries. The former quarry is subject to managed dewatering
- The route is partly urban so residential properties border the some of the existing railway and possible routes. There are other buildings and local developments in the area.

10.5. The study, and the development of the options, whilst considering these constraints, has not generally aimed at minimising any associated impacts. It has highlighted the impacts and recommended certain allowances to be made in the costing. When the study is further developed, all of these constraints, and any others that may emerge from more detailed information, should be considered in more detail and appropriate solutions developed.

11.1. The tables on the following pages detail the over line structures between the Channel Tunnel & Swanley Junction, Fawkham Junction (for train from High Speed 1) & Swanley Junction and Swanley to the West London Line via the Catford Loop.

11.2. Currently, container trains have to use a specialist 'pocket' or low profile wagon to carry high-cube containers because at 2.9m high (9ft 6in) they are 30cm (one foot) taller than the usual shipping containers and that makes all the difference for gauge clearance.

11.3. Being a box, the containers do not have profiled roofs similar to a passenger coach or a typical wagon, so they require extra clearances otherwise they will come into contact with platform canopies, tunnel walls, bridge portals etc.

11.4. High-cube containers are becoming the new standard container but hiring in these specialist wagons is costly for the freight operators so these containers are often moved by road. This is an inefficient way of transporting containers as at 12.2m (40ft) long they can only be carried singly on the UK road network.

11.5. A train load of high cube containers would reduce the number of heavy goods vehicles on the roads running in parallel to the railway.

**Table 11.1 - Overline structures (Saltwood Junctions - Bearstead)**

From/At	To	ELR	Bridge no.	Name	Road	Type
Folkestone West	Sandling	XTD	472	Bargrove	B2065	Road bridge
Folkestone West	Sandling	XTD	468#B1	Saltwood Tunnel		Tunnel
Sandling		XTD	464	Station footbridge		Footbridge
Sandling	Westenhanger	XTD	461	Sandling Tunnel		Tunnel
Sandling	Westenhanger	XTD	457B	Stanford By Pass		Road bridge
Westenhanger		XTD	453D	Station bridge		Road bridge
Westenhanger	Ashford International	XTD	440	Herringe Road		Road bridge
Westenhanger	Ashford International	XTD	431C	Station bridge		Road bridge
Westenhanger	Ashford International	XTD		Unknown farm access bridge		Road bridge
Westenhanger	Ashford International	XTD	924	Mersham Tunnel		Tunnel
Westenhanger	Ashford International	XTD	914	Highfield Lane		Road bridge
Westenhanger	Ashford International	XTD		Bad Munsterfeifel Road		Road bridge
Westenhanger	Ashford International	XTD		Boys Hall Footbridge		Footbridge
Westenhanger	Ashford International	XTD		Canterbury Road		Road bridge
Westenhanger	Ashford International	XTD	561606	Waterbrook Crossing Footbridge		Footbridge
Westenhanger	Ashford International	XTD		Unknown footbridge		Footbridge
Ashford International		XTD	403F	Ashford (Country End) Staff Footbridge		Footbridge
Ashford International		XTD	401F	Footbridge from Platforms 3/4 to International		Footbridge
Ashford International		XTD	401AA	Beaver Road (Southbound carriageway)		Road bridge
Ashford International		XTD	401	Beaver Road (Northbound carriageway)		Road bridge
Ashford International	Charing	XTD	399	Market Footbridge		Footbridge
Ashford International	Charing	SBJ	597A	Godinton Road (new)		Road bridge
Ashford International	Charing	SBJ	697	Chart Road		Road bridge
Ashford International	Charing	SBJ	696	Repton Farm		Road bridge
Ashford International	Charing	SBJ	695A	Rowcroft Barracks (new construction)	A28	Road bridge
Ashford International	Charing	SBJ	695	Maidstone Road	A20	Road bridge
Ashford International	Charing	SBJ		Sandyhurst Lane		Road bridge
Ashford International	Charing	SBJ	684A	Woolpack Lane (shown on Bing as Westwell Lane)		Road bridge
Ashford International	Charing	SBJ	679	Westwell Leacon (shown on Bing as Maidstone Road)	A20	Road bridge
Charing		SBJ	673	Pluckley Road		Road bridge
Charing		SBJ	672A	Charing Station Footbridge		Footbridge
Charing	Lenham	SBJ	670	Hook Farm (shown on Bing as Hook Lane)		Road bridge
Charing	Lenham	SBJ	669	Tile Lodge Road		Road bridge
Charing	Lenham	SBJ	663	Maylum		Road bridge
Charing	Lenham	SBJ	661	Powells Bridge		Road bridge
Charing	Lenham	SBJ	658	Lenham Road (shown on Bing as Headcorn Road)		Road bridge
Lenham		SBJ	657A	Lenham Station Footbridge		Footbridge
Lenham	Harrietsham	SBJ	657	Ham Lane		Road bridge
Harrietsham		SBJ	652B	Harrietsham Station Footbridge		Footbridge
Harrietsham	Hollingbourne	SBJ	648	Hospital Road		Road bridge
Hollingbourne		SBJ	642A	Hollingbourne Station Footbridge		Footbridge
Hollingbourne	Bearstead	SBJ	637A	CTRL/HS1 flyover		Rail bridge
Hollingbourne	Bearstead	SBJ	637B	M20 overbridge	M20	Road bridge
Hollingbourne	Bearstead	SBJ	637	Brickfield (shown on Bing as Crismill Lane)		Road bridge
Bearstead		SBJ	628A	Bearstead Station Footbridge		Footbridge

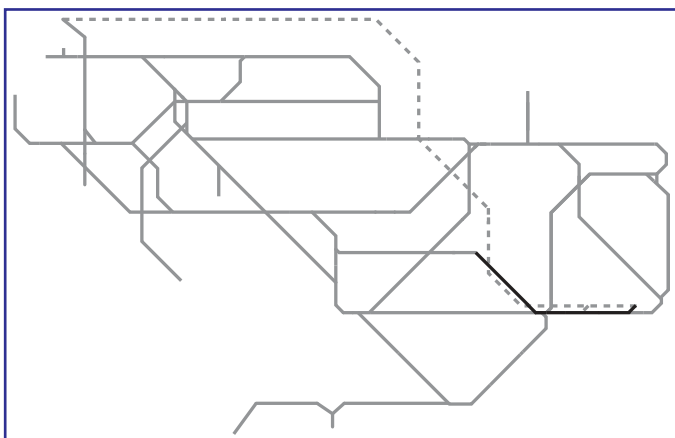
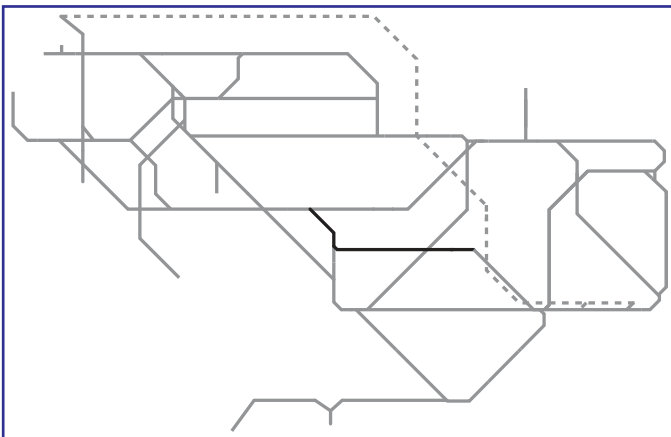




Table 11.2 - Overline structures (Bearstead -Swanley)

From/At	To	ELR	Bridge no.	Name	Road	Type
Bearstead	Maidstone East	SBJ	628	Allotment		Road bridge
Bearstead	Maidstone East	SBJ	623	Public footbridge		Footbridge
Bearstead	Maidstone East	SBJ	622	Kilicks (redundant)		Road bridge
Bearstead	Maidstone East	SBJ	621	Weaving Street		Road bridge
Bearstead	Maidstone East	SBJ	620	Raigersfield (shown on Bing as Ashford Road)	A20	Road bridge
Bearstead	Maidstone East	SBJ	615	Vinters		Road bridge
Bearstead	Maidstone East	SBJ	614	Sittingbourne Road	A249	Road bridge
Bearstead	Maidstone East	SBJ	613	Wheeler Street Tunnel		Tunnel
Bearstead	Maidstone East	SBJ	612	Week Street Tunnel		Tunnel
Maidstone East	Barming	SBJ	610	River Medway		River bridge
Maidstone East	Barming	SBJ	606	Great Bucklands		Road bridge
Maidstone East	Barming	SBJ	606A	School Access		Road bridge
Maidstone East	Barming	SBJ	601	Bunyards/Castle Road		Road bridge
Barming		SBJ	597A	Barming Station Footbridge		Footbridge
Barming	East Malling	SBJ	597	Barming Road (shown on Bing as Hermitage Lane)		Road bridge
Barming	East Malling	SBJ	596	Preston Hall B Footbridge		Footbridge
East Malling	West Malling	SBJ	589	Springgate Hill/Broadwater Road		Road bridge
East Malling	West Malling	SBJ	587B	West Malling By-pass	A228	Road bridge
West Malling		SBJ	587A	West Malling Station Footbridge		Footbridge
West Malling	Borough Green & Wrotham	SBJ	585	Police Court (shown on Bing as Meadow Bank)		Road bridge
West Malling	Borough Green & Wrotham	SBJ	584	Bull Bridge/High Street		Road bridge
West Malling	Borough Green & Wrotham	SBJ	582	Stubblesdown Footbridge		Footbridge
West Malling	Borough Green & Wrotham	SBJ	579	Aldon Farm (shown on Bing as Aldon Lane)		Road bridge
West Malling	Borough Green & Wrotham	SBJ	576	Wrotham Heath (shown on Bing as Windmill Hill)		Road bridge
West Malling	Borough Green & Wrotham	SBJ	573	Walmisleys		Road bridge
West Malling	Borough Green & Wrotham	SBJ	569A	Public footbridge		Footbridge
West Malling	Borough Green & Wrotham	SBJ	569	Wrotham Road	A227	Road bridge
Borough Green & Wrotham		SBJ	568B	Borough Green Station Footbridge		Footbridge
Borough Green & Wrotham	Kemsing	SBJ	565	Col. James - replaced by new by-pass bridge (Fen Pond Road)		Road bridge
Kemsing		SBJ	558B	Kemsing Station Footbridge		Footbridge
Kemsing	Otford	SBJ	558	Noahs Ark		Road bridge
Kemsing	Otford	SBJ	554	Childbridge Lane		Road bridge
Kemsing	Otford	SBJ	553F	Nash's Footbridge		Footbridge
Otford		SBJ	542	Otford Station Footbridge		Footbridge
Otford		SBJ	541	Otford Road (shown on Bing as Station Road)	A225	Road bridge
Otford	Shoreham	SBJ	540	Bowles Bridge		Road bridge
Shoreham		SBJ	538A	Shoreham Station Footbridge		Footbridge
Shoreham	Eynsford	SBJ	537	Castle Farm		Road bridge
Shoreham	Eynsford	SBJ	536	Beech Road		Road bridge
Eynsford		SBJ	535	Eynsford Station Footbridge		Footbridge
Eynsford	Swanley	SBJ	532	Eynsford Tunnel		Tunnel
Eynsford	Swanley	SBJ	531A	M25 overbridge	M25	Road bridge
Eynsford	Swanley	SBJ	531	Wested Lane		Road bridge
Eynsford	Swanley	SBJ	529/529A	Crockenhill Road (shown on Bing as Goldsel Road)		Road bridge



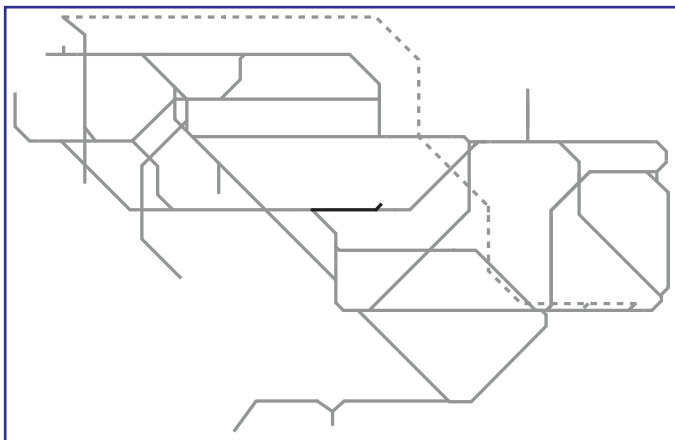
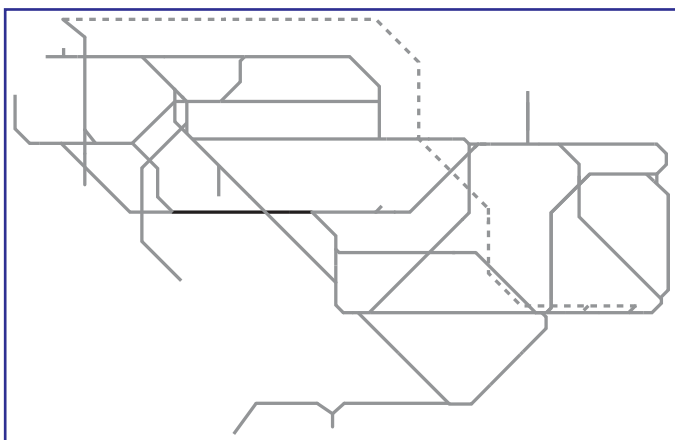


Table 11.3 - Overline structures (Fawkham Junction -Swanley)

From/At	To	ELR	Bridge no.	Name	Road	Type
Fawkham Jn	Farningham Road	VIR	108	Rabbits (shown on Bing as Wilson Lane)		Road bridge
Fawkham Jn	Farningham Road	VIR	107	Gills Bridge		Road bridge
Fawkham Jn	Farningham Road	VIR	106	Home Bridge (shown on Bing as East Hill/Gorringe Avenue)		Road bridge
Farningham Road		VIR	102	Station footbridge		Footbridge
Farningham Road	Swanley	VIR	101	Homefield House (shown on Bing as Homefield Farm)		Road bridge
Farningham Road	Swanley	VIR	100A	M25 overbridge	M25	Road bridge
Farningham Road	Swanley	VIR	99	Park Lane		Road bridge
Farningham Road	Swanley	VIR	98	Alice Dean/Beechenlea Lane		Road bridge
Farningham Road	Swanley	VIR	97A	Footbridge		Footbridge
Farningham Road	Swanley	VIR	97	London Road (shown on Bing as High Street)		Road bridge
Farningham Road	Swanley	VIR	96A	Footbridge		Footbridge

Table 11.4 - Overline structures (Swanley - Bromley South)

From/At	To	ELR	Bridge no.	Name	Road	Type
Swanley		VIR	96	Footbridge		Footbridge
Swanley		VIR	95C	Public footbridge		Footbridge
Swanley	St Mary Cray	VIR	95B	Swanley By-pass	A20	Road bridge
Swanley	St Mary Cray	VIR	95A	Brickfields Footbridge		Footbridge
Swanley	St Mary Cray	VIR	93	Sheepcote Farm		Road bridge
Swanley	St Mary Cray	VIR	92	Birchwood Road/Sweeps Lane		Road bridge
St Mary Cray		VIR	89	St Mary Cray Station Footbridge		Footbridge
St Mary Cray	Bickley	VIR	85	Chislehurst Road	A208	Road bridge
St Mary Cray	Bickley	VIR	82A	Public footbridge		Footbridge
St Mary Cray	Bickley	VIR	80	Intersection XTD over VIR		Rail bridge
St Mary Cray	Bickley	VIR	121260	Intersection Bridge 154A CSM2 over VIR		Rail bridge
St Mary Cray	Bickley	VIR	78	Blackbrook Lane		Road bridge
St Mary Cray	Bickley	VIR	77	St Georges (Private Road)		Road bridge
Bickley		VIR	76	Southborough Road		Road bridge
Bickley		VIR	76	Bickley Station		Building
Bickley		VIR	76A	Bickley Station Footbridge		Footbridge
Bickley	Bromley South	VIR	75	Clarence Road (Private Road)		Road bridge
Bickley	Bromley South	VIR	70	Wendover Road/Ivy (shown on Bing as Murray Avenue)		Road bridge
Bickley	Bromley South	VIR		Footbridge (adjacent to Structure 70)		Footbridge
Bromley South		VIR	69	Kentish Way	A21	Road bridge
Bromley South		VIR	67B	Station footbridge		Footbridge
Bromley South		VIR	67A	Station footbridge		Footbridge
Bromley South		VIR	67	Bromley South Station		Building
Bromley South		VIR	67	Bromley High Street		Road bridge
Bromley South		VIR	66A	High Street Raft (shops over)		Building
Bromley South	Shortlands	VIR	64	Mill Pond Footbridge		Footbridge
Bromley South	Shortlands	VIR	61	Mill Stream Footbridge		Footbridge
Bromley South	Shortlands	VIR	59	Waterworks Footbridge		Footbridge





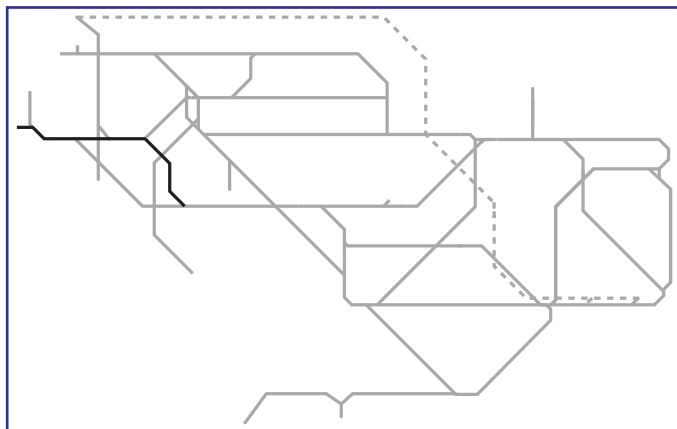


Table 11.5 - Overline structures (Shortlands - Longhedge Junction)

From/At	To	ELR	Bridge no.	Name	Road	Type
Shortlands	Ravensbourne	RVC		Ravensbourne Chord dive-under (VIR over)		Rail bridge
Shortlands	Ravensbourne	CAT	490	Downs Hill		Road bridge
Shortlands	Ravensbourne	RVC	490	Downs Hill		Road bridge
Ravensbourne		CAT	489	Footbridge		Footbridge
Ravensbourne		CAT	488	Crab Hill		Road bridge
Ravensbourne	Beckenham Hill	CAT	485	Beckenham Place		Road bridge
Ravensbourne	Beckenham Hill	CAT	484	Beckenham Hill Road	A2015	Road bridge
Beckenham Hill		CAT	483	Footbridge		Footbridge
Beckenham Hill	Bellingham	CAT	482	Southend Lane	A2218	Road bridge
Bellingham		CAT	480	Station Road (Randlesdown Road)		Road bridge
Bellingham		CAT	479	Station footbridge		Footbridge
Bellingham	Catford	CAT		No over line structures		
Catford	Crofton Park	CAT	464	Brockley Grove		Road bridge
Crofton Park		CAT	463	Footbridge		Footbridge
Crofton Park		CAT	462	Brockley Road	B218	Road bridge
Crofton Park	Nunhead	CAT	461	Dalrymple Road		Footbridge
Crofton Park	Nunhead	CAT	455	St Asaph Road		Road bridge
Nunhead	Peckham Rye	CAT		No over line structures		
Peckham Rye	Denmark Hill	CAT/ATL		Grove Tunnel		Tunnel
Denmark Hill		CAT/ATL		Station footbridge		Footbridge
Denmark Hill		CAT/ATL		Denmark Hill Station		Building
Denmark Hill		CAT/ATL		Windsor Walk		Road bridge
Denmark Hill	Brixton/Clapham High Street	CAT/ATL		Denmark Hill Tunnel/Denmark Hill Road	A215	Tunnel
Denmark Hill/Brixton	London Victoria/Clapham High Street	VIR/ATL	19	Hubert Grove Footbridge		Footbridge
Clapham High Street/Brixton	London Victoria/Wandsworth Road	VIR/ATL	15	Larkhall Rise		Road bridge
Wandsworth Road		ATL	344A	Wandsworth Road Station Footbridge		Footbridge
Wandsworth Road	Longhedge Jn	FLL1		Intersection: ATL over FLL1		Rail bridge
Wandsworth Road	Longhedge Jn	FLL1		Intersection: VTB1 over FLL1		Rail bridge

# 12 Passenger circulation at stations

May 2018

South East Route: Kent Area Route Study - Technical Appendix 156

12.1.1. Station capacity is an important consideration in accommodating demand across the Kent area. Stations form an integral part of a passengers' journey and if sufficient capacity is compromised, walk times, inconvenience and congestion can impact on running an efficient operation. Providing the necessary space at stations is crucial to achieving higher frequency services, maintaining performance levels, running longer trains and ensuring passenger comfort.

12.1.2. An initial list of stations was drawn out at a Working Group (WG2 session in order to highlight the capacity constraints in the baseline This list was then validated by reviewing the passenger demand estimates as per MOIRA. Other sources of information where also used for developing the final shortlist:

- Stations previously identified within the 2011 Network RUS – Stations.
- Station capacity assessments and passenger surveys at high priority stations.
- ORR's annual footfall figures.
- Market study growth forecasts.
- Current station capacity constraints (e.g. entrance, footbridge, stairs,
- Platforms, gatelines, run-offs).
- Train service level changes
- Planned renewals and enhancements
- The potential impact of the Thameslink Programme.

12.1.3. As part of this shortlisting exercise, passenger count surveys and site visits were carried out at the high priority stations during peak times. The evidence gathered from surveys and capacity analysis is captured in datasheets in this Appendix. This information was used, together with the data listed above, to identify the potential impact of future capacity issues and the requirement for interventions (alphabetically by station).

12.1.4. A total of 12 stations were shortlisted across the Route Study area, each with different capacity constraints. The prioritisation

exercise was based on the current and anticipated capacity constraints identified. This prioritisation process also took into account the strategy and themes emerging from the Route Study option development work.

12.1.5. To evaluate and compare the shortlisted stations, a high level methodology was developed based primarily on passenger safety. This process produced a high level recommendation and timeline to when interventions may be required at the station.

12.1.6. Based on this methodology each station was categorised into the following timelines:

- **By 2019** - there are a number of stations on the network that experience high levels of passenger congestion at peak times and need manual interventions on a regular basis. Such stations will be reviewed periodically by the Network Rail Station Capacity team to identify the need for escalating any enhancement plans.
- **2019-24** – stations to be placed within the national list to be recommended for funding during the next control period.
- **Longer Term (beyond 2024)** - stations to remain on the shortlist and reassessed during the next planning cycle.

12.1.7. Station performance across the area will be reviewed by Network Rail and Train Operators during CP5 and CP6 to identify capacity issues that have not been highlighted here. This includes stations where passenger demand may exceed the Market Study high growth forecasts. Such impacts from change in land-use on station capacity will be reviewed on a station by station basis during CP5 in order to identify any further station interventions that are required in CP6.

12.1.8. In addition to those stations with congestion issues identified in the table below, there are a number of stations that, depending on the infrastructure choices selected, may be directly affected. Proposed interventions at these stations may, therefore, be necessary to support the growth in passenger numbers.



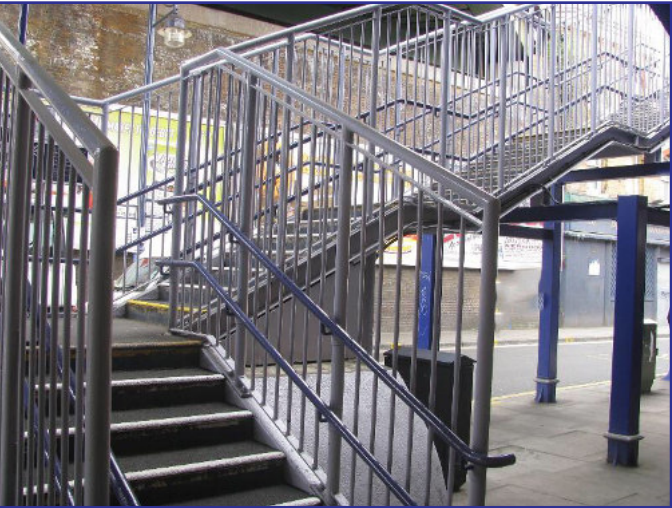


12.2 Brixton



Above - passengers on Platform 1 queuing to descend staircase to street level.

Below - the staircase from Platform 1 at street level



12.2.1 Background

Brixton station is a commuter station in South London (Zone 2). It is served by Southeastern trains between London Victoria and Orpington, It is closely situated to Brixton London Underground station.

12.2.2 Current Capacity Constraints

**Stairs** – Egress capacity from Platform 1 is severely restricted and results in queues backing up to the coped edge, which poses safety and performance risks.

The issue is compounded by the location of two ticket validators on either side of the exit doorway resulting in slow egress.

12.2.3 Possible Interventions and Timeframe

**CP6** – Install a second staircase to street level from Platform 1. Additional ticket validators should be provided.

Since many alighters intend to access the Victoria Line from Brixton, the interchange journey times should be considered for locating the new staircase.

Brixton		
Annual footfall		
ORR Estimates of Station Usage	2014/2015	1.0 million
2015 Passenger Count Survey		
AM Peak 3 Hours (07:00 – 10:00)	Count survey not done	Count survey not done
PM Peak 4 Hours (16:00 – 20:00)	Count survey not done	Count survey not done
Forecast Growth		
London and South East Market Study	2014 – 2023	2014 – 2043
	11.1 %	46.2 %
Interventions summary		
	CP6	Longer Term
Ticket Hall (Gatelines, Station Entrance)	✓	
Circulation (Stairs, Subway, Footbridge)	✓	
Platforms (widen, lengthen, declutter)		✓

12.3 Bromley South



Above - passengers await their train on Platform 3

Below left - the platform width between the buildings and trains reduces capacity

Below right - circulation is difficult for passengers alighting



12.3.1 Background

Bromley South is a suburban station in South East London (Zone 5), served by Southeastern and ThamesLink services. It is located on the Chatham Main Line and served by a mixture of fast and stopping trains between London Victoria, Bedford and Kent.

There are a number of buildings on the platforms and an interchange footbridge located approximately in the middle of the platforms.

Bromley South is a popular commuter station; it is the final stop for fast Southeastern services to London Victoria. This leads to Platform 3 being the busiest platform in the AM Peak as it is served by fast services. The platform is very narrow in some sections due to the station buildings, the narrow points are towards the London-end of the platform, where the stopping position for all trains is located.

Passengers tend to dwell towards the London-end to make sure they can board any train that arrives, whatever its length, and to reduce the distance they need to walk at both Bromley South and London Victoria.

12.3.2 Current Capacity Constraints

**Platforms** - buildings on Platforms 3 & 4 reduce the usable width and force passenger to dwell close to the platform edge, which poses a safety risk.

**Stairs** - insufficient stair width for Platforms 3 & 4 results in queuing on the platform level close to the platform edge, which poses a safety and performance risk.

12.3.3 Possible Interventions and Timeframe

**CP6** – remove buildings on Platforms 3 & 4.

**Longer term** - construct a transfer deck above the platforms and introduce new staircases.

Bromley South		
Annual footfall		
ORR Estimates of Station Usage	2014/2015	7.4 million
2015 Passenger Count Survey		
AM Peak 3 Hours (07:00 – 10:00)	5,600 Boarders	3,200 Alighters
PM Peak 4 Hours (16:00 – 20:00)	3,900 Boarders	5,500 Alighters
Forecast Growth		
London and South East Market Study	2014 – 2023	2014 – 2043
	11.1 %	46.2 %
Interventions summary		
	CP6	Longer Term
Ticket Hall (Gatelines, Station Entrance)		✓
Circulation (Stairs, Subway, Footbridge)		✓
Platforms (widen, lengthen, declutter)	✓	



12.4 Denmark Hill



Above - passengers waiting on Platform 1 for a train to London Victoria or Clapham Junction .

Below - passengers boarding and alighting on Platform 1 with a London Victoria train in the platform, the narrow staircases can be seen in the picture.



12.4.1 Background

Denmark Hill Station is a suburban station in South East London (Zone 2), served by ThamesLink services connecting destinations north and south of London via St Pancras, Southeastern services between Kent and London Victoria, and London Overground services between Clapham Junction and Highbury and Islington.

Denmark Hill has two overbridges, with the second bridge having been installed in 2013 by the Access for All (AfA) programme. The AfA overbridge is at the country end of the platforms, with both bridges linked to an entrance on the south side of the station (above Platform 1). A set of stairs drops from each bridge to each platform island, with lifts on the AfA overbridge. We understand this portion of the station to have 'listed' status.

12.4.2 Current Capacity Constraints

**Station access** - Insufficient entrance and overbridge provision leads to passenger congestion at peak times.

**Stairs** - Queuing also occurs at the bottom of the stairs at platform level close to the platform edge.

**Gateline** – Due to insufficient number of gates the barriers are left open.

12.4.3 Possible Interventions and Timeframe

**CP6** - Provide a new station entrance onto Windsor Walk, linked to the AfA footbridge. Encourage increased passenger use by:

- Relocating existing station entrance nearer to the AfA footbridge.
- Lengthen platforms to terminate services closer to the AfA footbridge.
- Provide cover to the AfA footbridge and associated walkway.

CP6 - Additional gates on existing entrance / exit gatelines.

Denmark Hill		
Annual footfall		
ORR Estimates of Station Usage	2014/2015	5.6 million
2015 Passenger Count Survey		
AM Peak 3 Hours (07:00 – 10:00)	4,300 Boarders	4,700 Alighters
PM Peak 4 Hours (16:00 – 20:00)	4,700 Boarders	3,000 Alighters
Forecast Growth		
London and South East Market Study	2014 – 2023	2014 – 2043
	11.1 %	46.2 %
Interventions summary		
	CP6	Longer Term
Ticket Hall (Gatelines, Station Entrance)	✓	
Circulation (Stairs, Subway, Footbridge)	✓	
Platforms (widen, lengthen, declutter)	✓	

12.5 Lewisham



Above - passengers queue to exit Platform 1 at the barrier line at the top of the stairs to the subway.

Below - queuing in the original subway (between all platforms);



12.5.1 Background

Lewisham is a suburban station in South East London (Zone 2/3), served by Southeastern services. It is located in the middle of a junction complex; to the north trains diverge towards either London Cannon Street or London Charing Cross via London Bridge or to London Victoria or London Blackfriars via Denmark Hill.

Lewisham is a major interchange station; the DLR provides the main link between South-East London, Kent and the London Docklands. In addition, there are a number of schemes and developments proposed or under construction around the station, including the Bakerloo Line Extension and Lewisham Gateway masterplan. Following the introduction of the final ThamesLink timetable in 2018, capacity at Lewisham will be reviewed to validate requirements.

Recent work includes the addition of extra gates in main and DLR gatelines and the demolition work took place earlier in 2015 to widen the accesses to Platforms 2 and 3 by removing some rooms in the building.

12.5.2 Current Capacity Constraints

**Gatelines** - Insufficient provision of gates leading to queues backing on to the platform edge on Platform 1. Other gatelines also experience queuing.

**Stairs** - Queuing occurs at the top and bottom of the interchange subway stairs on Platform 1.

**Platforms** – There are large stepping distances on Platforms 1 and 2 resulting in passenger incidents at the platform-train interface. These platforms have a width less than 2.5m (standard minimum) for more than half of their lengths. This results in high passenger densities and constrains the flows at peak times.

12.5.3 Possible Interventions and Timeframe

**CP6** - Additional gates required and the relocation of the gateline on Platform 1

Increase interchange and platform egress capacity by widening existing stairs or providing new staircases.

Widen platforms to encourage better passenger distribution and improve passenger safety at platform train interface.

Lewisham		
Annual footfall		
ORR Estimates of Station Usage	2014/2015	9.2 million
2015 Passenger Count Survey		
AM Peak 3 Hours (07:00 – 10:00)	4,900 Boarders	6,800 Alighters
PM Peak 4 Hours (16:00 – 20:00)	6,800 Boarders	6,300 Alighters
Forecast Growth		
London and South East Market Study	2014 – 2023	2014 – 2043
	11.1 %	46.2 %
Interventions summary		
	CP6	Longer Term
Ticket Hall (Gatelines, Station Entrance)	✓	
Circulation (Stairs, Subway, Footbridge)	✓	
Platforms (widen, lengthen, declutter)	✓	



## 12.6 Peckham Rye



Above - passengers queue to exit Platform 4 to descend the narrow stairs to the connecting walkway linking all the platforms.

Below - passengers from all four platforms exit the station through the booking hall.



### 12.6.1 Background

Peckham Rye Station is a suburban station in South East London (Zone 2), served by ThamesLink services connecting destinations north and south of London via St Pancras, Southeastern services between Kent and London Victoria, London Overground services between Clapham Junction and Highbury and Islington and Southern services between West Croydon, Beckenham Junction and London Bridge via Tulse Hill. Peckham Rye Station consists of four platforms:

- Platforms 1 and 2 share an island and are served by Southern and London Overground services
- Platform 3 and 4 are single face platforms served by Southeastern and ThamesLink.

Recent works at the station include an Access for All (AfA) scheme to install lifts and the removal of station buildings on Platform 1&2, with a view to increase the space available for passengers. There is also a masterplan to redevelop area to front and rear of station buildings.

### 12.6.2 Current Capacity Constraints

**Gatelines** - Insufficient gateline provision results in queuing on stairs in both peaks.

**Stairs** - Insufficient staircase width from Platform 4 results in queues extending onto the platform during peak periods, posing a safety risk. Platform 1 & 2 stairs is also congested at these times.

**Platforms** - Platforms 3 & 4 have narrow sections that impede passenger circulation at peak times. Passengers unable to board crowded Up ThamesLink services in the AM peak on Platform 3 are left behind contributing to platform crowding. Platforms 1 & 2 become congested during the AM peak, impeding passenger circulation.

### 12.6.3 Possible Interventions and Timeframe

**CP6** – Reconfiguration to ticket hall and provide additional gate.

- Widen existing platform stairs or provide additional platform access stairs.
- Remove buildings and de-clutter Platforms 3&4.
- Provide canopies along platforms to encourage better passenger distribution.

Peckham Rye		
Annual footfall		
ORR Estimates of Station Usage	2014/2015	5.0 million
2015 Passenger Count Survey		
AM Peak 3 Hours (07:00 – 10:00)	5,500 Boarders	1,900 Alighters
PM Peak 4 Hours (16:00 – 20:00)	2,400 Boarders	5,300 Alighters
Forecast Growth		
London and South East Market Study	2014 – 2023	2014 – 2043
	11.1 %	46.2 %
Interventions summary		
	CP6	Longer Term
Ticket Hall (Gatelines, Station Entrance)	✓	
Circulation (Stairs, Subway, Footbridge)	✓	
Platforms (widen, lengthen, declutter)	✓	

# 13 TfL's Metroisation concept

May 2018

South East Route: Kent Area Route Study - Technical Appendix 162

13.1. The proposals contained in this section are those of Transport for London (TfL), and have been developed independently to the Route Study process.

## Options Summary

13.2. Metroisation is a Transport for London (TfL) concept which facilitates significant improvements to train length, frequency and customer experience on London's suburban rail network. North London has a dense network of London Underground routes in addition to suburban rail services, whereas few Underground lines reach into south or south east London, resulting in a greater dependency on rail services.

13.3. Despite this dependency, there is evidence to suggest that the Underground network in south and south east London experiences higher use than would otherwise be expected. Underground stations in south and south east London are substantially busier than equivalent suburban rail stations, with large volumes of bus demand between rail-served areas and Underground stations. These stations include Brixton, Tooting Broadway, North Greenwich, Canada Water, Elephant & Castle and Morden.

13.4. The suburban rail network is therefore potentially under-utilised and could deliver far more for passengers if major changes were made.

13.5. TfL believes that by bringing the simplicity and dependability of the Underground to the suburban rail network in south and south east London, capacity could be increased, helping to accommodate the expected growth in passenger demand across the region. To do this, six key areas would need to be addressed:

### • Predictable services:

- Identifiable "lines" that operate all day every day, with consistent stopping patterns and even intervals
- Turn-up-and-go frequencies maintained from early morning to late evening
- Additional peak services to meet demand and maintain connectivity.

### • Better connections:

- Higher frequency train services, including off-peak improvements
- Short wait times at stations, so no need to plan journeys in advance
- This is particularly useful for those making local connections across south and south east London, who currently have to plan around half hourly services and long waits
- New and upgraded interchanges to boost connectivity, not just to / from central London.

### • More capacity:

- Longer trains to take full advantage of previous platform lengthening schemes
- Making full use of the true capability of existing infrastructure
- Consistent train lengths
- Metro-style rolling stock on inner suburban services
- Infrastructure investment to relieve key bottlenecks on tracks and at junctions that currently constrain both inner and outer suburban services.

### • Shorter journey times:

- Higher performance trains that accelerate and brake faster, and have plenty of room to board and alight
- Staff actively managing dwell times at key locations
- Investment in signalling enhancements
- New infrastructure at key bottlenecks to reduce the need for padding in the timetable.

### • Reliability:

- Incentivise reliability within contracts as has been done for London Overground and the DLR
- Simplification of service patterns to reduce conflicts at junctions and mitigate against the cumulative impact of delays elsewhere
- Infrastructure investment to relieve key bottlenecks will allow more reliable services, both inner suburban and outer suburban.

### • Better customer service:

- All day station staffing with ticket barriers in operation
- Improved information provision
- Station and train deep cleans and refurbishment
- Better stations with consistent wayfinding
- Reliable ticket machines which sell both National Rail and TfL tickets
- Consistent and easily understood fares across the whole network
- More modern station facilities and shops.





13.6. TfL's Metroisation scheme was developed to increase capacity in the south east London suburban area by up to 25%. The package builds on previous work undertaken in south London for the Sussex Route Study with more frequent services throughout the day, better interchanges and increased train lengths. In some cases, this also means simplifying service patterns within the London area to unlock operating capacity. Further refinement work then took place on the preferred option to produce a more even spread of trains on each branch. TfL's proposal for Metroisation in south east London can be summarised as follows:

### South East London Metroisation Service Specification

#### 13.7. All day metro services:

- Cannon Street – Greenwich – Slade Green – Sidcup – Hither Green – Lewisham – Charing Cross circular service (six trains per hour)
- Cannon Street – Lewisham – Bexleyheath – Dartford (six trains per hour)
- Victoria – Denmark Hill – Lewisham (six trains per hour, continuing to / from the Bexleyheath and Sidcup routes at three trains per hour each)
- Victoria – Herne Hill – Bromley South – Orpington (six trains per hour)
- Charing Cross – Lewisham – Hither Green – Orpington – Sevenoaks (four trains per hour)
- Grove Park – Bromley North (four trains per hour)
- Charing Cross / Cannon Street – Hayes (four trains per hour to / from London Bridge)
- Dartford and beyond semi-fast services (four trains per hour)
- Blackfriars – Catford Loop services (four trains per hour).

Additional services may operate at peak times on each route (except Bromley North). Origin, destination and calling points are indicative only.

#### Enhancements required to deliver full Metroisation

13.8. Analysis undertaken by TfL has identified the following infrastructure enhancements as being necessary to deliver Metroisation on the south east London suburban network:

- Expansion of existing Thameslink European Train Control System (ETCS)/Automatic Train Operations (ATO) section of railway to an area bounded by Charing Cross, Cannon Street, Deptford, Blackheath, Hither Green and Ladywell
- Provision of two stabling / turnback sidings on Park Street Viaduct, accessible from Platforms 5 – 7 at Cannon Street
- Provision of an additional track to the west of Platform 1 at Dartford
- Re-arrangement of the tracks and pointwork to the east of Dartford to provide two central reversing sidings
- Extension of the Kent House loops to Penge East to provide a four track section between these two stations
- Improvements to interchange facilities at Lewisham
- Traction power supply upgrades
- Additional 300 vehicles to lengthen existing services to their maximum possible length and provide additional services
- Additional stabling and depot capability
- Station refurbishment and gating.

### Detail on Enhancements Required to Deliver Full Metroisation

#### ATO in South East London

13.9. There are various stretches of railway, both plain line and junctions, that will need to handle up to 30 trains per hour. To achieve this, it will be important to optimise the signalling locations (or European Train Control System (ETCS) beacons, or Automatic Train Operation (ATO) sections where appropriate). To accommodate this level of service reliably for three hours of the peak, ATO is thought to be required at the London end of routes serving Charing Cross and Cannon Street. ATO is not necessary at this stage on routes serving Victoria.

13.10. Automatic Train Control (ATC) provides a closer train separation than with lineside signals. It provides an additional level of rail capacity but the driver is still in control. The upper level of ATC is ATO where the driver is still in his cab (mainly for emergency purposes) but he does not drive. The driver is then able, at the end station of the ATO zone, to take back the control of the train either with an ATC system or with the basic lineside signalling.

13.11. Any ATO system has two components:

- A trackside component
- An on-board component.

#### Ground issues:

13.12. The boundary points for the South East Metro ATO should be:

- Charing Cross
- Cannon Street
- Deptford
- Blackheath
- Hither Green
- Ladywell.

13.13. Taking account of the number of tracks on each route section inside the boundary points, the overall length of single track to be equipped with ATO is around 85km.

#### On-board issues:

13.14. Southeastern has a current fleet of rolling stock operating on Metro routes of 226 trainsets divided into:

- 36 Class 376 trains (ten years old)
- 147 Class 465 trains (more than 20 years old)
- 43 Class 466 trains (more than 20 years old).

13.15. It has been assumed that the newer Class 376 units will remain on the network for the foreseeable future and ATO would be retrofitted, while the 190 older Class 465 and 466 units will be replaced by modern rolling stock. Additional new units will make up the fleet required to deliver Metroisation. ATO would form part of the specification for the future rolling stock.





### Carriage Sidings South of Cannon Street

13.16. Assessment of the terminal capability in the Cannon Street area demonstrated the benefits of being able to avoid returning all Cannon Street arrivals through London Bridge. However, with it no longer being possible to reverse empty coaching stock to the south of Blackfriars and thence via Elephant and Castle, an innovative solution was required to maintain peak frequencies.

13.17. Two aspects of the track layout should be noted:

- Two sidings accessed from Platform 7 (only 4 -car length and cannot be extended without property purchase)
- The single line track to/from Waterloo East/Blackfriars Jn (leads to Metropolitan Junction where it will join the pair of tracks being installed for ThamesLink trains between Blackfriars and London Bridge).

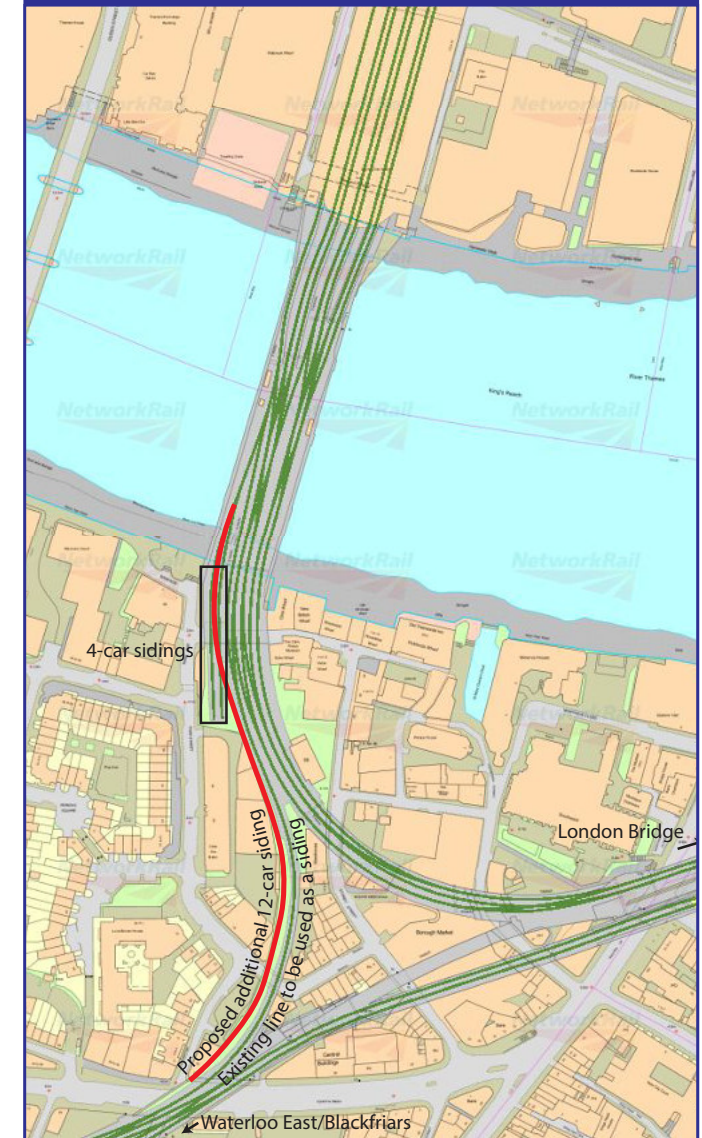
13.18. The existing structure leading to Metropolitan Junction is a viaduct (Park Street viaduct) bearing only one line, although it was built for a double line. This will become the first siding and it will be adapted to accommodate a 12-car train.

13.19. For the second siding, the solution will be to reintroduce a second siding track capable of stabling a twelve car train. The existing siding will be reachable from Platforms 5 to 7. The second siding will be established west of the existing one with a link with Platform 7 only in Cannon Street station as shown on the scheme plan in [Figure 13.1](#).

13.20. Due to the angle between the existing Park Street viaduct and the new one, it will no longer be possible to connect the existing siding with Thameslink lines at Metropolitan Junction. Only the new siding on the West side could perhaps get the connection but this has to be checked at a later stage. For the current study, TfL has considered that no link is available.

13.21. With two twelve car trains stabled on Park Street viaduct and a further two 12-car arrivals stabled in Platforms 6 and 7, TfL believes it is possible to maintain 27tph at Cannon Street during the high peak, with the lower frequency off-peak service operated using the remaining five platforms.

Figure 12.1 - Two carriage siding scheme at Cannon Street



### Dartford Additional Track West of Platform 1

13.22. Working arrangements at Dartford are complex:

- The four platforms have to handle both terminating and through trains
- The three track layout to the west of the station constrains the flexibility to make parallel moves, particularly when using Platforms 1 and 2 (the lower two platforms)
- The potential to use carriage sidings to the east to facilitate reversing trains is constrained by such moves conflicting with through trains
- The adjacent triangular junctions at Crayford and Slade Green further constrain the ability to timetable trains to optimise capacity at Dartford.

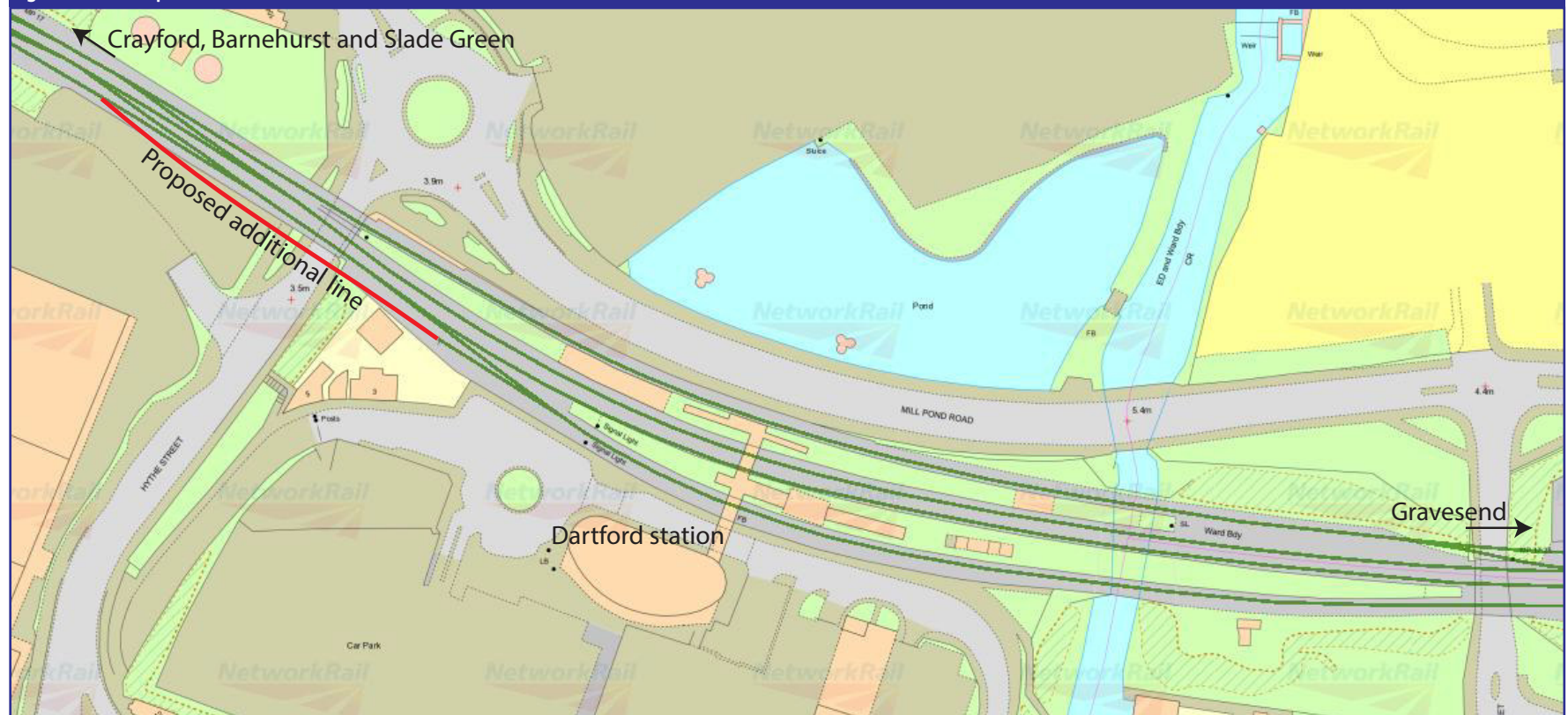
13.23. Increasing the number of trains terminating at this station presents a number of challenges, none of which appear to work efficiently with the current layout.

13.24. Improving the flexibility of access to Platforms 1 and 2 from the west of the station would require construction of an additional bridge and associated track connections immediately to the east of Platform 1. This would then permit parallel workings with these two platforms. The following layout shown in [Figure 12.2](#) is proposed.

13.25. This would require the following interventions:

- Widening of the Dartford Viaduct by creating a new single line bridge (length = +/- 100 m). The new bridge would support the elongated platform 1 line towards the west
- Permanent land purchase required for the site of the new bridge
- Temporary access to property outside of railway ownership
- Demolition and relocation (if required) of the "DARTFORD E.T.M." building located on the alignment of the new track
- Installation of approximately 200m of new track equipped with a third rail
- Removal of the existing trap points and its associated buffer stop, replaced with a 20mph set of points. At the west end of the new track, a 20mph set of points would also be required to connect the Up main line
- Installation of new signal routes
- Modification to the existing communications network to adapt it to the new layout.

Figure 13.2 - Proposed additional track west of Dartford





### Dartford – Central Reversing Sidings at East End

13.26. The station working at Dartford is complicated and difficult:

- The four platforms have to handle both terminating and through trains
- The three track layout to the west of the station constrains the flexibility to make parallel moves, particularly when using Platforms 1 and 2 (the lower two platforms on the plan above)
- The potential to use carriage sidings to the east to facilitate reversing trains is constrained by such moves conflicting with through trains
- The adjacent triangular junctions at Crayford and Slade Green further constrain the ability to timetable trains to optimise capacity at Dartford.

13.27. Increasing the number of trains terminating there presents a number of challenges and none appear to work well with the current layout.

13.28. Reorganising the track layout to the east: Move the through running lines to be the most northerly and southerly tracks placing the siding tracks between them so that reversals can be undertaken with minimal interference to the through trains. In this format, all eastbound trains would use Platforms 3 and 4 and westbound Platforms 1 and 2.

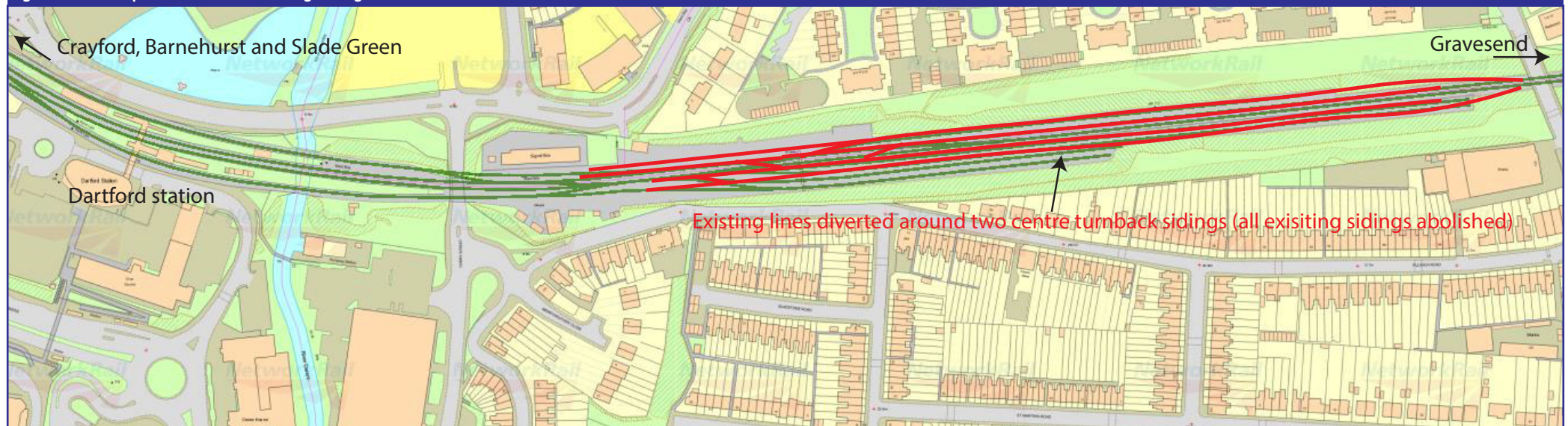
13.29. The new layout is shown in [Figure 13.3](#), and described as follows:

- The Down main line towards Gravesend will be moved aside at the location of the actual reception siding
- The Up line will be moved aside at the location of the actual sidings no 1 and 2
- Sidings 3 and 4 will be retained
- The intervention is limited on its east side by the St Vincent Road Bridge.

13.30. This would require the following interventions:

- Construction of graded embankment and retaining walls to follow the incline of the line between Dartford and Gravesend
- Construction of a train drivers footway between sidings
- Removal of 300m of track, slewing of 300m of track and installation of 1,200m of new track equipped with third rail
- Installation of two buffer stops
- Removal of four sets of trap points, installation of five sets of 20mph points, a diamond crossing and two trap points
- Installation of four main signals and two block signals, modifications to existing signal routes
- Modification to the existing communications network to adapt it to the new layout.

Figure 13.3 - Proposed central reversing sidings east of Dartford



### Penge East and Kent House – Additional Lines

13.31. The route via Beckenham Junction and Herne Hill shows significant capacity issues, primarily because a fast train is 7 minutes faster between Shortlands and Herne Hill than a stopping train. There would seem to be three possible solutions:

- **Option i.** Slow down the fast trains so that they have to follow the stopping trains signal by signal
- **Option ii.** Reduce the number of trains running – probably close to the levels running today
- **Option iii.** Introduce an overtaking opportunity in the route.

13.32. Option i would be unacceptable to longer distance passengers to/from Kent.

13.33. Option ii would fail to meet TfL's Metro standard.

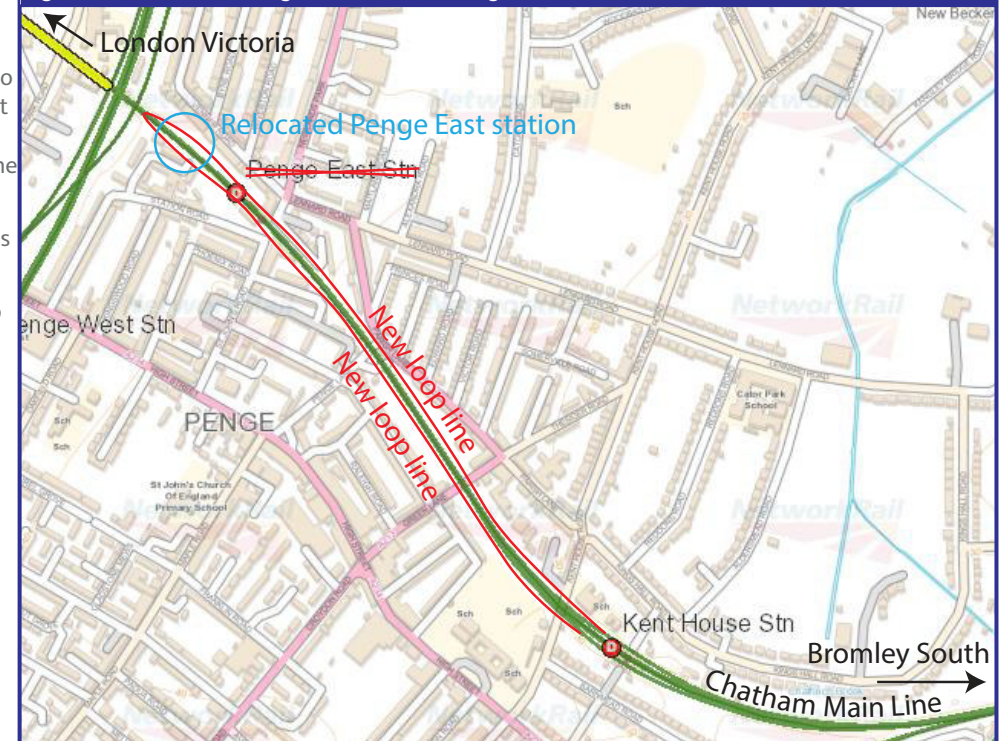
13.34. Option iii merits further study. Loops do currently exist at Kent House which enable fast trains to pass stopping ones. However these are not routinely used as the consequential time penalty for stopping trains is high. Best practice for overtaking loops is that they should have two stations within them so that the combined dwell times give enough time for a faster train to pass without significant extended times to the stopping trains. It may be possible (though may require land purchase) to extend the Kent House overtaking loops west to include Penge East station which may be achievable if the Penge East platforms were moved west closer to Penge Tunnel.

13.35. **Figure 13.4** shows the proposed track layout between Penge East and Kent House.

13.36. This would require the following interventions:

- Construction of a wider embankment would be required to support the new 4 track infrastructure. The embankment could be supported by retaining walls on either side to minimise impact on adjacent land and any potential land purchases required to facilitate the scheme
- Construction of a retaining wall (and earth fill being) from Penge East Platform to Penge Lane, from Bycroft Street to Green Lane and from Green Lane to Kent House Road
- Installation of noise barriers on the embankment
- Construction of new platforms (and installation of a temporary platform during construction)
- Construction of a new station building at Penge East
- Widening of two bridges from two to four tracks. As the main lines will not be moved, additional bridge decks would be required on each side of the existing ones
- Demolition of the existing platforms and buildings at Penge East station
- If required, land purchase on the up side for approximately 70m, where the railway property is around 17 metres wide
- Rebuild of the footbridge linking platforms 1 and 2 at Penge East Station
- Installation of 2,500m of new track equipped with third rail
- Slewing of the lines south of Penge East Station by approximately 1m (to avoid land purchase on the down side of the line)
- Installation of two sets of 40mph points and one set of 15 mph points
- Installation of new signals and routes
- Modification to the existing communications network to adapt it to the new layout
- Removal of the set of points situated at the London-end of Kent House station for entering the Down Platform Loop and leaving Up Platform Loop (Platforms 4 & 1 respectively).

**Figure 13.4 - Four-tracking Kent House to Penge East**





### Lewisham – Station Interchange Improvements

13.37. There are multiple inter-related flat junctions in the Lewisham area. The capacity analysis indicates that, even with the proposed growth in services, the individual junctions have the capability to handle the predicted increase in traffic. However, the close proximity of the junctions means that overall network capacity will be constrained as it will be challenging to timetable parallel moves across each junction, even with ATO. A reduction in station dwell time at Lewisham will be required to help mitigate against this.

13.38. To enable the proposed Metroisation service pattern, as well as to cope with increased customer numbers changing between different services and the DLR, the station at Lewisham would need to be configured to maximise the ability to interchange. This could mean wider platforms, broader staircases, escalators and a wide interchange concourse above or below the platforms.

13.39. Lewisham station has 4 platforms, all of them already being able to be served by twelve car trains. Their width varies as follows (approximate taken from aerial photographs):

- Platforms 1 and 2: from 3.0 m (country end) to 4.0 m (London end)
- Platform 3: from 2.5 m (country end) to 4.0 m (London end)
- Platform 4: from 1.5 m (London end) to 2.5 m (country end) with a 6.0 m part in the middle.

13.40. Due to its configuration with platforms close to each other on the London side and rapidly diverging towards the country side (until 200 metres from platform ends as the crow flies), “natural” interchange is performed on the London side of the platforms. Unfortunately, the London side is also the one where trains are the most crowded because it reduces the journey time by foot in London terminal stations.

13.41. The platforms are connected by 3 subways:

- Connecting platforms 1 and 2
- Connecting platforms 3 and 4
- Connecting all four platforms.

13.42. Only the last one can provide an interchange facility between platforms 1 and 3 and between platforms 2 and 4.

13.43. If the existing subway were to be widened, the impact on customers during the construction period would be an important consideration as the subway would need to be closed during this time. This would put additional pressure on the other two subways, as well as platforms and the station concourse area. For this reason, the construction of a second subway parallel to the existing one, with its own stairs and lifts, is the preferred option.

13.44. The subway works would entail temporary works on the station building, on platforms, on cable ways and on the tracks. Due to an increased number of commuters, platforms should also be widened by 1.5 metre on their London side.

13.45. An alternative solution could be to build a footbridge but, without plans and cross sections of the station and its outbuildings, this potential solution has not currently been assessed.

### Traction Power Supply Upgrades

13.46. South east London Metroisation will require a high number of additional trains, the traction power supply should be upgraded in order to provide trains with sufficient power to operate to the revised timetable.

13.47. At this stage no traction power surveys have been performed to understand the requirements.

13.48. The number of existing substations powering the South East London Metro area is around 35. The number of running trains is anticipated to be increased by 15% for Metroisation.

13.49. Based on these increases, the available electric power should be increased in the same proportion. In practice, the upgrade can either be by implementing new substations, or increasing the power of existing ones.

13.50. Assuming that 50% of the requirement will lead to increases in the number of substations and 50% will lead to upgrade existing substations three new substations and upgrades to two substations will be required for Metroisation.



### Other Key Points to Note

13.51. An incremental approach to Metroisation is intended, with the various components of the six key areas listed in [Paragraph 13.5](#) to be delivered over a number of years/control periods. In addition:

- The overall BCR of the scheme is calculated in accordance with TfL's appraisal methodology at 2.3:1, including provision for installation of ETCS/ATO in the area between Lewisham and Charing Cross/Cannon Street
- Minimum frequencies on each core route would generally be at least 6tph in inner London (roughly zones 2 to 4) and at least 4tph in outer London (zones 5 and 6)
- A simplified network would, in some cases, result in a reduced choice of London terminals for some south east London stations, so easy to reach strategic interchange stations would be developed and promoted so customers can change trains quickly and confidently
- A simplified network would have performance benefits where conflicting movements could be reduced or eliminated, and infrastructure enhancements would enable reliable operation of higher frequencies
- It is recognised that some passengers would not welcome the loss of journey options, for example if they no longer had a choice of travelling directly to both Charing Cross and Cannon Street all day. However, TfL considers that provided the benefit to passengers is sufficiently large (higher frequencies, simple interchanges, improved journey experience), then this disadvantage can be overcome, with most passengers benefiting in economic terms despite the loss of some direct routes. A comprehensive stakeholder engagement campaign would be needed
- Further work would be required to ascertain how stabling and depot capability could be increased across the network to accommodate the larger train fleet required to deliver Metroisation
- TfL recognises that there will be challenges to delivering Metroisation, and that it will be necessary to not adversely affect longer distance services from outside London, freight services or the availability of diversionary routes for trains during planned or unplanned disruption
- The Metroisation concept detailed here has been developed as a free-standing project, but has been designed with flexibility in mind to complement other proposals where appropriate.





