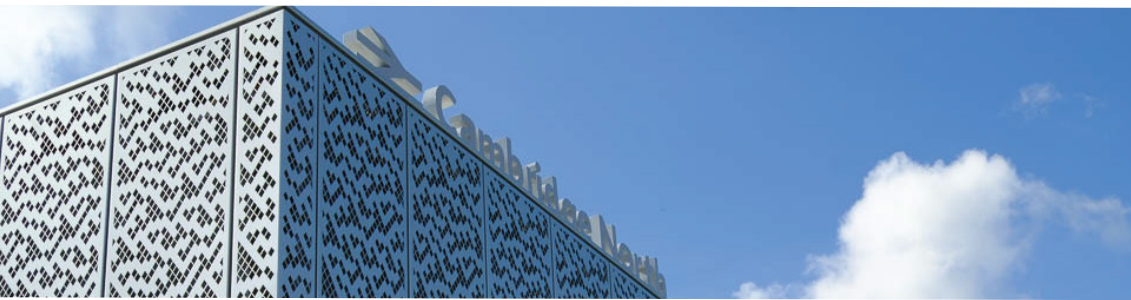


Cambridgeshire Corridor Study

Railway investment choices



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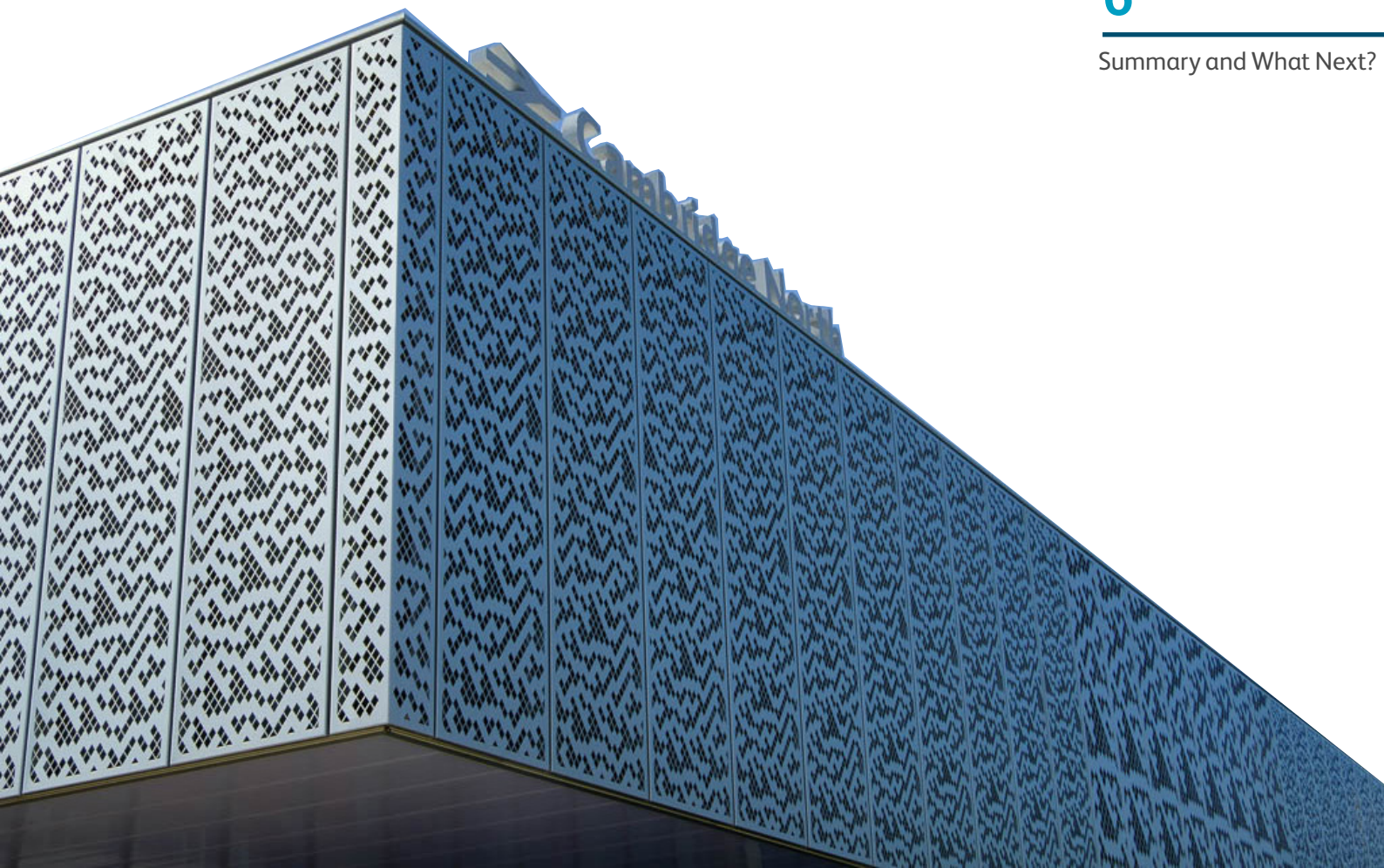
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Executive Summary

The Cambridgeshire Corridor Study assesses forecast growth across the railway in and around Cambridgeshire over the next 15 and 25 years, and identifies and costs a series of infrastructure improvements to help funders make informed decisions about planning the network in years to come.

The study forms part of Network Rail's Continuous Modular Strategic Planning (CMSP), and is funded by the Department for Transport (DfT), Cambridgeshire County Council, the Cambridgeshire and Peterborough Combined Authority and the Greater Cambridge Partnership. It uses both Government-endorsed and local aspirational growth forecasts, with the infrastructure options identified to support the Government forecast.

The study has assumed East West Rail (EWR) services as part of the baseline for 2033 and 2043, with up to six trains per hour to and from Cambridge. The study has looked at six strategic questions to help establish the required train services, for both 2033 and 2043, including whether any of the six EWR services should be extended beyond Cambridge to address local demand.

The Government-endorsed growth scenario has identified that by 2033, an extra service is required between Cambridge and London King's Cross, and by 2043, one EWR service is extended towards Ipswich. For 2043, the aspirational growth scenario requires an additional Ely to Cambridge service to support the demand towards Cambridge on this corridor, a new Ely to London King's Cross service and up to five EWR services extending beyond Cambridge: three towards Ipswich and two towards Ely, with one extending to Norwich. If EWR services were not provided, these services would start from Cambridge.

A higher level of growth has been identified in the Cambridgeshire and Peterborough Independent Economic Report. The implications of this are not considered but could be in a further study.

The study has identified additional infrastructure to support the Government endorsed growth. These options include two additional platforms (and associated switches, crossings and additional track) at Cambridge by 2033, and from 2043, doubling of the Newmarket single line for approximately 3.5 miles from Coldham Lane Junction towards Newmarket. Enhancements may be required earlier should growth be higher than forecast.

An 'order of magnitude' cost range has been assessed for these options. The study recommends that these options are developed to a Strategic Outline Business Case, aligned with the Government's rail enhancement funding process.

Options have also been explored around the stabling required to support a future train service. These range from minimal options, such as supplying the necessary additional stabling in or around Cambridge, through to moving all existing stabling facilities to release the land for alternative uses or over-site development.

The recommendations in this study have been developed by Network Rail in partnership with the DfT and local authorities and partnerships. These recommendations support the continued development of the Cambridgeshire and Peterborough area and the contribution of rail to transport and economic growth across the sub-region.

1 What is the Cambridgeshire Corridor Study?

The Cambridgeshire Corridor Study forms part of Network Rail's Continuous Modular Strategic Planning (CMSP). Using 2020 as the baseline (following significant timetable changes and proposed infrastructure changes in and around Cambridge), the study assesses a number of strategic questions, the answers/outputs to which will help determine the required infrastructure at Cambridge station, the line between Cambridge and Chippenham Junction (via Newmarket) for the next 15 and 25 years, and stabling requirements to support these.

1.1 Location

Cambridgeshire is located on both the West Anglia Main Line (WAML) and the Cross Country corridor and is also served by a number of services to/from London King's Cross via the East Coast Main Line (ECML). Thameslink route services connect Cambridge across central London to Brighton via Gatwick Airport and will also connect to Maidstone East from December 2019. **Figure 2** below shows the railway infrastructure through Cambridgeshire and the Unitary Authority of Peterborough.

1.2 Continuous Modular Strategic Planning (CMSP)¹

Greater devolution of economic planning, transport planning and decision-making means that strategic planning involves a greater level of complexity when compared with the previous Route Study process. As there will be a wider range of potential funders, the Long Term Planning Process needs to be more agile and responsive in order to provide evidence based choices to inform funding decisions. Feedback from our customers, funders and stakeholders has highlighted the need for responsive, devolved decision making that puts passengers and freight end-users at the heart of the long term planning process.

It also enables a more focused view on future rail enhancements for a local area and a greater understanding of the future growth.

With industry support, Network Rail has examined how to better deliver the route enhancement planning process to address the Anglia route's business needs, inform funder decisions through production of the enhancements pipeline and support the franchising process. For the Cambridgeshire Corridor Study, working with our stakeholders, we are implementing CMSP in order that we:

- Determine the medium and long term growth forecasts for the next 15 and 25 years;
- Identify the medium and long term requirements;
 - for Cambridge station that allows for forecasted passenger growth
 - for the Newmarket single line that allows for forecasted passenger growth
- Identify what additional stabling may be required and options to achieve this.

Figure 2 – Cambridgeshire and Peterborough map



¹ Further information on long term planning is available on the Network Rail website

This involves:

- identifying strategic questions, in liaison with Network Rail's devolved routes, passenger and freight train operators, and funders
- working more closely with key stakeholders to prioritise and 'package' the questions
- developing clearly defined and focussed remits
- better engagement with stakeholders through the creation of focussed multi-disciplinary working groups (including customers and external stakeholders) to answer each remit
- creating, publishing and consulting upon concise reports
- proactively reviewing and revisiting studies as further questions arise and/or baselines, assumptions and/or forecasts change.

1.3 The need for the Cambridgeshire Corridor Study

Following the publication of the Anglia Route Study in March 2016, a workshop took place with train and freight operators and the Department for Transport into Network Rail's CMSP priorities for the Anglia route in July 2017. The following factors were identified as to why this study was a priority for CMSP:

- the amount of developing projects and commitments
- increased rail usage and
- housing and employment growth in and around Cambridgeshire.

1.3.1 A changing railway and the base case

There are a number of projects in the Cambridgeshire area in development, which are assumed as part of the base case for this study. Although these schemes are not fully funded at present, the study has used a set of aspirations based on those schemes already in development. These schemes could change the amount of trains and present new and increased travel opportunities:

East West Rail

East West Rail is a major project, connecting East Anglia, the South Midlands, and South West England. The project will require work on existing Network Rail owned infrastructure and new infrastructure between Oxford and Cambridge. The diagram below ([Figure 3](#)) shows how the route is split into three sections – Western, Central and Eastern. The second phase of the Western Section, between Bicester and Bedford, is expected to enter the delivery phase from late-2019, with services operational by 2024. Work on Central Section continues to assess the best rail alignment between Bedford and Cambridge, with the potential of the full Oxford to Cambridge route open by the mid-2020s. Work on the Eastern section from Cambridge to Norwich and Ipswich is yet to be commissioned

An initial study was undertaken by the consultant, Atkins, commissioned by the EWR Consortium², to understand the service levels required to meet growth for the Eastern Section assessing journey times,

² The Consortium brings together local authorities and railway and regional stakeholders, along with local businesses and private sector partners from across the South East and East of England to promote the development of the rail project.



connectivity and capacity³. Whilst the Cambridgeshire Corridor Study does consider some of the recommendations made, the scope of this study is to understand how Cambridge and the wider geographical area makes best use of EWR in line with local and regional growth aspirations to/from and through Cambridge. It should be noted that the Western section of EWR to Bedford is committed, the Central section is commissioned to develop a Strategic Outline Business Case (SOBC) and Eastern section from Cambridge to Norwich and Ipswich is yet to be commissioned.

For EWR, the train service options looked to provide up to four trains per hour (tph) to Cambridge (following a series of workshops) and the possibility of an hourly off-peak freight path. These outputs have since been aligned with the Network Rail 2013 Long Distance Market Study (LDMS)⁴, which identifies the theoretical number of trains required over any given line of route based on distances between stations. This change requires up to 6tph to/from Cambridge, with an increased focus on connectivity rather than journey time. This is in line with recommendations from the National Infrastructure Commission (NIC)⁵

Whilst the 6tph proposal is in consultation with stakeholders, it was considered prudent to anticipate that the additional 2tph would be approved by stakeholders and formally instructed by the EWR Company, which is a non-departmental public arm's length body set up by the Government to accelerate the East West Rail project⁶. Assumptions around where these additional 2tph go to/from will be subject to the market studies analysis. The below shows the assumptions used for the future, base EWR train service options.

The assumed train service from EWR that will be considered for this study is:

six trains per hour terminating at Cambridge and one freight train per hour to and from Felixstowe port via Cambridge.

It is assumed for this study that EWR services would access Cambridge station from the south but it is noted that this could change.

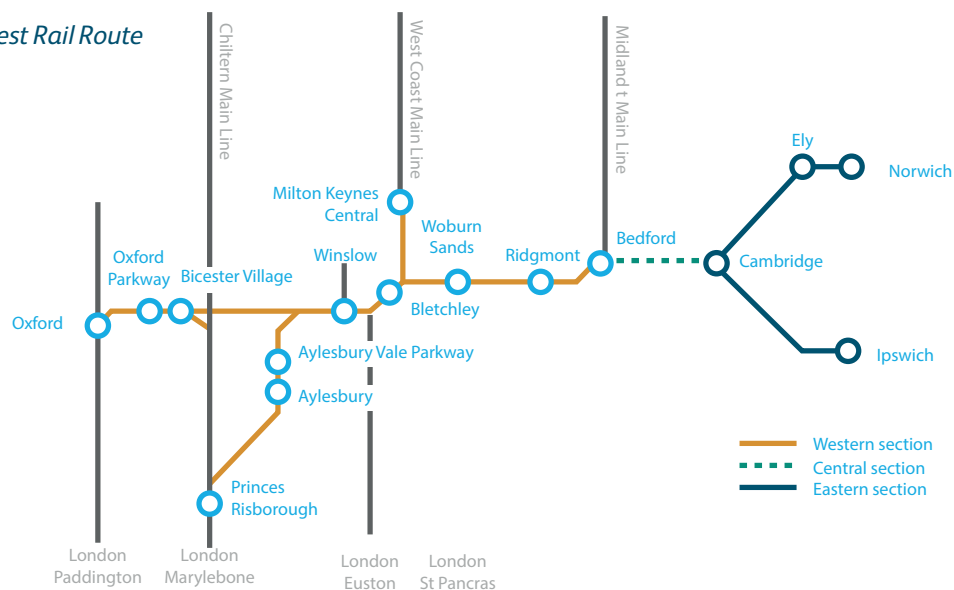
Local/Regional Aspirations

There are a number of schemes within various stages of development within the scope area of the study as follows:

- Kings Lynn 8-car programme – longer platforms and selective door opening at stations between Kings Lynn and Waterbeach to allow for 8-car trains to cater for passenger demand to/from Cambridge and onwards to London King's Cross.
- Ely Area Capacity Enhancements (EACE), including Queen Adelaide Level Crossing Road Study – early development of a programme aimed at unlocking a major capacity constraint and to allow for increased freight and passenger services through the Ely Area.



Figure 3 – East West Rail Route



³ Atkins: East West Rail - Eastern Section Conditional Outputs Statement

⁴ Network Rail Long Distance Market Study

⁵ NIC Cambridge - Milton Keynes - Oxford Corridor: Interim Report

⁶ East West Rail Company

- Waterbeach station re-location – linked to proposed plans to build up to 11,000 new homes in Waterbeach, a third party aspiration to move the station closer to new development.
- Soham new station – a new station to provide rail journeys to/from Soham on the Ipswich to Peterborough service. Although not serving Cambridge, connecting services can be used at Ely, Kennett (and other stations).
- Cambridge South new station – early project development to establish the potential for a new station, south of Cambridge, to provide better public transport options to Addenbrooke's hospital and the relocated Papworth Hospital, Cambridge biomedical campus.

There are also aspirations for services to/from Wisbech to better connect Fenland and North East Cambridgeshire.

Figure 4 – A 4-car class 387 train at Ely. The Kings Lynn 8-car programme would allow these services to be up to 8 carriages.



1.3.2 Rail Usage

On average, the number of passengers using Cambridge station between 2006/7 and 2016/17 has grown by approximately 5% year on year⁷.

This growth has been the result of an increase in housing and employment within Cambridge and its surrounding areas for the reasons noted below. The associated increase in rail usage means services are becoming busier both to/from Cambridge as is Cambridge station itself.

The initial findings of the Cambridgeshire and Peterborough Independent Economic Commission identifies a need to improve transport and its associated infrastructure within the region and for Cambridge in particular, the need for alternative options to road travel given existing road congestion within the city⁸.

This study seeks to examine the role of rail in supporting continued housing and employment growth in Cambridgeshire over the next 25 years.

1.3.3 Stabling

A number of train operating companies (TOCs) stable rolling stock in the Cambridge area including Greater Anglia (GA) Govia Thameslink Railway (GTR) and Cross-Country (XC), however, not all required rolling stock is able to stable at Cambridge overnight owing to limited space. Given the expected growth in rail services to and from Cambridge and the potential for increased land value in and around the station, consideration needs to be given to capacity of stabling facilities in the future. The relocation of all stabling away from Cambridge must be considered as an option, however, this must factor in the associated operational requirements and costs.

⁷ ORR - station usage statistics

⁸ Cambridge and Peterborough Economic Interim Review

Figure 5– Addenbrooke's Hospital would benefit from Cambridge South new station

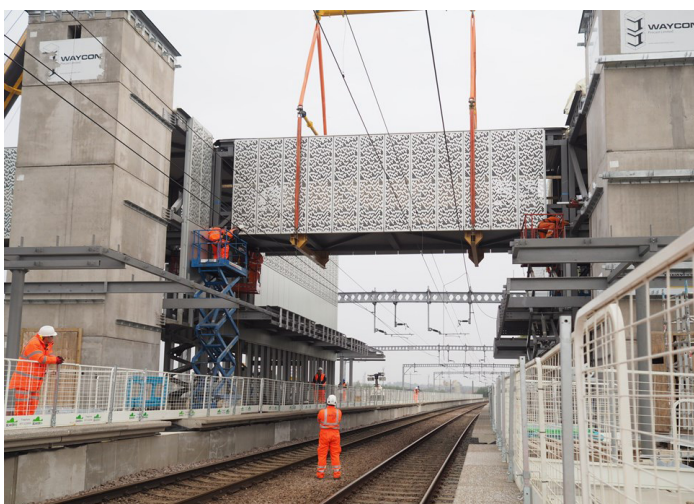


1.3.4 Housing Growth

Savills identified that in the City of Cambridge, 1,299 homes were completed in 2013/14, adding over 2.5% to the existing housing stock. This is more than double the average rate in the city over the previous ten years and the second highest rate of any local authority in the country. The England average for the same period was 0.6%. A similar rate of delivery is forecast to continue over the next five years, adding 1,245 homes per year on average. Development has and continues to take place in the form of urban extensions, but other sites have been identified to facilitate the population and housing growth in and around Cambridge, such as Alconbury, Northstowe and Bourn Airfield.

1.3.5 Employment Growth

Cambridge has a significant biomedical industry, with Astra Zeneca, a global pharmaceutical company, relocating their headquarters there in May 2016. The initial findings of the Cambridgeshire and Peterborough Independent Economic Commission shows that employment within Cambridgeshire and Peterborough has grown by 3.3% per annum between 2010 and 2016 (based on UK Business Register and Employment Survey data (BRES)), with forecasted rates above 2.5% up to 2051.



2 How has the study been done?

Cambridge is both a location where people commute to and commute from, primarily to London. It is important, therefore, to recognise there are passenger flows both to and from Cambridge. This study considers what train services are required in the high peak hour, where there is currently the highest number of train services. For Cambridge this is between 0730 and 0829 hours.

2.1 Infrastructure Assumptions

As identified in **Section 1.3.1** 'A Changing Railway,' there are a number of aspirations, and schemes currently in development which do not have a funding commitment to deliver. As the Cambridgeshire Corridor Study is assessing the infrastructure requirements for 2033 and 2043 levels of growth, there has been a review of the aspirational rail schemes that could be influential to the layout of Cambridge and the Newmarket single line. Cambridge South new station requires four platforms, and therefore four tracks.

To integrate Cambridge South with Cambridge, requires four-tracking from Cambridge and therefore, this has been a key assumption for the required infrastructure from Cambridge towards Cambridge South. No other assumptions are required at this stage.

2.2 Strategic Questions

With the established base assumptions set out in **Section 1.3**, the study sets out to answer a number of strategic questions (SQ) to understand the required interventions for the next 15 (2033) and the 25 years (2043) to meet forecasted demand in the high peak hour (0730-0829). It also seeks to establish the associated stabling requirements to support these. The primary questions agreed are:

Figure 6 – Strategic Questions for Train Service and Infrastructure

Train Services and Infrastructure

SQ1: What solutions are required to support the Cambridgeshire Corridor Study Concept Train Plan for 2033 and 2043 for both Cambridge station and the line between Coldham Lane Junction and Chippenham Junction?

SQ2: How can the Cambridgeshire Corridor Study Concept Train Plan support the growth and demand scenarios for 2033 and 2043 to provide value for money solutions?

SQ3: What other solutions are required beyond those for East West Rail to support other growth and demand scenarios for Cambridge in 2033 and 2043?

The impact of additional train services means more daytime and overnight stabling and maintenance facilities are often required.

The study will, therefore, consider a set of secondary strategic questions to understand the implications of any changes in rolling stock and/or infrastructure within the defined scope areas. These are:

Figure 7 – Strategic Questions for Stabling and Land Opportunity

Stabling and Land Opportunity

SQ4: How much additional stabling is required to support the additional train services for the scenarios in 2033 and 2043?

SQ5: Do the solutions for Cambridge station have an impact on existing stabling? If so, options to be provided around alternative stabling locations.

SQ6: Where are there potential land opportunities for additional stabling to support the additional train services for the scenarios in 2033 and 2043?

To be able to answer the SQs, a number of steps have been taken to understand what is required to cater for future growth and demand and the interventions required to support it.

Following this, it was agreed with funders to provide high level designs and cost-based orders of magnitude for any rail based identified interventions to help inform any next stage development and potential funders.

Figure 8 – Steps taken to answer strategic questions

Economic Analysis:

Understand growth and demand scenarios to help realise future passenger numbers.

Timetable Analysis:

What can be done with existing infrastructure?
What is needed to support future train services?

Conditional Outputs:

How many additional passengers?
Train lengthening/additional services.

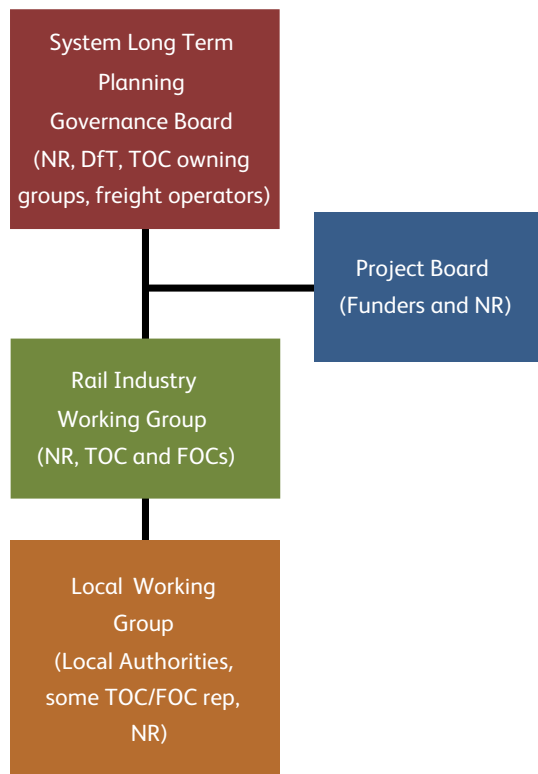


2.3 Governance

The Cambridgeshire Corridor Study has followed a similar format to other studies being progressed across the country.

As the study requires funding to answer the strategic questions, an additional layer of governance has been added. **Figure 9** shows the structure for the study:

Figure 9– Cambridgeshire Corridor Study Governance Structure



Roles:

Local Working Group

Formed of local government, local enterprise partnerships, train and freight operators (TOCs and FOCs), Department for Transport (DfT). Help understand how the railway and the wider developments (such as local plans) work together to answer the SQs.

Rail Industry Working Group

Formed of TOCs, FOCs, Rail Delivery Group (RDG), DfT. Focus on what is required for the railway to answer the SQs.

Project Board:

Funders of the study alongside Network Rail. Agree and approve how funding is spent and outcomes.

System Long Term Planning Governance Board:

Endorse study. Network Rail led.

2.4 Economic Analysis

The economic analysis of the Cambridgeshire study area included a review of current and historic passenger demand for rail at key stations. As stated in **Section 1.3**, demand at Cambridge station, Ely and Kings Lynn has seen average yearly growth of over 4-5% p.a. over the last ten years. To estimate future growth, particularly focusing on Cambridge station as a key interchange hub within the study area, a number of growth scenarios were developed to understand the forecasted demand:

- Aligned with baseline growth⁹
- Aspirational growth – looking at growth per corridor to/from Cambridge and how growth could continue;
- Growth at 3% (mid-point range)
- Network Rail London and South East Market Study Growth.

⁹ Treasury Green Book 'DfT compliant' growth



2.4.1 Scenarios for Conditional Outputs

Following a review of the growth scenarios above, it was agreed by the project board to focus the study on two specific scenarios (Figure 10), against the base train service specification, to determine what interventions were required in both 2033 and 2043 to support such growth:

The growth assumptions for both scenarios assess flows on corridors to/from Cambridge, though Scenario 2 splits these down by corridors, defined by where the railway

lines split and join. These corridors are shown in Figure 11 below. Ely, Waterbeach and Cambridge North have been considered as part of the 'Kings Lynn' corridor owing to the higher frequency of train services on this corridor.

Employment density in Cambridge is not just City Centre focused and is diffused across wards as can be seen in Table 13. Even with spread out employment, modal shift to rail from other forms of transport has continued to rise between 2001 and 2011.

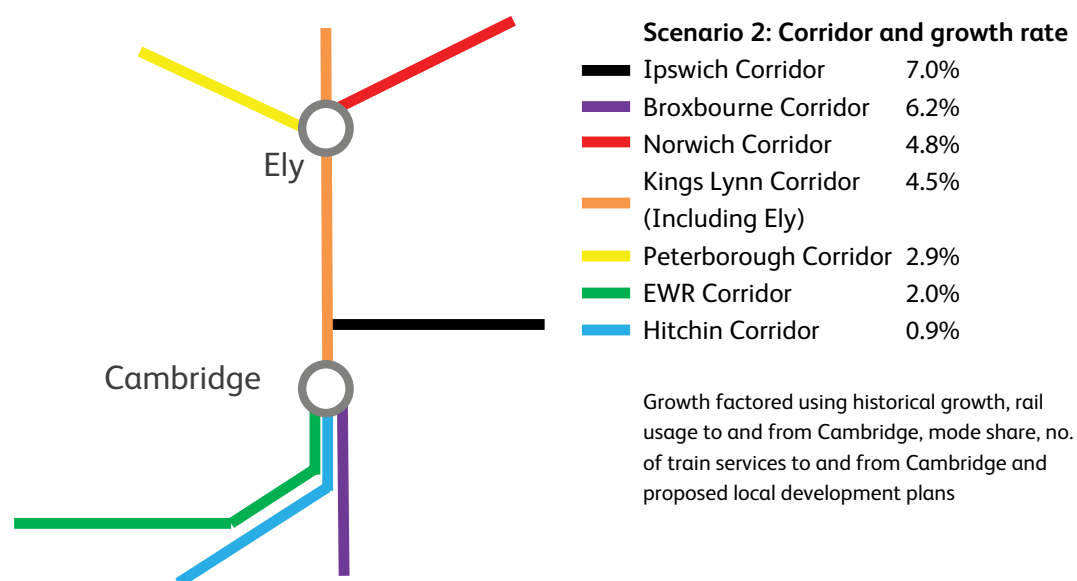
Figure 10 - Growth Scenarios assessed for Conditional Outputs

Scenario 1:

This is compliant with the Department for Transport's Network Modelling Framework model that forecasts demand for the geographical scope area.

Scenario 2: This Assesses growth in line with historical trends, mode share and factors in local development plans.

Figure 11 – Scenario 2 Corridors to/from Cambridge, including growth rates (map not geographically to scale)



Ease of access and proximity to railway stations will be a key driver of growth in demand for rail services in the future. Overall Cambridge rail mode share increased by 94% between 2001 and 2011.

As well as understanding demand to and from specific stations, connectivity is also important. We have examined the flows to and from the study area. For example, over the last ten years, there has been a doubling of rail passenger demand between Cambridge and Stansted Airport, Waterbeach, Newmarket,

Norwich, March and Bury St Edmunds. The demand between Cambridge and Ipswich, Stevenage, Letchworth, Littleport and Whittlesford increased by just over 90% in the same time period.

An Independent Economic Review was carried out for the Cambridgeshire and Peterborough Combined Authority area. This report set out a growth target of doubling the economy of the area in 25 years, or an annual growth rate of over 2.8%, and also the provision of up to 8,000 homes per year.

2.5 Timetable Analysis

To understand what train services are required for the scenarios, a 2020 base peak train service specification was agreed and established.

This date was chosen as it is when significant timetable changes for both Greater Anglia and Govia Thameslink Railway will have been implemented.

At Cambridge, in 2020 there will be 15 trains per hour (tph) in the high peak direction, 0730-0829 (which includes services into Cambridge and those towards London).¹⁰

For 2033 and 2043, there is an assumed train service uplift, following the introduction of East West Rail (EWR) services to 21tph to/from Cambridge. The EWR services are assumed to be formed of 4 carriages and, if required, they may increase to 8.¹¹

Figure 12 – Congestion in Cambridge



Table 13 – Census data (2001-2011) assessing mode share and employment density⁹

| Geographic area | Employment Density | | | Train Share | | |
|-----------------------------------|-------------------------------------|-------------------------------------|--|-------------------------------|------------------|---|
| Cambridge Ward | 2001 Employment Density per hectare | 2011 Employment Density per hectare | Change in employment density per hectare between 2011 and 2001 | 2001 Train Share | 2011 Train Share | Change in train share between 2011 and 2001 |
| Market | 108.6 | 119.7 | 10.2% | 3.1% | 5.5% | 77.4% |
| Petersfield | 37.9 | 49.2 | 29.8% | 2.5% | 5.9% | 136.0% |
| Trumpington | 13.8 | 15.9 | 15.2% | 4.9% | 9.9% | 102.0% |
| Queen Edith's | 20.9 | 33.4 | 59.8% | 1.2% | 2.9% | 141.7% |
| East Chesterton | 20.9 | 30.6 | 46.4% | 1.0% | 1.9% | 90.0% |
| Coleridge | 17.8 | 19.9 | 11.8% | 1.8% | 2.8% | 55.6% |
| Castle | 17.8 | 20.8 | 16.9% | 1.2% | 2.6% | 116.7% |
| Romsey | 20.1 | 18.2 | -9.5% | 1.7% | 2.4% | 41.2% |
| Newnham | 10.1 | 13.9 | 37.6% | 1.6% | 2.9% | 81.3% |
| West Chesterton | 19.7 | 21.5 | 9.1% | 1.4% | 1.8% | 28.6% |
| Abbey | 12.5 | 11.4 | -8.8% | 0.8% | 1.8% | 125.0% |
| Cherry Hinton | 5.7 | 8.5 | 49.1% | 1.0% | 1.9% | 90.0% |
| Arbury | 10.4 | 10.6 | 1.9% | 0.4% | 1.5% | 275.0% |
| King's Hedges | 12.9 | 10.7 | -17.1% | 0.3% | 0.7% | 133.3% |
| Total for Change Cambridge | Employment Density: 16.8% | | | Rail Mode Share: 94.3% | | |

¹⁰ Split join services are treated as 1tph if they join at Cambridge

¹¹ [Census Data](#)



Scenarios 1 and 2 have been tested against the uplifted service frequency of 21tph through Cambridge, plus the following infrastructure assumptions and associated benefits:

- Kings Lynn 8-car: platform extensions and other infrastructure to enable longer (8-car) trains to operate between Kings Lynn and Cambridge. This may allow for different options for splitting/joining and train services on this route.
- Ely Area Capacity Enhancements: allowing for 12-car services from Ely.
- Cambridge South (and associated 4-tracking requirements) allowing more flexibility for train services to/from Cambridge.

Beyond these assumptions, this study can then identify if any additional services are required in 2033 and 2043 and what interventions are needed to support these. Non-infrastructure solutions, such as train lengthening, have been considered before infrastructure based solutions such as additional platforms and tracks.

The capacity analysis undertaken demonstrates that in the high peak hour (0730-0829), Cambridge station is only able to support one additional train per hour in one of the bay platforms from 2020. The reason for the station becoming full is a result of the introduction of longer fixed formation trains across the Anglia Route which, due to their length, can only use through platforms (1, 4, 7 and 8).

Figure 14 – Timetable Analysis Process for the Conditional Outputs for Scenarios 1 and 2

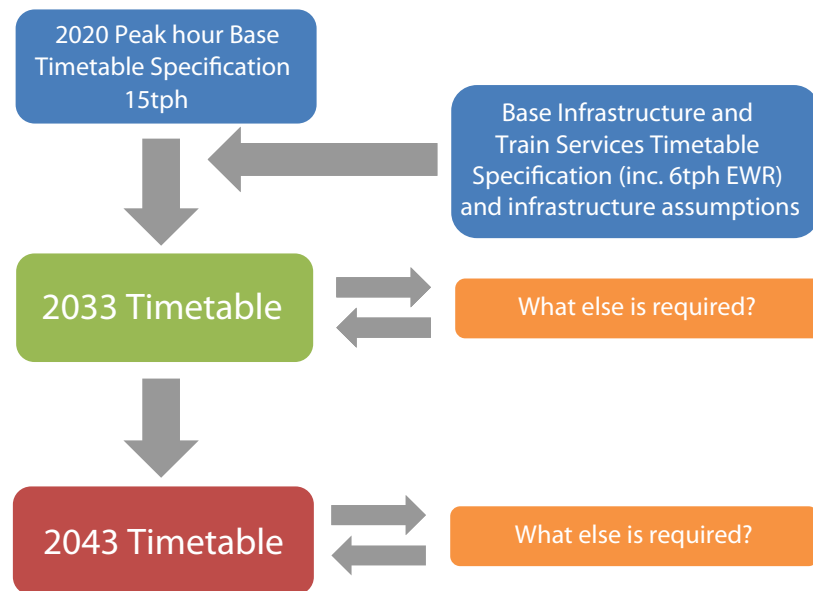


Figure 15 – Cambridge Station



Many of these trains start and terminate at Cambridge and require sufficient station dwell times to allow for operational tasks to be undertaken, such as crew changes. Both utilise existing capacity. It is clear, from the analysis, that the additional 6tph required for EWR services **cannot** be accommodated within the existing track and station layout.

2.6 Passenger capacity at Cambridge station

Figure 15 shows today's station layout, which features four terminating (or bay) platforms and four through platforms (two of which are joined together).¹²

Approximately two-thirds of passengers use platforms 4-8, one-third use 1-3, and around 5% interchange between platforms. Although the station has sufficient gatelines for today's passenger numbers, the following factors create a sub-optimal operating environment:

- Customer information screens – passengers congregate around these to check the train running information which creates congestion around the gateline and platforms (where these are positioned).
- Staircase – this creates a barrier for passengers moving to/from platforms 5/6 and some of platform 4, with those wishing to access platforms 7/8.

Figure 16– Cambridge Station platform 1



- Retail – on platform 1 and 4 the retail is on the platform face, along with the station entry/exit, causing disruption to passenger flows, with passengers frequently walking beyond the yellow line area due to competing usage for space (retail, interchange, entry/exit gateline) which can be seen in the photograph above.

With either growth scenario, any increase in passenger numbers beyond the levels today will further exacerbate the operational challenges that exist through increased interchange and gateline usage.

¹² Cambridge Station - National Rail Enquiries



3 Conditional Outputs

As explained in **Chapter 2**, the study has forecast two growth scenarios. The study has reviewed those services where demand exceeds capacity in 2033 and 2043 and considered what options are required to accommodate this. To assess these outputs, metrics around standing allowances have been applied for those stations within 20 minutes of Cambridge to align with the guidelines around rail passenger numbers and crowding¹³.

The options explored further consider the following questions:

- Are there other train services to/from Cambridge either to/from destinations where demand exceeds capacity and therefore distribute demand effectively within the high peak hour?
- Can existing services be lengthened?
- How many additional services are required and how long can these need to be? ¹⁴

¹³ DfT: Rail Numbers Crowding and Passenger Statistics

¹⁴ May be able to achieve more with longer trains rather than even more additional trains.

These options are known as the 'Conditional Outputs'. These are the outputs that the rail industry and funders may wish to achieve, conditional on there being a value for money and affordable way of delivering them. The outputs can include both non-infrastructure and infrastructure options.

In both scenarios, during the high peak hour (0730-0829), there is overcrowding for fast services to/from London King's Cross (which typically start from Kings Lynn/Ely). Furthermore, both scenarios 1 and 2 indicate overcrowding for services from the Ipswich corridor (via Newmarket) into Cambridge during the high peak hour. **Table 17** illustrates the train service interventions required to address overcrowding for both scenarios 1 and 2.

Table 17 – Scenario 1 and 2: Conditional Outputs for 2043

| Requirements | | Scenario 1: (Baseline Growth) | Scenario 2: (Aspirational Growth) |
|--------------|---|---|--|
| 2033 | What are the EWR service requirements? | 6tph from EWR to Cambridge (All 4-car) | 4tph ¹⁵ EWR to Cambridge (4-car) |
| | Could any of these services be extended beyond Cambridge to support local growth? | | 2tph EWR towards Ipswich(8-car) Or 3tph EWR to Cambridge (4-car) 3tph EWR towards Ipswich(4-car) |
| | Are any additional services required? | 1tph 12-car Cambridge to London King's Cross* | 1tph 12-car Cambridge to London King's Cross |
| | Total | 7tph additional | 7tph additional |
| 2043 | What are the EWR service requirements? | 5tph EWR to Cambridge | 1tph EWR to Cambridge |
| | Could any of these services be extended beyond Cambridge to support local growth? | 1tph EWR towards Ipswich (All 4-car) | 1tph EWR towards Norwich (4-car) 4tph EWR towards Ipswich(8-car) Or 2tph EWR to Cambridge 1tph EWR towards Norwich (4-car) 3tph EWR towards Ipswich(8-car) and 1tph additional Ipswich to Cambridge local service (4-car) |
| | Are any additional services required? | 1tph 12-car Cambridge to London King's Cross* | 1tph 12-car Ely to London King's Cross |
| | Total | 7tph additional | 7-8tph additional |

¹⁵ tph is 'trains per hour in the peak hour'

For both 2033 and 2043, it has been assessed that an additional 7-8tph are required for peak direction services in to Cambridge to meet both growth scenarios. Six of these are EWR terminating or extending services and 1tph towards London (and with the option of an additional local service in the Aspirational growth scenario).

Any increase in freight through Cambridge will largely be dependent on the development of East West Rail to provide an alternative/new cross-country route.

3.1 Scenario 1 Summary

Figure 19 illustrates the additional trains per hour required to meet the growth expected within Scenario 1. The lines in **purple** illustrate the changes to EWR services required to align with demand from Cambridge, and those in **green** show any other new services (non-EWR related) during the high peak hour.

3.1.1 Services from Cambridge to London

There is a requirement for an additional hourly 'fast' service from Cambridge to London King's Cross. All the existing services from Cambridge are required to be 12-car and, therefore, the requirement is for an additional 12-car service to meet 2033 demand from Cambridge to London King's Cross in the high peak hour. The East Coast Main Line study identified that extra capacity may be provided through the introduction of digital signalling between London King's Cross and Peterborough, which could allow for this additional service to operate. This additional service may not be able to accommodate all forecast demand, however, other services to London could provide for this. These services have slower journey times but do offer direct and/or different connectivity options.

3.1.2 Services from Ipswich to Cambridge

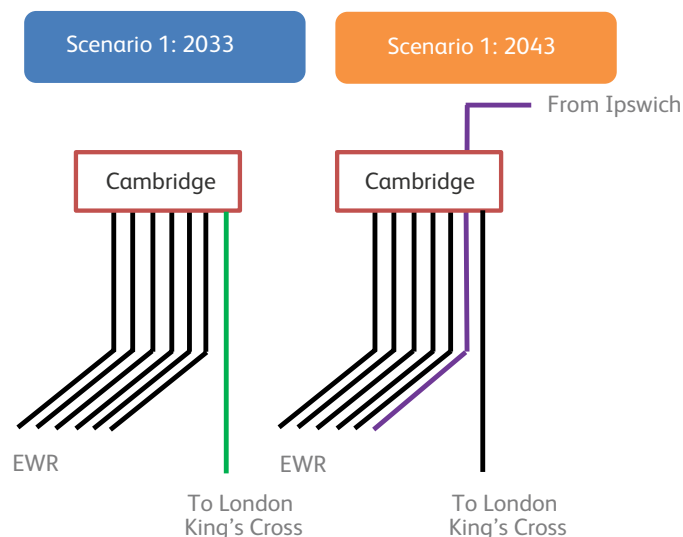
No additional services are required in the high peak hour on the corridor between Cambridge and Ipswich to meet 2033 demand; however, to meet 2043 demand, an additional hourly 4-car service would be required. This could be an extension of an EWR service beyond Cambridge, which supports SQ3. It is worth noting that nearly half the passengers on the Ipswich to Cambridge corridor, board trains at Newmarket and around a quarter at Bury St Edmunds. This needs to be taken into consideration for any choices of where additional services may start or terminate.

An alternative option that could be considered achieve the 2043 demand could be the lengthening existing services from 4 to 8-car. This would, however, require the stations between Cambridge and Ipswich to have significant platform extensions (See [Table 18](#)) and could have implications on other infrastructure such as level crossings and signalling that would need to be relocated. Also, this option would not address SQ3 or provide the same benefits for the Ipswich to Cambridge corridor through improved frequencies and connectivity with destination on the EWR route.

Table 18 – Current platform lengths between Cambridge and Ipswich

| Station | Platform Length (Up) | Platform Length (Down) |
|---------------------------------|----------------------|---------------------------|
| Dullingham | 5-car | 5-car |
| Newmarket | 2-car | N/A (Single line section) |
| Kennet | 3-car | 4-car |
| Bury St Edmunds | 5-car | 8-car |
| Thurston | 4-car | 4-car |
| Elmswell | 3-car | 3-car |

Figure 19– Scenario 1: Additional Services required for 2033 and 2043



3.1.3 Services from Kings Lynn/Ely to Cambridge

To support passenger demand for both commuters between Kings Lynn and Waterbeach and those from Cambridge to London (identified in 3.1.1) requires the following:

- A 12-car train from Cambridge to London King's Cross, which consists of an 8-car service from Kings Lynn and Cambridge and a 4-car train from Ely to Cambridge;
- A 12-car train from Cambridge to London King's Cross, which consists of an 8-car service from Kings Lynn and Cambridge and an additional 4-cars to join at Cambridge.

3.1.4 Services from other locations to Cambridge

Having assessed the demand for both 2033 and 2043, no other services are required from other destinations to/from Cambridge in the high peak hour. However, it should be noted that there are stakeholder aspirations to see EWR services extended to Norwich as well as Ipswich in the future, which would have connectivity benefits.

3.2 Scenario 2

Figures 20 and 21 show two options for the additional trains per hour required for Scenario 2.

3.2.1 Services from Cambridge to London

There is a need for an additional 8-car service to meet 2033 demand from Cambridge to London King's Cross in the high peak hour. As in Scenario 1, the future introduction of digital signalling could allow for this additional service to operate. To meet 2043 demand, this service would need to be a 12-car service and be extended back to start from Ely due to the high levels of growth on the corridor.

3.2.2 Services from Ipswich to Cambridge

There is a requirement for two additional 4-car services to meet 2033 demand on the corridor between Ipswich and Cambridge. This is most efficiently provided by extending EWR services beyond Cambridge, although could be a separate service starting from Cambridge.

To meet 2043 demand on the corridor between Ipswich and Cambridge, either four EWR services would need to be extended beyond Cambridge, or three EWR services extended and one new local service introduced. As mentioned in 3.1.2, nearly half the passengers on the Ipswich to Cambridge corridor come from Newmarket and around a quarter from Bury St Edmunds, therefore

this needs to be taken into consideration for any choices of where additional services begin or end their journey.

As stated in Section 3.1.2, lengthening existing services could also provide additional capacity; however, this does not address SQ3 or provide other connectivity and frequency benefits for the Ipswich to Cambridge corridor.

3.2.3 Services from Norwich to Cambridge

No additional services are required in the high peak hour on the corridor between Cambridge and Norwich to meet 2033 demand; however, to meet 2043 demand, an additional hourly 4-car service is required. This service could be an extension of an EWR service beyond Cambridge to Norwich, providing additional connectivity benefits.

Lengthening existing services could also provide additional capacity. However, this does not address SQ3 or provide the same benefits for the Norwich to Cambridge corridor that connecting directly with EWR would offer. To provide longer trains requires all nine stations on the route between Norwich and Ely to have longer platforms to support 8-car services.



3.2.4 Services from Kings Lynn/Ely to Cambridge

To support passenger demand between Kings Lynn and Waterbeach and those between Cambridge and London, two 12-car trains are required from Cambridge to London King's Cross, providing an 8-car service from Kings Lynn and Cambridge and a 4-car train from Ely to Cambridge.

3.2.5 Services from other locations to Cambridge

Having assessed the demand for both 2033 and 2043, no other services are required from other destinations to/from Cambridge in the high peak hour. Whilst high demand is seen on services between Cambridge and Stansted Airport, there are three trains per hour from Cambridge to Stansted Airport in the high peak hour, with sufficient capacity across these three services to cater for demand.

Figure 20 – Scenario 2: Option 1 Additional Services required for 2033 and 2043

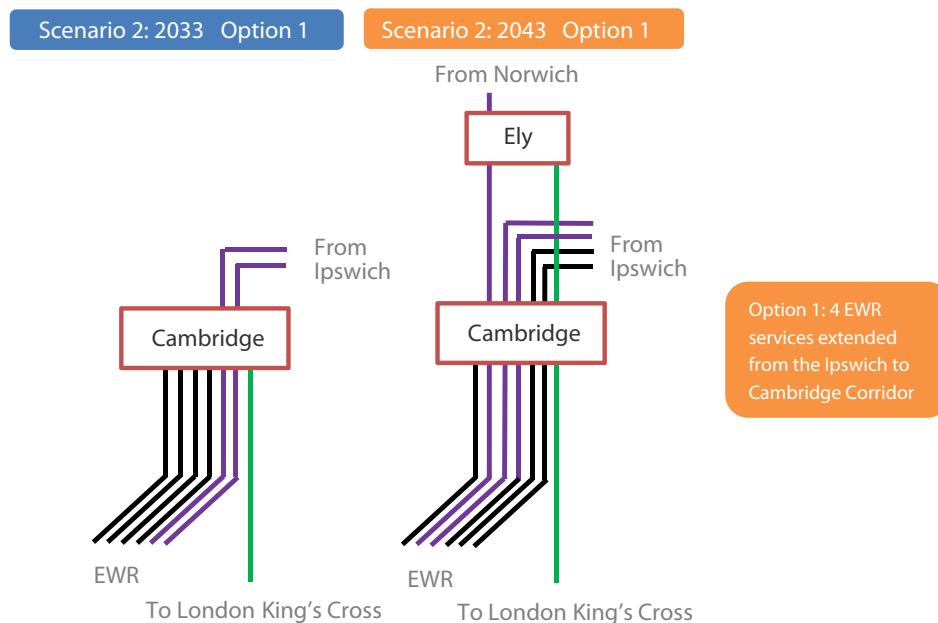
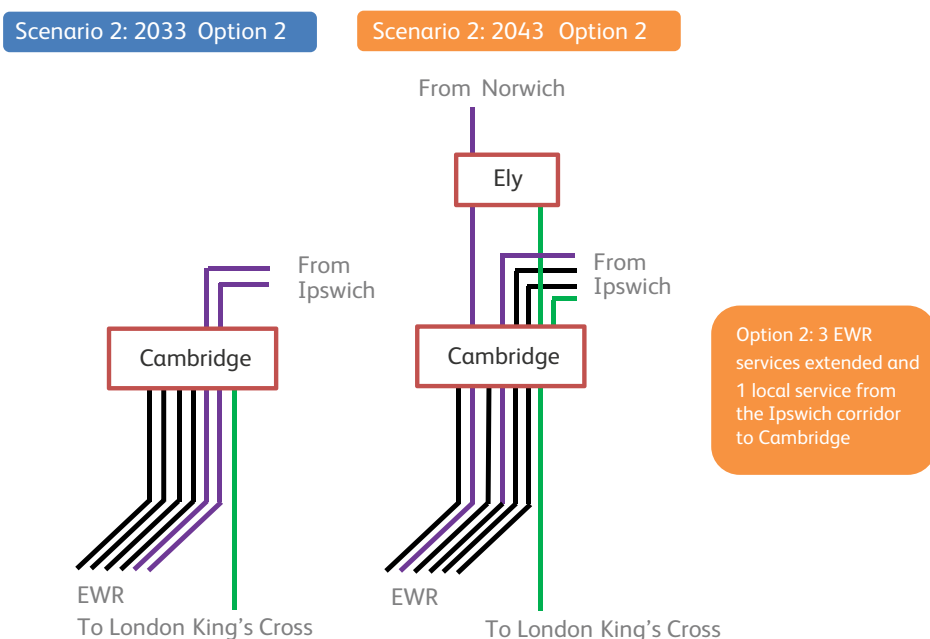


Figure 21 – Scenario 2: Option 2 Additional Services required for 2033 and 2043



4 Meeting the Conditional Outputs

Timetable analysis has shown there to be no capacity for any additional through services at Cambridge station after 2020. Given the number of services to be introduced by East West Rail and the additional services identified within **Chapter 3**, further infrastructure will be required to support both expected growth scenarios. The next chapter identifies the potential infrastructure interventions required to support Growth Scenario 1, which is the scenario compliant with the Department for Transport's Network Modelling Framework. The reason for only taking this scenario forward is owing to the limited funding and timescales for the delivery of this study, though more importantly, the scenario must be compliant to be further developed as a Strategic Outline Business Case in line with the Rail Network Enhancement Pipeline (RNEP) process.

This chapter seeks to answer Strategic Questions 1 to 3 for Growth Scenario 1. Figure 23 shows the required services to achieve the forecast demand for 2043. Each line shows an hourly service. At Cambridge some services from Ely and Kings Lynn join together, and continue as one train to London King's Cross. The diagram does not include empty carriage stock movements that may attach to services at Cambridge.

Table 23 provides a summary of how these questions are answered with further detail provided throughout this chapter.

Figure 22 – Scenario 1: Additional Services required for 2033 and 2043

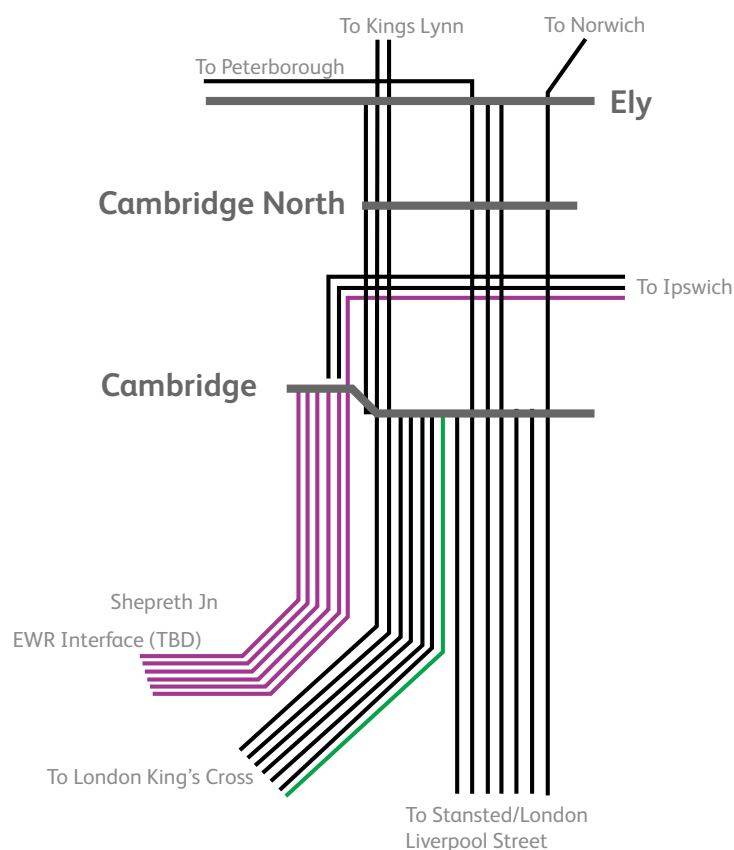


Table 23 – Strategic Questions for Train Service and Infrastructure

| Strategic Question (SQ) | Question | Summary answer |
|-------------------------|--|--|
| SQ1 | What solutions are required to support the Cambridgeshire Corridor Study's future train service requirements in 2033 and 2043 for both Cambridge station and the line between Coldham Lane Junction and Chippenham Junction? | Cambridge for 2033: <ul style="list-style-type: none"> two new platforms; new, removed and relocated switches and crossings Newmarket single line for 2043; <ul style="list-style-type: none"> 3.5 miles of track doubling; optional Newmarket turnback. |
| SQ2 | How can the Cambridgeshire Corridor Study's future train service requirements support the growth and demand scenarios for 2033 and 2043 to provide value for money solutions? | Extension of EWR services to align with forecasted local growth and demand through 1tph EWR to Ipswich Corridor in 2043. |
| SQ3 | What other solutions are required beyond those for East West Rail to support other growth and demand scenarios for Cambridge in 2033 and 2043? | No further infrastructure solutions are supported above those identified in SQ1. |

4.1 Cambridge Station

The additional services required at Cambridge station in the high peak hour to achieve Growth Scenario 1 are as follows in **Table 24** shown below:

Table 24 – Additional Train Services required in 2033 and 2043 for Growth Scenario 1¹⁶

| 2033 | 2043 |
|--|--|
| 6tph EWR to Cambridge (4-car) | 5tph EWR to Cambridge (4-car) 1tph EWR to Ipswich (4-car) |
| 1tph Cambridge to London King's Cross (12-car) | 1tph Cambridge to London King's Cross (12-car) |

As stated in **Section 2.1**, this study assumes that there will be 4-tracking south of Cambridge station, to support the infrastructure required for a new station south of Cambridge. Therefore, this has been factored into the layout required to achieve the overall train service requirements for 2033 and 2043 in Growth Scenario 1. To achieve the additional train service for 2033, changes to Cambridge station are required and include:

- Two new additional 12-car platforms
- New, relocated and in some cases, removal of switches and crossings, to achieve the train service requirements
- Required relocation of the engineering siding
- Access to/from existing stabling.

The reception roads, required for freight movements, are

¹⁶ Assumes EWR delivery, otherwise services starting from Cambridge

retained owing to their operational requirements.

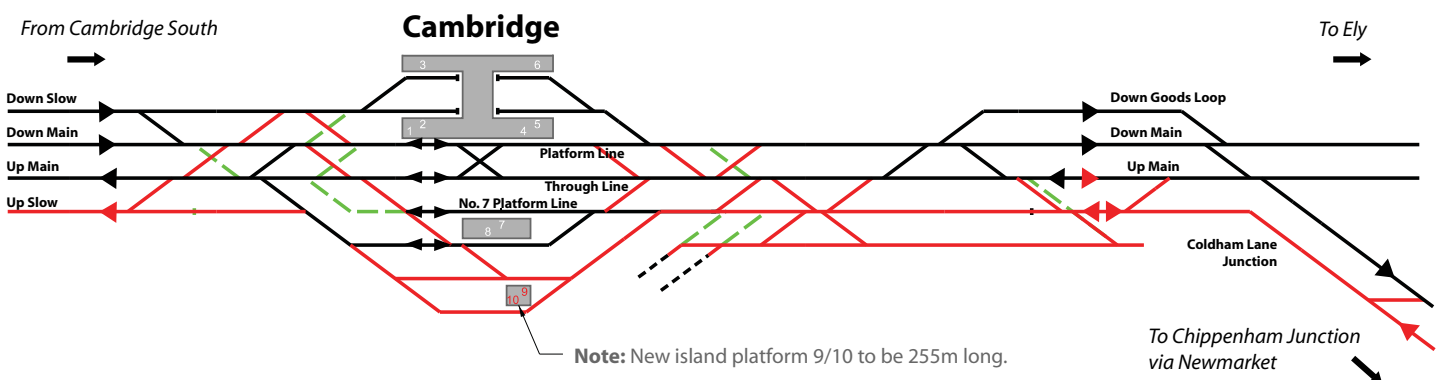
Figure 25 shows the layout required which is needed to achieve the 2033 and 2043 train service requirements.

4.1.1 Freight through Cambridge

Although the proposed layout focuses primarily on the train service requirements for 2033 and 2043, considerations have been given to freight through Cambridge. Whilst the EWR train service remains in development, this study assumes there is a need to support an off-peak hourly freight path via Newmarket, through Cambridge towards the EWR central section. Within the train service requirements there are a number of peak only services, therefore, there is capacity to achieve freight movements through Cambridge using these time slots.



Figure 25 – Cambridge Station layout required for Growth Scenario 1 to achieve 2033 and 2043 train service requirements.



4.1.2 Stabling Considerations

The strategic questions (**Section 2.2**), seek to understand stabling options for Cambridge. The options developed assume there is still stabling in Cambridge. If stabling were to be relocated, then this layout may need further evaluation as to the requirements to/from existing stabling.

4.1.3. Order of Magnitude Cost Range

An 'order of magnitude' (OOM) cost range has been provided for the required layout at Cambridge to support the 2033 and 2043 train service requirements and is shown in **Table 26**.

Table 26 – Additional Train Services required in 2033 and 2043 for Growth Scenario 1

| | |
|---|----------------|
| Cambridge Station to achieve 2033 and 2043 passenger service requirements | £191m to £220m |
|---|----------------|

4.2 Newmarket single line

The additional services required on the Newmarket single line in the high peak hour to achieve Growth Scenario 1 are as follows in [Table 27](#):

Table 27 – Additional Train Services required in 2033 and 2043 for Growth Scenario 1

| 2033 | 2043 |
|---------------------|-----------------------------|
| No changes required | 1tph EWR to Ipswich (4-car) |

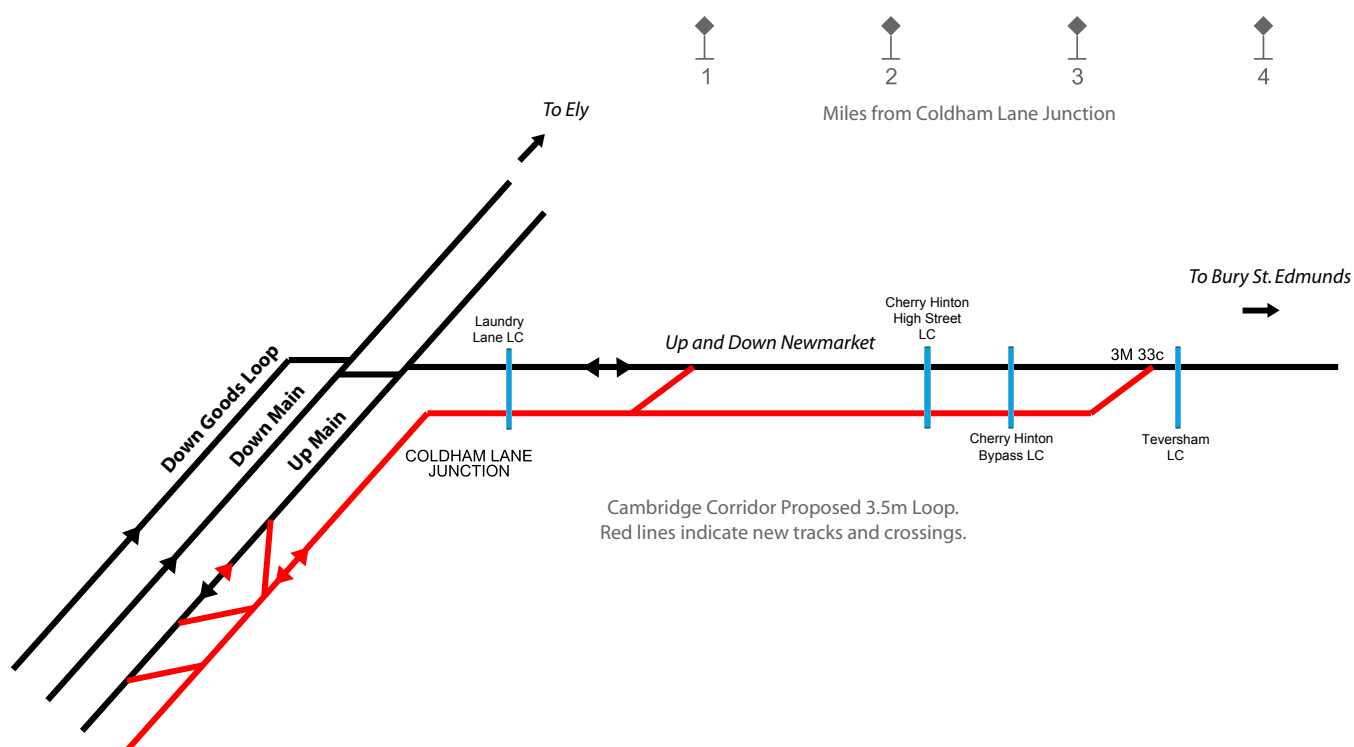
To achieve the additional train services for 2043, the Newmarket single line would require enhancement. Based on the timetable used to support the train service requirements for Growth Scenario 1, the recommendation is that a strategically located dynamic passing loop be located on the first 3.5 miles of the Newmarket Branch, located to avoid trains straddling

one or more of the numerous level crossings along the route. The point at which the track doubling would end needs to allow for a standard intermodal freight train length of 775m to not overhanging on to any level crossings. Whilst level crossings are not fully assessed as part of this study, the track doubling goes over three existing level crossings, thus options for any track enhancement would need to be explored further during development.

This loop option is the minimum required to meet future service needs. Other longer options have also been considered. The location and length of this loop could be influenced by an aspiration for additional services towards Ipswich.

Figure 28 shows the layout required which is needed to support the 2043 train service requirements.

Figure 28 – Newmarket Single layout required for Growth Scenario 1 to achieve 2043 train service requirements



4.2.1 Option at Newmarket

As mentioned in **Chapter 3**, a large number of the passengers on services between Ipswich and Cambridge travel from Newmarket. An option has been assessed to consider providing a turnback at Newmarket, allowing services to start and terminate within the station limits.

Figure 29 below shows the layout required, which is needed to achieve the 2043 train service requirements.

4.2.2 Freight on the Newmarket single line

Although the Newmarket layout focuses primarily on the passenger train services requirements for 2043, consideration has been given to an off-peak 1tph freight route via Newmarket and through Cambridge towards the west.

Like at Cambridge, on the Newmarket single line there are a number of services that only operate in peak hours. A total of three passenger services are required during the peak (2tph East Anglia Franchise and 1tph from EWR). In the off-peak, today there is 1tph, and even if a second path were to be introduced, the layout

on the Newmarket single line allows for 3tph, and therefore should be able to accommodate freight.

4.2.3. Order of Magnitude Cost Range

An 'order of magnitude' (OOM) cost range has been provided for both the required track doubling on the Newmarket single line and the turnback option at Newmarket.

Table 30 – Cambridge Station OOM Cost Range for Scenario 1 to achieve 2033 and 2043 train service specification

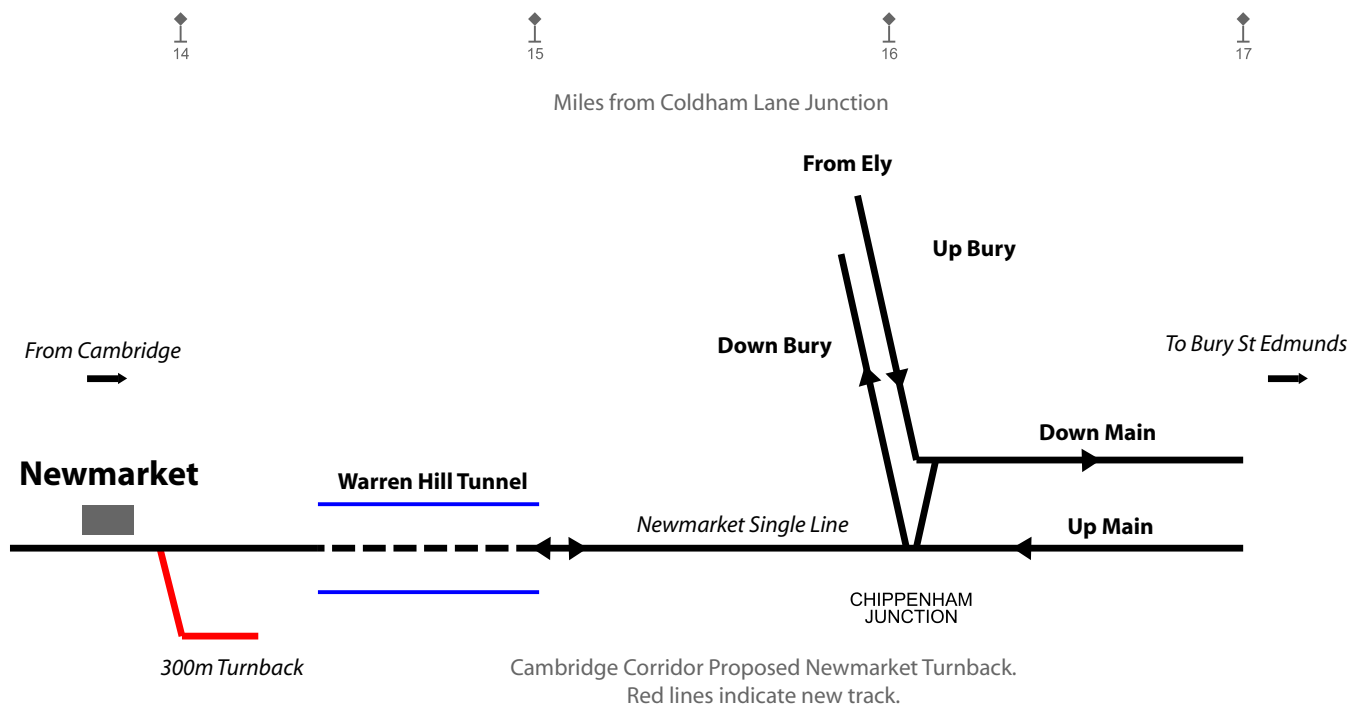
| | |
|---|----------------|
| Newmarket Single Doubling to achieve 2043 train service requirement | £131m to £151m |
| Newmarket Turnback Option | £4.5 to £5m |

4.3 Digital Railway

For any new infrastructure, there would need to be consideration for provision of more advanced technologies such as digital signalling. There is a potential for digital signalling, and the associated rolling stock fitment, to enable more frequent train services to operate on existing tracks through improved headways, performance and reliability. The Digital Railway Delivery Strategy aims to see digital solutions as 'business as usual' by around 2027 onwards.¹⁷

¹⁷ Digital Railway Strategy

Figure 29 – Newmarket turnback option for Growth Scenario 1 2043 train service requirements



5 Stabling

Chapter 4 has identified the services which require lengthening and those additional services are required to meet the conditional outputs for 2033 and 2043. However, for these additional services to operate, there also needs to be somewhere for the rolling stock to stable overnight and during the day.

This chapter seeks to answer Strategic Questions 4 to 6 for Growth Scenario 1. This does not factor in the stabling requirements for East West Rail (EWR) services as the EWR project has not yet determined the stabling strategy. [Table 31](#) provides a summary of how these questions are answered with further detail provided throughout this Chapter.

5.1 Cambridge Stabling

A number of train operating companies (TOCs) stable trains at Cambridge ([Figure 32](#)) within the

carriage sidings which run adjacent to the station and continue north under Mill Road. These are used by Greater Anglia (GA) and Govia Thameslink Railway (GTR). There is further stabling north of Cambridge station at Coldhams Lane Depot, which is used by Cross-Country (XC).

This study has identified that the following is needed to support the DfT aligned growth in the high peak hour by 2043:

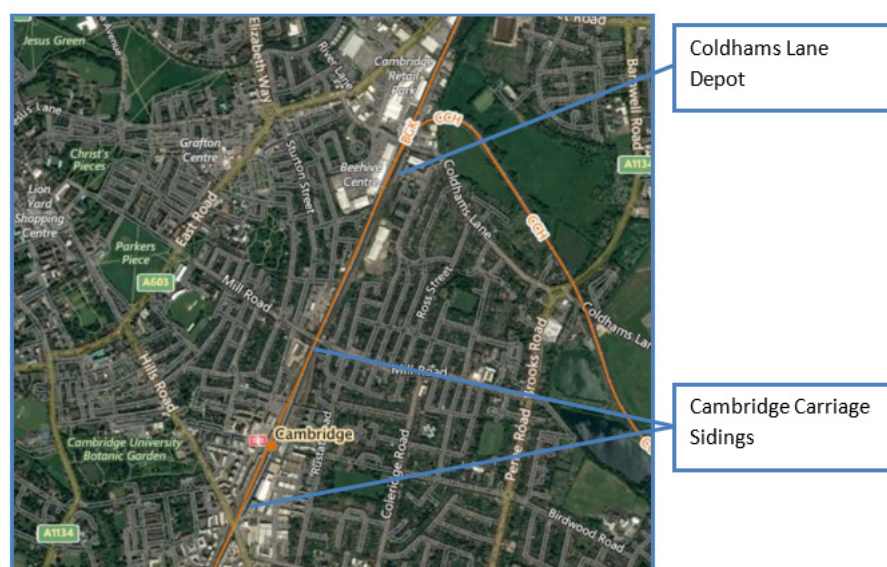
- by 2033: Two new platforms at Cambridge station¹⁸
- by 2043: Approximately 3.5 miles of track doubling on the Newmarket Single and consideration for a turnback at Newmarket
- the need for 6-7 x 12-car and 2 x 1-car stabling by 2033.

¹⁸ Can also support Aspirational Growth Scenario

Table 31 – Strategic Questions for Stabling and Land Opportunities

| SQ | Question | Summary answer |
|------------|---|--|
| SQ4 | How much additional stabling is required to support the additional train services for the scenarios in 2033 and 2043? | 2033 and 2043 (same requirements) <ul style="list-style-type: none"> • Up to 7 12-car services – which includes 5x12-car East Anglia Franchise sets in sub-optimal locations • Additional 1-car to the 2-car Cross Country sets. |
| SQ5 | Do the solutions for Cambridge station have an impact on existing stabling? If so, options to be provided around alternative stabling locations. | Alternatives to stabling considered for 2033 and 2043 requirements |
| SQ6 | Where are there potential land opportunities for additional stabling to support the additional train services for the scenarios in 2033 and 2043? | At this stage, specific locations cannot be determined, however options around size and scale of stabling requirements have been reviewed, with options identified for 2033 and 2043 requirements. |

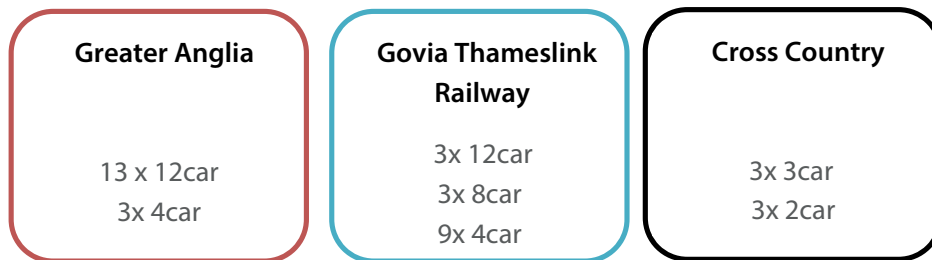
Figure 32 – Cambridge Stabling Locations



To understand the future stabling requirements for 2033 and 2043 it is important to understand the base timetable position. In 2020, when all rolling stock changes and improvements to stabling (through the Thameslink Programme) are assumed to have taken place, the stabling capability at Cambridge is as follows:

In 2020, it is expected Cambridge is unable to accommodate all operators' stabling requirements. The ability to accommodate all stabling requirements would reduce empty coaching stock moves and reduce operating costs.

Figure 33 – Stabling Capability at Cambridge for 2020



To answer SQ4, “How much additional stabling is required to support the additional train services for the scenarios in 2033 and 2043?” there needs to be consideration of not only the additional train services, and the associated additional rolling stock to support this, but also those trains which are currently stabling, or

are expected to stable, at sub-optimal locations.

Table 34 shows the stabling requirements for 2020 and then the additional requirements to meet the both the 2033 and 2043 train service requirements.

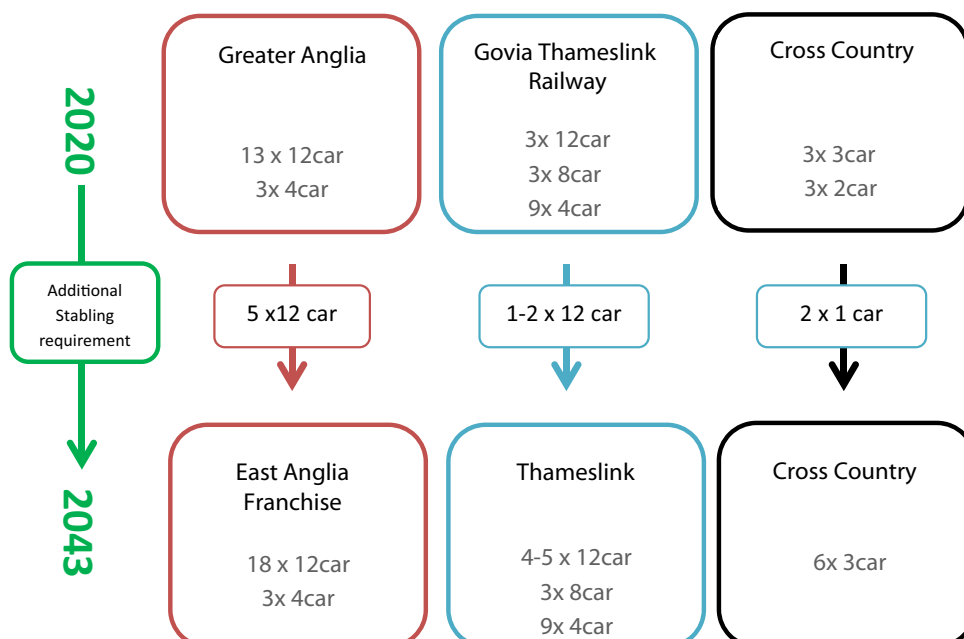
Table 34 – Additional Stabling Requirements from 2020 to 2043

| 2020 Additional Stabling Requirement (due to lack of capacity at Cambridge) | 2033 and 2043 Additional Stabling Requirements (to support train service requirements) |
|---|---|
| <ul style="list-style-type: none"> 5 x 12 car Greater Anglia | <ul style="list-style-type: none"> 2 x 12 car – for additional 1tph Cambridge to King's Cross Strengthening from 2 x 2 car to 2 x 3 car – Cross-Country |

Although there is an issue highlighted for 2020, this study seeks to assess the requirements for 2033 and 2043.

Figure 35 shows the overall additional stabling requirement from 2020 to 2043 for each train operator that stables at Cambridge.

Figure 35 – Stabling Requirements from 2020 to 2043



To accommodate the additional stabling required for 2043, a number of options have to be considered in line with the strategic questions as shown in **Table 37** below.

5.1 Minimal

To assess the minimal option, it is likely that an attempt to accommodate all the stabling requirements would require either a redesign or reconfiguration of the existing stabling arrangements in Cambridge, or something which brings the carriage sidings and Coldhams Lane Depot together as a single site.

With the minimal option, this could help provide stabling for the displaced GA rolling stock. It could also provide stabling capacity for additional services required where interventions may take place over the next 5-10 years, such as the Ely Area Capacity Enhancements. Whilst an intervention such as Ely helps provide capacity through a major constraint, stabling is required for any additional services and there may be some benefits through exploring existing capacity in and around Cambridge to accommodate these.

5.2 Medium

Whilst providing another site would resolve stabling capacity in totality, it would potentially create a disjointed stabling arrangement operationally. Whilst not ideal, this option would remain operationally beneficial by keeping the existing stabling in a central location such as Cambridge, allowing for ease of access for train crew, train care and light maintenance. Its benefits would be subject to where the new site is and how easily accessible it was for train crew.

This option does not consider the benefits of alternative land use for the current stabling around Cambridge for housing and employment.

This could potentially raise capital to fund some of the required interventions identified in this study.

5.3 Maximum

The relocation of all the stabling out of Cambridge could support funding of the required interventions identified in this study through the selling of land, currently used for stabling. This could be possible due to the location of the current stabling sites close to the city centre and its potential for alternative uses (eg. housing and employment). With the land being so close to Cambridge station the site would be an ideal location for property development, subject to planning permission.

A new stabling site away from the existing location would, however, require the relocation of train crew and train care operations, not just of rolling stock. A new site would require good transport links, and to be near a station. A new site would need further discussion with local authorities to establish where there are practical locations, and would need to be equivalent in size to the existing Cambridge stabling.

5.4 Hybrid

An alternative option could be to consider an over-site development at the current location. This option would look to keep the stabling at the existing location with, in all likelihood, some reconfiguration. This option would allow for rail operations to remain in situ, with housing and employment opportunities occurring in and around the stabling points.

Table 36 – Stabling Options

| Question | Options for Consideration |
|--|--|
| Can all stabling be accommodated within the Cambridge location? | Minimal – potentially some change in the existing site |
| Is there a need to find some additional stabling? | Medium – other locations need to be found |
| If some stabling need to be located elsewhere, could a new site for all stabling be considered? | Maximum – brand new stabling location |
| Are there different options that could be considered e.g. over-site development, with stabling remaining in Cambridge? | Hybrid – factors in more than just stabling e.g. station development |

6 Summary and What Next?

6.1 Recommendations

This study recommends the development of the required interventions in the following order:

1. Interim stabling solutions to support interventions within scope area (e.g. Ely Area Capacity Enhancement)
2. Initial Joint workstream¹⁹
 - a. Cambridge station – required to support EWR services to/from Cambridge.
 - b. Overall stabling required for up to 2043. Needs to be done alongside Cambridge station development work, to support any service increases, which are required from 2033.

3. Newmarket single line capacity – required by 2043.

The interventions at Cambridge station will need developing further to allow for the EWR services to and from Cambridge. Alongside this, stabling options will need to be developed further to determine the preferred option to support the train service requirements in 2033 and 2043. As the increased capacity of the Newmarket single line is not required for 2033 forecast growth, this could be developed as a separate workstream following the initial work required for Cambridge station and the stabling facility.

It is recommended that Cambridge station and the stabling facility are considered together with the Newmarket single line measures treated separately.

¹⁹ Depending on the recommended option for future stabling requirements these may need to be split into separate projects

The interfaces that exist between them should not be lost in addition to those with other interventions including Cambridge South, EWR and Ely Area Capacity Enhancements.

6.1.1 Alignment with the Rail Network Enhancement Pipeline Process

For all enhancements, these should be aligned to the DfT's Rail Network Rail Enhancement Pipeline (RNEP) Process. The recommendations from this study not yet entered this process. The first stage of the RNEP process is the 'determine' stage (See [Figure 37](#)), which is to establish the case for intervention and requires the development of a **Strategic Outline Business Case (SOBC)**.²⁰

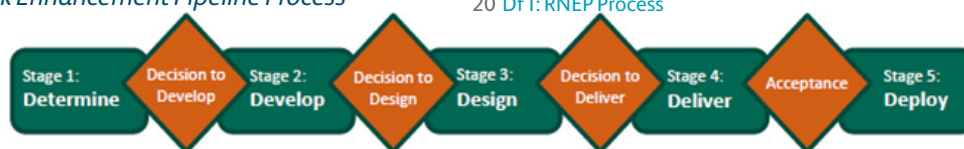
All business cases must include the five cases – strategic, economic, financial, commercial and management.

[Table 39](#) below shows the next steps for each case of the SOBC and where further funding would be required to achieve these.

6.1.2 Alignment with the Rail Network

It should also be recognised that this study has considered evidence to support the potential for rail growth in the study area to be higher than those in the DfT aligned growth. While this study did not seek to answer the strategic questions for growth scenario 2, it is recommended that, should short term levels of growth align more closely with scenario 2, further assessment should take place consider how these conditional outputs can be met.

Figure 37– Rail Network Enhancement Pipeline Process¹⁷



²⁰ DfT: RNEP Process

Table 39 – Next Steps to develop an SOBC

| Case | Next Steps | Further Funding Required? |
|------------|---|--|
| Strategic | None – sufficient data contained within the study | No |
| Economic | Value for Money assessment – would need to separate EWR only benefits | No – can be delivered within System Operator |
| Financial | Project Estimate (PEst) and Programme Identified funders for next stages | Yes for PEst and Programme |
| Commercial | Procurement Strategy Plan to move from SOBC to Outline Business Case (OBC) | Yes for Procurement Strategy |
| Management | Stakeholder Management Plan Further Industry Liaison Risk identification High Level Timeline | No |

