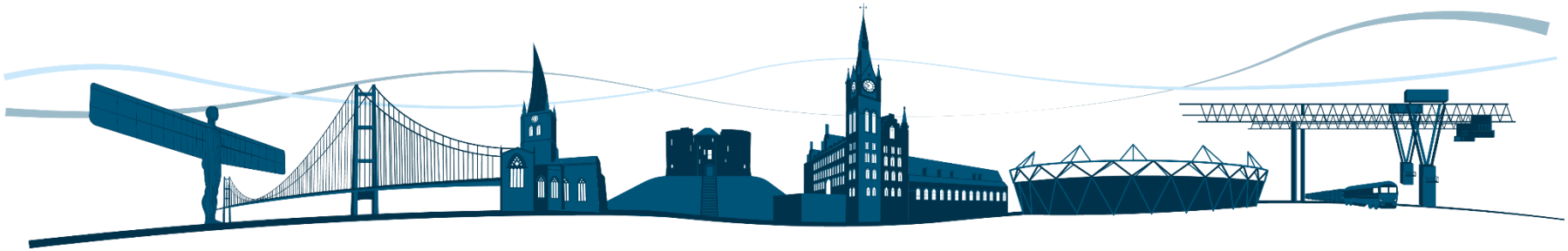
Norfolk & East Suffolk Strategic Advice

Railway improvement options for the Norfolk and East Suffolk branch lines

April 2025



Contents

Front cover images clockwise from top left: Wymondham station; Greater Anglia service crossing Oulton Broad swing bridge; East Midlands Railway service north of Ely; Greater Anglia service at Brundall station.

Reedham swing bridge on the Norwich <> Lowestoft route.

1. Executive summary

This study has been undertaken to identify how future aspirations for the rail network across Norfolk and East Suffolk could be met. The study covers a geographic area including Norwich to Sheringham, Great Yarmouth, Lowestoft and Cambridge; and Ipswich to Lowestoft and Felixstowe.

Across the study area, train frequencies are typically one train per hour for all key stations, with some smaller stations having a lower frequency, such as one train every two hours or during peak hours only. Some limited peak hours strengthening also occurs on some routes. Demand forecasting shows that over the next 25 years, there are not expected to be many significant on-train capacity challenges across the study area, with only services between Norwich and Ely/Cambridge likely to require capacity enhancements to accommodate rising peak hours demand. This study is therefore largely focussed on responding to partner aspirations, which were collaboratively set by the study working group. These aspirations include two trains per hour frequencies on all routes, improved journey times and improved connectivity. This study has undertaken timetable analysis to understand how these aspirations could be achieved.

This study has identified a moderate capacity challenge in the medium-term on the Norwich <> Cambridge route, which would need to be addressed by either train lengthening or increasing frequency in peak hours. Delivering frequency improvements on this route will be challenging due to multiple constraints, as well as the current uncertainties around how East West Rail trains will operate to and from the Cambridge area. Ongoing government support has been given to East West Rail in the October 2024 budget, and Network Rail is working closely with the East West Rail Company to develop a viable timetable and affordable infrastructure improvements which do not significantly hinder aspirations for additional services between Norwich and Cambridge in the future. Further study, once the outputs for East West Rail are finalised, will be required to establish how this connectivity could be delivered, for example, a standalone additional hourly Norwich <> Cambridge service, or by extending an East West Rail train through Cambridge towards Norwich.

For most of the other routes within the study area, infrastructure investments will be required to support frequency or journey time improvements. This could comprise track doubling to allow more trains to operate on parts of the network which are currently single line. Without more double track sections – particularly on the Sheringham branch and the East Suffolk Line – additional trains at even intervals (approximately 30 minutes apart) are not possible.

There are numerous level crossings across the study area which often impose operating restrictions. Many of these would require upgrading or closure in the event of additional or faster trains, the specifics of which would need to be identified alongside the service improvements proposed. If services on all routes to/from Norwich were to be enhanced, upgrades in capacity at Norwich station may also be required. Full details of the assessment of proposals and main summary of findings can be found in parts 4 and 5.

Developing proposals further for improvements on this part of the network will be challenging due to the nature of the network, which provides a service for social value and requires an operating subsidy, rather than being revenue generating. With demand growth or crowded trains not being the primary driver for service uplifts, demonstrating a strong business case – particularly an economic case – will not be straightforward. Attracting government funding to begin business case development will also be difficult, so local partners may need to fund this development work, with which Network Rail would be keen to be engaged. As demonstrated in case studies throughout this document, joint funding approaches have been able to successfully deliver similar improvements on similar rural lines. The potential for Norfolk and Suffolk to form a new devolved Mayoral Combined Authority in the future, potentially with its own transport budget and stronger decision-making powers could be one way to progress the options set out in this study.

It is expected that any growth in the limited number of freight services across the study area will be accommodated. Growth in Felixstowe container traffic, which interfaces with the study area on the Felixstowe branch line and at Ely and which is crucial to meeting the national freight growth target, will depend on a programme of investment in the Ely area and elsewhere along the cross-country freight corridor. Growth in Felixstowe traffic could also be enabled by EWR and capacity improvements across London.

2. A new study for Norfolk and East Suffolk

This section sets out the overall aims and purpose of this study, a summary of the geography and demographics of the area, and details the characteristics of the railway lines in the study area.

2.1. Rail industry planning, study aims and purpose

Network Rail has a responsibility to plan the future needs of the railway in the short-, medium-, and long-term and across all parts of the network for both passenger and freight needs. This is achieved through the development and publication of targeted studies of particular geographies and themes, working with relevant industry partners to ensure the correct questions are being asked to deliver robust strategic advice with widespread support. A 'whole industry' approach is sought, ensuring all elements of the rail system are assessed, including infrastructure capability, rolling stock, depots, connectivity and so on. This enables Network Rail to advise on behalf of the industry how required and aspired outcomes can be met for the study geography in question.

For this study, Network Rail has worked with industry partners, including Greater Anglia, Transport East and local authorities to;

- review and assess the impacts of likely growth in passenger and freight demand in the long-term;
- understand aspirations from local stakeholders for improvements to the passenger rail service across the study area;
- identify improvement options which can meet future needs and aspirations, and;
- set out a potential staging of these options in order to sustainably build up improvements over time.

These objectives are assessed with a view to supporting the local and regional economy as well as social outcomes for local people.

Stakeholders may use the evidence and options in this study to bring the case for rail improvements in this area to Government and other funders.

The study assesses the needs and aspirations of a predominantly rural part of the rail network and completes the first set of detailed studies in an ever-evolving programme of strategic advice across the whole of Network Rail's Anglia route, complementing other studies already completed for interfacing areas, including the Great Eastern Main Line, West Anglia Main Line and Cambridge area, all of which can be found on Network Rail's website.[1] These studies, including this one, will be updated as the picture of usage and demand develops, investments are delivered and aspirations evolve.

This study has been identified as a priority at this time for several reasons.

- This area has not been the subject of a targeted piece of study since the 2016 Anglia Route Study. Since 2016, the methodology of Network Rail's strategic planning has changed significantly, with a detailed whole industry approach developed to assess and respond to more than just demand forecasts, and be more responsive to aims and aspirations of local stakeholders.

- Since Network Rail's approach to strategic planning began to evolve into more targeted geographic studies, this is one of the last remaining areas on the Anglia route not yet assessed. This is therefore an opportunity to align with other updated studies elsewhere on the Anglia route.

- Since the 2016 Anglia Route Study, interfacing high profile schemes have begun to be developed into business cases, including upgrading of the railway in the Ely area and the new East West Rail line from Bedford to Cambridge. This study will account for the likely outcomes of these schemes when assessing needs and aspirations for Norfolk and East Suffolk.

[1] Previous studies assessing the Anglia route can be found in the 'Eastern' section of Network Rail's long-term planning page.

Through liaising with local stakeholders, this study is designed to assess the railway in the study area on a whole industry basis, and produces advice across three remit themes, listed below.

- **Passenger rail connectivity** across the secondary and rural routes in Norfolk and East Suffolk; the study's main focus.
- **Supporting freight growth** to/from the various terminals in the area.
- **Whole industry considerations**, such as wider passenger connectivity, decarbonisation and stabling.

These remit areas were established by Network Rail following research into local priorities and review with local partners, and align with Transport East's four key rail priorities set out in its 2023 State of Rail report,[2] as well as the Government's new key transport priorities ahead of the industry's restructuring into Great British Railways.[3] These priorities are outlined below.

Government priorities

- Improving **performance on the railways** and driving forward rail reform.
- Improving bus services and **growing usage** across the country.
- **Transforming infrastructure** to work for the whole country, **promoting social mobility** and **tackling regional inequality**.
- Delivering **greener transport**.
- Better **integrating transport** networks.

Transport East priorities

- 'Decarbonisation for passenger and freight', including **encouraging modal shift** and shifting away from diesel.
- 'Growing towns and cities', including **increasing frequency**.
- 'Rural and coastal', including better **connecting coastal communities**.
- 'Unlock international gateways', including mode **shift to rail freight**.

By aligning with these regional and national objectives, it ensures the study is asking the right questions and will give answers and evidence to questions relevant to local and national funders alike.

A remit was circulated to and endorsed by members of Network Rail's Regional Investment Review Group (RIRG), which was also used as a governance channel for progress updates and endorsement of overall findings. Specific working groups were set up to discuss and endorse particular topics such as train service specifications to test.

The study therefore answers the strategic questions listed below. A headline Strategic Question is supported by three additional Strategic Questions, specific for each of the remit themes. These questions are answered at the end of the document.

Headline

What are the strategic choices for the rail network in Norfolk and East Suffolk to improve passenger and freight customer outcomes?

Passenger rail connectivity

How can train services be improved to better serve existing passengers and attract new ones in both the short- and long-term?

Supporting freight growth

What opportunities are there to support new freight flows and growth in line with the government's freight growth target?

Whole industry considerations

What supporting factors need to be considered to deliver improvements to the rail network and passenger experience in Norfolk and East Suffolk?

[2] State of Rail, Transport East, February 2023, p. 11.
[3] Transport Secretary sets out 5 key priorities to deliver the biggest overhaul to transport in a generation, Department for Transport, July 2024.

2.2. Area context and demographics

The area in scope of this study is influenced by railway geography and train service structure, illustrated below in Figure 1, with the red lines in scope.

Figure 1 – Area in study scope.

The area covered by this study is broad and covers a variety of different landscapes, including cities, towns, villages, suburban, rural and coastal areas. Several data sources can be reviewed to give an overall picture of the demographics of the study area, including the Indices of Deprivation and data from the 2021 census. A detailed overview of the area demographics is shown in Appendix 2, but in summary, the study area has a diverse social make-up, including parts of the study area which are relatively disadvantaged and have poorer socioeconomic outcomes compared to other parts of the region and country. Overall, parts of the study area, particularly coastal areas;

- have a higher proportion of people who are economically inactive;
- have a higher proportion of people with poor health and disabilities, and;
- have a lower level of qualifications and higher tendency to perform routine work.

There is a potential for rail improvements to play a key role in improving the social outcomes for people in this area. While improvements to rail services alone are unlikely to vastly improve social outcomes, they would nevertheless give people more public transport options when seeking access to education, training and employment opportunities that tend to be concentrated in larger economic centres, such as Norwich, Ipswich and Cambridge, as well as greater opportunities to access leisure activities.

2.3. Rail network overview

The railway in the north of East Anglia is mainly made up of branch and regional lines, excluding the Great Eastern Main Line (GEML) and the West Anglia Main Line (WAML), which carry intercity services to/from London. This section gives an overview of the passenger and freight services across the study area. A more detailed line by line summary can be found in Appendix 1.

2.3.1. Passenger services

Most passenger services operate between the major regional centres and coastal termini, passing through a predominantly rural landscape with multiple town and village stations. Frequencies tend to be 1 train per hour (tph), with a variety of calling patterns for stations en-route. Limited peak hours strengthening does occur on some routes or for some particular stations. Some stations also exist with very low levels of service and usage, sometimes with only a peak hours service or just one or two trains a day. These are generally very rural stations, with little immediate population surrounding them.

All routes operated by Greater Anglia use Class 755 bi-mode (diesel and electric) units operating mostly on diesel traction. Other Train Operating Companies (TOCs) operate in the area, with East Midlands Railway (EMR) and CrossCountry (XC) both using diesel only units on their routes to Norwich and Cambridge/Stansted Airport respectively. Great Northern operates on the WAML north of Cambridge, operating its service between London Kings Cross and Ely/Kings Lynn.

There are fifty stations including five major stations within the study area, defined here as having over a million entries and exits per year. The major stations are:

- **Norwich** – the terminus of the Great Eastern Main Line and four of the routes which make up the study area.
- **Ipswich** – a through station also on the Great Eastern Main Line and the terminus of the East Suffolk Line and Felixstowe branch.
- **Ely** – an important interchange on the West Anglia Main Line for local and long-distance routes.
- **Cambridge North** – a relatively new station serving the northern suburbs of Cambridge as well as local business parks.
- **Cambridge** – the busiest station in Eastern England and a key interchange station on the West Anglia Main Line with frequent services to London Kings Cross, Liverpool Street and St Pancras.

These stations all serve large built-up areas, generating trips from their large populations for travel elsewhere. They are also attractors, bringing in passengers for work and leisure. All of these stations also have major interactions with other main rail routes outside the study area, which drive much of their footfall, particularly with London, as per Table 1, above right.

Station pairing	Journeys
Cambridge <> London Kings Cross	2,507,492
Norwich <> London Liverpool Street	1,029,906
Ely <> Cambridge	929,454
Ipswich <> London Liverpool Street	816,568
Cambridge <> London St Pancras	689,226

Table 1 – Major stations top five journey pairings.

Station pairing	Journeys
Ely <> Cambridge *	929,454
Cambridge North <> Cambridge *	213,968
Norwich <> Great Yarmouth	159,230
Norwich <> Lowestoft	145,636
Norwich <> Cambridge	140,846
Norwich <> North Walsham	111,570
Norwich <> Thetford	107,820
Norwich <> Wymondham	100,854
Norwich <> Attleborough	99,378
Ipswich <> Felixstowe	95,912
* Note, most journeys made on the starred routes will be made on train services outside the scope of this study.	

Table 2 – Top ten journey pairings between stations in the study area only.

Most other stations within the study area are small one or two platform stations with facilities commensurate with their catchments and usage. Journeys to/from smaller local stations tend to be to/from the nearest major regional stations, with the largest flows wholly within the study area between the larger towns and nearest regional centre, as per Table 2, left.[4]

Figure 2 overleaf shows the current passenger service structure across the study area, based on the weekday timetable. Each black line indicates one train service group (e.g. Norwich <> Sheringham), with the different coloured circles indicating intermediate stations. The colours indicate the level of service the stations receive as per the key. For example, every train to on the Sheringham branch calls at North Walsham, but the yellow marker for Gunton and others indicates the service is limited to once every two hours for much of the day. Grey dashed lines indicate connecting services around Norwich, Ipswich, Ely and Cambridge out of scope of this study.

[4] Origins and destinations data in Tables 1 and 2 is from 2022/23, sourced from the Rail Data Marketplace. The total figures shown are the sum of journeys in both directions.

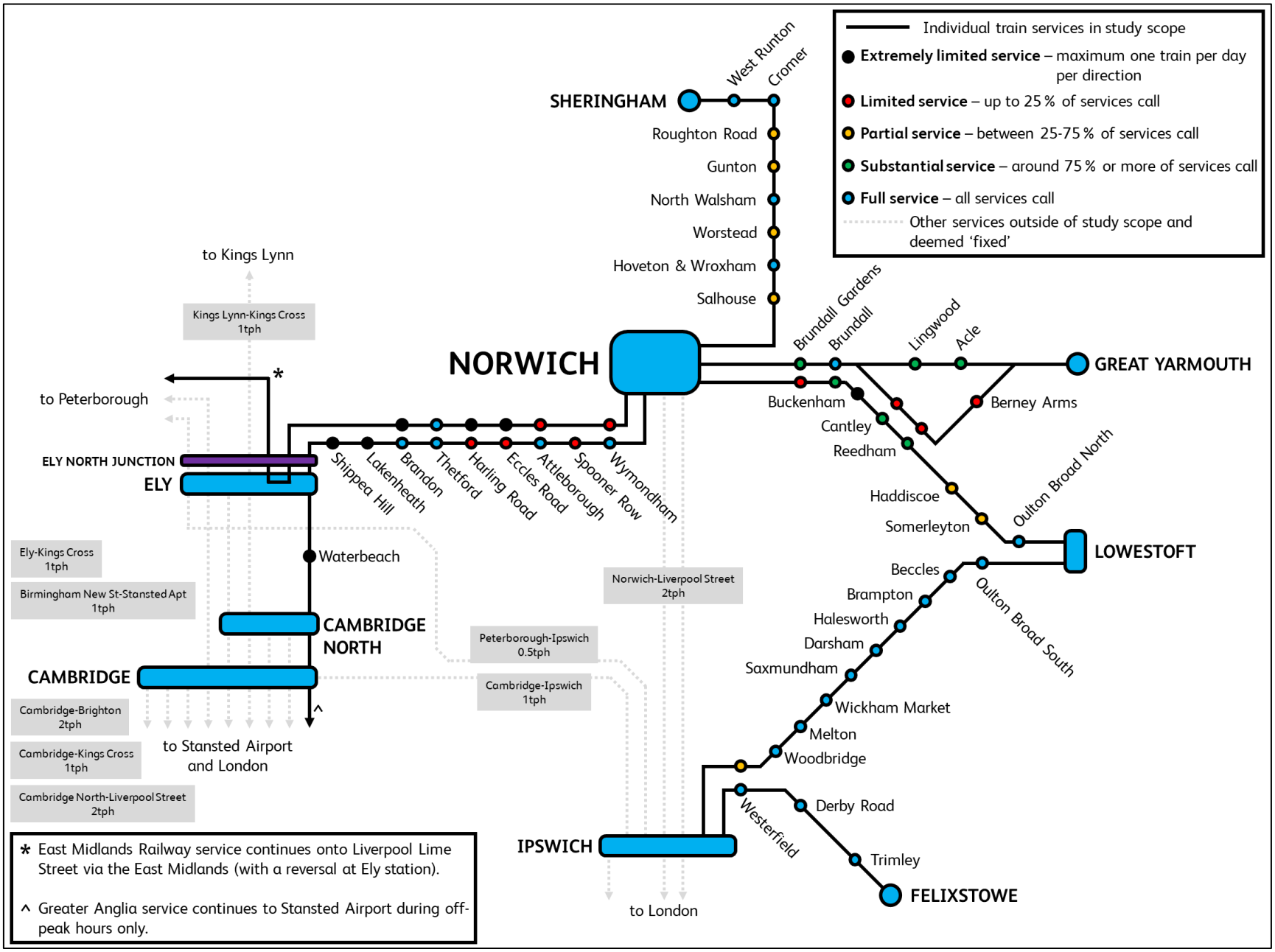


Figure 2 – Individual services within study area.

2.3.2. Freight services

Rail freight services are relatively limited, however multiple terminals exist, including aggregates terminals in Norwich, Brandon and Lowestoft, and a gas pipeline facility in North Walsham which loads regular trains with gas condensate, bound for Harwich. The study area interfaces with the nationally important cross-country freight corridor between Felixstowe and the midlands, though this study does not seek to re-assess the case for improvements on this corridor as they are well-established and development funding is being sought.

Figure 3 opposite shows the routing of the regular freight flows within the study area, indicated by the coloured lines and markers. Typical maximum trains per day (in one direction only) are shown by the numbers adjacent to the coloured lines, though these numbers can vary by day of the week as dictated by demand.

Four main types of flow exist:

- **Intermodal container traffic to/from the Port of Felixstowe, shown in red**. This nationally significant corridor has been the subject of major attention in recent years and has begun business case development to make improvements at various points along the route, including at Haughley Junction and in the Ely area. The rail industry and stakeholders are continuing to make the case to Government to release funding for further development. As a result, this study will not undertake any further analysis on this corridor but will take into account the assumed deliverables in the Ely area to enable growth on this route.

Figure 3 – Regular freight flows within the study area.

- **Inbound aggregates to four different facilities on the Breckland Line and in Norwich, shown in orange**. These sites receive materials in bulk from quarries in the Peak District and elsewhere for onward processing and distribution.

- **Outbound imported aggregates from Lowestoft to Whitemoor yard near March, shown in dark blue**. This is a relatively new flow, commencing in March 2022 following redevelopment of the sidings near the station.

- **Outbound gas condensate from North Walsham to Harwich, shown in light blue**, a long-established regular flow via Norwich and the GEML.

As well as these main sites, several other locations exist in the study area indicated with black text and markers, including aggregate facilities at Chesterton (adjacent to Cambridge North station) and Ely (adjacent to Ely North Junction), which have irregular flows. Paths also exist in the timetable for transportation of spent nuclear fuel from Sizewell to Sellafield via London and Crewe, which is rarely used at present. The delivery of Sizewell C nuclear power station is expected to lead to additional usage on the East Suffolk Line for the delivery of construction materials and removal of waste and spoil.

There are also other sites nearby the study area, including near Kennett for import of aggregates, Middleton Towers near Kings Lynn for outbound quarried sand, and Whitemoor near March which handles materials for rail maintenance and enhancements across East Anglia. These other sites do not tend receive or generate significant traffic, but their services cross in and out of the study area, and therefore are also accounted for in this study's analysis.

2.3.3. Constraints

Being a rural network, the lines within the study area typically have lower capabilities than main line railways. The main constraints on rural or secondary routes tend to be;

- the extent of the infrastructure available, i.e. prevalence of single track;
- signalling capability;

Attleborough level crossing and station.

- lower line speeds, and;
- the types and quantity of level crossings.

Sections of single line exist on the routes to Great Yarmouth, Sheringham and Felixstowe, as well as on the East Suffolk Line between Ipswich and Lowestoft. These single line sections restrict the potential service frequency, timetable flexibility and are a significant risk to performance during times of disruption.

Signalling is relatively basic and has long block sections, meaning trains cannot closely follow one another. This is generally not an issue for the current level of passenger service, but can create issues in some circumstances, such as planning passenger and freight trains to run closely to each other.

Line speeds are typically around 50-70mph maximum, although the Ely-Norwich line does have some sections up to 90mph, only 10mph below rolling

stock maximum speed, reflecting its role as the main route between Norwich, Ely and Cambridge. Differential speed limits for freight services (meaning they must run slower) exist across much of the area. These differential speeds can cause capacity issues as trains take longer to clear signalling sections.

In addition, rural routes such as these tend to have more level crossings, the presence of which can sometimes place constraints on how the network can be operated, such as the number of trains permitted to pass over them, or their speed, in order to keep both rail and road users safe. As detailed in Network Rail's Sectional Appendix, there are around 290 level crossings of all types within the study area.

Finally, none of the lines are electrified, save for the approaches to Norwich and Ipswich stations, where the secondary lines join the GEML, and on the WAML where Norwich <> Cambridge and Norwich <> Liverpool trains join at Ely North Junction. All trains currently rely on diesel traction for most or all of their journeys.

2.3.4. Rail network summary

In summary, the infrastructure in this area has some challenging, but not unusual characteristics for rural routes across the British railway network. The main challenges to operating regular service patterns, as well as more frequent and faster services, are sections of single line, low line speeds, and the prevalence of level crossings, combined with the interaction with other main line services around Norwich, Ipswich, Ely and Cambridge. Secondary issues such as lack of electrification and instances of poor accessibility at stations also exist, which potentially discourage certain people from travelling by train in Norfolk and East Suffolk.

For a more detailed overview of each of the lines within the study scope, including their characteristics, capabilities and usage, see the summaries in Appendix 1.

2.4. Recent improvements

Since the Anglia Route Study was published in 2016, there have been several improvements to the rail network in the study's geographic area. Some of the most significant improvements are noted below.

- The **Wherry Lines** between Norwich and Great Yarmouth & Lowestoft were **modernised** between 2018 and 2020, including a full replacement of the signalling system, replacing the 130 year old semaphore signals with modern colour light signals, alongside level crossing upgrades and track and junction renewals.

- In May 2017 **Cambridge North station** opened, situated between Cambridge and Waterbeach stations in the suburb of Chesterton close to Cambridge Science Park, offering an alternative to the city centre station and an interchange with the Cambridgeshire Guided Busway. The station has proved to be extremely popular, with 0.95 million users recorded in 2019/20, growing to 1.27 million in 2023/24.

- **Freight-led enhancements** were delivered on the **Felixstowe branch line** in 2018 and 2019 to increase the number of freight trains to and from the Port of Felixstowe by 10 a day in each direction. This included 1.4km of new track to create a passing loop, a new footbridge and closure of six pedestrian level crossings.

- Between 2019 and 2022 Greater Anglia replaced its entire **fleet of trains** consisting of various classes and ages of rolling stock with three new types for different service groups across the Greater Anglia network. The Class 755 bi-mode unit operates on all lines within the study area and was the first to arrive from summer 2019.

2.5. Planned improvements

There are also several schemes at various stages of the investment process in the area, with key projects listed below.

- **Cambridge South station** is under construction and will serve residents on the south side of Cambridge as well as acting as a public transport gateway to the Cambridge biomedical campus and hospitals. The station, due to open in early 2026, is expected to support 27,000 jobs and 4,000 new homes by 2031.

- **East West Rail** (EWR) is developing the scheme for its new section of line between Bedford and Cambridge. Expected to be delivered in the mid-2030s, 4tph are proposed to operate to/from Cambridge, connecting Cambridge with Oxford via Bedford, offering new regional connectivity options and reducing the need for travel via London for rail journeys to the midlands, including for passengers travelling to or from parts of this study area. The line could also offer new freight routing opportunities for terminals within this study area, including the Port of Felixstowe. A new line will be built between Cambridge and Bedford, as well as significant remodelling at and around Cambridge station. Aspirations exist to extend EWR services to Norwich and Ipswich, offering even greater connectivity, however this does not form part of EWR's current remit.

- **Wymondham station** (shown opposite) could benefit from **step-free access**, having been selected as a recipient for Access for All funding in Control Period 7 (2024-2029), subject to final DfT funding decision. If approved, this will likely be delivered as a new bridge with lifts.

- **Ely Area Capacity Enhancements** (EACE) is a nationally significant scheme and part of a programme of proposed improvements to enable more consumer goods to be carried by rail freight to/from the Port of Felixstowe and enable modal shift to rail. An Outline Business Case has been produced, however funding to progress beyond this has not been made available.

- Network Rail is supporting the development of **Sizewell C nuclear power station**, which is currently proposed to have much of its construction material delivered by rail. To facilitate this, the Sizewell branch line is set to be comprehensively upgraded along with some targeted improvements on the East Suffolk Line. These upgrades will allow four freight trains per day to serve the construction site for at least 10-12 years from 2026.

Wymondham station.

- The **signalling in the Cambridge area** is also due to be upgraded in CP7 to provide improved reliability and safety, as well as paving the way for digital signalling in the future. Equipment at Cambridge power signal box will be replaced, three manual signal boxes will be closed and seven level crossings will be upgraded to full barrier crossings.

2.6. Study scope summary

The section above illustrates the demographic and railway make-up of the study area. It reveals an area which has some social disadvantages, as well as a railway, which, away from the main lines has relatively limited capabilities to deliver the faster, frequent services local partners aspire to.

This study therefore concentrates on the themes and strategic questions set out in section 2.1 as a way of meeting these aspirations and improving the social outcomes of the area.

3. Demand assessments and future service aspirations

This section outlines forecast demand across both passenger and freight markets using recognised industry models. It also outlines local aspirations for improved passenger services as well as potential opportunities to grow the rail freight market.

Passenger demand figures shown in this section are derived from 2022/23 estimated average weekday train loads from the rail industry's MOIRA2 model. Future rates of growth from DfT's EDGE model, which considers all key rail demand drivers such as population and employment, can then be applied to forecast demand in future years. This allows suitable improvement options to meet future needs to be identified in strategic advice such as this.

Freight demand is derived from Network Rail's freight growth forecasts, published in 2019 and available on the Network Rail website.

3.1. Current passenger demand

Current levels of demand vary significantly between services in the study area and between different times of day. Figure 4 opposite illustrates the highest number of passengers on each line of route in the study area throughout the day at the Critical Load Point (CLP – the point on the train's journey where it has the highest number of passengers).

In other words, it shows the busiest point of the busiest train and therefore the maximum number of passengers each route normally carries. It is not reflective of how many passengers in total use an individual service as it is not a cumulative total. However, it is beneficial in that it illustrates the maximum number of passengers that need to be accommodated when demand forecasts are applied to it.

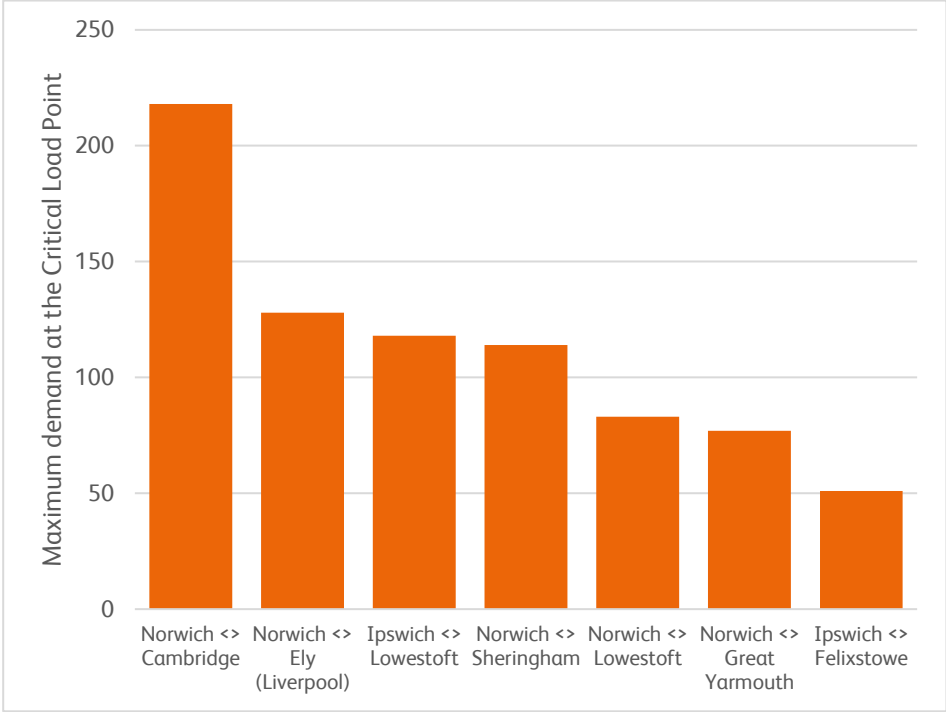


Figure 4 – Illustration of the current typical maximum demand per train service on each line across the study area, from the MOIRA2 model.

By far the busiest service group is the Norwich <> Cambridge route, followed by the East Midlands Railway service between Norwich and Liverpool (data for the Norwich-Ely part only), making the Norwich-Ely section comfortably the corridor with the greatest demand within the study area.

This is anticipated, reflecting the line's role in being a corridor between the region's two major economic and population centres, as well as being the eastern end of a cross-country route which links Norwich directly with Peterborough, Nottingham, Sheffield, Manchester and Liverpool. The branch lines have a much lower maximum usage, with the Felixstowe branch having the lowest usage.

Each of the lines exhibit morning and evening peak periods to a greater or lesser degree, with the Norwich <> Cambridge and Norwich <> Sheringham routes having the most pronounced peaks, suggesting a higher degree of commuting. The data on both the GA and EMR services shows that the AM peak towards Norwich is not very pronounced, suggesting that commuting towards Norwich from towns such as Thetford or Wymondham is relatively low. However, a clear AM peak towards Cambridge and PM peak away from Cambridge exists, though it appears this is strongly influenced by heavy commuting between Ely and Cambridge, rather than people travelling from further afield.

More even levels of usage, with less pronounced peaks are seen on the Felixstowe branch and Norwich <> Great Yarmouth route. Some routes have very low off-peak usage, with average maximum passenger loads on many afternoon and early evening services on the Ipswich <> Felixstowe and Norwich <> Lowestoft routes below 30 passengers.

3.1.1. Current rolling stock and occupancy

On the rural routes considered by this study all trains operated by Greater Anglia are operated with Class 755 trains in 3- or 4-car formations. The 3-car units have 167 seats and the 4-car units have 229 seats, including tip-up seats. The East Midlands Railway service between Norwich and Liverpool Lime Street is typically operated with 2-car Class 158 units with 153 seats, with some services occasionally worked by 2x 2-car Class 158s or 2- or 3-car Class 170s with 122 or 185 seats.

A review of occupancy data for each of the routes shows that for most of the day, on average, on most routes seating occupancy does not often exceed 50% even based on the smaller 3-car Class 755. During peak hours on the Sheringham branch and on the East Suffolk Line some trains can become busy but still have seats available. On the Norwich <> Cambridge route all trains are normally operated with the 4-car variant and some trains in peak periods can become close to full occupancy, again illustrating the primacy of this route in the study area. EMR's long-distance service to/from Liverpool has a similar pattern of occupancy to the GA Norwich <> Cambridge services, with plenty of space available in the off-peak and a few busier peak hours services on the Ely to Norwich section. These services normally join with another Class 158 at Nottingham and continue as 4-car trains in the north of England where demand on this service is much greater. Table 3 below summarises current average occupancy levels. As this is an average indication, some trains could be busier than this table suggests. Note, for the GA services other than Norwich <> Cambridge, this is based on a 3-car train.

		2022/23	
Service	**Normal train formation**	**Off-peak occupancy**	**Peak occupancy**
Norwich <> Sheringham	3- or 4-car 755		
Norwich <> Great Yarmouth	3- or 4-car 755		
Norwich <> Lowestoft	3- or 4-car 755		
Ipswich <> Lowestoft	3- or 4-car 755		
Ipswich <> Felixstowe	3- or 4-car 755		
Norwich <> Cambridge	4-car 755		
Norwich <> Liverpool	2-car 158		

KEY	
	Plenty of seats on all services
	Around two thirds of seats used on at least one service
	Nearly all seats used on at least one service
	All seats used on one service
	All seats used on two or more services

Table 3 – Summary of current seating occupancy.

It is also important to note that the Critical Load Point (where trains are at their busiest) is often close to the destination station in the morning peak and close to the departure station in the evening peak, indicating that even when trains are busy, they are not busy for a significant portion of their journey.

3.1.2. Commuting habits and mode share

Train loading data referred to above in section 3.1 begins to show a pattern of usage, but census data also reveals more deeply how people travel to work – often the most important and frequent journey most people make. Analysis of 2011 census data reveals the mode share of commuting for locations

within the study area.[5] Looking at the larger towns within the study area, typically a very low mode share of around 0.5-1.5% of commuting trips are being made by train. At very local levels, usually nearest to stations, these percentages can vary up to around 4 or 5%. These very low rates of commuting by train are, however, typical for areas of England and Wales away from the largest cities, especially London.

Table 4 below illustrates the data recorded by the 2011 census and a broadly consistent pattern of percentage mode share in terms of travel to work, with travel by private car or van consistently and by far the most popular method of travelling to work. Again, this is characteristic of most areas of the country outside of larger cities.

Mode	Great Yarmouth	Lowestoft	North Walsham	Cromer, West Runton & Sheringham	Wymondham	Attleborough	Thetford	Woodbridge	Felixstowe
Work mainly at or from home	1.9	2.2	2.5	5.0	3.8	2.8	1.9	6.1	3.6
Train	0.4	0.7	1.4	1.1	1.2	1.6	0.6	2.2	0.9
Bus, minibus or coach	4.9	1.8	1.0	1.9	4.2	0.9	1.7	1.7	1.2
Driving a car or van	29.2	37.5	39.7	31.4	45.9	47.3	41.2	38.6	39.2
Passenger in a car or van	4.3	3.6	3.1	3.1	3.2	3.6	7.2	2.5	2.9
Bicycle	2.7	4.2	2.5	1.2	2.7	2.2	2.5	2.7	3.8
On foot	10.3	6.7	9.2	11.3	6.6	8.8	11.7	8.2	9.0
Not in employment	44.0	41.0	39.0	43.6	30.7	31.6	32.0	36.6	37.5

Table 4 – 2011 census travel to work data for largest rail-connected towns within the study area, with train mode share highlighted (some modes not shown).

Census data also reveals *where* people are travelling for work.[6] Of all the towns listed above in Table 4, the vast majority of people work locally, within the same or adjacent statistical areas. But some notable external flows outside of the respective towns do occur, including;

- Lowestoft to Great Yarmouth
- North Walsham to Cromer
- North Walsham to Norwich
- Sheringham to Cromer
- Wymondham to Norwich
- Attleborough to Norwich
- Felixstowe to Ipswich

In all cases though, the use of any form of public transport is low, with bus usage often scoring similar levels of usage as the train. The percentages of people using bus or train is dwarfed by those using cars or vans, both driving themselves or being driven as a passenger. In all but one of those flows (Lowestoft to Great Yarmouth), the train is in principle a viable alternative to driving, but currently potential passengers are not choosing to take the train. While public transport will never be suitable for all people (such as those who have no fixed work location or that have to carry tools or equipment, like those in the building trades) there are clearly actual or perceived barriers to using the train for travelling to work and more generally.

[5] 2011 census data has been used rather than 2021 as responses to this were skewed by the Covid-19 pandemic, although it is acknowledged some travel patterns could have changed since the 2011 census. Mode share data from the interactive census data map produced by Datashine.
[6] 2011 travel to work census data is available to view on the interactive origins and destinations map produced by Datashine.

3.2. Future passenger demand

Network Rail undertakes demand forecasting to assess future capacity needs of the railway and make recommendations for capacity-based improvements. The demand forecast for this study has been assembled using industry demand data which includes growth rates for future reference years at 2029/30, 2039/40 and 2049/50.

For the study area, each individual line of route has been analysed separately to enable reporting of separate growth rates for each of them. Additionally, the Norwich <> Cambridge and Norwich <> Liverpool Lime Street services have been separated due to their differing calling patterns and destinations.

The average demand growth rates in weekday passengers from a 2022/23 base are as shown below in Table 5.

Service group	2029/30	2039/40	2049/50
Norwich <> Sheringham	14.2 %	36.2 %	54.6 %
Norwich <> Great Yarmouth	14.1 %	36.3 %	55.8 %
Norwich <> Lowestoft	15.0 %	37.9 %	56.4 %
Ipswich <> Lowestoft	15.7 %	37.6 %	54.9 %
Ipswich <> Felixstowe	13.0 %	33.6 %	51.5 %
Norwich <> Cambridge[7]	12.2 %	36.8 %	55.1 %
Norwich <> Ely (Liverpool)[8]	15.4 %	39.2 %	60.2 %

Table 5 – Expected growth rates by service group.

Across the study area, the growth rates are broadly similar to each other and are similar to growth rates on neighbouring main lines.

As explained in section 3.1.2, varying levels of on-train occupancy exist within the study area, with only a few routes exhibiting notably higher levels of demand during peak hours. When applying the rates of growth shown in Table 5 and assuming the same rolling stock formations on all routes, the occupancy on all routes can be described as shown in Table 6 overleaf for each of the future reference years. This gives a good understanding of likely future demand which will need to be accommodated, and any likely capacity deficiencies.

The summary below in Table 6 again assumes the 'worst case' scenario of using the 3-car version of Greater Anglia's Class 755 on all routes other than the Norwich <> Cambridge route, which uses the 4-car version as its base. Key findings from the analysis shows that;

- On all routes other than the Norwich <> Cambridge and Norwich <> Liverpool routes, no major demand-led capacity issues are expected, even in the long-term reference year of 2049/50.

- Several trains on the Norwich <> Cambridge service could become over-capacity in the medium-term (2039/40), even when using the longer 4-car Class 755. Several off-peak services will likely be approaching maximum seating capacity at the Critical Load Point in the medium- and long-term.

- On the Norwich <> Liverpool route, some peak hours trains could become crowded in the medium- and long-term, based on a 2-car unit usually operated today.

- The Sheringham branch and the East Suffolk Line could have one or two peak hours trains approaching maximum seating occupancy in the long-term. The Critical Load Point location on these services indicate that these trains are unlikely to be busy for long, however.

- Off-peak services on all routes other than Norwich <> Cambridge have plenty of space to meet demand in all reference years.

[7] Greater Anglia direct train only.
[8] East Midlands Railway train only. The percentage shown applies to the Norwich-Ely section only.

Service	Normal train formation	2029/30 Off-peak occupancy	2029/30 Peak occupancy	2039/40 Off-peak occupancy	2039/40 Peak occupancy	2049/50 Off-peak occupancy	2049/50 Peak occupancy
Norwich <> Sheringham	3- or 4-car 755						
Norwich <> Great Yarmouth	3- or 4-car 755						
Norwich <> Lowestoft	3- or 4-car 755						
Ipswich <> Lowestoft	3- or 4-car 755						
Ipswich <> Felixstowe	3- or 4-car 755						
Norwich <> Cambridge	4-car 755						
Norwich <> Liverpool	2-car 158						

KEY	
	Plenty of seats on all services
	Around two thirds of seats used on at least one service
	Nearly all seats used on at least one service
	All seats used on one service
	All seats used on two or more services

Table 6 – Future seating occupancy assessment.

3.2.1. Norwich <> Cambridge detailed analysis

The Norwich <> Cambridge route demonstrates the highest level of demand and potential future crowding, and therefore a detailed examination of six months of train loading data from Greater Anglia has also been made to validate the standard baseline advised by MOIRA2 data. This extra analysis shows a slightly higher level of demand at the critical load point versus the baseline, particularly during off-peak hours. The highest average level of demand is similar in both sets of data.

Figure 5 opposite shows the extent of the Critical Load Point on each train between Cambridge/Stansted Airport and Norwich according to both the modelled MOIRA2 and Greater Anglia count data. This chart illustrates the average maximum demand on each train service on an average weekday (Mon-Fri) and helps to illustrate the busier peak periods where capacity may need to be increased in the future. In the reverse direction, a similar correlation is seen.

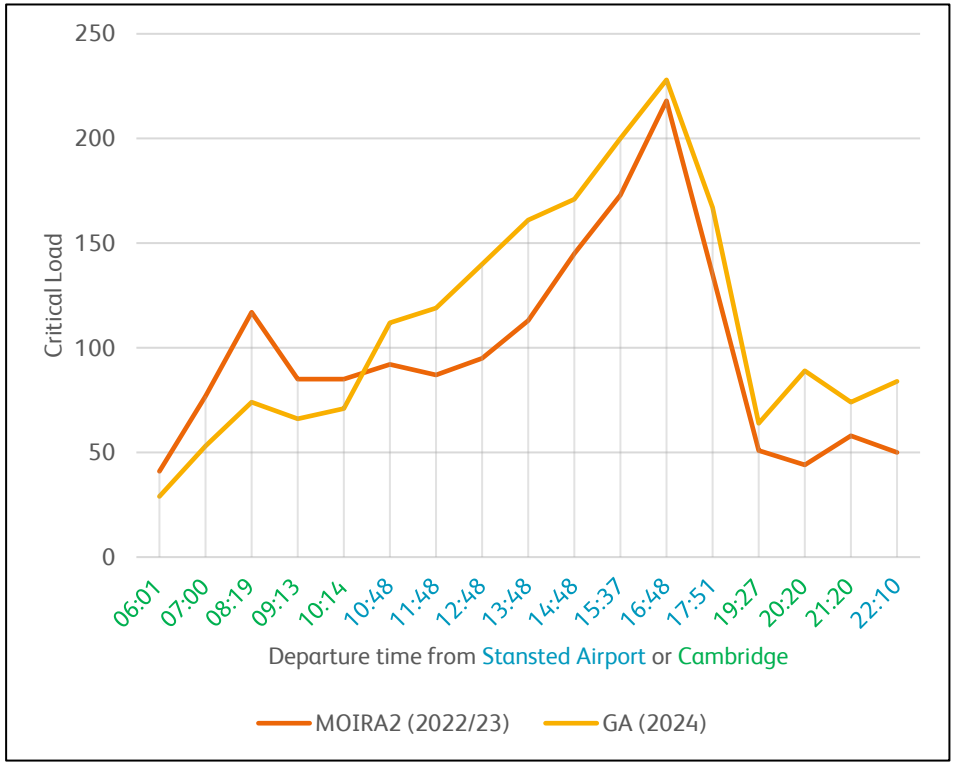


Figure 5 – Average Critical Load on each service between Cambridge/Stansted Airport and Norwich from MOIRA2 and Greater Anglia data.

The profile of demand throughout the day is also slightly different, with GA's count data indicating less demand towards Norwich in the morning peak and less demand away from Norwich in the evening peak. This correlates with census travel to work data illustrated above in Table 4 with few respondents reporting travelling by train for work from Wymondham, Attleborough or Thetford. Despite these slight differences, a high degree of corroboration exists, giving confidence to the baseline MOIRA2 position.

Deeper analysis of the count data and the location of the Critical Load Point shows that trains are typically relatively lightly loaded for much of their journeys, with the occupancy increasing significantly between Ely and Cambridge. Typically, demand is comfortably within the capacity of a 4-car Class 755 train, with demand only nearing capacity between Cambridge and Ely in both directions.

3.2.2. Alternative growth scenarios

The growth rates noted above are standard industry forecasts. Some partners believe that, factoring in local economic plans, rail growth could be higher than the standard industry forecasts, especially on the Cambridge route, the Sheringham branch and the East Suffolk Line. For example, the standard forecast may not fully account for potential growth due to;

- construction site workers using the East Suffolk Line during the building of Sizewell C;
- areas of large scale housing development, such as near Salhouse on the Sheringham branch, or;
- the government's new housing targets, which is raising targets across the study area, such as from 905 dwellings per year to 1,644 dwellings per year in East Suffolk.

To be reflective of a scenario where growth is higher than anticipated, a +10% sensitivity test has also been applied to the base rate of growth. Assessing this uplift shows that by the same reference year date, a few more peak trains on the busier routes will become crowded in the longer term, but there are no significant differences by the 2030 or 2040 reference years. This is due to the relatively low baseline of passengers from which the forecast is projecting.

The picture on the Norwich <> Cambridge route is slightly different – due to its higher baseline of passengers – and with 10% higher growth two trains would be expected to be over 100% seating occupation by 2029/30, with another three very close to maximum seating capacity. The standard forecast suggests one train over 100% and one train close to 100%. The view is similar on the EMR service, with two PM peak services breaching 100% by 2029/30 rather than 2039/40 when applying a 10% uplift. It is therefore essential that options for accommodating future demand on these routes are considered.

3.3. Passenger service aspirations

It is clear from the demand summary outline above, including the +10% sensitivity test, that no widespread capacity issues are expected on any lines other than between Norwich and Ely/Cambridge. And on this route issues will be generally confined to the Ely-Cambridge section in the peak periods with some shoulder peak services also becoming busy in the longer-term.

Therefore, there are limited demand-led improvements that the railway will need to plan for across the study area. It is, however, acknowledged that partners have aspirations beyond what a solely demand-led study would suggest is required. Through collaboration with stakeholders and analysis of local policy documents, the key passenger service outcomes listed below in Figure 6 have been established.

Half hour frequencies	• On all routes, 30 minute frequencies for key destinations.
Improved journey times	• Reduction of journey times on all routes.
Improved connectivity	• Quicker connections between routes at key interchange stations. • Extension of EWR beyond Cambridge.

Figure 6 – Key passenger service outcome aspirations.

These aspirations are included in Norfolk and Suffolk county councils' local transport plans and rail prospectuses.[9] This study will provide advice on how these aspirations could be achieved.

Network Rail has worked with stakeholders to establish an aspirational service specification across the study area to be analysed.

3.4. Future freight demand and market opportunities

Network Rail also produces freight forecasts to guide strategic planning activity and to ensure that future freight demand is accounted for. Within the study area there are several minor terminals plus the nationally significant cross-country intermodal traffic to/from Felixstowe.

The numbers in Table 7 below illustrate the current and future demand for freight trains within the study area. The numbers are the **sum of trains per day in both directions**. Network Rail's freight forecasts include five scenarios (A-E), ranging from a low growth scenario to a high growth scenario. Table 7 shows the high growth scenario (B) and the central case (E).

Location	Trains per day		
	Baseline	2033/34 Scenario B (high growth)	2033/34 Scenario E (central case)
Breckland Line (Norwich to Ely)	2.5	3.2	2.8
WAML (Ely to Cambridge)	6.7	7.3	7.0
East Suffolk Line (south of Saxmundham)	0.2	0.2	0.2

Table 7 – Freight forecast.[10]

Network Rail's forecast suggests that changes in freight usage on the routes in this study area will be negligible in any scenario due to the low baseline which currently exists. Almost the whole make-up of paths used and forecasted are from aggregates trains and engineering trains. Sufficient paths exist in the study area's current timetable to accommodate these growth rates. For example, each weekday around 14 paths (seven in each direction) exist for freight on the Breckland Line between Norwich and Ely, with only three trains per day expected in the high growth scenario by 2033/34.

The static figure on the East Suffolk Line does not account for the expected increase in freight traffic specifically for the purpose of constructing the new Sizewell C power station, as these forecasts were made in 2018/19 when the development was still uncertain. Up to four trains per day are expected to serve the construction site via a purpose-built temporary rail connection branching off the existing Sizewell branch line. These services, bringing in construction materials and taking out waste, are planned to operate at night so that the passenger service on the East Suffolk Line is not affected. These services are expected to only be required for the duration of the power station's construction, although this will be for at least 10-12 years. Beyond the construction period, total freight traffic on the East Suffolk Line is expected to revert to today's level.

As part of the transition into Great British Railways, a target to grow freight by at least 75 % by 2050 has been set by the Government, with a 7.5 % target set for the current Control Period (2024-2029). How this target applies to the network and its different markets and flows will differ across the country, with much of the growth expected to be derived from more trains along established major flows enabled by infrastructure upgrades, such as East West Rail and the Felixstowe to the Midlands and North programme. Gains made through more efficient train path utilisation and longer and heavier trains will also contribute to the overall growth target. For this study area, growth is likely to be low as reflected in the forecasts illustrated in Table 7. However, container traffic to/from Felixstowe is expected to be one of the markets to contribute the most towards the growth target, subject to the delivery of capacity upgrades on the cross-country freight corridor, including in the Ely area.

[9] Norfolk Local Transport Plan 2021-2036 and draft Norfolk Rail Prospectus 2024; Suffolk Local Transport Plan 2011-2031 and Suffolk Rail Prospectus.
[10] Further details can be found in 'Freight planning' section the Long-term planning page of Network Rail's website.

Opportunities exist at several of the freight sites within the study area that Network Rail is actively exploring with site owners, local authorities and freight operating companies. This includes;

- increasing aggregates traffic into Eccles Road;
- expanding usage of the carriage sidings in Great Yarmouth to bring in aggregates, and;
- exploring options for express freight into Norwich.

The study area interfaces with the cross-country intermodal route to/from Felixstowe. Around 25 trains per day in each direction typically make the journey via Ely (plus around another 10 via the GEML and London). The widely supported case for upgrading the railway at Haughley Junction and in the Ely and Soham areas would enable an additional six freight trains in each direction per day. This study accounts for these additional services in its modelling.

Ely North Junction, looking north. The line to Norwich is to the top right of the image.

4. Meeting the needs and aspirations

As explained above there are strong aspirations to grow both passenger and freight services across the study area, as well as evidence of a moderate capacity challenge on the Norwich <> Cambridge route. This section will explain how these aspirations can begin to be met, the challenges that exist to providing improvements, and what can be done to address them.

Analysis and findings are provided for each line of route across three subject areas – **demand-led capacity needs**, **frequency aspirations** and **journey time aspirations**. Summaries of the core findings are shown in blue boxes.

4.1. Demand-led capacity needs

Only the Norwich <> Cambridge and Norwich <> Liverpool routes exhibit any sign of demand-led capacity challenges within the next 25 years. This is particularly so if growth rates are higher than expected as per the standard forecast. Potential options for both services are set out below.

4.1.1. Norwich <> Cambridge

The Norwich <> Cambridge route has the greatest level of demand, with more capacity likely required at certain times of day in the short-term. This is likely to be during the mid-2030s depending on rate of growth described above in section 3.2. It is also the route with the strongest aspiration for frequency improvements to drive regional connectivity, as well as modal shift.

Unfortunately, the route arguably has the most challenges to meeting these needs and aspirations of any in the study area, with constraints at both ends of the route at Norwich and Cambridge, as well as at Ely North Junction in the middle of the route. The demand-led opportunities are set out below.

There is a clear peak in demand towards Cambridge in the morning and away from Cambridge in the evenings. To ensure the railway does not alienate existing or potential future passengers, as well as maintain operational performance,[11] greater capacity for demand to and from Cambridge will be required first. Several potential options exist for accommodating future demand on these busiest services.

A. <u>Lengthening trains by adding another car to the formation</u>

Train lengthening is an option commonly taken to provide more capacity to existing trains, and can be relatively straightforward and cost-effective to achieve, depending on what supporting infrastructure is required. Lengthening Greater Anglia's existing 4-car trains to 5-car trains, however, may be more problematic to achieve due to the coupling setup between the cars. These trains are in fixed formations with coaches sharing bogies and due to this setup, these trains may be at their maximum design length. Detailed investigations would be required with the manufacturer, Stadler, to determine whether a lengthening solution is possible.

Articulated coaches with shared bogies on the Class 755.

If another car could be added, several platforms would need lengthening to cater for a train approximately 16 metres longer. Selective door opening (SDO) – which is currently used on these units at some stations, including Spooner Row – could also be an option, though it has clear disbenefits than platforming the whole train. Level crossings adjacent to several stations would also need to be taken into account to ensure that trains do not cross the roadway when in the platform.

[11] Congestion caused by high numbers of passengers trying to alight and board trains can cause station dwell times to extend, causing delays to the service and potentially others.

Capacity and capability of Norwich Crown Point depot to handle additional rolling stock would need to be assessed, also noting that a third formation, or 'sub-class', of 755 would be created, which would create operational challenges. These considerations would need to be assessed in turn if this option were to be developed further.

B. Lengthening trains by joining two units together

Formation	Length (m)
3	65
4	81
5 (hypothetical)	97
3+3	130
3+4	146
4+4	162

Table 8 – Class 755 lengths.

An alternative strategy for train lengthening could be to join two 3-car trains into a longer 6-car (3+3) train, which would not carry any of the potential technical fleet problems associated with adding a fifth car into the formation.

However, platform lengths and their associated challenges would be an exacerbated issue, with the train length approximately 130m versus 81m for a 4-car train and 97m for a 5-car train. More platforms would be too short for this formation, including platforms 1 and 2 at Stansted Airport,[12] and platform 5 at Cambridge. These are bay platforms, which potentially makes platform lengthening more challenging due to points situated close to the end of the platforms, which might need to be moved.

Furthermore, it may not be possible to guarantee two 3-car units would always be available. This could cause issues if anything longer than a 3+3-car formation is not permitted to operate and result in trains being short-formed as a 4- or even 3-car unit resulting in no benefit for passengers. If deemed to be a significant risk, planning for a 3+4 or even 4+4 formation could be assessed also, but longer formations would mean even more platforms are too short.

C. Running additional services

Adding trains into the timetable at key times can bring not only a capacity benefit but also greater convenience and increase the attractiveness of the railway as a transport option. The Norwich <> Cambridge route is heavily constrained at both ends and additional trains will not be straightforward to achieve. Further details on frequency improvements are shown in section 4.2 below.

D. Reconfiguring the internal layout of the train

The amount and layout of seats determines a train's seating and standing capacity. Class 755s are a mixture of 'airline' style and seats either side of tables. Reconfiguring this arrangement with fewer tables could allow some extra seats to be installed but would be unlikely to make a significant difference to the overall capacity.

Core Finding:
A capacity improvement in peak hours is likely to be required in the early 2030s to accommodate expected increases in demand. This would most likely be achieved with one of the two train lengthening options, but frequency options should also be explored if suitable pathing availability can be found alongside or within EWR and EACE projects. Further investigation into the optimal method, weighing up the costs and benefits of the various options, would be required if capacity improvements were taken forward. More details on the frequency options are outlined below in section 4.2.

4.1.2. Norwich <> Liverpool Lime Street

The Norwich <> Liverpool service shows a similar profile of demand at the critical load point as per Table 6 above, with certain peak hours services expected to be at-capacity in the mid-2030s. However, the trains used for this service and used to define the occupancy of the service are 2-car Class 158 trains. To cater for increasing demand during peak hours it is recommended that longer trains are operated when demand requires it. This can be achieved by running two 2-car 158s together or by using other, longer, rolling stock. The Class 158 fleet is now around 35 years old and nearing the end of its expected working life. It is recommended that when these units are replaced, sufficient

[12] Platform 1 at Stansted Airport is frequently simultaneously occupied by both a 12-car Class 745 Stansted Express and a 3- or 4-car Class 755 Norwich service, but would be too short for two 3-car 755s joined together and a 12-car Class 745.

units are procured (either by rolling stock cascade, or as a new fleet order) to operate longer 3- or 4-car trains in peak hours.

Core Finding:
To accommodate higher numbers of passengers expected in peak hours by the mid-2030s, longer trains are likely to be required, and any new fleet procurement should account for this need.

4.2. Passenger frequency aspirations

On top of the need to plan for increasing demand between Norwich and Cambridge in the medium-term, local stakeholders have strong ambitions for other frequency improvements on the railway across the study area. This section outlines how frequency could be improved on all routes. Where possible, smaller and more affordable improvements, capable of being delivered in the shorter-term are identified, though larger and more expensive upgrades will be required to deliver a significant step-change in many parts of the study area.

4.2.1. Planning guidelines

The following basic guidelines were agreed with study stakeholders and Network Rail's analysts when undertaking concept timetable modelling.

- Additional services would be planned with as close to a 30 minute spacing as possible.
- Connectivity at Norwich or Ipswich with other services, for example to/from London, should be no worse than today, with a target interchange time of 20 minutes or less.
- The current times of other interfacing trains in the Norwich, Ipswich, Ely and Cambridge areas should be fixed due to their interfaces on other parts of the network, including the Great Eastern, West Anglia and East Coast Main Lines. Moving these trains is highly likely to have impacts on other services, and much deeper analysis than is possible in this study would be required to assess whether moving other trains would be feasible.
- Pertinent to the Norwich <> Cambridge route, the latest assumptions around East West Rail and the Ely Area Capacity Enhancements have been taken into account, though it must be noted that these assumptions could also change as the projects develop and affect the findings set out in this study.

4.2.2. Norwich <> Cambridge

Currently, there is one direct train an hour between Norwich and Cambridge, with some services continuing to Stansted Airport. Doubling this service all day to 2tph is not required from a demand perspective in the short-term, except in peak hours as described above, however a strong aspiration exists to enhance the service to provide greater connectivity. Network Rail agreed with stakeholders the service specification shown below in Figure 7 for timetable analysis. This shows a 'semi fast' the same as the current off-peak service and a 'stopper' service calling at more stations between the two cities.

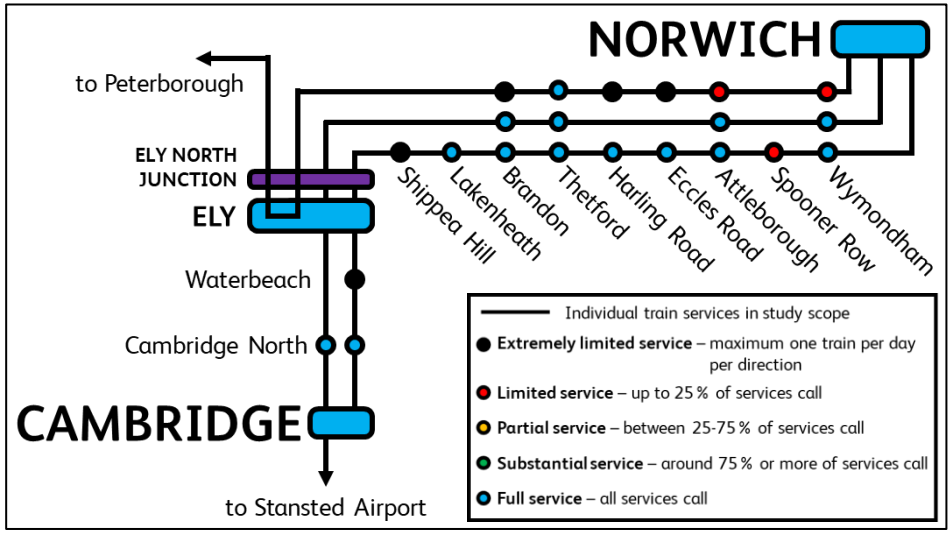


Figure 7 – Norwich <> Cambridge proposed service specification.

A second service would provide a roughly half hourly frequency between Norwich and Cambridge themselves, as well as the larger towns en route such as Wymondham and Thetford. A second service would also allow some of the

smaller village stations such as Harling Road and Eccles Road to have an all-day service. This could support proposed housing and employment developments in locations such as Snetterton and Larling as identified in Breckland District Council's draft local plan.[13] The EMR service is proposed to be unchanged but could potentially have some of its limited calls removed if they are duplicated by the additional Norwich <> Cambridge service. However, this will need to be weighed up with the connectivity this service provides to destinations west of Ely, including Peterborough.

Cambridge station, with a service from Norwich to Stansted Airport (right).

Timetable analysis has been undertaken to assess the ability to insert this second service into the timetable structure. Due to a combination of the existing level of service in the Norwich, Ely and Cambridge areas, several infrastructure constraints, as well as uncertainties over what will ultimately be delivered by the EWR and EACE projects, it is not possible at this time to provide definitive advice on how an additional train can be included into the timetable.

As described above the analysis undertaken for this study has incorporated the most likely outputs of EWR and EACE projects, as advised by the most recent development at the time of writing, as well as not moving the current timing of existing interfacing services. In any situation it is clear that it will not be straightforward to double the service and keep existing services the same as today due to the constraints set out below.

Trowse swing bridge and Trowse Lower Junction

These are both single track sections which significantly constrain the approach to Norwich station. Currently trains from Norwich towards Cambridge cross the bridge around xx:25 to xx:35 (exact timings each hour differ) and trains from Cambridge towards Norwich pass around the same time. Therefore, to create a well-spaced service, trains in both directions will need to cross the bridge around half an hour earlier between approximately xx:55 and xx:05.

Over the bridge, a 3 minute gap between trains is mandated by the timetable planning rules, meaning at least a 6 minute gap between existing trains is needed to insert an additional train into the timetable. While gaps do exist into which additional trains can be pathed, these paths are either too close to the existing Norwich <> Cambridge services or create conflicts with other trains at other locations, such as at Norwich station. Additionally, there is space either side of the EMR service which departs Norwich each hour around xx:55 but trains cannot precede or follow this train closely due to the length of signalling block sections on the Ely to Norwich line. Figure 8 overleaf shows an example of typical utilisation across Trowse swing bridge between 12:00 and 13:00 on a weekday, though timings differ slightly between hours.

It could be possible to amend some of the timings of other services in the Norwich area, but exploration of this has not been included in the scope of this study due to the other uncertainties this causes.

[13] Breckland District Council Draft Local Plan Preferred Options, June 2024.

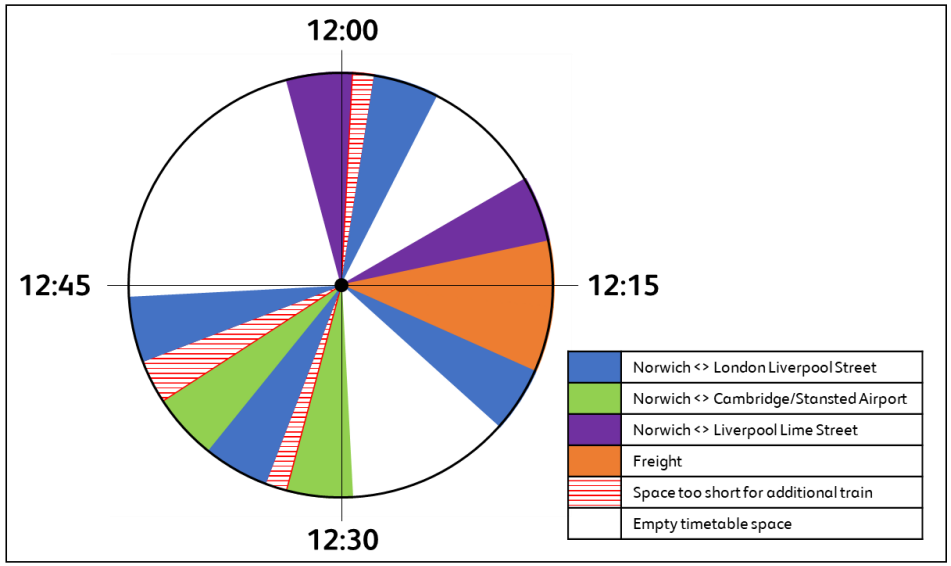


Figure 8 – Example of timetable usage across Trowse swing bridge.

It could also be possible to deliver similar capacity improvements by doubling the nearby Trowse Lower Junction, which branches as a single line from the GEML, and then returns to double track. The most efficient enhancement in this area will need to be determined during detailed development.

Ely North Junction

As the point on the network where lines from four directions meet, Ely North Junction is a well-known constraint for trains on several routes, including between Norwich and Cambridge. The junction (along with other infrastructure in the vicinity) is a nationally significant high priority investment option for Network Rail and a range of stakeholders, principally for intermodal freight traffic to/from the Port of Felixstowe. However, funding required for detailed development and delivery is not available despite its strong benefits case and priority status within the rail industry.

Even with the proposed EACE upgrade layout, it was not possible to path a second Norwich <> Cambridge service through the Ely area when attempting evenly space services. To accommodate services between Norwich and Cambridge, this may need to be formally included as a requirement in the scope of the project if this enters further development, however, to date, this has not been included as a core deliverable of the Ely upgrade. Decisions between allocation of capacity to passenger services may need to be made.

Coldham Lane Junction

Coldham Lane Junction is where the line to Newmarket, Bury St Edmunds and Ipswich branches off the WAML around a mile north of Cambridge station. Timetable investigations for this study have accounted for the latest assumed proposed service structure for EWR services, which includes 2tph terminating at Cambridge station and then turning into a new turnback siding on the Newmarket line to ensure they do not block platforms at Cambridge station for a significant time. While this resolves an issue of blocking lines and platforms at Cambridge station, it creates more crossing movements at Coldham Lane Junction which restrict capacity and reduce flexibility north of Cambridge station.

To accommodate another Norwich <> Cambridge service, either an infrastructure or timetable solution will be needed between Cambridge station and Coldham Lane Junction which resolves these conflicts. An infrastructure option would likely involve an additional line to better segregate moves to/from the Newmarket line, whilst a timetable solution could involve assessing which services cross the junction to/from the Newmarket line.

This has been identified as a risk to future service aspirations by Network Rail in EWR's development. Option development is, however, ongoing, and Network Rail will continue to work with EWR to establish suitable solutions for EWR trains terminating at Cambridge.

Other constraints

This timetable exercise has attempted to insert another direct service, keeping other existing services unchanged. It is clear that some of these existing services occupy the ideal timings for an additional direct service, most notably the EMR services between Norwich and Ely, and the CrossCountry service

between Ely and Cambridge. It is unlikely a second direct service could be achieved without affecting one or both of these services.

Long signalling block sections on the Ely-Norwich line and a high number of level crossings, including busy urban crossings such as Chesterton level crossing near Cambridge North station, are also challenges which will need to be factored in during more detailed option development.

East West Rail uncertainties

East West Rail is a priority rail project for the government and local stakeholders, which will deliver train services between Oxford and Cambridge via Bedford. Four trains per hour will operate to and from Cambridge, and to accommodate them significant infrastructure changes around Cambridge station are needed. Network Rail is working with the East West Railway Company (EWR Co.) to define the investment required to achieve this.

While concept timetables and proposed infrastructure solutions do exist and have been taken into account by this study, there is still a potential that this will change between now and project delivery.

It is recognised by Network Rail that extension of EWR services to Norwich is aspired to by local stakeholders, and would have clear long distance connectivity benefits, however EWR Co. is not remitted to provide this. Due to this exercise being unable to achieve a viable path between Norwich and Cambridge, the ability to extend one of the EWR services to Norwich has not been confirmed.

Indirect connectivity

The EMR Norwich <> Liverpool service provides connectivity between Norwich and Ely. When travelling towards Cambridge, this service often provides good connectivity with either the CrossCountry or the Great Northern services travelling south to Cambridge, with short interchange times of around 7 minutes. Travelling towards Norwich, the timings are not as consistent, with some connection times being up to 25 minutes, extending journey times up to around 1 hour 40 minutes.

Where connection times are good, as the CrossCountry and EMR services have limited calling points, journey times are comparable with the direct Greater Anglia service at around 1 hour 15 minutes. These journeys operate around 20-40 minutes from the existing direct service, giving a good alternative to the direct train, although it is acknowledged that passengers prefer journeys with no changes. A shorter-term aim to improve connectivity between Norwich and Cambridge could be to ensure that short connections at Ely are available each hour in addition to the direct service. An exercise to review calling points could also be carried out. A desktop summary of services to be investigated further is included in Appendix 3.

Summary

The timetabling exercise carried out for this strategic advice has shown that there is no straightforward way to add an additional service between the region's two largest economic centres when accounting for local priority rail enhancements. This is due to a combination of factors outlined above which together mean that there is no credible way to fit another train between existing ones on current and proposed infrastructure. It has not been deemed appropriate to amend times of interfacing services (such as Norwich <> London Liverpool Street or Kings Lynn <> London Kings Cross) as this would need to carry significant caveats and assumptions that their paths would remain viable and not impact other trains further afield.

It is clear that a much more in-depth exercise would need to be undertaken to establish options for achieving the aspiration of 2tph between Norwich and Cambridge. However, it is Network Rail's view that it would not be beneficial to carry out this exercise at this time due to the level of uncertainty around what the infrastructure and train service will look like due to the level of maturity of the high priority EWR and EACE projects. It is instead recommended that either;

- this takes place once the deliverables for EWR and EACE are confirmed and unlikely to change (though there is no clear timeline for this), or;
- the requirement for accommodating a second Norwich <> Cambridge path is formally included in the project remits for EWR and EACE, however this will need to be remitted by the DfT.

Alternatively, if it is not possible to overcome constraints to provide a second service via Ely, it may be necessary to consider other more 'outside the box' options, such as a new routing via Diss and Bury St Edmunds, which would require a new chord at Haughley Junction, and possibly other improvements en route. In addition, trying to ensure a quality connection each hour between the existing EMR, CrossCountry and Great Northern services at Ely in both directions, and ensuring this is publicised in journey planners may help to give passengers more options in the short-term.

Core Finding:
A second service between Norwich and Cambridge should either be assessed only once the deliverables for the EWR and EACE are confirmed, or if the scope of Norwich <> Cambridge connectivity is included in either of these projects. It is acknowledged that there is a strong desire for frequency improvement but the current constraints in these areas along with the volume of variables and uncertainties makes it difficult to provide definitive advice at this time.

Ensuring existing indirect connections are available each hour is also a shorter-term option, however this would require further investigation to establish whether timetable adjustments could be made.

4.2.3. Norwich <> Sheringham

The three towns of Sheringham, Cromer and North Walsham are greater cumulative generators of demand than the larger towns of Great Yarmouth or Lowestoft, and generate a reasonable level of traffic between themselves, not just with Norwich. This is shown in more detail in Appendix 1.

Due to the single line constraints on this route, it is not possible to satisfactorily introduce a second end-to-end train on this route without additional sections of double track. Network Rail has therefore initially assessed how far along the line a second service can be introduced without any infrastructure improvements, and what would be required to reach the coastal towns of Cromer and Sheringham. The long-term aspiration is to achieve a service structure as shown opposite in Figure 9, with an all-stations service similar to today, and an additional semi-fast service only calling at the larger towns.

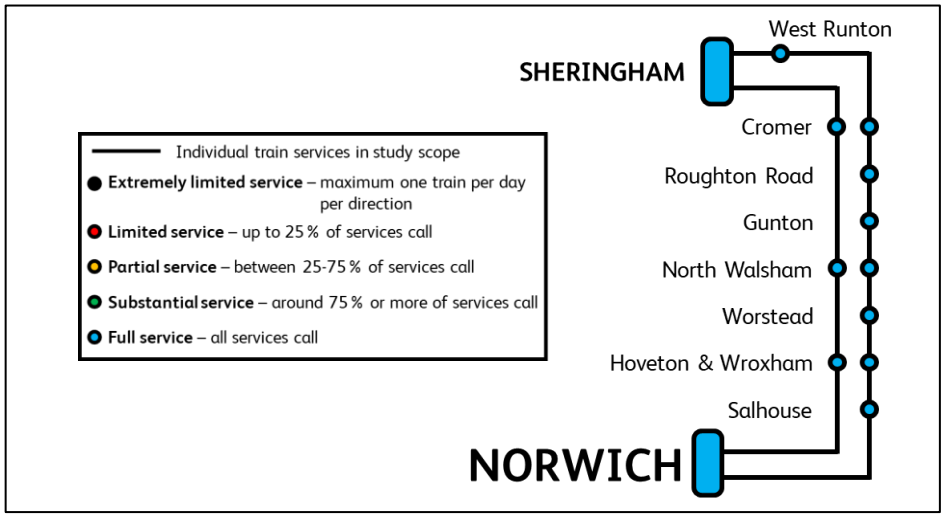


Figure 9 – Norwich <> Sheringham proposed service specification.

Timetable analysis shows that it would be possible to operate an additional service with a spacing of around 25-35 minutes between Norwich and North Walsham without any changes to the infrastructure. This would benefit passengers travelling between North Walsham, Hoveton & Wroxham and Norwich, but would have no benefits for any communities north of North Walsham, including the seaside towns of Cromer and Sheringham. The operating costs of implementing an additional service for a relatively limited benefit which cannot benefit two of the three key towns on the line are likely to be prohibitive.

To provide an additional service all the way between Norwich and Sheringham, an infrastructure enhancement would be needed to enable the additional service to pass the existing one coming from the other direction. Analysis shows that based on existing line speeds and planning rules this would need to be between Cromer and Roughton Road stations to maintain optimal timings and not to extend journeys in the form of longer station dwells. Further analysis would be required to identify the optimal location within an undulating landscape, with the railway quickly switching between cuttings and embankments.

An alternative option could be to provide a second platform at Roughton Road station on the outskirts of Cromer with both trains calling at the station, however this would extend journey times slightly. Both options would require more detailed investigation to determine the most effective solution.

The demand profile on the Sheringham branch shows a peak in the morning towards Norwich and a peak in the evening away from Norwich. Any doubling of the service should therefore initially concentrate on these hours to provide a better service at the times of greatest demand. Additionally, there are several daily freight paths to and from the gas terminal at North Walsham, as well as a daily (seasonal) railhead treatment train. A second passenger service would not be able to run at the time the freight and operational trains run.

Finally, to achieve an all-stations service all day (currently some smaller stations such as Gunton only have a train every other hour in the off-peak), a journey time saving would need to be made to ensure trains can travel from North Walsham to Sheringham and back to North Walsham within an hour. This is essential to ensure trains pass efficiently at North Walsham between sections of single line and maintain an hourly service between Norwich and Sheringham. This would need to be achieved by increasing the line speed. More on journey time improvements can be found in section 4.3.

In the short-term, minor timetable changes would enable hourly calls at Salhouse or Worstead stations using the existing train service and no changes to the infrastructure. While the population around both stations is currently low, a significant amount of housebuilding is due near Salhouse station, including up to 3,850 homes at North Rackheath.[14] An hourly call could help residents of this large development make more sustainable journeys.

Core Finding:
Doubling the service requires a passing solution in the Roughton Road area, together with a line speed improvement north of North Walsham. Delivered together, these improvements would allow an all-day all-stations service, plus a limited stop service as outlined in Figure 9. In the short-term, calling frequency improvements at Salhouse could be considered.

[14] Proposed Development – Land North of Rackheath, Taylor Wimpey.

4.2.4. Norwich <> Great Yarmouth

Norwich <> Great Yarmouth is the station pairing which generates the greatest number of passengers across the study area other than on the WAML between Ely, Cambridge North and Cambridge (as shown in section 2.3.1). It is also the only route with two routeing options – via Acle and via Reedham – with the route via Reedham only served a few times a day on weekdays at the expense of the route via Acle, which then has two hour gaps in service. Limited peak hours strengthening currently occurs as well as additional direct services with no intermediate calls in summertime only, indicating that 2tph is likely to be possible throughout the day.

Figure 10 below shows the service specification Network Rail agreed with partners to test. This proposes to run a full service on both routes giving all intermediate stations (except Berney Arms) a 1tph service to Norwich and Great Yarmouth, and a 2tph service between Norwich and Great Yarmouth themselves.

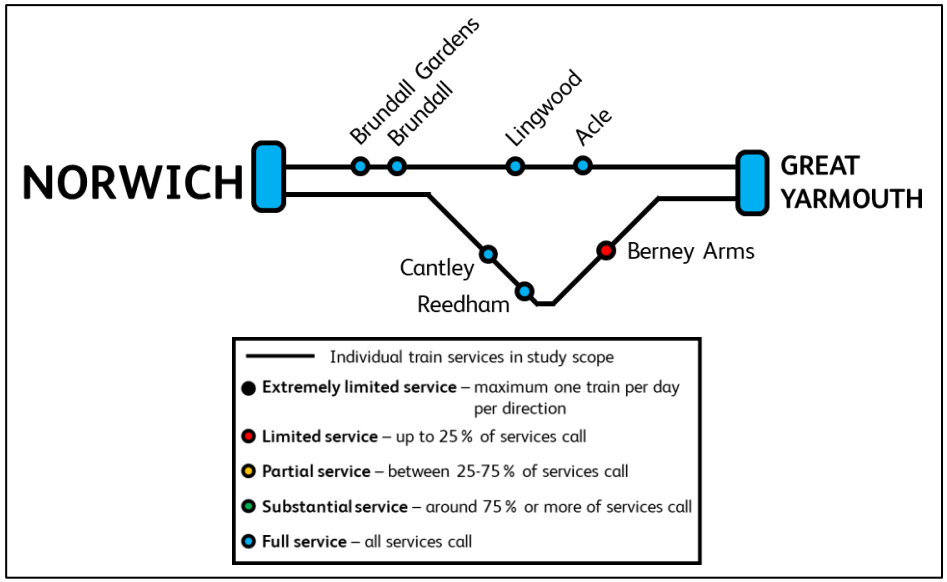


Figure 10 – Norwich <> Great Yarmouth proposed service specification.

Timetable analysis has shown that it is possible to operate additional services to this specification without any additional infrastructure, and well-spaced timings very close to 30 minutes apart could be achieved. However, due to the length of time which services would need to occupy platforms at Norwich station, empty coaching stock (ECS) moves to and from sidings would be required to free up platforms for other services. This adds in operational complexity and potentially increases risk of poor performance.

Mitigations to these ECS moves would be to either retime services or to provide another platform at Norwich station. Retiming services so they occupy platforms at Norwich for less time would result in uneven spacing for services and trains running closer together, diluting the convenience benefit a second train provides, as well as extending some journey times.

An additional platform would provide more capacity and operational flexibility for the Great Yarmouth service and others but would require a relatively significant capital investment to achieve. Unless other benefits beyond the Great Yarmouth service could be proved, securing investment for delivery of an additional platform is likely to be challenging. More on platforming needs can be found in section 4.2.8 below.

Core Finding:
Running 2tph between Norwich and Great Yarmouth, with one on each routeing option would not require additional infrastructure, although an additional platform at Norwich would ease operational challenges.

4.2.5. Norwich <> Lowestoft

Norwich <> Lowestoft is the branch line to/from Norwich with the lowest level of usage. Similar to the Great Yarmouth route, it is characterised by one main destination with several very small intermediate population catchments en route. Figure 11 opposite shows the service specification agreed to be tested.

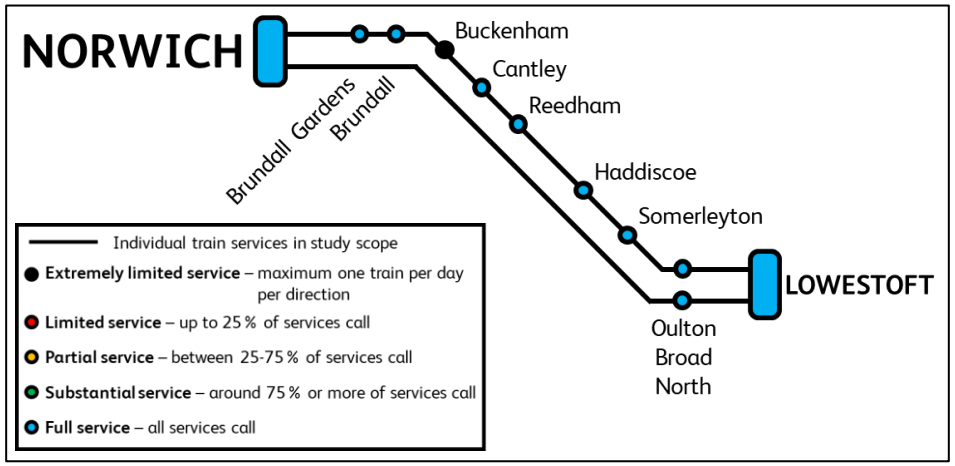


Figure 11 – Norwich <> Lowestoft proposed service specification.

Currently the off-peak service level alternates between a fast service calling only at Oulton Broad North and a stopping service calling at some, but not all, intermediate stations. This proposed specification proposes to operate both services in each hour, with the stopper extended to call at all stations except Buckenham each hour. It therefore keeps the fast service connecting the main stations and extends the second service to all communities on the line each hour.

With the route being fully double track throughout, there are fewer infrastructure constraints than on any of the other routes considered in this study. As a result, there is ample capacity to accommodate both services with good spacing close to 30 minutes apart. With such diverse calling patterns, naturally journey times would vary, with the stopping service taking around 8-12 minutes longer than the fast service.

Core Finding:
There are no infrastructure challenges to operating the proposed service pattern, however low levels of demand mean it is likely to be least viable from a business case perspective.

4.2.6. Ipswich <> Lowestoft

The East Suffolk Line between Ipswich and Lowestoft is one of two branch lines connecting into Ipswich and has far greater passenger usage than the branch to Felixstowe. Due to the length and orientation of the line – about 49 miles on an approximately north-south axis – the line has more complex markets than most other areas of the study, with the main towns at both ends of the line being a draw for passengers, as well as more of a through-market to London via a change of trains at Ipswich. The delivery of Sizewell C power station could potentially grow rail demand and add in additional notable flows, if workers involved in its construction choose to travel by rail to and from site, including via a park and ride site next to Darsham station.

It is recognised that aspirations exist to double the service between Ipswich and Lowestoft, but due to the significant constraints on the line it is already known that it is not possible to add in another service all the way without several upgrades on multiple sections of the line. Therefore, due to the known inability to path in a second train all the way along the line, and reflecting the polarised passenger flows, the greater economic value of Ipswich/London-orientated journeys, as well as the potential for a second service to be beneficial during the construction period of Sizewell C, it was agreed to split the line approximately half way and initially test whether the option of a second service as far as Saxmundham (referred to below as '**East Suffolk Line South**') could be achieved.

At the same time, a second service on the north end of the line to benefit passengers between Saxmundham and Lowestoft was agreed to be tested (referred to below as '**East Suffolk Line North**'). The reason for this separation was to see if there were any opportunities for additional services without the need for costly infrastructure changes at either end of the line.

Noting aspirations and potential opportunities connected with the development and delivery of Sizewell C power station, a sensitivity of extending the southern orientated service onto the Sizewell branch, or providing a shuttle, to a new station at Leiston has also been considered. This results in the service structure shown opposite in Figure 12.

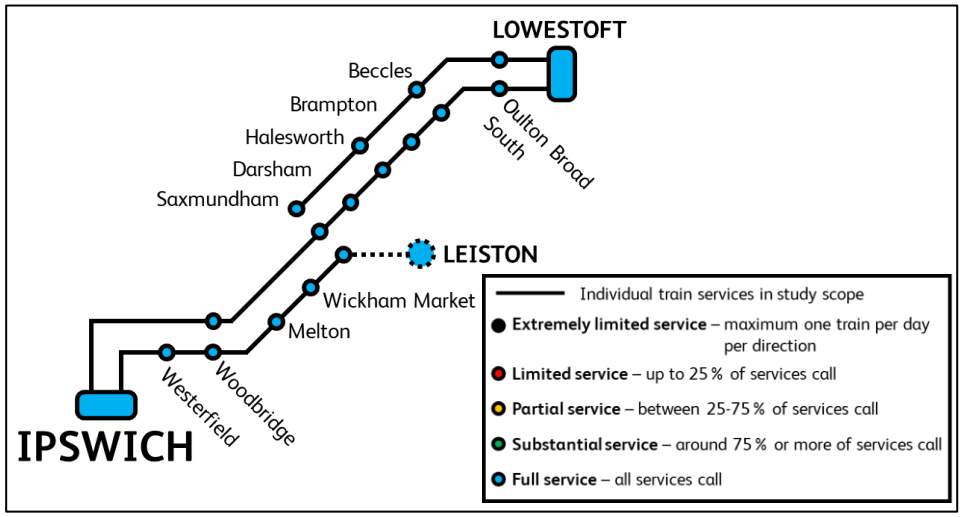


Figure 12 – Ipswich <> Lowestoft proposed service specification.

All stations keep their direct connectivity with Ipswich and connecting services to London and Cambridge, and the larger towns of Woodbridge and Saxmundham benefit from a second train to/from Ipswich. At the north end of the line, all stations keep their direct connectivity with Lowestoft, with the larger towns benefitting from a second service.

This analysis accounts for the works on the East Suffolk Line connected with the Sizewell C project. This includes some minor signalling modifications south of Saxmundham and an additional crossover from the northbound line to the southbound line just south of Saxmundham Junction.

East Suffolk Line South

Timetable analysis shows that at the south end of the line, another location would be needed to allow a second train to pass the existing one. Based on current line speeds and planning rules, the optimal place for this would be around Wickham Market. Passing trains at a station where both are planned to stop is more resilient than an isolated loop away from a station, so therefore it is recommended that if a second train was proposed at the south end of the East Suffolk Line, the second platform at Wickham Market station is reinstated, and both services call at the station – a slight deviation from the

proposed service specification shown above, with Wickham Market gaining a second station call.

To facilitate a second train, the single track Down/Up Lowestoft line between East Suffolk Junction and Ipswich station would need to be doubled. Adjacent to this line is an array of sidings predominantly used by freight trains to/from Felixstowe for timetable regulation, driver and locomotive changes, locomotive and wagon stabling, maintenance and refuelling. Empty passenger trains also occasionally stable here for short periods, freeing up platforms at Ipswich station for other trains. Providing an additional running line would most likely involve rearrangement of connections between existing lines to provide a continuous fourth line between Ipswich station and East Suffolk Junction. Further development would be required to determine the extent of the upgrade required, its impact on other train services, particularly freight, and whether any alternative options may be available.

An additional service on the East Suffolk Line would require a long dwell at Ipswich station, which would not be possible with its current platform layout. Either a timetabling or infrastructure solution would need to be found, such as ECS moves, interworking of units or an additional platform. This would need to be assessed alongside options to double the line to East Suffolk Junction.

East Suffolk Line North

At the north end of the line, to accommodate a second service between Saxmundham and Lowestoft, doubling the single track between Oulton Broad North Junction and Oulton Broad South station would be required, although the station itself could remain with a single line and platform. This section of line was previously double track, so the rail corridor is potentially wide enough for a second line. This section includes two road level crossings and Oulton Broad swing bridge over Lake Lothing. Detailed assessments would need be undertaken to ensure the level crossings remain safe for all users and whether modifications to either of them would be needed, and that the structure of the swing bridge could accommodate another line. Trains terminating at Saxmundham from the north could terminate in the northbound platform 2 using the crossover to be delivered by the Sizewell C project.

Connecting Leiston

There are two ways Leiston could be reconnected to the national rail network – with an extension to the proposed second service on the south end of the East Suffolk Line, or with a standalone shuttle service. This connection would not only be beneficial in the long-term, but also in the short-term during the construction of Sizewell C, to enable travel for those involved in the power station's construction.

To connect the second 'East Suffolk Line South' train to Leiston, significant improvements would be required on the Sizewell branch. This is mainly due to the timings and fixed passing points on the East Suffolk Line previously described to keep a half hour spacing with the current Ipswich <> Lowestoft service. The second service would arrive from Ipswich at Saxmundham at xx:16 and would need to be back at Saxmundham for its journey south at xx:31, giving only 15 minutes for a train to travel to Leiston, turn around and come back. This is unachievable so another train would be required to operate this service, with the trains passing each other on the Sizewell branch. A degree of double track would therefore be required, as well as increased operational costs. This option does, however, have direct connectivity to Ipswich and a single connection to trains to London, Norwich and Cambridge.

An alternative option would be to operate a shuttle service between Saxmundham and Leiston only. Analysis has shown that it would be possible to operate this and connect with the current East Suffolk Line service by terminating at Saxmundham around 10 minutes before the Ipswich <> Lowestoft trains are due (these pass each other at Saxmundham), and then reversing into the siding just to the north of the station. The shuttle service can then return to Saxmundham station to pick up any passengers bound for Leiston, again with around a 10 minute connection time. While this generates undesirable ECS moves and a potential performance risk, it does ensure good connections with the through service in both directions without the need to provide a bay platform. Running the shuttle service into and straight back out of Saxmundham would result in poor connection times of around 30 minutes, or good connections in one direction and almost an hour connection time in the other.

The current line speed of the Leiston branch is 25mph, though this is due to be reduced to 10mph when works are carried out for the Sizewell C project. This is due to a restriction on speed of construction trains imposed by the project's Development Consent Order (DCO) to reduce noise and vibration of the freight passing trains. To operate a competitive and worthwhile passenger service, the permitted speed of the line, at least for passenger trains, would need to be increased. While anything above 20mph would be workable from a timetable perspective for the shuttle service, higher speeds would be ideal from a journey time perspective and to offer a step-change versus bus journey times to Saxmundham. Either mode of operation of the passenger service would require a comprehensive review of level crossings on the line to ensure they are safe for all users.

Diverse stopping pattern challenges

The service specification shown in Figure 12 was devised with a view to reducing journey times slightly by skipping the smaller stations on one of the services. However, due to the significant single line sections and limited and fixed passing points, missing out station calls simply means these trains get to the passing points quicker and have to be held longer to wait for the train travelling in the other direction to pass, or have 'pathing time' added to slow them down. Therefore, it is recommended that any additional services adopt an all-stations calling pattern to provide the maximum connectivity benefit.

Freight

A daily weekday return freight path exists in the timetable between Sizewell and Sellafield in Cumbria via London and Crewe for the purpose of transporting waste nuclear fuel away from Sizewell. This path is retained in the timetable but is rarely used, with only two return journeys made in 2024. Due to the network constraints on the line, when this train is timetabled the passenger service cannot operate in its regular pattern with gaps between services growing up to 1 hour 40 minutes and end-to-end journey times extending. This train is timetabled to operate during the morning and afternoon peaks so disrupts the most important time on the route from a passenger perspective. Its current timings would also mean that a second service could not be operated during the peak periods. When planning an additional service on the East Suffolk Line, how to accommodate the freight service would need to be considered. Adjusting its timings may be the only way to timetable everything without significant works, such as more double track on the south end of the East Suffolk Line. It is however, acknowledged that re-timing this service is unlikely to be easy due to its path on the Great Eastern Main Line, North London Line and West Coast Main Line.

Core Finding:
The East Suffolk Line is possibly the most constrained line within the study area due to its lengthy single line sections. Doubling the service throughout its entire length will be cost-prohibitive, so a shorter-term goal would be to introduce a second service on the southern half of the line first, as far north as Saxmundham, with the option of extending the service to Leiston.

This will still require track doubling at Wickham Market (similar to what was delivered at Beccles in 2012), an additional line from East Suffolk Junction to Ipswich station, as well as retiming of the nuclear flask train to avoid the peak hours, where an additional passenger service would be most useful.

The market at the north end of the line is not as strong, and as infrastructure changes would also be required to operate a second train on this section of the line, it is not recommended that a service is operated here independently. As a result, the staging shown below in Figure 13 is likely to be the most effective way to introduce and then extend a 2tph service, noting that this could reduce the efficiency of operating a passenger service on the Sizewell branch, if this commenced at Stage 1.

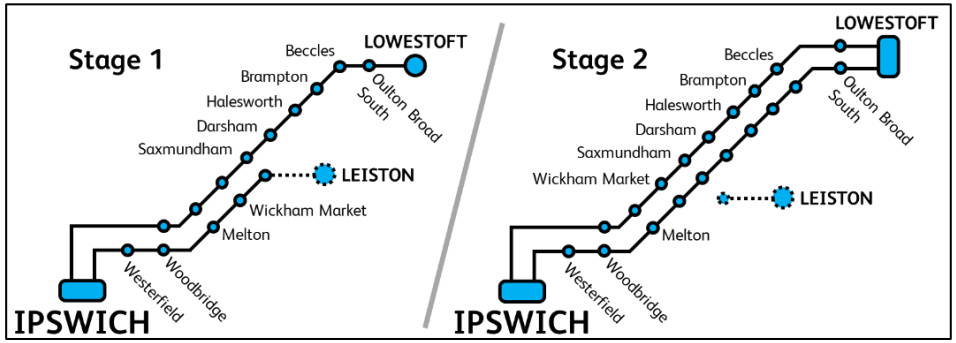


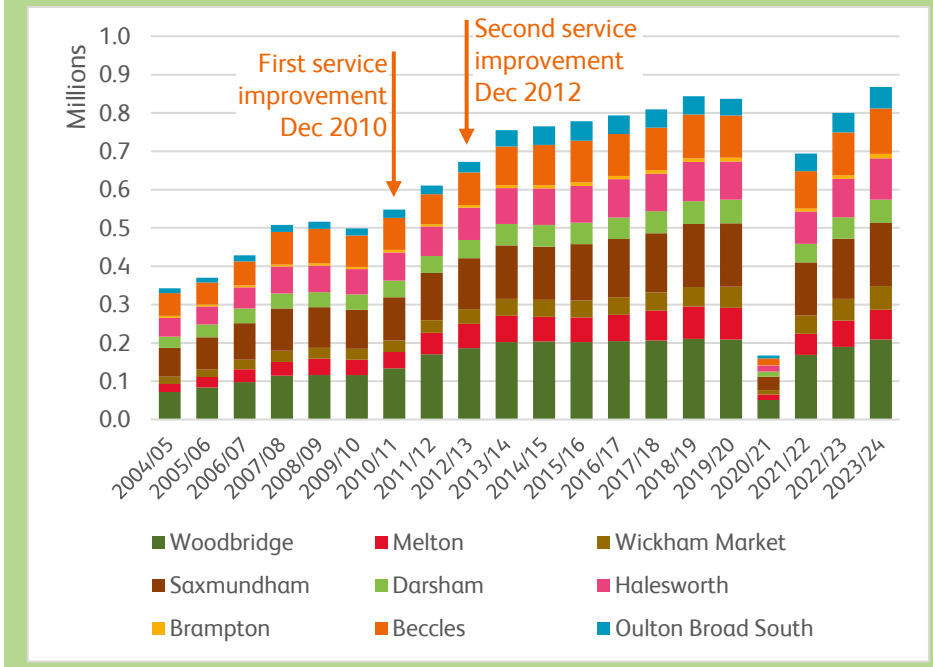
Figure 13 – Potential staging of East Suffolk Line improvements.

Case Study 1 – East Suffolk Line, Suffolk[15]

In 2010 and 2012, the East Suffolk Line benefited from service improvements which have led to a steady rise in patronage. Before December 2010, the service was only once every two hours. After this date, the service was doubled to 1tph on the section between Ipswich and Saxmundham, which immediately delivered an increase in passenger numbers, particularly at Woodbridge, where entries and exits grew from 116,000 in 2009/10 to 202,000 in 2013/14.

This improvement was the first step in providing an hourly service all the way between Ipswich and Lowestoft, which was ultimately enabled by the construction of a passing loop and reinstatement of a platform at Beccles station (its opening pictured below). This £4m scheme delivered by December 2012 was jointly funded by Network Rail and Suffolk County Council, who contributed £3m and £1m respectively. Again, passenger numbers responded, with entries and exits at stations north of Saxmundham growing from 228,000 in 2011/12 to 301,000 in 2013/14.

Usage has continued to steadily increase and reached a new high in 2023/24, having recovered strongly post-Covid. These improvements demonstrate how improvements in rural frequency can deliver strong increases in patronage for a relatively low capital cost. Similar improvements, potentially driven by local partners may be able to deliver similar growth.



[15] New hourly service on East Suffolk Line, Network Rail, December 2012.

4.2.7. Ipswich <> Felixstowe

The Felixstowe branch line is the least used line in terms of numbers of passengers within the study area, as outlined in Appendix 1, and plenty of on-train space is projected to be available for passengers at all times of day in the long-term. Nevertheless, it is recognised aspirations also exist here to enhance the train service up to 2tph. It is also the shortest route with only three intermediate stations. A second service is proposed to call at Trimley and Derby Road only, as Westerfield could also be served with 1tph on one of the East Suffolk Line services. This results in the service pattern shown below in Figure 14.

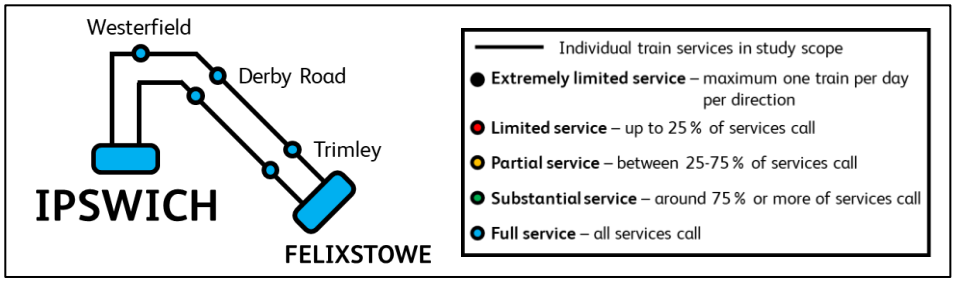


Figure 14 – Ipswich <> Felixstowe proposed service specification.

Additional services could not be operated without double tracking of the line, which is currently single track for most of its length. Doubling of East Suffolk Junction would also be required, as explained above in section 4.2.6.

Track doubling on the branch is recommended as an improvement to be implemented in the longer-term as part of Network Rail's Felixstowe to the Midlands and the North (F2MN) programme principally aimed at increasing capacity for intermodal freight traffic to and from the Port of Felixstowe. This option is not currently being developed, as several other connected schemes are required before this one, including the EACE project.

Doubling of the passenger service could be considered as part of the freight doubling scheme if it gets taken forward, however given the low numbers of passengers on this line and the expected abundance of on-train capacity even in the long-term, it is likely that using all additional track capacity for freight services would represent better value for money for the industry overall and help contribute towards the aims of modal shift for long-distance freight.

Core Finding:
Additional capacity is proposed to be provided in the long-term for freight services. If it does not impede freight services, it is possible a second passenger service could be provided at this time, but it is unlikely that there would be sufficient demand to justify the service. It is not recommended service frequency enhancements are considered before the freight scheme comes forward.

Felixstowe station.

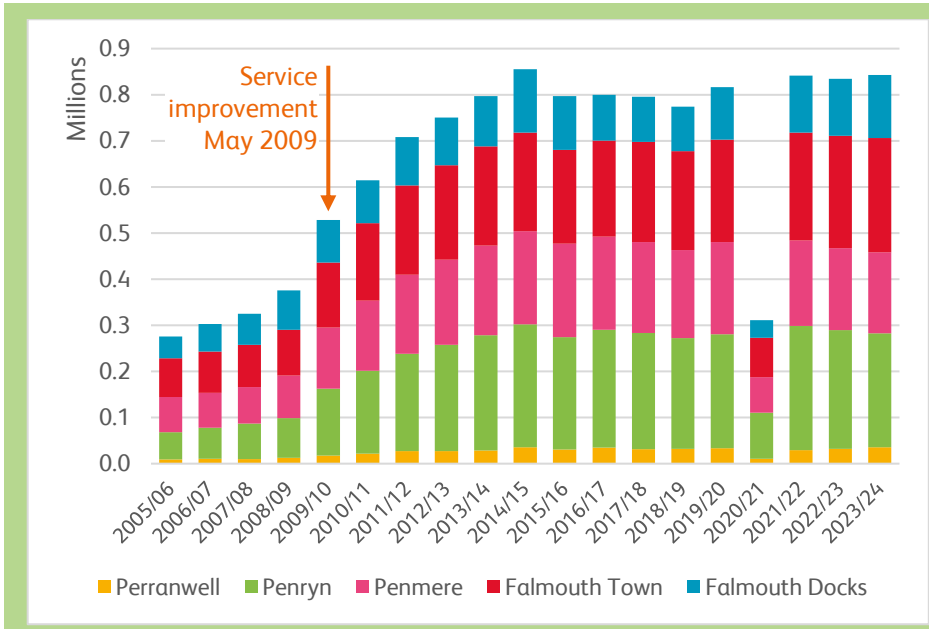
Case Study 2 – Falmouth branch line, Cornwall[16]

The Truro-Falmouth branch line in Cornwall, also known as the Maritime Line, is an 11 mile branch line, serving similar rural and coastal communities to some of the routes within this study. The line has five stations (plus Truro on the Cornish Main Line) – three in Falmouth, plus Penryn and Perranwell en route. Before 2009, the line was single track, having had a passing loop removed in the 1960s, with an hourly service between Falmouth and Truro.

A campaign to provide a passing loop to double the service to half hourly was successful and a collaborative funding package of £4.7m from the European Union, £2.5m from Cornwall County Council and £0.6m from Network Rail enabled the delivery of a new passing loop and platform extension with associated signalling works, at Penryn station. An unusual operational layout with a single long platform was chosen for this scheme, allowing both trains to call concurrently, operating in a similar way to how platforms 1 and 4 work at Cambridge station.[17]

Usage has responded extremely positively since the service frequency was doubled. In the last full year of the hourly operation in 2008/09, the ORR estimated around 375,000 entries and exits at the line's five stations. In the first year of hourly operations (2009/10), this had risen to 528,000 and then onto 855,000 in 2014/15. Totals have remained around 800,000 since then, including a strong and immediate recovery after the Covid-19 pandemic.

The growth on this line following a relatively modest investment has clearly enabled this quiet, local line to reach its full potential, offering greater connectivity, encouraging modal shift and allowing access to the city of Truro by offering more convenient journeys to local people. With similar investments in parts of Norfolk and East Suffolk, similar results could be achieved.



4.2.8. Cumulative impacts on key infrastructure

The analysis outlined above has been undertaken line by line to assess the ability to provide additional services on each route individually. Operating two or more additional trains could lead to the need for additional capabilities at key nodes, each of which is explored below.

4.2.8.1. Level crossings

All routes within the study area have level crossings over the railway line, which can place significant constraints on the quantity and speed of trains which can use the railway. While this study has not investigated the impacts on specific crossings, it is highly likely that doubling of the number of trains on

[16] It's the final countdown to extra rail services on Falmouth branch line, Network Rail, April 2009.
[17] A demonstration of how the single platform operates can be found here.

some routes would require level crossings to be upgraded or closed. Specific needs would be investigated at further stages of development.

4.2.8.2. Norwich station to Thorpe Junction

Norwich station is a terminus for four of the lines within the study area. Currently, services which use 2, 3 or 4-car trains often share platforms, with trains arriving after and departing before other trains with longer dwell times. Analysis for this study has indicated that adding in further services with relatively short dwell times does not require additional platforms. The additional Great Yarmouth service – with a long dwell time – would require an additional platform to avoid ECS moves, which are not desirable from an operational point of view.

Timetable analysis has shown that with one extra platform it would be possible to operate an extra service on all Norwich routes together (Sheringham, Great Yarmouth, Lowestoft and Cambridge). Sidings exist on both sides of the existing platform layout at Norwich station which could be remodelled to make space for one or more additional platforms.

A fourth line between the station and Thorpe Junction would also offer greater performance resilience and timetable flexibility. This would not be required in the short-term but if multiple additional services were proposed to be added to/from Norwich, the need for a fourth line should be assessed.

4.2.8.3. Ipswich station

Ipswich station is already constrained, with Greater Anglia needing to undertake ECS moves throughout the day to make platforms available for other trains. Adding in any additional services will require at least one additional platform. Network Rail has previously identified options for providing additional platforms at the station as part of the Suffolk Corridor Study, with locations available on either side of the station.[18]

Looking towards Thorpe Junction from Norwich station.

4.2.8.4. Interworking of units

Greater Anglia currently 'interworks' units between routes, meaning an arrival at the terminus station from one branch line may form the next service on a different line, rather than solely operating on one line all day. This currently occurs at Norwich, Lowestoft and Ipswich and results in a more efficient operation as trains spend more time in service than idling in platforms. Therefore, platform utilisation is lower due to shorter dwell times. This study has not been able to assess all permutations of where further interworking of units may be possible, but it is likely as more services are put into the timetable, more options to do this will be available, especially at Norwich.

[18] Suffolk Corridor Study, Network Rail, November 2022.

4.3. Passenger journey time aspirations

Partners and stakeholders have an aspiration to see reduced journey times across the study area in order to make the railway more attractive to prospective passengers and encourage mode shift. There are four main ways in which this can be achieved;

1. Using faster trains
2. Removing station calls
3. Shortening station dwell times
4. Improving the capability of the infrastructure

The Class 755 rolling stock used on all routes is high performing, with good acceleration and a top speed of 100mph, so there is little opportunity to improve journey times with new trains. Trains typically call at most or all stations on their journeys, so removing station calls is technically a feasible option, but given all routes are currently operated at only a 1tph frequency, removing stops would reduce connectivity and be at odds with the aspiration to improve calling frequencies. Dwell times at stations vary usually according to how many passengers are expected to board and alight, or whether a train needs to wait for an operational reason, such as entering a single line section. Dwell times across the study area are typically 30 or 60 seconds. There could be some opportunities to reduce some of the 60 second dwells to 30 seconds, however the total amount of time saved is unlikely to be significant even if feasible.

The lack of scope for the first three options means that the capability of the infrastructure needs to be improved. Assuming the timetable planning rules are maximising the capability of the infrastructure

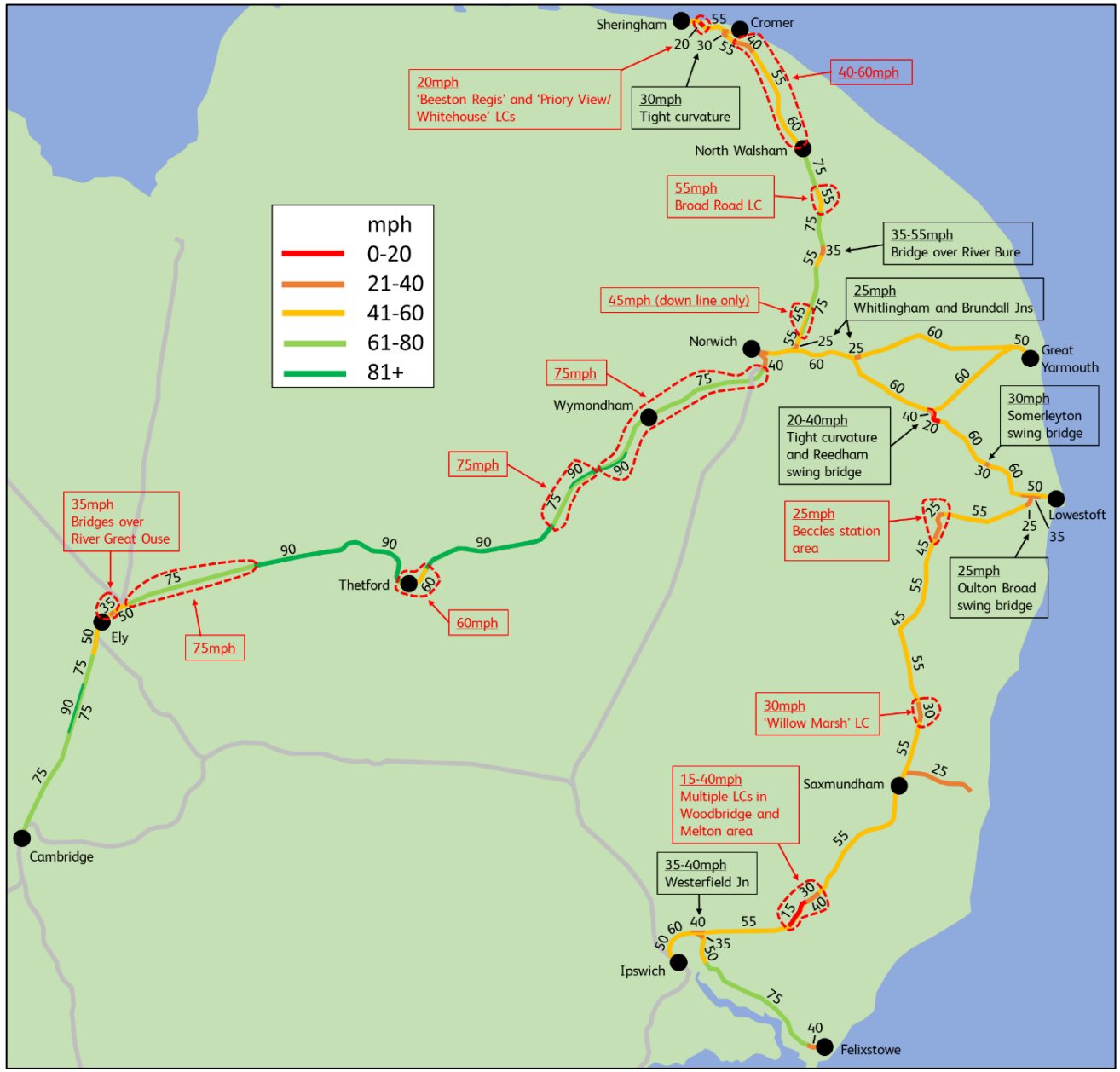


Figure 14 – Summary of current line speeds across the study area.

already, then improvements must be sought. This is principally achieved by raising the permitted line speed. Figure 14 above shows an approximate geographic representation of the maximum line speeds for passenger trains on all lines within the study area as published in Network Rail's Sectional Appendix, which should be referred to for full details.[19]

For simplicity, this representation does not have full details of;

- differential speed limits for different types of train (e.g. freight);
- short, minor (e.g. 5mph) fluctuations in maximum speed, or;
- bi-directional or single line sections which have slight differences in speed limit by direction.

Locations where speeds are notably lower than the prevailing line speed are identified. Those shown in red text are areas which would benefit from a review to understand what improvements would allow the permitted speed to be increased. Where it is known what is restricting the speed, this reason has been listed.

Analysis has been undertaken to advise the extent of line speed improvement which would be required to meet a 10% journey time saving on all routes, with each route analysed in turn below. Time values have been generalised as journey times can differ at different times of the day. Factors determining maximum line speed can be many and complex, and detailed investigation would be required to determine whether these speed upgrades are attainable, what upgrades would be needed and whether they are affordable.

4.3.1. Norwich <> Cambridge

Current journey times in both directions between Norwich and Cambridge usually vary between 1 hour 15 and 1 hour 20 minutes, though some services, particularly those with additional station calls above the standard calling pattern have extended end-to-end journey times. If a 2tph 'semi-fast' and 'stopper' pattern described in section 4.2.2 could be achieved this would allow the 'semi-fast' services to have a more consistent journey time, but it is acknowledged that stakeholders have a desire to reduce journey times further, particularly to be more competitive with travel by road. Norwich and Cambridge are linked by the A11 dual carriageway which closely follows the railway for much of its route, and is undoubtedly an attractive alternative to rail travel for many people, with city to city journeys possible in around 1 hour 20 minutes with light traffic.

Most of the route is either 75mph or 90mph, with the biggest opportunity for journey time improvements to be made by increasing the 75mph sections up to 90mph, as well as some increases in other slower speed sections, such as increasing speeds around the Ely area. The strength of two bridges over the River Great Ouse is the reason for a 35mph speed limit just north of Ely station and these bridges are proposed to be replaced as part of the Ely Area Capacity Enhancements scheme.

Improving speeds on the Ely to Norwich section would also slightly improve journey times on this section of the EMR service to/from Liverpool via Peterborough, Nottingham and Sheffield.

4.3.2. Norwich <> Sheringham

Journey times are currently a barrier to delivering an all-stations service each hour on this route. Without skipping some stations, such as Gunton and Roughton Road, round trips for trains would take more than two hours, meaning either the timetable would 'drift' creating a gap of more than an hour between trains, or more trains would be required to run the service and station dwell times at termini would increase significantly, along with operational costs. This timetable drift can be seen in the current morning and evening timetable where more stations are served.

To offer an all-stations service, the time it takes to travel from North Walsham to Sheringham and back again would need to be reduced to under 60 minutes. As much of the line as possible would need to be increased to at least 75mph, especially the section between North Walsham and Roughton Road station. The 30mph limit on the tight curve between Cromer and Roughton Road

[19] Anglia Route Sectional Appendix, September 2024.

stations would likely not be able to be increased. The type of level crossings on existing 20mph sections between West Runton and Sheringham stations, and a 55-60mph section just south of Worsted station will likely prevent improvements without level crossing upgrades or closures.

4.3.3. Norwich <> Great Yarmouth

Journey times between Norwich and Great Yarmouth via Acle are around 32 minutes in both directions, 2-3 minutes quicker than the slightly longer route via Reedham and Berney Arms. Journey time on this route is crucial to the railway's competitiveness with road transport, including fast buses which operate on the A47.

Current line speeds are 60mph except for a few lower speed sections at both ends and across Whitlingham and Brundall Junctions. In order to reduce journey times, line speeds would need to be increased to 70 to 80mph across at least half of each route. Focussing on the section between Thorpe Junction and Brundall Junction would benefit both the Reedham and Acle routes, as well as Lowestoft and Sheringham services.

4.3.4. Norwich <> Lowestoft

With the service pattern alternating between a stopper service and a fast service throughout the day, journey times vary significantly between the two. The fast service only calling at Oulton Broad North en route takes 35-37 minutes, with the stopping service taking around 8-9 minutes longer.

Like the route to Great Yarmouth, most of the line is 60mph, with some slower sections around junctions and over the two swing bridges near Reedham and Somerleyton. To meet these journey time aspirations, some sections of the line would need to be raised to at least 70mph. The section between Thorpe Junction and Reedham with some larger gaps between stations, including where the Lowestoft service does not usually call (Brundall Gardens and Buckenham) would likely be the most effective area to increase speed and could benefit the Sheringham and Great Yarmouth routes too.

4.3.5. Ipswich <> Lowestoft

End to end journey times on the East Suffolk Line take around 1 hour 26 minutes, and the route has the lowest maximum line speeds of any line in the study area. Most of the line is 55mph, with only the short section between East Suffolk Junction and Westerfield Junction permitted for 60mph. Some lower speed sections also exist, most notably between Woodbridge and Melton where speeds are restricted to between 15 and 40 mph by multiple level crossings used to access riverside properties, including marinas and moorings.

It is likely to be challenging and impractical to improve line speeds on this route without other complementary improvements. The East Suffolk Line has 89 level crossings, across a length of 47 miles between East Suffolk Junction and Oulton Broad North Junction, which averages out at around one level crossing every half a mile. The frequency and types of crossing on the line mean that a significant number of level crossing upgrades and closures would be required before the speed could be increased.

In addition, as explained in section 4.2.6, much of the line is single track, with trains timed to pass each other in the double track sections at Woodbridge, Saxmundham and Beccles. Speeding up trains on this route in particular would mean that these fixed passing points would be in the wrong place. Therefore, if the East Suffolk Line were to be improved, a joint upgrade of both frequency and speed would be required to ensure that both objectives could be met, or one objective would need to be chosen over the other.

4.3.6. Ipswich <> Felixstowe

Current journey times between Ipswich and Felixstowe are around 26 minutes in each direction. The Felixstowe branch has a prevailing line speed of 75mph, with slower sections at each end of the line, and on the East Suffolk Line west of Westerfield Junction. To lower these journey times, some of these 75mph sections would need to be increased. As trains can travel from Ipswich to Felixstowe and back again in under an hour, a single unit can be used with very short dwell times at both termini so there would be no issues with trains crossing each other en route like on the East Suffolk Line, however the pathing

amongst freight trains, which would still be limited to 75mph unless rules are changed, would need to be assessed.

Core Finding:
Improvements to line speeds could bring about improvements on some routes in the shorter-term, however feasibility into whether it would be practical or affordable to achieve the journey time savings outlined in the section has not been possible within this study. Based on analysis undertaken, the following summary can be made for each of the routes;

- **Norwich <> Cambridge** – likely to be challenging to integrate journey time improvements with busy infrastructure at both ends without also impacting other trains.
- **Norwich <> Sheringham** – line speeds, especially north of North Walsham could be raised in order to deliver an all-stations service.
- **Norwich <> Great Yarmouth and Lowestoft** – potential to review both routes together to assess cumulative benefits from improvements on shared infrastructure west of Brundall Junction.
- **Ipswich <> Lowestoft** – no short-term journey time benefits possible due to fixed passing points. Further doubling of the line required if journey time improvements were made.
- **Ipswich <> Felixstowe** – already benefits from good journey times, with only minor gains possible. Any gains potentially constrained by needing to fit between freight services, including on single line sections.

4.4. Freight services

Timetable modelling for passenger services included expected future freight traffic to and from existing terminals within, or accessed via, the study area. The main flows are with various terminals along the Ely-Norwich line as well as Port of Felixstowe container traffic, which included the proposed initial uplifts in Felixstowe traffic expected to be enabled the EACE scheme.

It is expected that freight needs would be able to be accommodated within the passenger uplifts outlined above, notwithstanding the uncertainties and difficulties surrounding the improvement to the Norwich <> Cambridge service. This is because;

- it is not expected that an increase in freight paths will be required on the Ely-Norwich line over today's level, and;
- Felixstowe freight traffic is the driver behind any interventions due in the Ely area, which would need to be accommodated regardless of any passenger service improvements.

It is imperative that improvements on the cross-country freight corridor are made, which are likely to benefit not only Felixstowe traffic, but freight across the region, as more Felixstowe traffic is routed via Ely, rather than London.

It may also be possible to increase the efficiency and value of existing traffic to/from aggregates terminals in the study area through train lengthening, bringing train lengths up to 26 wagons from the existing 14-18 wagons. Infrastructure modifications at terminals would be required to accommodate longer trains.

In the short-term a minor signalling enhancement at Brandon to enable more efficient operations is a priority. Network Rail has identified options to modify the signalling to remove the need for an inefficient 32 mile locomotive run-round to Ely station and back, however no funding is currently available to deliver it.

4.5. Wider considerations

It is not only the timetable and required infrastructure to support needs and aspirations which are important to developing a long-term plan for the rail network in Norfolk and East Suffolk; supporting infrastructure and passenger-facing systems also need consideration.

4.5.1. Depots and stabling

Operating more or longer trains may require additional rolling stock to be procured and maintained. Greater Anglia performs maintenance on the Class 755 fleet at Crown Point depot in Norwich, with stabling sites available in

Norwich, Ipswich and Cambridge. It is likely additional stabling capacity would need to be found if more trains were introduced on this part of the network. Norwich would be the most likely location for this, being the hub of this part of the network. Cambridge, which serves multiple operators and has stabling sites near the station, and Ipswich, are also heavily used, and may also need to be considered. Rolling stock, and therefore depot and stabling needs, would have to be assessed as part of any train service enhancement plans in any part of this study area.

Doubling of the single track swing bridge and Trowse Lower Junction would not only be beneficial for the timing of Norwich <> Cambridge services, but would also allow extra capacity and timetabling flexibility for empty trains to access Crown Point depot, including those from outside the study area.

Due to the proximity of stabling sites adjacent to Norwich and Ipswich stations and the future need for additional platforms at both, station and stabling requirements will need to be considered together to ensure that appropriate levels of facilities will be maintained.

Crown Point depot, Norwich.

4.5.2. Decarbonisation

The UK government is committed to net-zero carbon emissions by 2050. For the railway, this includes reduction and removal of CO_2 emissions from rolling stock by using greener forms of traction. The government's Transport Decarbonisation Plan includes a commitment to the delivery of a net-zero railway by 2050, with sustained reductions in emissions along the way. It is important to note that modal shift to rail currently brings significant environmental benefits over road transport.

To date, rail decarbonisation has primarily been achieved through overhead line electrification, but battery passenger trains are starting to be trialled and introduced in the UK. Examples of battery passenger trains in use and on trial include the Greenford branch trial in London, the introduction of battery passenger trains in Wales, and a trial undertaken by TransPennine Express and Hitachi where batteries were fitted to a Class 802 train. It is expected that battery passenger trains will play a significant role in rail decarbonisation, including in this study area.

As outlined in more detail in Appendix 1, most of the study area is not electrified, with only the main line sections around Norwich, Ipswich, Ely and Cambridge able to support electric traction. Greater Anglia uses a fleet of bi-mode diesel/electric trains which use electric traction where efficient to do so, however they operate in diesel mode the vast majority of the time.

Network Rail published its Traction Decarbonisation Network Strategy (TDNS) in 2020,[20] which set out how each unelectrified route nationwide could be decarbonised by 2050. For this study area, TDNS recommended the following traction types;

- Norwich-Ely – **electrification**
- Norwich-Sheringham, Great Yarmouth and Lowestoft – **hydrogen/battery**
- Ipswich-Lowestoft – **hydrogen/battery**
- Ipswich-Felixstowe – **electrification**

[20] Traction Decarbonisation Network Strategy Interim Programme Business Case, Network Rail, 2020.

Electrification with overhead line is the best solution for long-distance and intercity passenger services and currently the only viable solution for decarbonising heavy freight trains, hence its recommendation for the Felixstowe branch and the Ely-Norwich line. Battery and hydrogen technology is more suited to shorter, lower speed passenger routes.

Network Rail is currently reviewing and refreshing the findings of the TDNS, taking into account particularly the progression of battery technology for passenger trains, which can be supported by partial electrification. It is still expected, however, that full electrification will remain the only viable solution for decarbonisation of rail freight traffic, especially on busy freight corridors such as the route to and from Felixstowe. For other lines of route in this study area, it is likely that a battery passenger trains, supported by partial electrification, represents the best value for money to achieve decarbonised rail services.

It is expected that new bi-mode freight locomotives will be introduced on routes to Felixstowe from late 2025 to take advantage of existing freight routes which are partially electrified. Network Rail is currently exploring the details of electrification of the Felixstowe branch, including assessments of traction power capability.

Whichever forms of traction power are chosen, it is important that consideration to fleet homogeneity should be given to reduce the operational and maintenance inefficiencies which a diverse fleet brings.

4.5.3. Stations and accessibility

It is not expected that any of the stations within the study area will require significant investment to improve pedestrian capacity as a result of growth on the lines within the study area. The arrival of EWR is expected to increase usage at Cambridge station, and Network Rail is working with EWR to define station improvements required.

A passenger being assisted onto an EMR service at Norwich station.

On accessibility, of the fifty stations within the study area, 17 are fully step-free Category 'A' stations, 32 are Category 'B' providing partial or sub-optimal step-free access (such as via ramps which don't comply with modern standards or access via more than one entrance) and one is Category 'C' with no step-free access.[21] The National Rail Enquiries website and National Rail Accessibility Map include details on a station-by-station basis.[22] All of the study area's major stations are Category A, along with most of the larger towns, such as Great Yarmouth, Lowestoft and Felixstowe. Few stations have bridges with lifts, but some do have step-free access to all platforms via separate entrances, hence the high proportion of Category B stations.

As most of the busier stations are fully step free, this area has not benefited from significant funding from the national Access for All programme, with

[21] Step-free categorisation is defined in the ORR's Accessible Travel Policy.
[22] National Rail Accessibility Map.

only Ipswich being an early recipient, benefiting from a new bridge with lifts in 2011. Since then, stations in other parts of the country have taken priority, though Wymondham station has had funding announced to deliver step-free access as part of the CP7 Access for All fund, subject to final DfT funding approval. Other stations which, based on usage and the current level of step-free access, could be considered as higher priorities for improvements include Thetford, North Walsham, Beccles and Woodbridge. Network Rail would encourage funding bids in future rounds of Access for All, or similar funds, as well as encourage local planning authorities to consider whether funding for accessibility or other facility improvements at stations can be leveraged from local developments.

It is not only provision of step-free access which can make stations more accessible for a wider range of people. Modern, high quality facilities including information systems, waiting facilities, toilets and security & lighting can all help to make stations more accessible. Between 2021 and 2023, accessibility audits were carried out at all stations nationally to assess the status of key enabling facilities. For stations within the study area, provision is generally good, with the main improvement areas on top of the step-free options already mentioned being around information provision, wayfinding and shelters on platforms.

4.5.4. Growth of the network

Several stations have been proposed within the study area to either serve existing developments or support proposed housing growth. While Network Rail in principle supports the growth of the network and bringing the railway within reach of more communities, it is important that station promotors consider the effects new stations can have on existing train services, which could be at odds with the aspirations set out in this report. More station calls, particularly on faster lines of route can increase journey times, and where trains are currently tightly timed, additional station calls can necessitate other enabling infrastructure to be provided. Further guidance on investing in stations can be found on Network Rail's website, as well as the Rail Delivery Group's Station Funding Toolkit, which highlights the variety of available funding avenues for new stations and station upgrades, complete with case studies of successful schemes.[23]

4.5.5. Integrated transport

The rail network in the study area connects most of the major towns to its nearby regional centres but is not a convenient transport choice for many smaller towns and villages. As it is not realistic to expect the rail network to expand with new lines to more towns and villages, transport needs to be integrated where beneficial to do so to allow more people to use the rail network. Examples of how networks could be better integrated are wide and variable in terms of cost, complexity and responsibility, and could include;

- cross-referencing of bus and rail timetables to advise suitable connections;
- improved walking or cycling routes to railway stations;
- amended bus routes to call closer to stations, and;
- restructured timetables to shorten interchange times.

Linking together bus and train better is an initiative which is now being extensively developed in other parts of the country, including in South West England by Great Western Railway and local bus operators.[24] While not in the remit of this study to investigate individual cases of bus and rail integration, it is encouraged that where practical and feasible to do so, integration opportunities are implemented not only for the benefit of the passenger but also the mutual benefit of rail and bus operators.

Integrated transport is a growing priority at all levels of government and Transport East is developing initiatives to improve rural mobility and transport integration, including by establishing a Rural Mobility Centre of Excellence, compiling a wealth of research and examples of national and international good practise across a range of subjects.[25]

[23] Investment in Stations, Network Rail, 2023, part of Network Rail's suite of built environment guidance documents, and Station Funding Toolkit, Rail Delivery Group, 2024.
[24] GWR's integrated transport boosts bus and rail, Modern Railways, August 2023.
[25] Rural Mobility Centre of Excellence, Transport East.

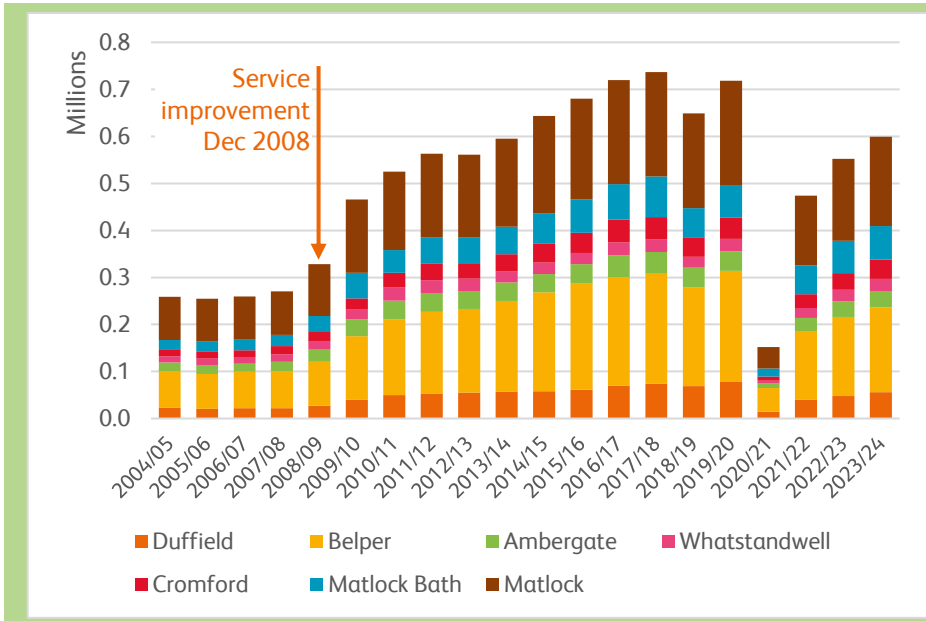
Developing successful arguments ultimately leading to investment in transport in rural areas is often challenging, and one of the standout recommendations from Transport East's recent Rural Connections report is a recommendation to central government to include a "social value module for transport business case appraisals including monitoring and evaluation".[26]

The current five-case model is influenced heavily by economic factors making it difficult to make a positive case for investment in rural transport networks, where the economic value could be relatively low, but the social value for thinly spread, rural communities could be relatively high. A formal social value metric could help promotors make more positive cases for investment in both rail improvements as well as complementary schemes to deliver wider integrated transport improvements.

Case Study 3 – Derwent Valley Line, Derbyshire

A timetable change in 2008 enabled a significant service improvement on the Derwent Valley Line in Derbyshire, which resulted in strong passenger growth. The service was improved from a two-hourly service between Matlock and Derby to an hourly service extended beyond Derby to Nottingham, offering greatly improved convenience and connectivity.

As with the other examples from Falmouth and on the East Suffolk Line, the line has a mixture of town and village stations, and the timetable change led to an immediate uplift in entries and exits at all stations, particularly in the larger towns of Matlock and Belper. Overall usage on the line increased from around 250,000 entries and exits before the improvement, growing to over 700,000 in before the Covid pandemic. This growth has been sustained over many years, once again demonstrating the key role train frequency has on driving passenger usage and mode shift.



[26] Rural Connections: Transport challenges and opportunities for communities in the East, Transport East, March 2024.

4.5.6. Industry Geographic Financial Model

Although rail enhancements can often be viewed through the lens of capital costs of infrastructure upgrades, section 2.1 highlighted the whole-industry approach taken by Network Rail and partners in the production of this strategic advice. A key component of whole-industry planning is working towards the financial sustainability of the rail industry, factoring in considerations such as operating costs and the maintenance and renewal of railway infrastructure. As rail reform continues in line with the government's consultation launched in early 2025,[27] Great British Railways will continue to prioritise value for rail users and taxpayers.

It is with this in mind that Network Rail has worked with the relevant TOC and used the Industry Geographic Financial Model (IGFM) to explore the financial implications of any train service changes within the study area. In general, this highlighted that existing services do not take enough revenue through the farebox to cover costs, and therefore that without a transformational change in ridership, any service increases would require a significant ongoing subsidy. On the East Suffolk Line and Norfolk branches alone, for example, the current estimated deficit is in excess of £50m per year accounting for Network Rail and TOC costs and revenues. An operating subsidy in excess of £7m a year is also estimated to be required on the Felixstowe branch.

IGFM data does not account for the social value of the railway, its environmental or wider economic benefits, and evidence has shown that improvements to services lead to an uplift in ridership. The model does however highlight that significant service uplifts are unlikely to be justifiable on their profit and loss implications alone, pointing to the difficulty of building a traditional transport planning business case for new services. This pushes the emphasis onto local partners and funders to highlight the wider benefits of their aspirations. The rail industry welcomes the opportunity to work with partners of opportunities to maximise the benefits case for aspirations and make sure that any specific proposals consider wider strategic rail implications so stand the best chance possible of success.

Oulton Broad swing bridge on the East Suffolk Line

[27] 'A railway fit for Britain's future' consultation, Department for Transport.

5. Findings

This section sets out answers to the study's Strategic Questions and summarises the findings and recommendations set out in detail in section 4.

5.1. Responses to the Strategic Questions

Headline – What are the strategic choices for the rail network in Norfolk and East Suffolk to improve passenger and freight customer outcomes?

Analysis of likely demand growth over the next 25 years shows that demand-led capacity issues will be predominantly limited to the Norwich <> Cambridge route, which should be prioritised for improvements in this area, and will most likely be delivered by train lengthening. Other improvements to frequency or line speed will be largely led by stakeholder preference and in a challenging economic climate will need to present strong strategic and socioeconomic cases for change to compete against other local and national proposals to secure government investment. The Sheringham branch and East Suffolk Line are suggested to be next priority options behind the Norwich <> Cambridge route.

As exhibited by the case studies throughout this document, passenger growth on rural routes can be successful following relatively modest investments, often developed and funded collaboratively by local authorities, train operators and Network Rail. Schemes which can demonstrate financial support from local transport authorities and private stakeholders are likely to be viewed favourably if central government funding was also to be sought.

For freight, expected modest growth to and from the small terminals within the study area is expected to be able to be accommodated due to the number of unused paths existing in the timetable currently. To benefit cross-country intermodal freight to/from Felixstowe it is necessary to deliver improvements in the Ely area (and elsewhere), and stakeholders may wish to consider their priorities for passenger paths which could be enabled by the project.

Passenger rail connectivity – How can train services be improved to better serve existing passengers and attract new ones in both the short- and long-term?

This document sets out by line of route what improvements would be required to provide a half hourly passenger service across the study area. On most routes, infrastructure improvements – usually short sections of track doubling and associated signalling changes – will be required to allow services to pass each other, some of which could be shorter term options, especially if driven with funding provided at a local level. As demonstrated in the three case studies in this document, these types of upgrades can lead to modal shift and drive passenger numbers up on rural and branch routes.

Other improvements, such as speed improvements on the East Suffolk Line, are likely to be much longer term aspirations due to the scale of intervention which will be needed. For the Norwich <> Cambridge route, the full extent of infrastructure improvements has not been able to be determined due to the level of uncertainties created by the ongoing East West Rail project and the high priority Ely Area Capacity Enhancements.

Supporting freight growth – What opportunities are there to support new freight flows and growth in line with the government's freight growth target?

Freight traffic in the study area is limited with most terminals receiving one or two trains a week. Even in a high growth scenario, it is likely that sufficient paths will be available for additional traffic as there are currently plenty of freight paths within the timetable on the study area's main freight route between Norwich and Ely. Network Rail's freight development team is working with freight operating companies, terminal owners and local authorities to explore options for growth at existing freight terminals such as at Snetterton near Eccles Road station, and also new markets and routes.

To meet the national freight growth target the most significant contributions to this will be on the cross-country corridor carrying container traffic to/from Felixstowe. Upgrades at Ely and Haughley Junction in the short-term would be required to enable this growth.

Whole industry considerations – What supporting factors need to be considered to deliver improvements to the rail network and passenger experience in Norfolk and East Suffolk?

Beyond train service and infrastructure improvements, upgrades to supporting parts of the overall rail system may also be required. Options also exist to modernise the network and improve passenger experience.

It is likely depots and stabling sites would need to be enhanced if more trains were required to operate more passenger services in the area. The extent of the need and suitable locations would need to be assessed during future option development.

In terms of environmental sustainability and decarbonisation, most of the lines in this area are not likely to be feasible for electrification with overhead wires, given its high capital cost, with only the Felixstowe branch and possibly the Ely-Norwich line suitable. For other routes, alternative forms of traction will be needed, most likely battery.

Transport East has undertaken research into multi-modal and rural connectivity to promote initiatives which can be implemented to improve public transport in rural areas. More bus-rail integration, such as that seen in South West England could be a model to follow in this area.

Ensuring stations are accessible for all is a key factor giving people confidence to use the rail network. While most stations are step-free, at some stations it is suboptimal; for example, requiring the use of alternative entrances. Busier stations without high quality step-free access include Beccles, Thetford, Woodbridge and North Walsham.

The majority of the stations in this area are in villages with very small population catchments, but there are also several major towns, many of which are also tourism destinations, with relatively high levels of usage. The train service provides vital transport links for local people and visitors in all settings. The case studies in this document highlight how usage responds on branch lines when services are improved, though proving a positive economic case, especially in the current era of financial sustainability is likely to be challenging.

5.2. Route-by-route summary

Table 9 overleaf summarises this study's findings by line of route, summarising how stated aspirations could be achieved, and gives a rating between 'Low' and 'Very high' for both complexity and capital cost.[28] Likely cost bands are as follows;

Low……<£10m	High……£20-50m
Med……£10-20m	Very high…>£50m

Additional ongoing operating costs, such as train crew, fuel, and maintenance of track and train could also be significant for some options, as well as rolling stock leasing costs if more trains are needed.

Table 9 also includes a suggested priority level, defined as;

1. Higher priority, and potential item for RNEP or similar funding mechanism if funding is required.
2. Beneficial scheme, but unlikely to be government priority. Network Rail could support locally led development.
3. Not a priority at this time.

These details could be used by local partners as a guide to prioritise improvement options across the area.

[28] Note, no cost estimating has not been undertaken for this study and these ratings are intended to serve as a guide only at this stage. Professional cost estimating would need to be carried out at the next stage of development. Determining a cost or complexity rating has not been deemed possible for line speed changes as many of the limiting factors of line speeds have not been identified at this stage.

Line of route	Aim	Required improvements	Likely complexity	Likely capital cost	Potential next steps for funders	Suggested priority level
Norwich <> Cambridge	Peak capacity increases	• Platform extensions for longer trains, and any associated improvements, e.g. to level crossings	Low to Med depending on scope	Low to High depending on scope	• Undertake option development for various configurations of train (e.g. 3+3, 3+4 and 4+4).	**1**
	2tph	• Trowse bridge and/or junction doubling • Ely area upgrades • Other improvements and timetable changes TBD	Very high	Very high	• Carry out further assessment of frequency options once decision on the EWR and EACE projects are made. • Undertake detailed analysis of improving indirect connectivity in the short-term.	**2**
	Faster journeys	• Increase 75mph sections to 90mph	TBD	TBD	• Commission study to investigate in detail line speed improvement options.	**2**
	Freight growth	• Upgrade signalling at Brandon to remove inefficient loco run-round • Potential terminal upgrades TBD	Low	Low	• NR freight development team to continue to seek funding for Brandon works. • Continue working with freight community to grow existing terminals.	**1**
Norwich <> Liverpool	Peak capacity increases	• Lengthening of trains to 3- or 4-car in peak times.	Low	Low	• Ensure availability of fleet for operating longer trains.	**1**
Norwich <> Sheringham	2tph	• Double track near Roughton Road	Med to High	Med to High	• Develop combined improvement package of double track and line speed improvements. • Consider trial of second service (as far as North Walsham).	**2**
	All-stations calls	• Reduce journey times north of North Walsham	TBD	TBD		
	Faster journeys					
	Hourly calls at Salhouse (short-term)	• Timetable change to create time for additional station calls (note, this would slightly increase journey times)	Low	N/A	• GA to consider timetable change to support developments	**1**
Norwich <> Great Yarmouth	2tph (1tph via Acle; 1tph via Reedham)	• No network upgrades expected if ECS moves made at Norwich, or, • Additional platform required at Norwich if ECS moves undesirable	Med (for platform)	Med (for platform)	• Continue with current peak hours service structure. • Consider trial of 2tph service across both routes.	**2**
	Faster journeys	• Increase some sections to 70 or 80mph	TBD	TBD	• Commission study of potential line speed improvements for Great Yarmouth and Lowestoft services.	**2**

Line of route	Aim	Required improvements	Likely complexity	Likely capital cost	Potential next steps for funders	Suggested priority level
Norwich <> Lowestoft	2tph	• No network upgrades expected	N/A	N/A	• Further development not recommended at this time due to low usage, however, a trial of second service in peak hours could be considered.	**3**
	Faster journeys	• Increase some sections to 70 or 80mph	TBD	TBD	• Commission study of potential line speed improvements for Great Yarmouth and Lowestoft services.	**2**
Ipswich <> Lowestoft	2tph – south	• Double track at Wickham Market • Double track Ipswich station to East Suffolk Jn • Additional platform at Ipswich station • Retiming of nuclear flask train	High	Very high	• Investigate with FOC whether the timings of the nuclear flask train can be changed. • Undertake initial development on 'south' options to scope exact works required, especially between East Suffolk Jn and Ipswich station. • Work with Sizewell C Ltd on Leiston options.	**2**
	Leiston service (extension of 'south' service or shuttle)	• New station in Leiston • Line speed increase on branch • Track doubling for service extension	Med	High		
	2tph – north	• Double Oulton Broad North Jn to Oulton Broad South station	Med	Med	• Further development not recommended at this time.	**3**
	Faster journeys	• Increase some sections to 70mph • New passing points	TBD	TBD	• Further development not recommended at this time.	**3**
Ipswich <> Felixstowe	2tph	• Full branch doubling (long-term F2MN option)	High	Very high	• Further development not recommended at this time.	**3**
	Faster journeys	• Increase some sections to 80mph	TBD	TBD	• Further development not recommended at this time.	**3**

Table 9 – Summary of findings.

In summary, to make improvements to the passenger train service in this area, on most routes, infrastructure upgrades such as track doubling will be required. Unfortunately, the routes which show the most demand and likely the highest potential for growth are the hardest to make improvements, especially on the Norwich <> Cambridge route. Conversely, those with the lowest demand appear to be the routes where service improvements would be simplest to achieve. Difficult choices on which aims to prioritise, such as journey times versus frequency or passenger versus freight will need to be made on some routes.

For freight, no specific improvements are expected to be required on the Norwich-Ely line, and this study reiterates the needs for infrastructure upgrades to facilitate cross-country freight to/from Felixstowe.

For all frequency and journey time improvement options, it is likely that multiple level crossings will need to be upgraded or closed, which is likely to be costly and challenging component of any package of upgrades.

5.3. Concluding points, phasing and development

As mentioned in section 2, this study forms a part of an evolving suite of rail investment advice Network Rail produces on behalf of the industry across the Anglia route. Updated strategic advice for the Great Eastern Main Line, which interfaces with all of the routes considered in this study is now in development, to be completed later in 2025.

This study has not identified that there are any necessary phasing choices between lines of route, so the order of further development will be largely shaped by stakeholder and funder preference, guided by factors such as potential business case strength, cost, availability of joint funding mechanisms and ease of delivery. Within lines of route themselves, some phasing is recommended, such as upgrading the southern half of the East Suffolk Line first due to its greater usage, connectivity at Ipswich and potential Leiston connectivity.

In terms of developing these findings further, it is likely to be challenging to attract government funding to develop a Strategic Outline Business Case within the Rail Network Enhancements Pipeline due to the level of competition for funding for rail improvement proposals nationally. It will also be a challenge to develop a strong business case on any of the lines of route, mainly due to the strength of the economic case, with the cost of infrastructure delivery and ongoing additional operational costs likely to weigh heavily.

Strong leadership from local transport authorities and stakeholders will therefore be essential for making the case for change and for funding early development and potentially delivery. As the case studies throughout this document have shown, joint funding to share the cost burden can be a factor in successfully advancing proposals such as these through their development process and onto delivery.

The potential devolution of powers to a Norfolk and Suffolk Combined Authority may be a vehicle to moving some of these options into development, and established Combined Authorities have a track record in successfully funding rail projects, such as Cambridge North and Soham stations by the Cambridgeshire & Peterborough Combined Authority, and ongoing works at Darlington station by the Tees Valley Combined Authority. Network Rail welcomes working with stakeholders to develop these options further, for example to identify precise enhancement options, their costs and therefore likely economic cases.

To attempt to develop the strategic rationale for the doubling of services and to gauge the potential level of demand on some routes, trials of some services could be undertaken to examine how demand responds. This could potentially be considered on the Great Yarmouth, Lowestoft and Sheringham routes.

6. Appendix 1 – Detailed line of route profiles

The pages below give a detailed overview of the individual lines which make up the study area, illustrating;

- The **regular passenger and freight services** which operate. Freight circulations quoted are typical actual movements per week. More paths exist in the Working Timetable but are not always used.

- The **top journey pairings** to and from stations on the line. This is informed by 2022/23 data sourced from the Rail Data Marketplace. The total figures shown are the sum of journeys in both directions. Since compiling data for this study, 2023/24 data has been released, and a basic analysis of this shows no major changes in the key flows identified.

- **Station usage and trends**, informed by several years' data sourced from the ORR Data Portal. Charts illustrating usage trends do not show all stations for legibility.

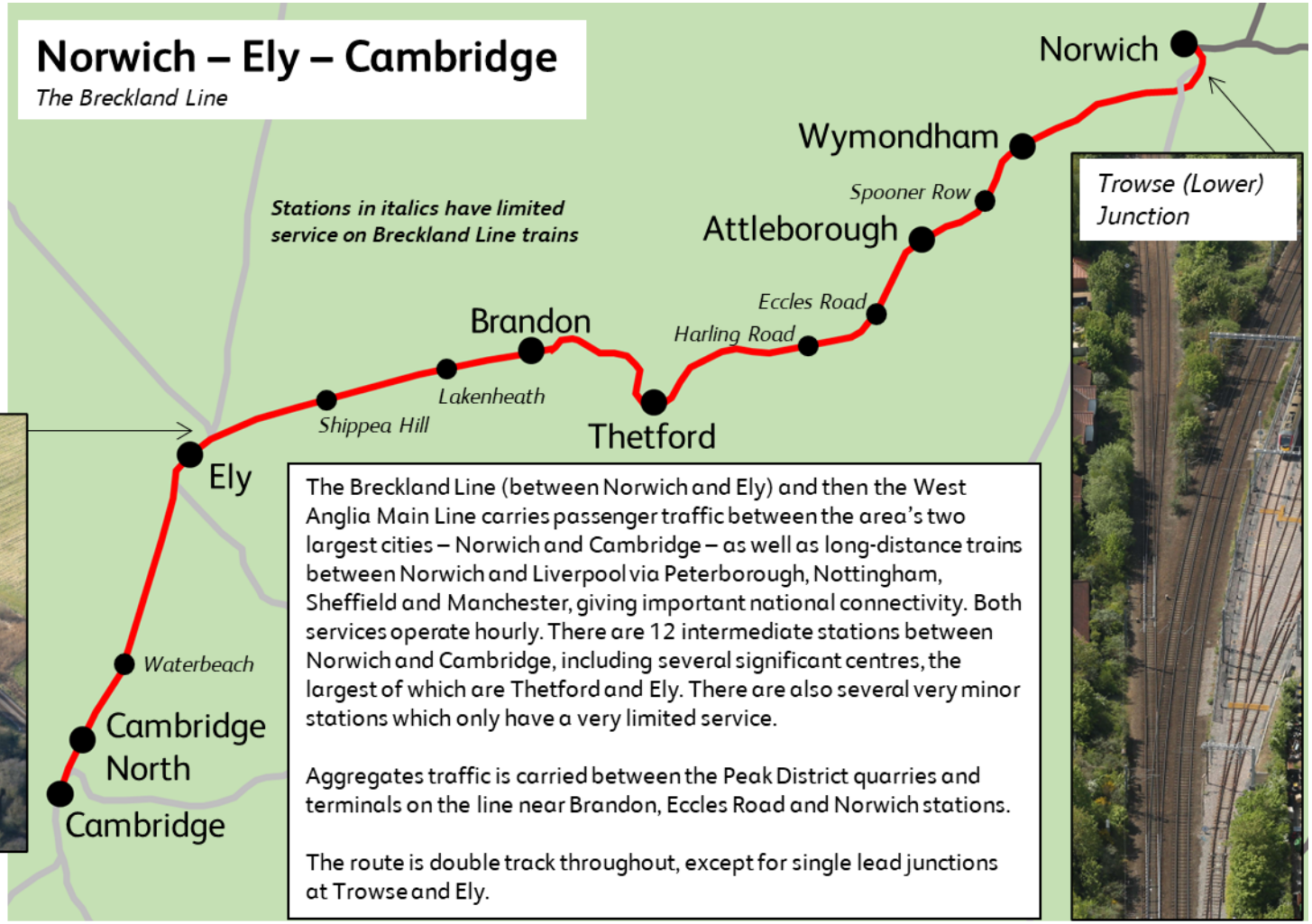
- The **infrastructure and its capabilities**, with descriptions largely informed by Network Rail's Sectional Appendix. The infrastructure diagrams shown are not to scale and for legibility do not include all crossovers, sidings or complex track layouts such as those at major stations. For full, details, see the Sectional Appendix on Network Rail's website.

A Greater Anglia service at Cantley.

Norwich – Ely – Cambridge

The Breckland Line

Ely North Junction



Trowse (Lower) Junction

The Breckland Line (between Norwich and Ely) and then the West Anglia Main Line carries passenger traffic between the area's two largest cities – Norwich and Cambridge – as well as long-distance trains between Norwich and Liverpool via Peterborough, Nottingham, Sheffield and Manchester, giving important national connectivity. Both services operate hourly. There are 12 intermediate stations between Norwich and Cambridge, including several significant centres, the largest of which are Thetford and Ely. There are also several very minor stations which only have a very limited service.

Aggregates traffic is carried between the Peak District quarries and terminals on the line near Brandon, Eccles Road and Norwich stations.

The route is double track throughout, except for single lead junctions at Trowse and Ely.

Passenger services

Route	Off-peak tph	Typical journey time
Norwich <> Cambridge/Stansted Airport	1	80 mins (Norwich-Cambridge)
Norwich <> Liverpool Lime Street	1	50 minutes (Norwich – Ely)

Freight services

Route	Typical circulations	Commodity hauled
Norwich/Brandon/Eccles Road <> Peak District quarries	7 per week	Aggregates
Lowestoft <> Whitemoor	1 per week	Aggregates

Journeys

Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
*Ely <> Cambridge **	*929,454*
*Cambridge <> Stansted Airport **	*366,136*
*Cambridge North <> Cambridge **	*213,968*
Norwich <> Cambridge	140,846
Thetford <> Norwich	107,820
Wymondham <> Norwich	100,854
Attleborough <> Norwich	99,378
*Cambridge North <> Ely **	*90,566*
Norwich <> Stansted Airport	76,922
Norwich <> Peterborough	69,994

** Most of the journeys on section between Ely and Cambridge will be made on other train services, including Great Northern and CrossCountry.*

Journeys on the Norwich-Cambridge route are dominated by flows at its western end. Four trains per hour typically run between Ely and Cambridge, so most of these journeys will therefore be made on other services. The largest flow made purely on trains on this route is between Norwich and Cambridge, and most of the remaining top 10 flows involve journeys to/from either Norwich or Cambridge, reflecting their status as major regional centres. Local journeys between stations along the line are comparatively low, numbering in the thousands rather than tens of thousands.

Usage on the line is generally strong, and has recovered well since the pandemic at the four towns along the route, shown below. There are, however, five rural stations with very low usage and limited calls.

Station usage

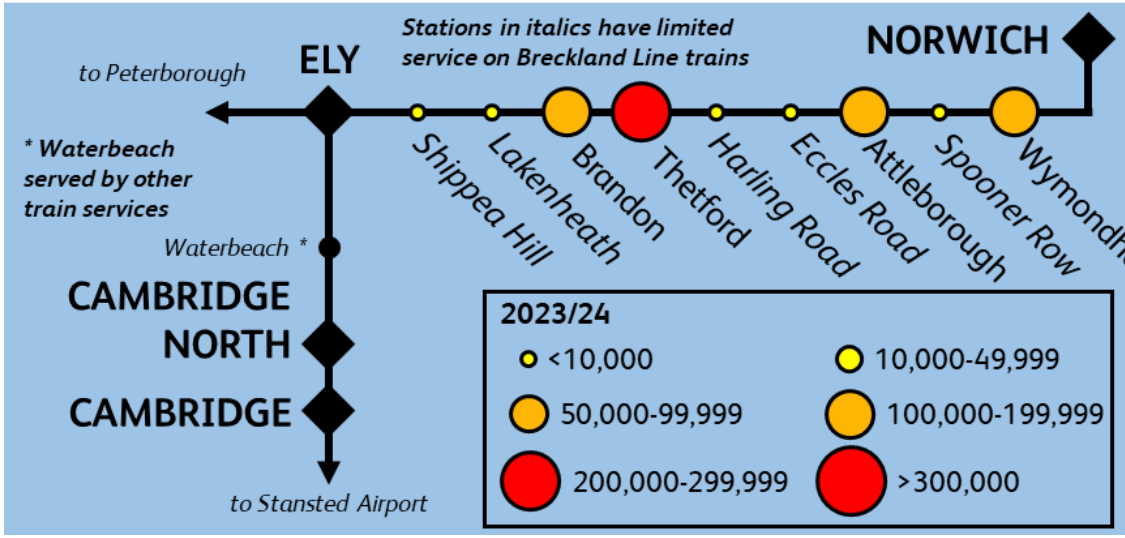
Station	2019/20	2023/24	2019/20 - 2023/24 % change
Wymondham	196,036	186,470	-4.9 %
Spooner Row	*276*	*698*	*152.9%*
Attleborough	158,464	172,376	8.8 %
Eccles Road	*2,390*	*1,568*	*-34.4%*
Harling Road	*3,794*	*3,364*	*-11.3%*
Thetford	286,700	295,514	3.1 %
Brandon	111,572	119,300	6.9 %
Lakenheath	*416*	*480*	*15.4%*
Shippea Hill	*164*	*70*	*-57.3%*

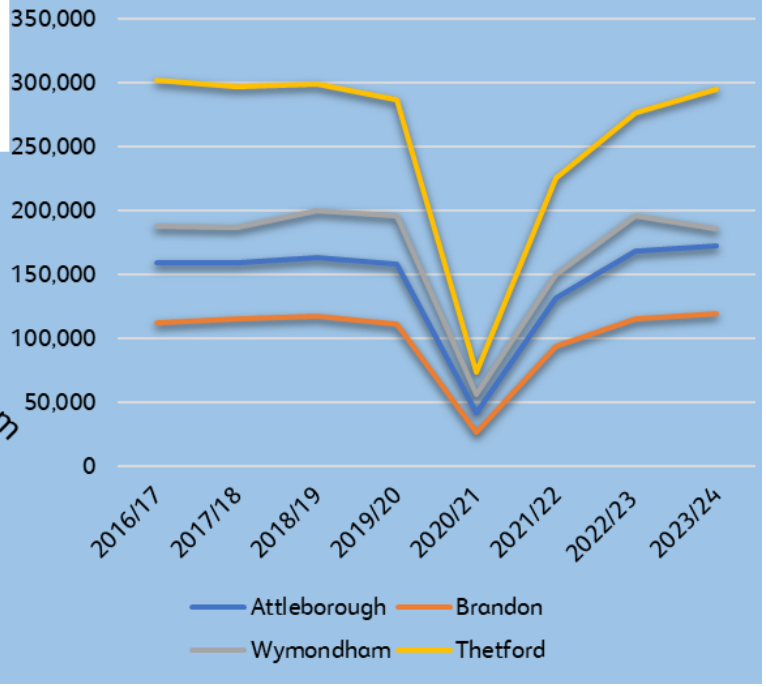
Yellow – journeys to nearest major town/city

Blue – other local journeys

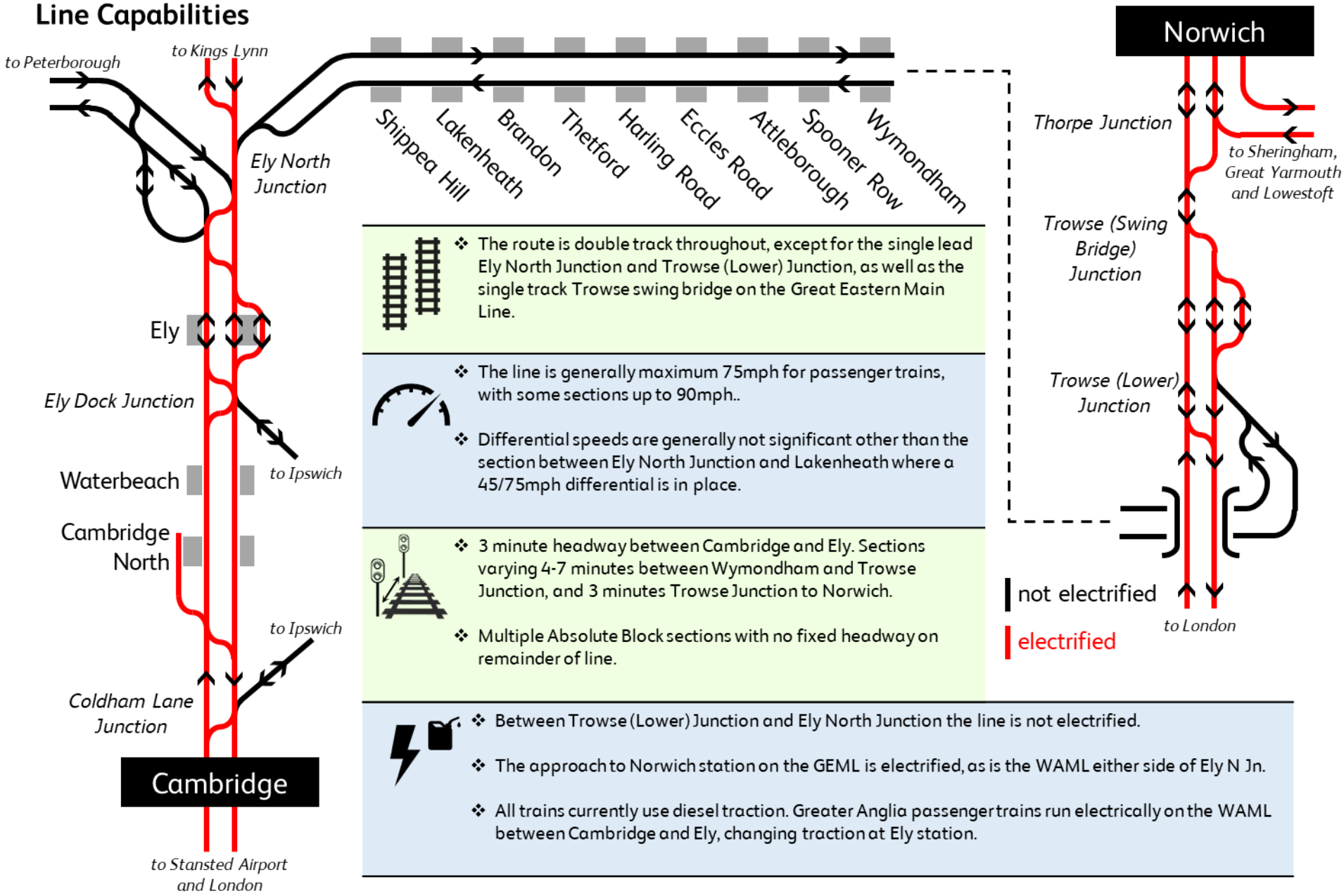
Green – London journeys

Orange – non-London long-distance journeys





Line Capabilities

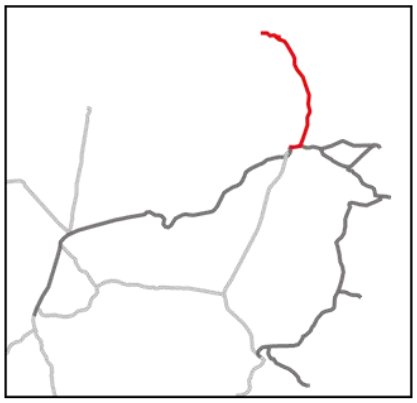


- The route is double track throughout, except for the single lead Ely North Junction and Trowse (Lower) Junction, as well as the single track Trowse swing bridge on the Great Eastern Main Line.

- The line is generally maximum 75mph for passenger trains, with some sections up to 90mph..
- Differential speeds are generally not significant other than the section between Ely North Junction and Lakenheath where a 45/75mph differential is in place.

- 3 minute headway between Cambridge and Ely. Sections varying 4-7 minutes between Wymondham and Trowse Junction, and 3 minutes Trowse Junction to Norwich.
- Multiple Absolute Block sections with no fixed headway on remainder of line.

- Between Trowse (Lower) Junction and Ely North Junction the line is not electrified.
- The approach to Norwich station on the GEML is electrified, as is the WAML either side of Ely N Jn.
- All trains currently use diesel traction. Greater Anglia passenger trains run electrically on the WAML between Cambridge and Ely, changing traction at Ely station.



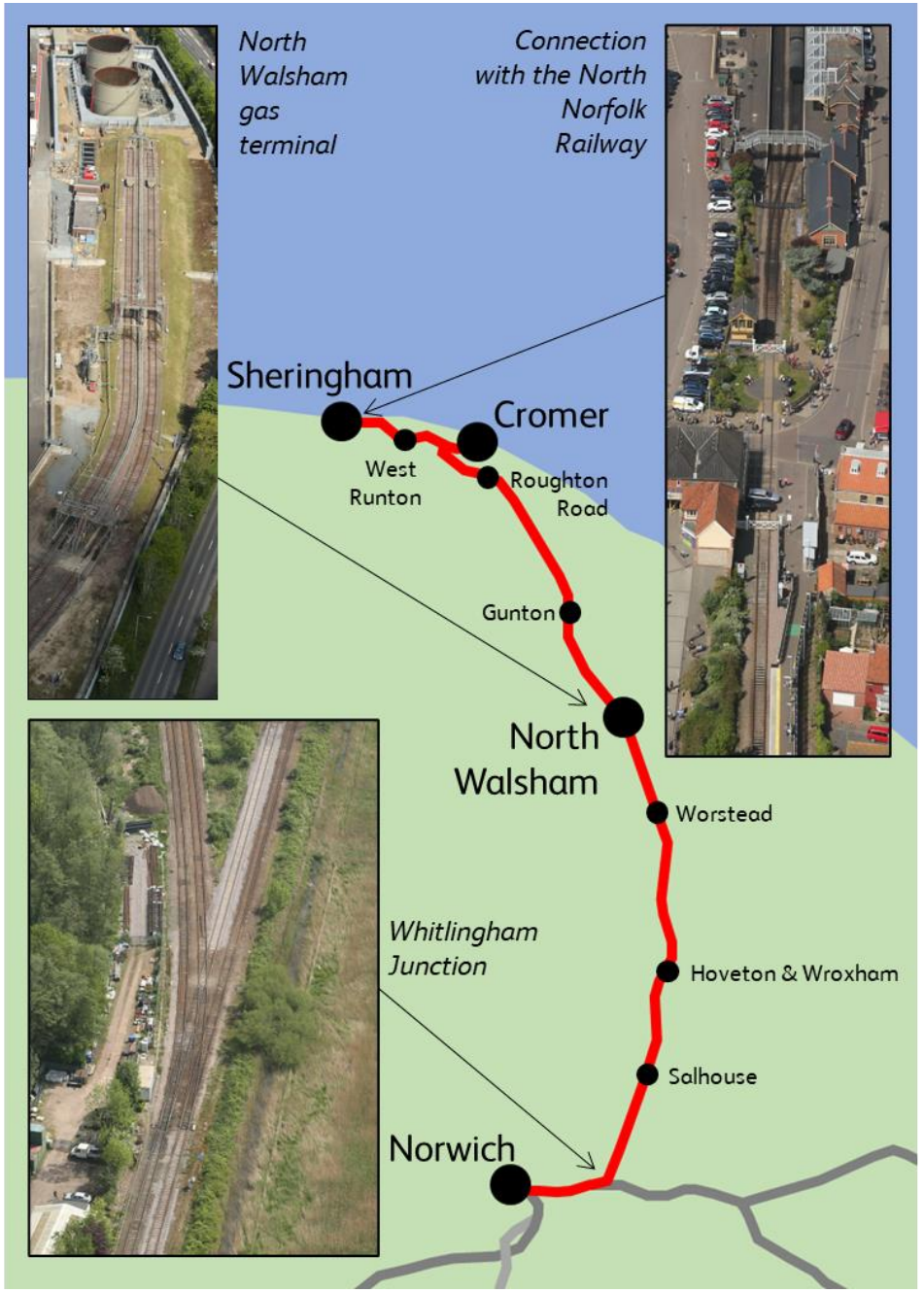
Norwich – Sheringham

The Bittern Line

The line between Norwich and Sheringham branches from the route to Great Yarmouth and Lowestoft at Whitlingham Junction and is a mix of single and double track sections. Passenger services call at most stations hourly, however gaps of two hours between trains exist at some stations and gaps more than an hour also exist in the timetable at certain times of the day.

There are ten stations on the branch (not including Norwich); the busiest being North Walsham, Cromer and Sheringham.

Gas condensate is carried from North Walsham to Harwich, and there is also a connection with the heritage North Norfolk Railway at the very end of the line.



Passenger services

Route	Off-peak tph	Typical journey time
Norwich <> Sheringham	1	55-60 mins

Freight services

Route	Typical circulations	Commodity hauled
North Walsham <> Harwich	1 per week	Gas condensate

Journeys

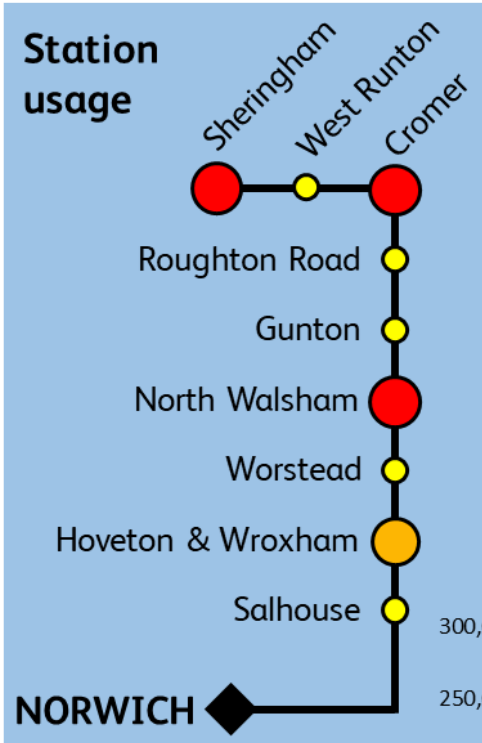
Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
North Walsham <> Norwich	111,750
Cromer <> Norwich	93,370
Sheringham <> Norwich	89,682
Hoveton & Wroxham <> Norwich	61,124
Sheringham <> Cromer	39,216
Cromer <> North Walsham	39,124
Sheringham <> North Walsham	25,004
Sheringham <> London Liverpool Street	21,686
Worstead <> Norwich	17,280
Cromer <> London Liverpool Street	16,180

Yellow – journeys to nearest major town/city
Blue – other local journeys
Green – London journeys
Orange – non-London long-distance journeys

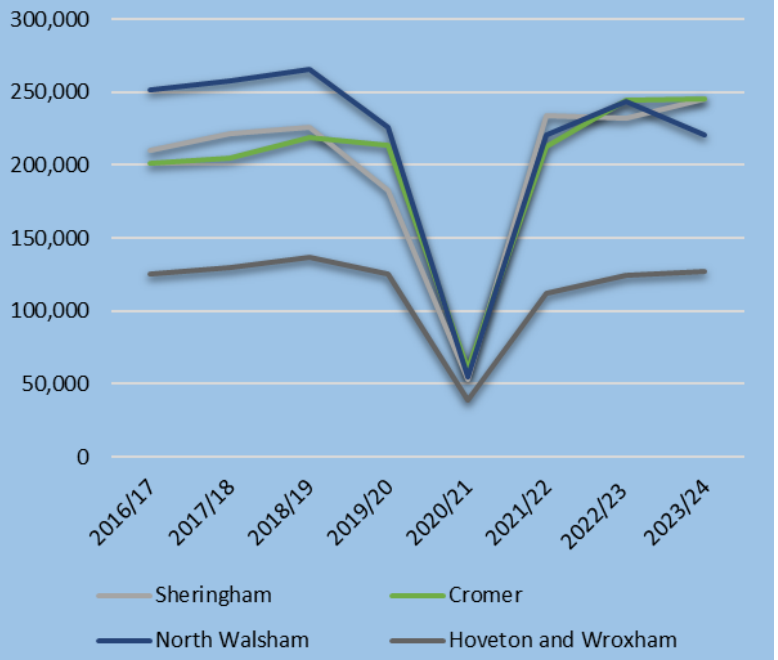
Most journeys on the Norwich-Sheringham route are between the three major towns and Norwich, with secondary flows between each of the towns on the line. Journeys between London and the seaside towns of Cromer and Sheringham also feature, but are comparatively low.

The three main towns all have similar levels of usage in 2023/24, and all but one station on the line had a higher usage in 2023/24 than 2019/20, indicating strong recovery post-Covid. The chart opposite shows the usage in recent years of the four largest stations.

Station usage



Station	2019/20	2023/24	2019/20 - 2023/24 % change
Sheringham	182,288	244,950	↑ 34.4 %
West Runton	26,076	34,194	↑ 31.1 %
Cromer	213,936	245,658	↑ 14.8 %
Roughton Road	21,552	21,736	→ 0.9 %
Gunton	18,560	30,084	↑ 62.1 %
North Walsham	226,116	221,002	→ -2.3 %
Worstead	25,404	27,188	↗ 7.0 %
Hoveton & Wroxham	125,260	126,828	→ 1.3 %
Salhouse	9,856	13,566	↑ 37.6 %



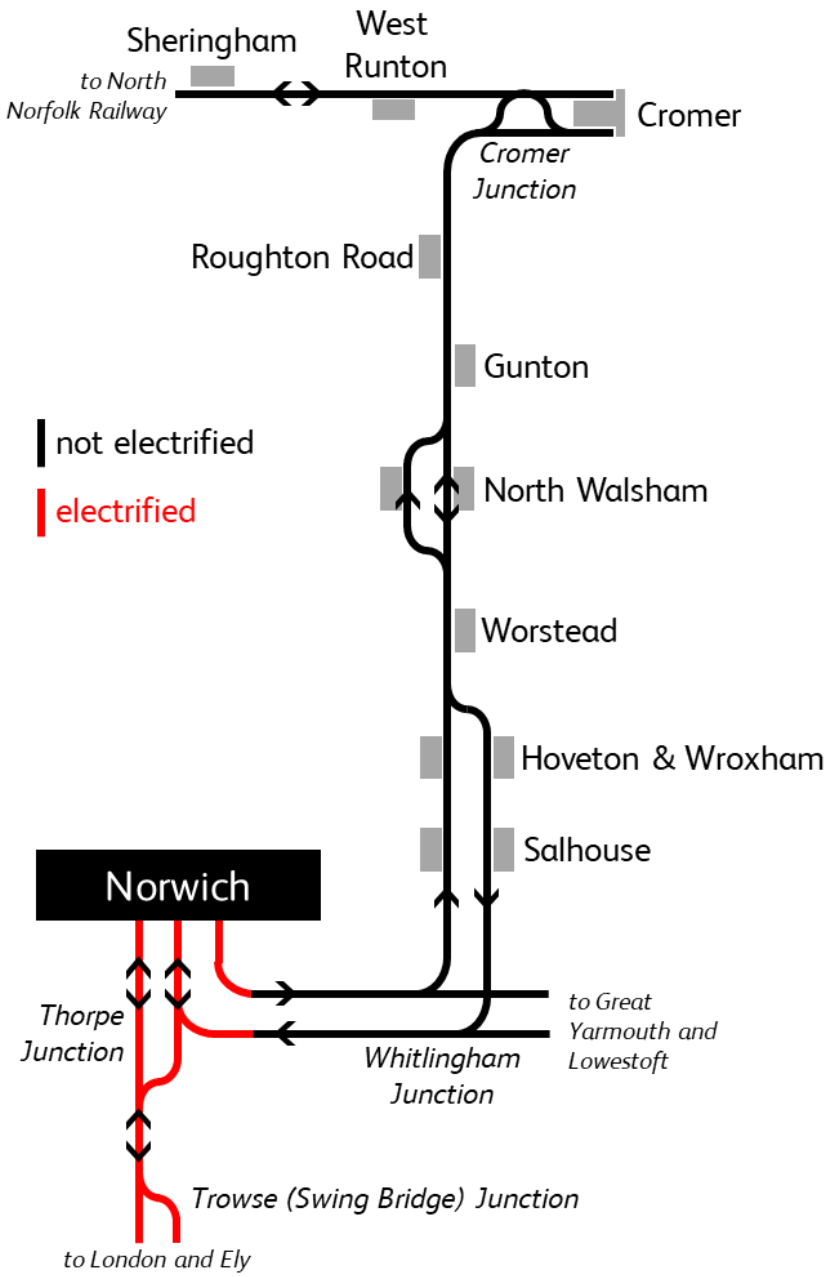
Line Capabilities

- Double track for 7 miles from Whitlingham Junction to Hoveton & Wroxham station.
- Single line for 17.5 miles between Hoveton & Wroxham and Cromer, with a passing loop at North Walsham station.
- North of North Walsham and the 4 miles between Cromer and Sheringham was originally built as single track, so most structures are built for one line only. The section between Hoveton & Wroxham and North Walsham was originally double track and subsequently singled.

- Mainly 75mph for multiple unit trains south of North Walsham.
- Mainly 55mph for multiple unit trains north of North Walsham and between Cromer and Sheringham.
- Localised slower speeds on approaches to single line sections.

- Four minute headway between Thorpe Junction and Whitlingham Junction.
- On the branch line north of Whitlingham Junction, signalling headway sections vary up to 12 minutes in length.

- No electrification, except on the approach to Norwich station, as far as the reception roads to Crown Point depot.
- All trains currently use diesel traction.



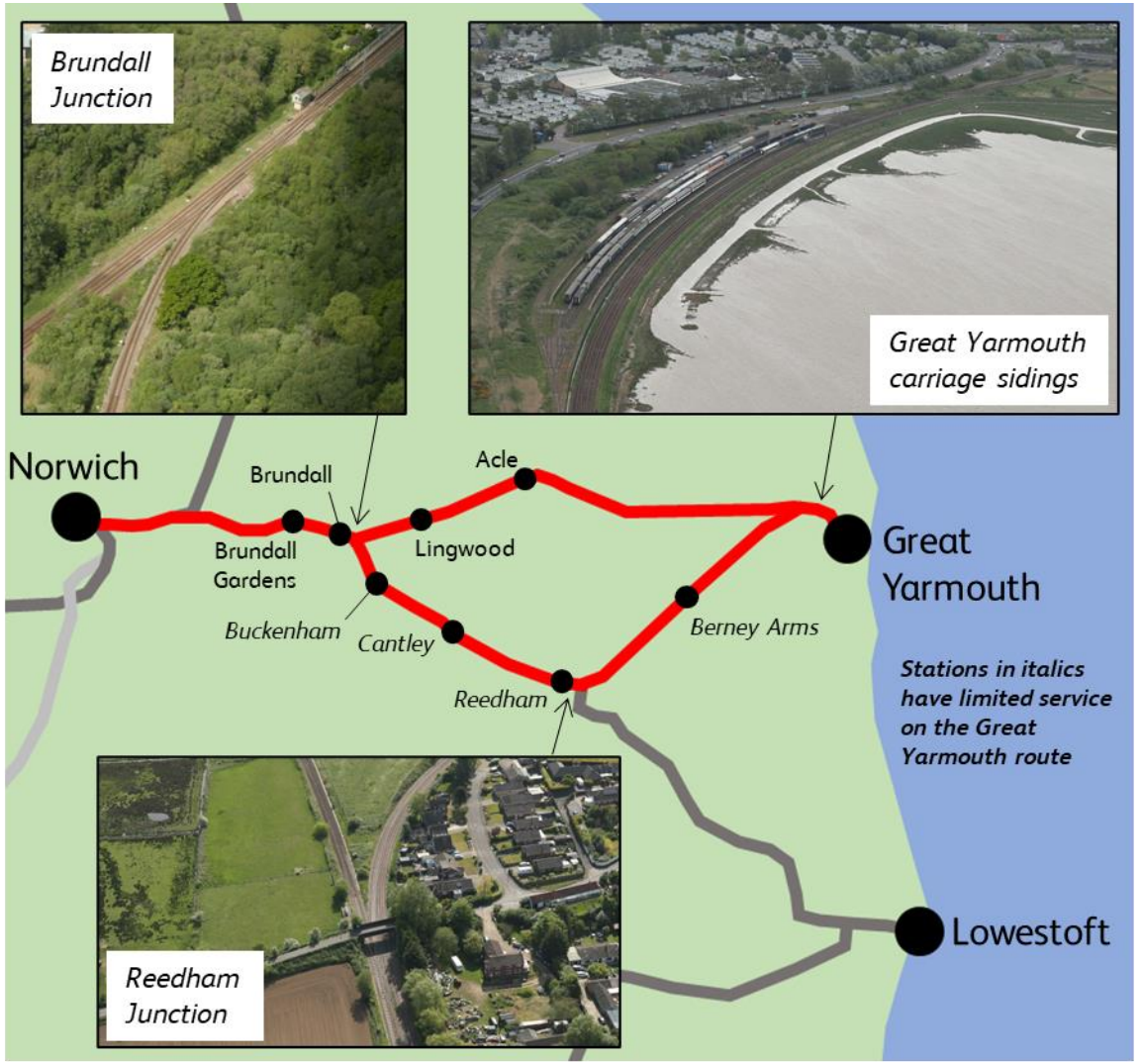
Norwich – Great Yarmouth

Part of the Wherry Lines

There are two routes between Norwich and the coastal town of Great Yarmouth, both of which have a mixture of single and double track sections. The shortest route via Acle generally has an hourly service, except for a few times throughout the day where the service instead travels via Reedham on the line towards Lowestoft. This leads to some two hour gaps in the off-peak timetable via Acle. The Sunday timetable splits services much more evenly between the two routes. Limited peak hours strengthening does occur, with extra services running in both directions. Additional services also operate in the summer.

There are five stations, not including Norwich, on the main route via Acle, plus another four on the route via Reedham.

There are no regular freight services, although a rolling stock leasing company does operate out of the carriage sidings near Great Yarmouth station.



Passenger services

Route	Off-peak tph	Typical journey time
Norwich <> Great Yarmouth (via Acle)	1	32 mins
Norwich <> Great Yarmouth (via Reedham)	Limited	36 mins

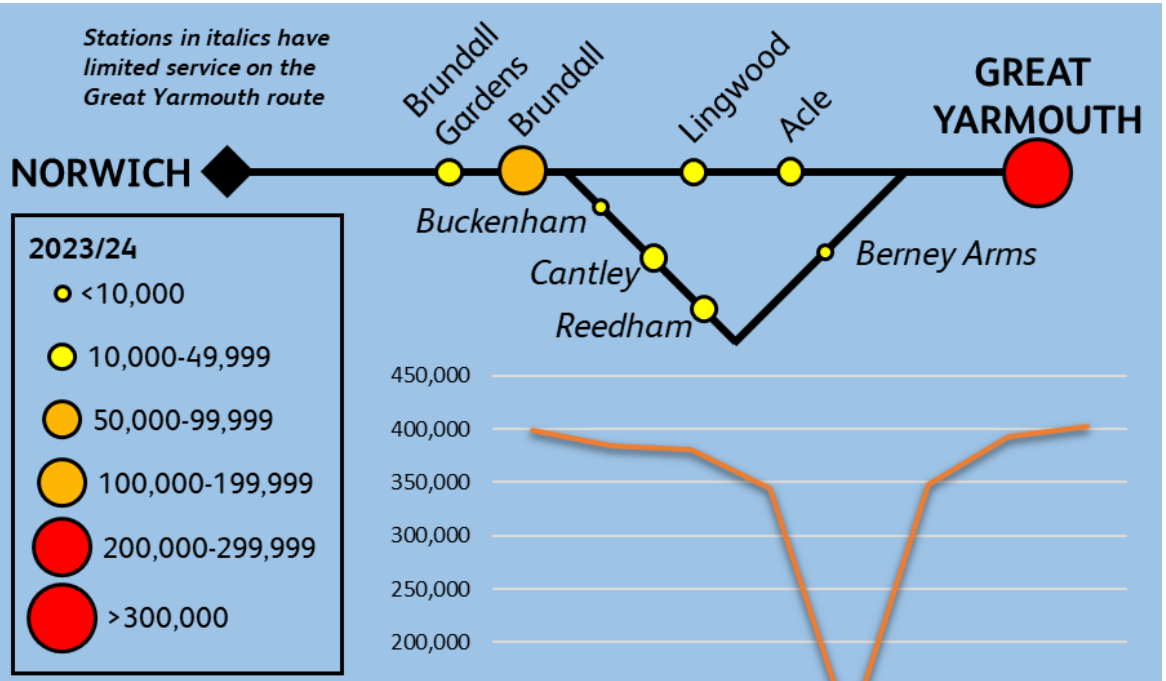
Freight services

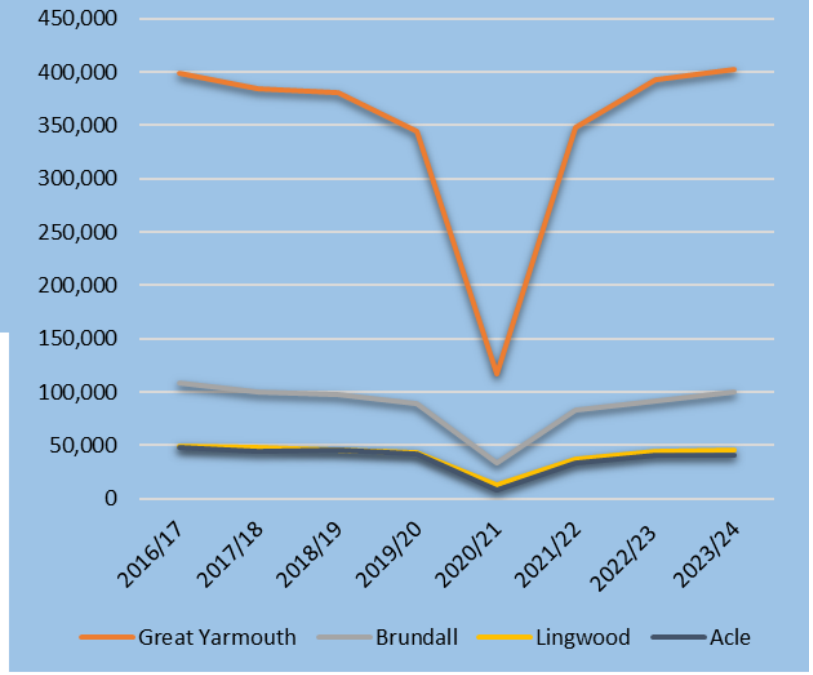
Route	Typical circulations	Commodity hauled
No regular services		

Station usage

Station	2019/20	2023/24	2019/20 - 2023/24 % change
Brundall Gardens	9,408	19,246	104.6 %
Brundall	89,742	100,552	12.0 %
Lingwood	43,536	45,572	4.7 %
Acle	41,618	41,334	-0.7 %
Buckenham	*212*	*360*	*69.8%*
Cantley	*17,048*	*18,298*	*7.3%*
Reedham	*41,074*	*39,320*	*-4.3%*
Berney Arms	*42*	*800*	*1804.8%*
Great Yarmouth	344,276	402,658	17.0 %

Stations in italics have limited service on the Great Yarmouth route





Journeys

Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
Great Yarmouth <> Norwich	159,230
Brundall <> Norwich	64,514
Great Yarmouth <> London Liverpool Street	64,206
Lingwood <> Norwich	32,230
Reedham <> Norwich *	*24,304*
Acle <> Norwich	23,622
Great Yarmouth <> Peterborough	13,476
Great Yarmouth <> Cambridge	13,242
Great Yarmouth <> Stratford (London)	12,786
Cantley <> Norwich *	*12,380*

** Journeys between Reedham/ Cantley and Norwich mostly made on trains to/from Lowestoft due to limited Great Yarmouth service.*

Yellow – journeys to nearest major town/city

Blue – other local journeys

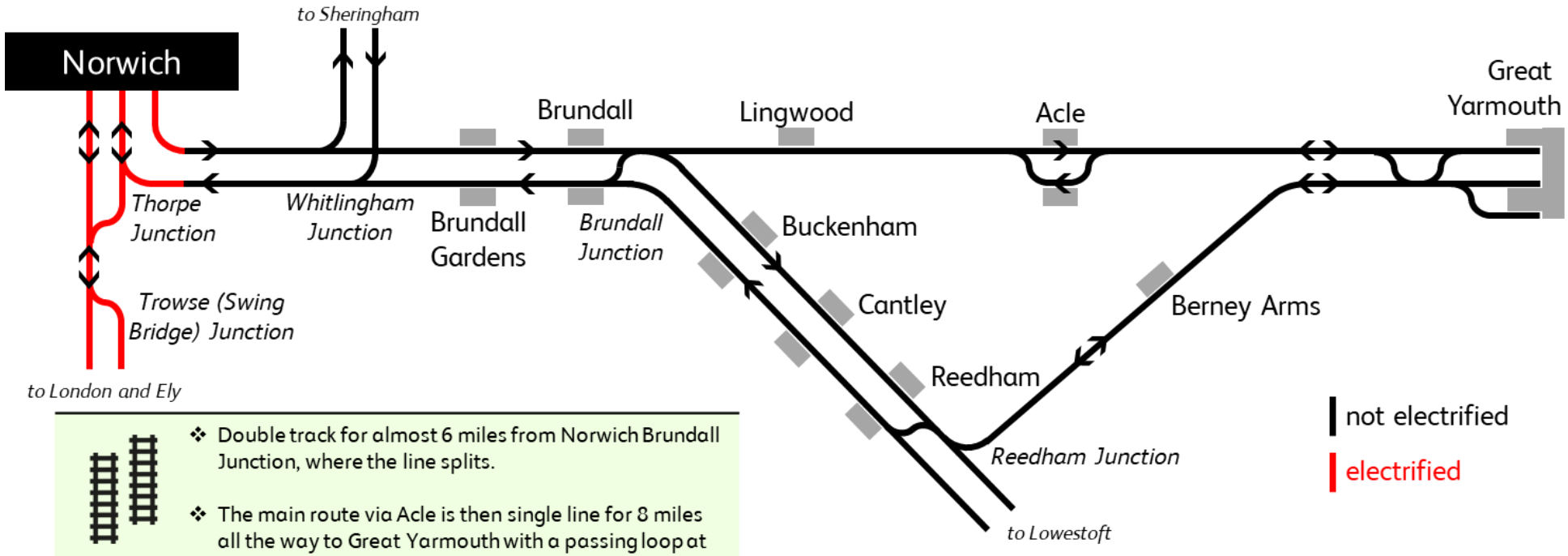
Green – London journeys

Orange – non-London long-distance journeys

The dominant flow on this route is between Great Yarmouth and Norwich, with the top journeys to/from intermediate stations also being with Norwich. Longer distance flows between Great Yarmouth and London also feature highly. Notably absent from the list are other local journeys, with relatively few journeys being made from the intermediate stops between each other or Great Yarmouth.

Usage on this route was slowly declining pre-Covid but has responded sharply since. It is unclear as to what may have driven this, but a new fleet of trains may have attracted some passengers.

Line Capabilities

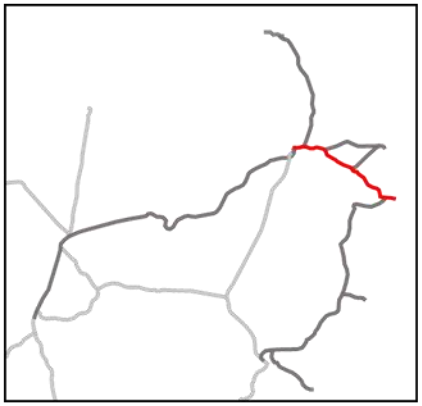


- Double track for almost 6 miles from Norwich Brundall Junction, where the line splits.
- The main route via Acle is then single line for 8 miles all the way to Great Yarmouth with a passing loop at Acle station.
- Via Reedham the line continues to be double track for another 6.5 miles until Reedham Junction, where the line towards via Berney Arms becomes single.
- The two lines approaching Great Yarmouth station operate as two independent bi-directional lines, though crossovers outside the station mean that trains from both routes can access all platforms.

- Mainly 60mph on both routes.
- Localised slower speeds on approaches to junctions and single line sections.

- Four minute headway between Thorpe Junction and Whitlingham Junction.
- East of Whitlingham Junction a series of Absolute Block sections with no fixed headway exist on both routes to/from Great Yarmouth.

- No electrification, except on the approach to Norwich station, as far as the reception roads to Crown Point depot.
- All trains currently use diesel traction.



Norwich – Lowestoft

Part of the Wherry Lines

The Norwich – Lowestoft route is double track throughout and runs alongside the limited service between Great Yarmouth and Norwich via Berney Arms north of Reedham. The route passes over two swing bridges at Reedham (pictured opposite) and Somerleyton, which open occasionally for river traffic.

Typically, an hourly service operates between Norwich and Lowestoft all day. In the afternoons, every other hour the service runs fast, only calling at Oulton Broad North. There are nine stations on the route, not including Norwich.

A limited freight service operates along the line, transporting aggregates between the sidings near the station and Whitemoor yard, near March. Typically, this occurs once a week, however paths exist in the timetable each weekday.

Passenger services

Route	Off-peak tph	Typical journey time
Norwich <> Lowestoft	1	35 mins (fast) 45 mins (stopper)

Freight services

Route	Typical circulations	Commodity hauled
Lowestoft <> Whitemoor	1 per week	Aggregates

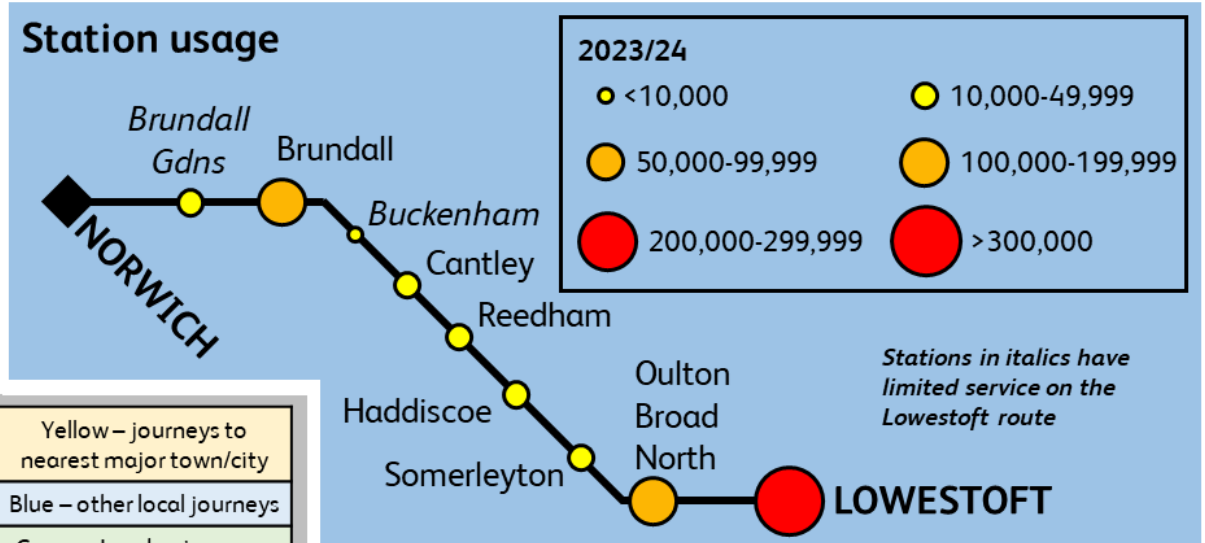
Journeys

Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
Lowestoft <> Norwich	145,636
Oulton Broad North <> Norwich	74,114
Brundall <> Norwich	64,504
Lowestoft <> London Liverpool Street *	*42,144*
Reedham <> Norwich	24,304
Lowestoft <> Oulton Broad North	15,620
Cantley <> Norwich	12,380
Brundall Gardens <> Norwich *	*11,118*
Lowestoft <> Peterborough	6,410
Haddiscoe <> Norwich	6,360

Yellow – journeys to nearest major town/city
Blue – other local journeys
Green – London journeys
Orange – non-London long-distance journeys

** Some London journeys will be via the East Suffolk Line interchanging at Ipswich, and most Brundall Gardens <> Norwich journeys will be on trains to/from Great Yarmouth.*

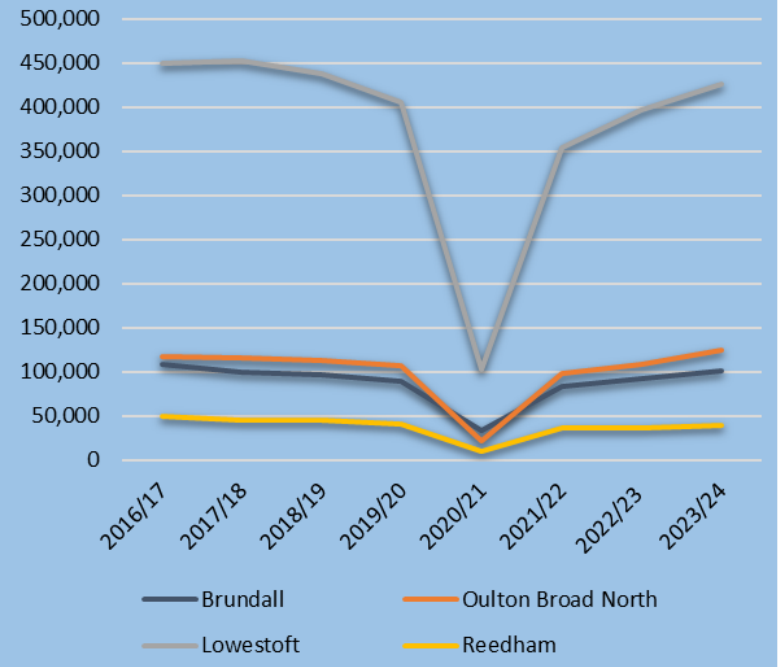
Station usage



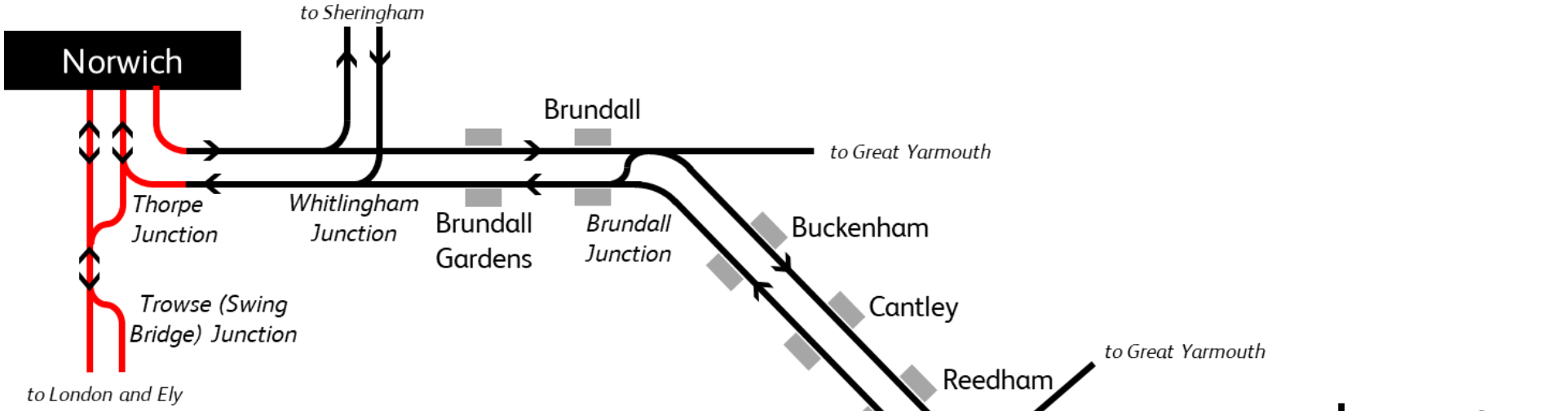
Most journeys on the Norwich – Lowestoft route are to/from Norwich. Very few local journeys between stations on the route are made. Journeys to/from London feature high in the top 10 pairings, but are still relatively low compared with Norwich flows.

Similar to the Great Yarmouth route, usage was declining pre-Covid but has responded relatively strongly since, with 2023/24 usage substantially recovered at most stations.

Station	2019/20	2024/24	2019/20 - 2023/24 % change
Brundall Gdns	*9,408*	*19,246*	*104.6%*
Brundall	89,742	100,552	12.0 %
Buckenham	*212*	*360*	*69.8%*
Cantley	17,048	18,298	7.3 %
Reedham	41,074	39,320	-4.3 %
Haddiscoe	12,650	12,064	-4.6 %
Somerleyton	10,898	10,076	-7.5 %
Oulton Broad N	106,438	125,458	17.9 %
Lowestoft	406,440	426,034	4.8 %



Line Capabilities



- Double track throughout.

- Generally 50-60mph throughout.
- Localised slower speeds on approaches to junctions.
- 20-30mph over both swing bridges.

- Four minute headway Thorpe Junction to Whitlingham Junction and Oulton Broad North Junction to Lowestoft.
- East of Whitlingham Junction a series of Absolute Block sections with no fixed headway exist.

- No electrification, except on the approach to Norwich station, as far as the reception roads to Crown Point depot.
- All trains currently use diesel traction.

Ipswich – Lowestoft

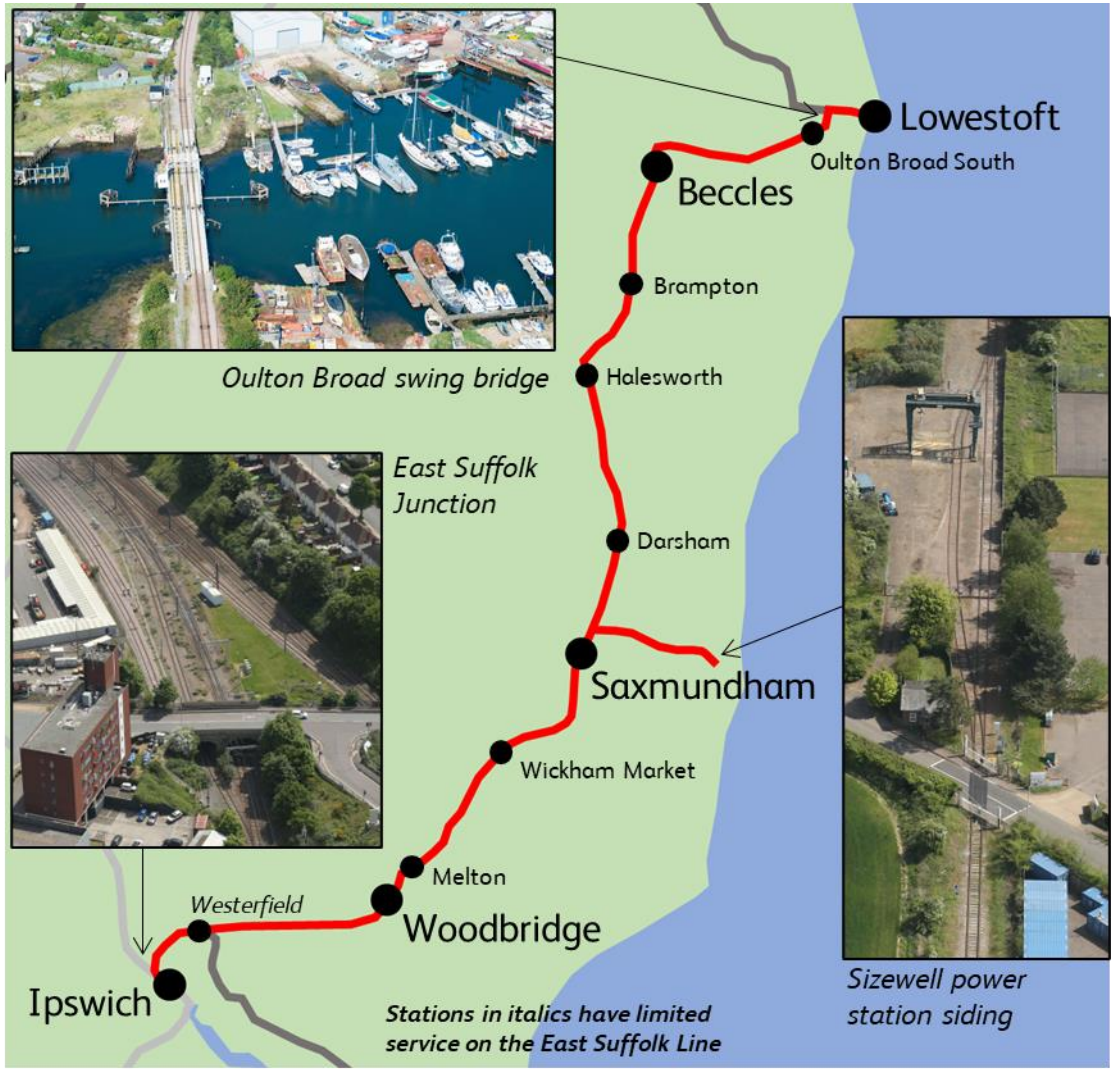
The East Suffolk Line

The East Suffolk Line is a 49 mile route connecting Lowestoft with Ipswich on the Great Eastern Main Line via a wide range of East Suffolk communities. Ipswich station acts as an important interchange for onward travel towards London, Cambridge and Peterborough.

The line is a mixture of double and single track sections, previously being double track in entirety and then rationalised in the latter half of the 20th century.

Passenger services are typically hourly, but some long gaps in service exist at certain points of the day. All trains tend to call at all stations except Westerfield, which is only served by East Suffolk Line trains in peak hours.

No regular freight services currently operate on the line, however the branch to Sizewell nuclear power station has been used to transport nuclear waste from the site. These paths still exist in the timetable, but are rarely used. The construction of Sizewell C power station will generate additional freight traffic from 2026 to deliver construction materials and remove waste, however this is expected to be at night with no impact on regular passenger services.



Passenger services

Route	Off-peak tph	Typical journey time
Ipswich <> Lowestoft	1	85-96 mins

Freight services

Route	Typical circulations	Commodity hauled
Various <> Sizewell	4 trains per day (from 2026)	Construction materials; waste

Journeys

Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
Woodbridge <> Ipswich	57,124
Woodbridge <> London Liverpool Street	50,598
Saxmundham <> London Liverpool Street	47,542
Lowestoft <> London Liverpool Street	42,144
Saxmundham <> Ipswich	39,280
Darsham <> London Liverpool Street	31,406
Beccles <> Lowestoft	30,706
Halesworth <> Lowestoft	23,050
Lowestoft <> Ipswich	22,878
Melton <> London Liverpool Street	22,076

Yellow – journeys to nearest major town/city

Blue – other local journeys

Green – London journeys

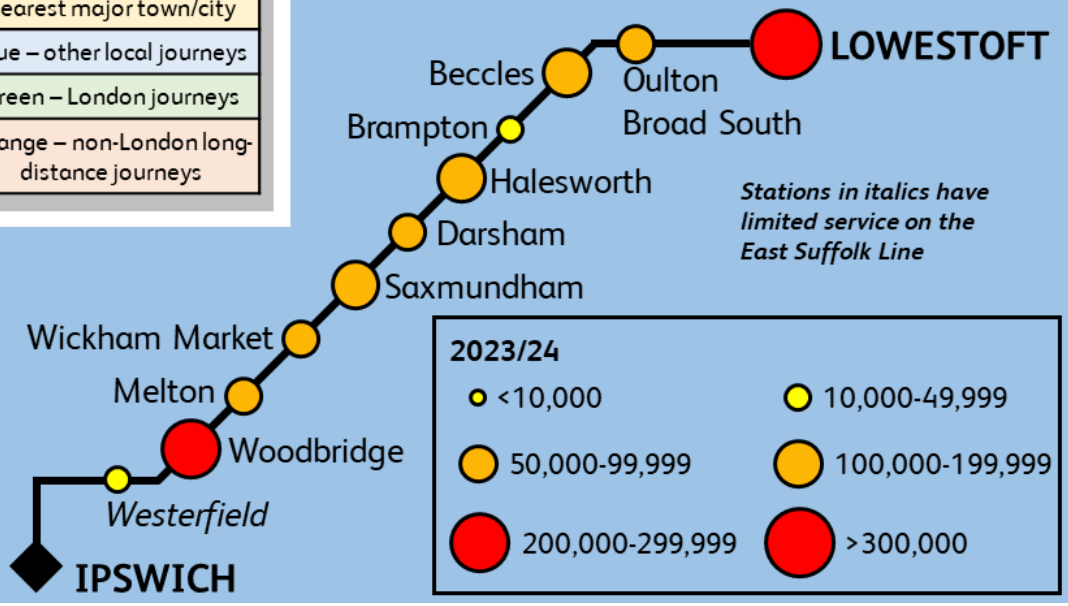
Orange – non-London long-distance journeys

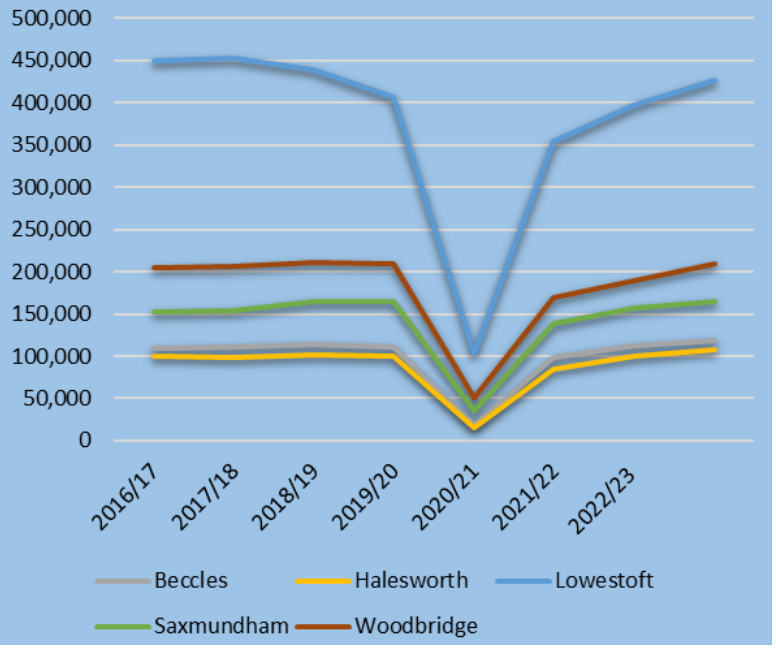
Journeys on the East Suffolk line follow a different pattern to those on the branch lines to/from Norwich, with no single dominant flow, and many more journeys to/from London featuring in the list of largest flows.

Most stations see a good level of patronage, including rural stations such as Darsham and Wickham Market. Usage before the pandemic at intermediate stations was steadily increasing, and has recovered well at the majority of stations along the route since the pandemic, as shown in the chart below, which shows usage at Lowestoft and the four largest settlements en route.

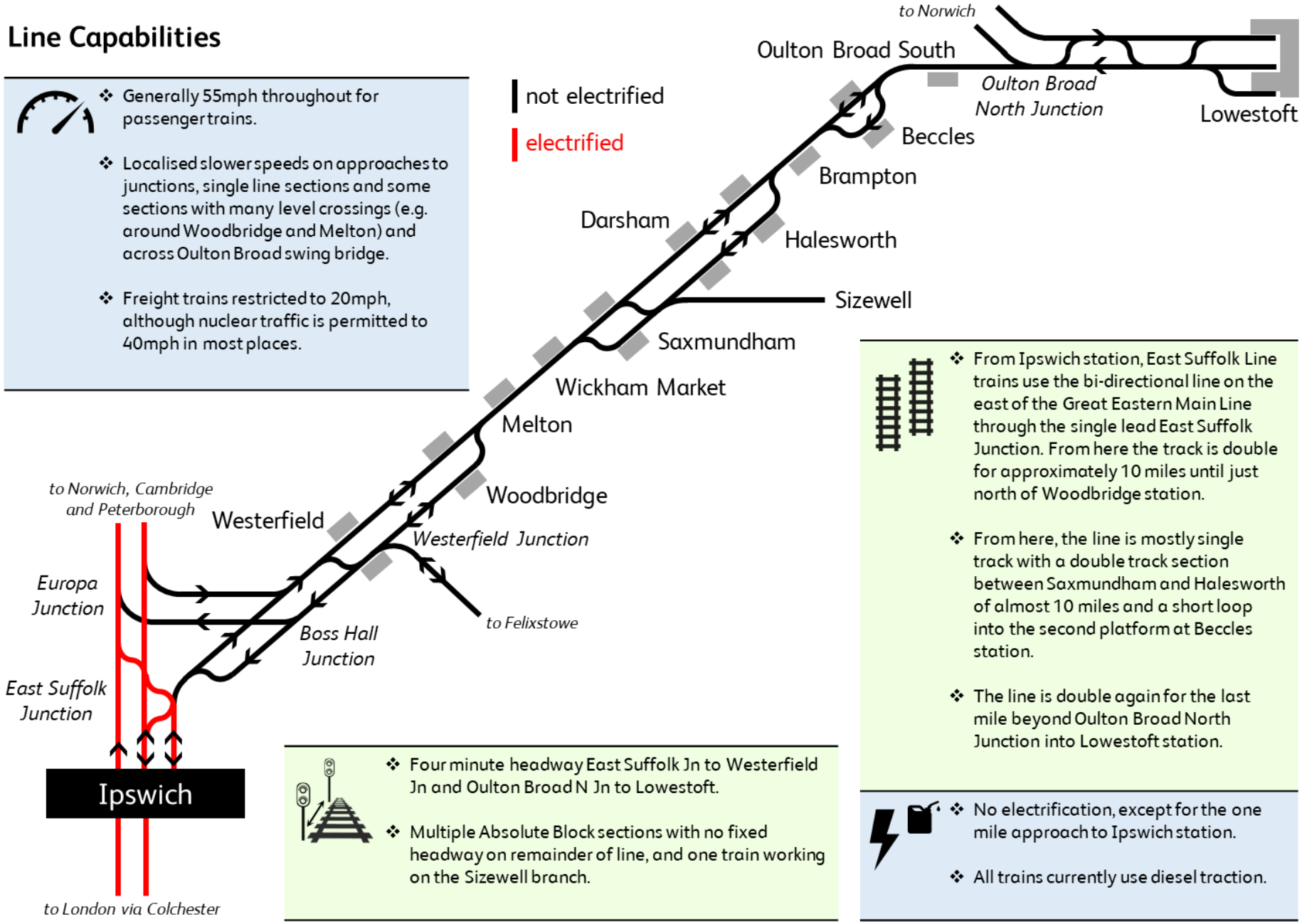
Station	2019/20	2023/24	2019/20 - 2023/24 % change
Lowestoft	406,440	426,034	4.8 %
Oulton Broad S	43,518	56,484	29.8 %
Beccles	110,152	118,074	7.2 %
Brampton	9,858	11,920	20.9 %
Halesworth	99,838	107,644	7.8 %
Darsham	61,534	60,836	-1.1 %
Saxmundham	165,274	164,480	-0.5 %
Wickham Market	55,266	62,200	12.5 %
Melton	82,562	77,364	-6.3 %
Woodbridge	209,172	208,998	-0.1 %
Westerfield	*11,284*	*16,444*	*45.7%*

Station usage





Line Capabilities

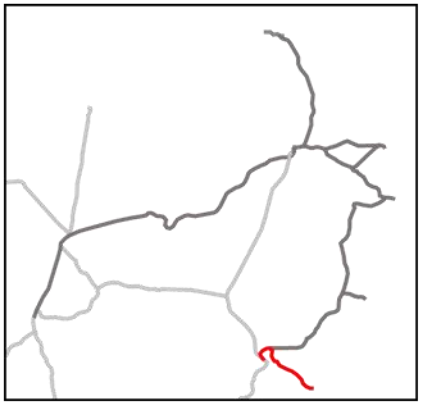


- Generally 55mph throughout for passenger trains.
- Localised slower speeds on approaches to junctions, single line sections and some sections with many level crossings (e.g. around Woodbridge and Melton) and across Oulton Broad swing bridge.
- Freight trains restricted to 20mph, although nuclear traffic is permitted to 40mph in most places.

- From Ipswich station, East Suffolk Line trains use the bi-directional line on the east of the Great Eastern Main Line through the single lead East Suffolk Junction. From here the track is double for approximately 10 miles until just north of Woodbridge station.
- From here, the line is mostly single track with a double track section between Saxmundham and Halesworth of almost 10 miles and a short loop into the second platform at Beccles station.
- The line is double again for the last mile beyond Oulton Broad North Junction into Lowestoft station.

- Four minute headway East Suffolk Jn to Westerfield Jn and Oulton Broad N Jn to Lowestoft.
- Multiple Absolute Block sections with no fixed headway on remainder of line, and one train working on the Sizewell branch.

- No electrification, except for the one mile approach to Ipswich station.
- All trains currently use diesel traction.



Ipswich – Felixstowe

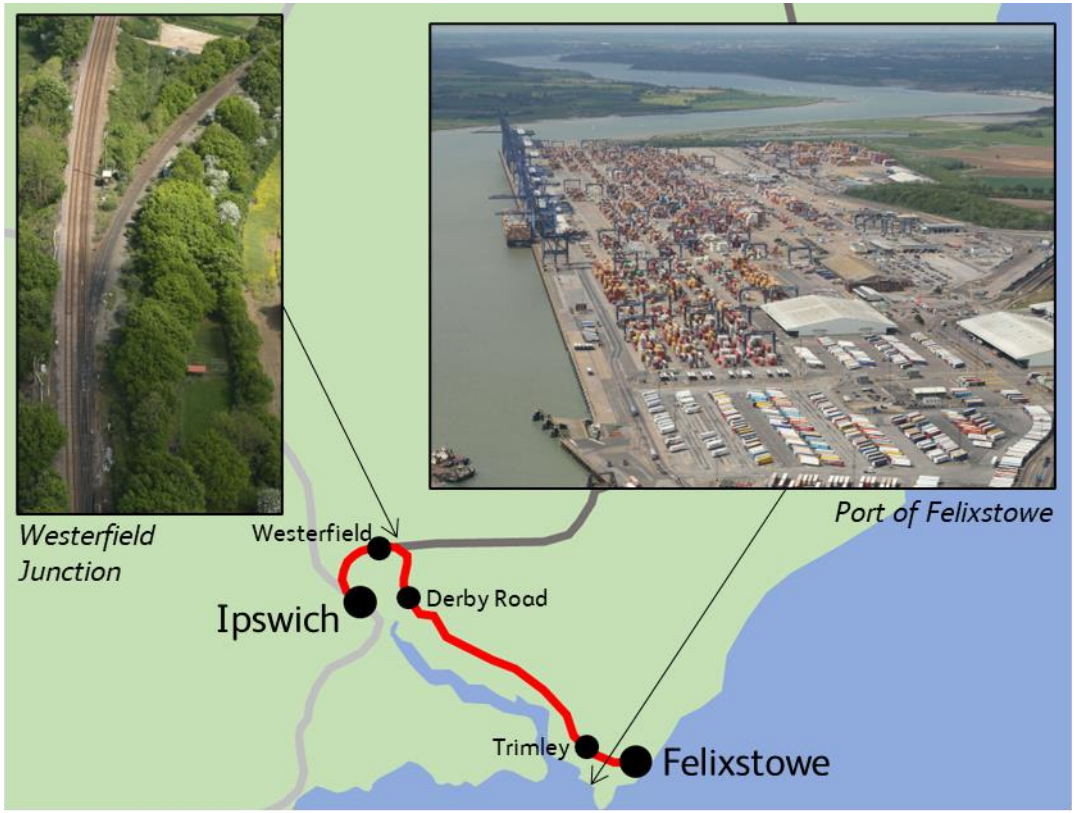
The Felixstowe Branch

The Felixstowe branch line is a relatively short line connecting Felixstowe with Ipswich via junctions with the East Suffolk Line at Westerfield Junction and East Suffolk Junction on the Great Eastern Main Line.

The line is mostly single track, with some short double track sections.

For passengers, an hourly service exists between Felixstowe and Ipswich, calling at all stations. There are only three intermediate stations on the route – Trimley just outside of Felixstowe, Derby Road in eastern Ipswich, and Westerfield just to the north of the town.

The line is a major freight route to and from the Port of Felixstowe, and currently typically sees up to 38 freight trains in each direction on weekdays, carrying intermodal containers nationwide predominantly to destinations in the midlands and northern England.



Passenger services

Route	Off-peak tph	Typical journey time
Ipswich <> Felixstowe	1	26 mins

Freight services

Route	Typical circulations	Commodity hauled
Felixstowe <> Midlands, North West, North East, Scotland and Wales	38 per day max across various destinations (see below)	Containerised consumer goods ("intermodal")

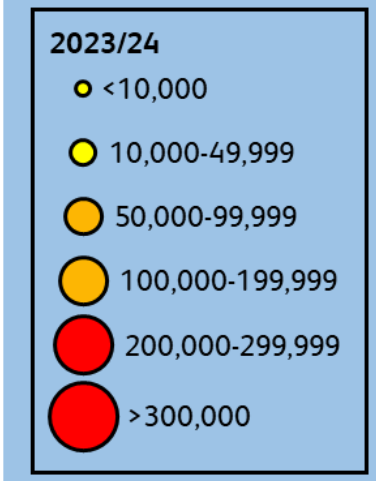
Midlands: East Midlands Gateway (Castle Donington), Hams Hall (Birmingham), Lawley Street (Birmingham), Birch Coppice (Tamworth), Daventry
North West: Ditton (Liverpool), Garston (Liverpool), Trafford Park (Manchester)
North East: Tinsley (Sheffield), Masborough (Rotherham), Doncaster, Leeds, Wakefield, Tees Dock
Scotland: Coatbridge (Glasgow)
Wales: Wentloog (Cardiff)

Journeys

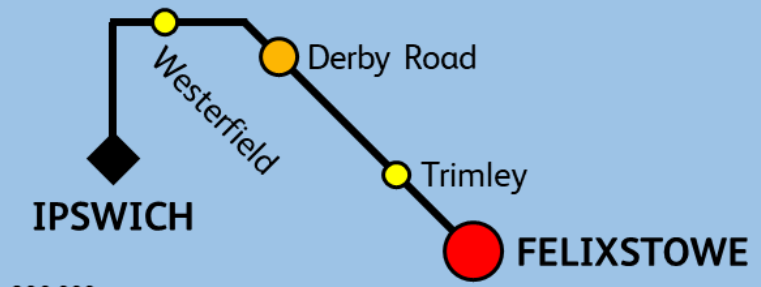
Top 10 station pairings (2022/23)	
Station pairings	**Journeys**
Felixstowe <> Ipswich	95,912
Felixstowe <> Derby Road	31,920
Felixstowe <> London Liverpool Street	22,948
Trimley <> Ipswich	19,016
Derby Road <> Ipswich	10,468
Felixstowe <> Norwich	6,382
Derby Road <> London Liverpool Street	5,564
Trimley <> Derby Road	5,114
Felixstowe <> Stowmarket	5,026
Felixstowe <> Colchester	4,792

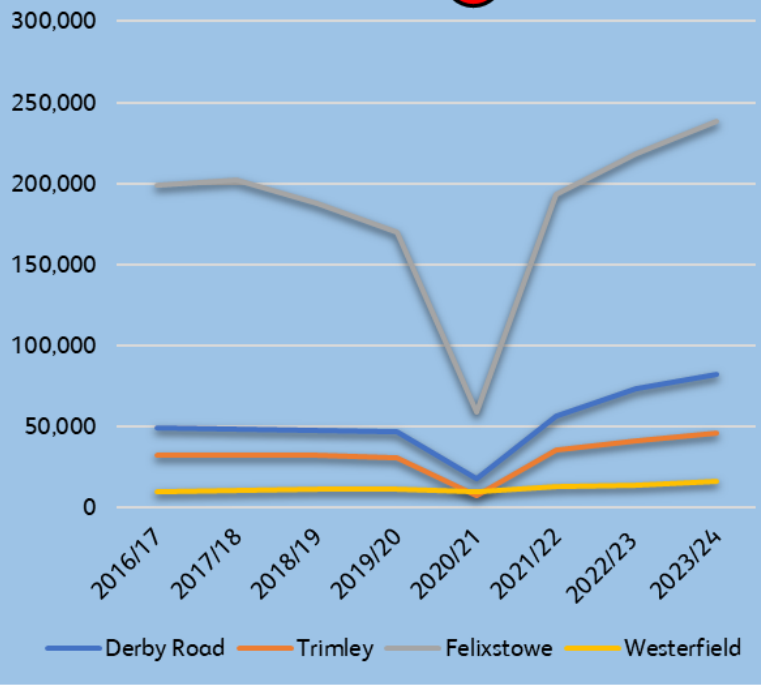
Yellow – journeys to nearest major town/city
Blue – other local journeys
Green – London journeys
Orange – non-London long-distance journeys

Station usage



Station	2019/20	2023/24	2019/20 - 2023/24 % change
Felixstowe	170,412	238,190	↑ 39.8 %
Trimley	31,122	45,948	↑ 47.6 %
Derby Road	46,808	81,986	↑ 75.2 %
Westerfield	11,284	16,444	↑ 45.7 %





There are only four stations on the Felixstowe branch line, with only Felixstowe station at the end of the line seeing significant footfall. All four, however have experience a very strong level of growth post-Covid, with usage up by around a third on the branch on average.

By far, the most significant flow is between Felixstowe and the nearest large economic centre, Ipswich. Seeing as the remaining stations on the route are relatively lightly used, trends in flows are more difficult to identify, with a variety of minor flows featuring in the top 10 with most involving journeys to/from Felixstowe, Ipswich or London.

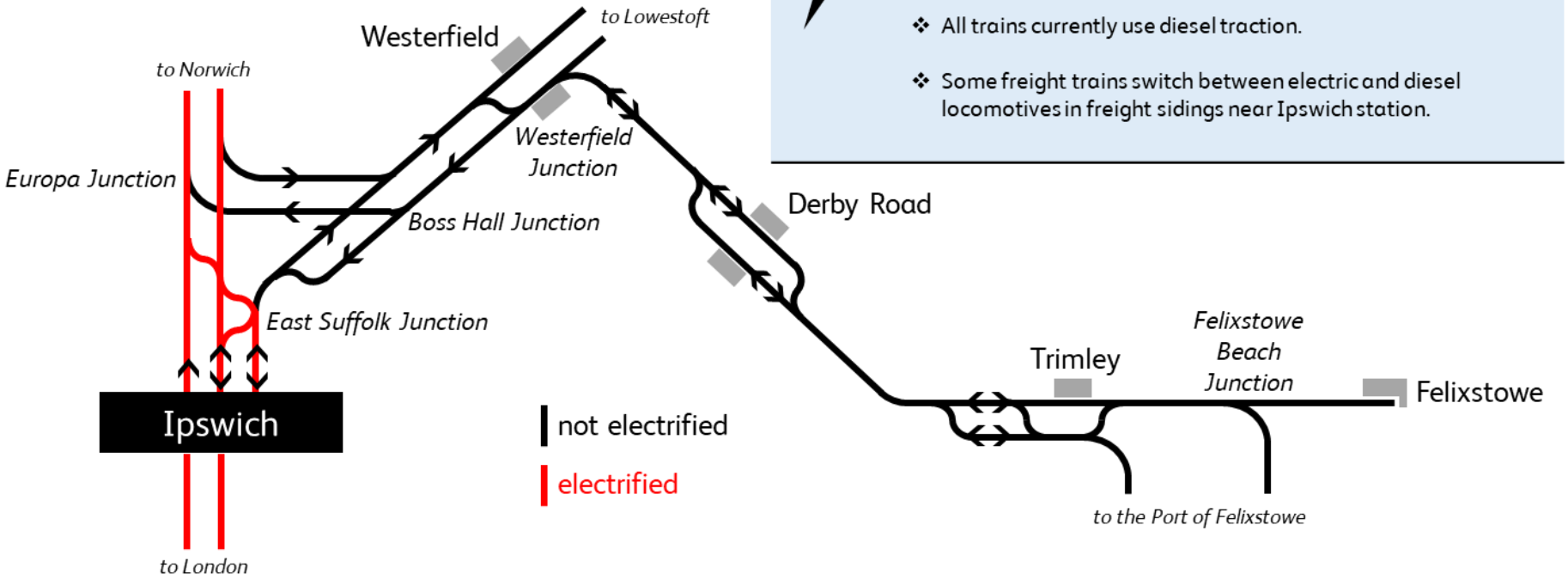
Line Capabilities

- From Ipswich station, Felixstowe branch trains use the bi-directional line on the east of the Great Eastern Main Line through the single lead East Suffolk Junction. From here they share the track with trains on the East Suffolk Line as far as Westerfield Junction, where the line branches off towards Felixstowe.
- The branch itself is mostly single track except for two loops at both of its intermediate stations.
- Two routes to/from the Port of Felixstowe branch off near Trimley station and about ¾ mile from Felixstowe station.

- Maximum 75mph for passenger trains, 50mph between Westerfield Junction and Derby Road station, and 40mph for the last ¾ mile to Felixstowe station.
- Freight trains restricted to 60mph.

- Four minute headway East Suffolk Jn to Westerfield Jn.
- Multiple Absolute Block sections with no fixed headway on remainder of line, and one train working between Felixstowe Beach Junction and Felixstowe station.

- No electrification, except for the one mile approach to Ipswich station.
- All trains currently use diesel traction.
- Some freight trains switch between electric and diesel locomotives in freight sidings near Ipswich station.



7. Appendix 2 – Study area demographics

This Appendix includes further detail of the demographics of the study area across a range of measurements.

7.1.1. Population

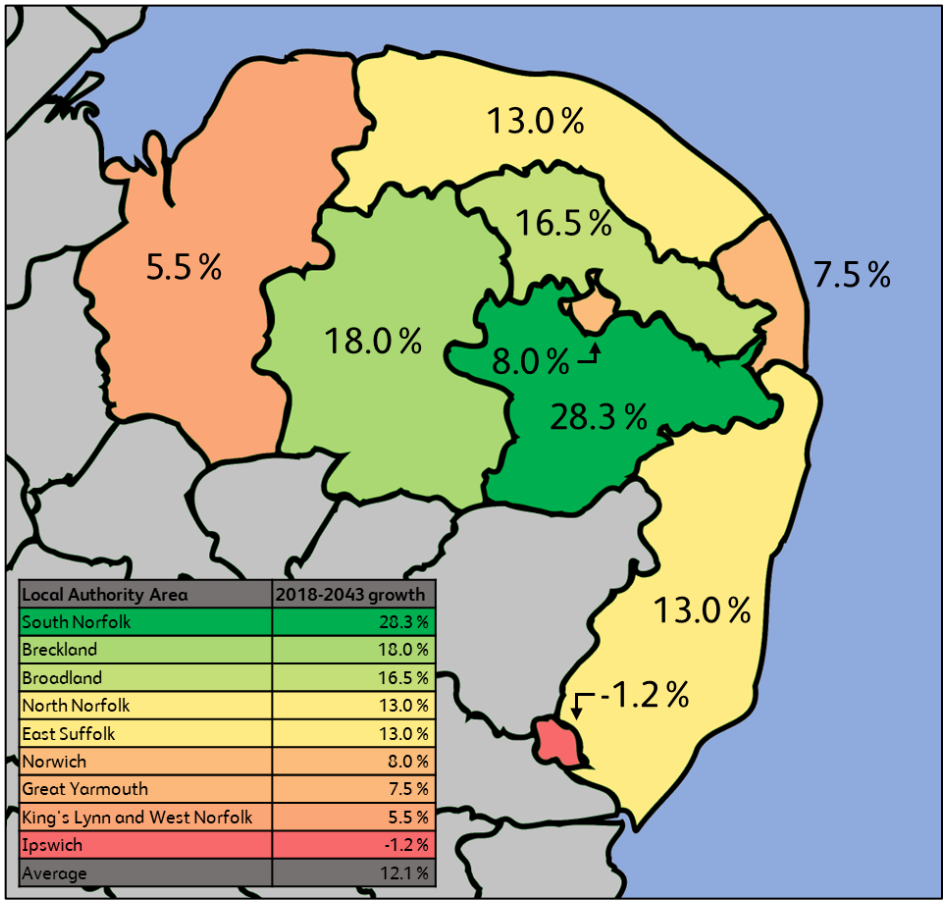
The population of Norfolk, Ipswich and East Suffolk, the main focus areas of this study, is around 1.3 million according to 2021 census data. A further 400,000 live in the districts between Cambridge and Ely which the Norwich-Cambridge/Stansted Airport services passes through.[29]

The total approximate population in Norfolk, Ipswich and East Suffolk within 5km of the railway within the study area is around 800,000 reflecting the relative sparsity of the network in this area, particularly its absence in much of mid- and north west Norfolk. Additionally, the line to Kings Lynn, although in Norfolk, is excluded from this study, as the service on this route forms part of the service structure of the West Anglia Main Line and East Coast Main Line. Around 200,000 live within 5km of the line between Ely and Cambridge, with most of these being in Cambridge itself.

According to Transport East, 140,000 new homes are planned to be built in Norfolk and Suffolk by 2036, with thousands more also required in the years beyond to accommodate population growth.[30] According to the latest dataset from the Office for National Statistics, the population of this area is expected to rise by over 150,000, or 12.1%, on average by 2043 across the local authority areas which form the majority of the study area, based on a 2018 baseline.[31]

A large variation exists in this projection as illustrated opposite in Figure 1, with the most significant growth expected in South Norfolk. Coastal authority areas have a lower projected growth rate.

These statistics are the latest available (with the next update due to be available in Spring 2025), and there could be changes due to the time elapsed since publication.



Local Authority Area	2018-2043 growth
South Norfolk	28.3%
Breckland	18.0%
Broadland	16.5%
North Norfolk	13.0%
East Suffolk	13.0%
Norwich	8.0%
Great Yarmouth	7.5%
King's Lynn and West Norfolk	5.5%
Ipswich	-1.2%
Average	12.1%

Figure 1 – Projected population growth at local authority level across the study area.

[29] The population between Ely and Cambridge is quoted separately as this area is generally served by other train services outside of the study scope.
[30] Transport Strategy 2023-2050, Transport East, p. 19.
[31] Data analysed from Office for National Statistics population projection data.

7.1.2. Indices of Deprivation

The UK government produces data on deprivation at local level, with the last statistical release in 2019. The output covers several metrics such as income, education and health. The overall view for the study area is that on average, this area has higher rates of deprivation than most other parts of East Anglia and the South East outside of London, as shown opposite in Figure 2. The yellow, orange and red areas indicate higher instances of deprivation compared to blue areas, which are less deprived.

Table 1 overleaf shows a summary of the scores for the seven indices and the overall Index of Multiple Deprivation for each of the local authority areas in Norfolk and East Suffolk that form part of this study area. Red shaded cells with lower numbers show the most deprived metrics, with the higher numbers and darker blues showing the least. These are averages of all the Lower Layer Super Output Areas (LSOAs)[32] within each local authority area.

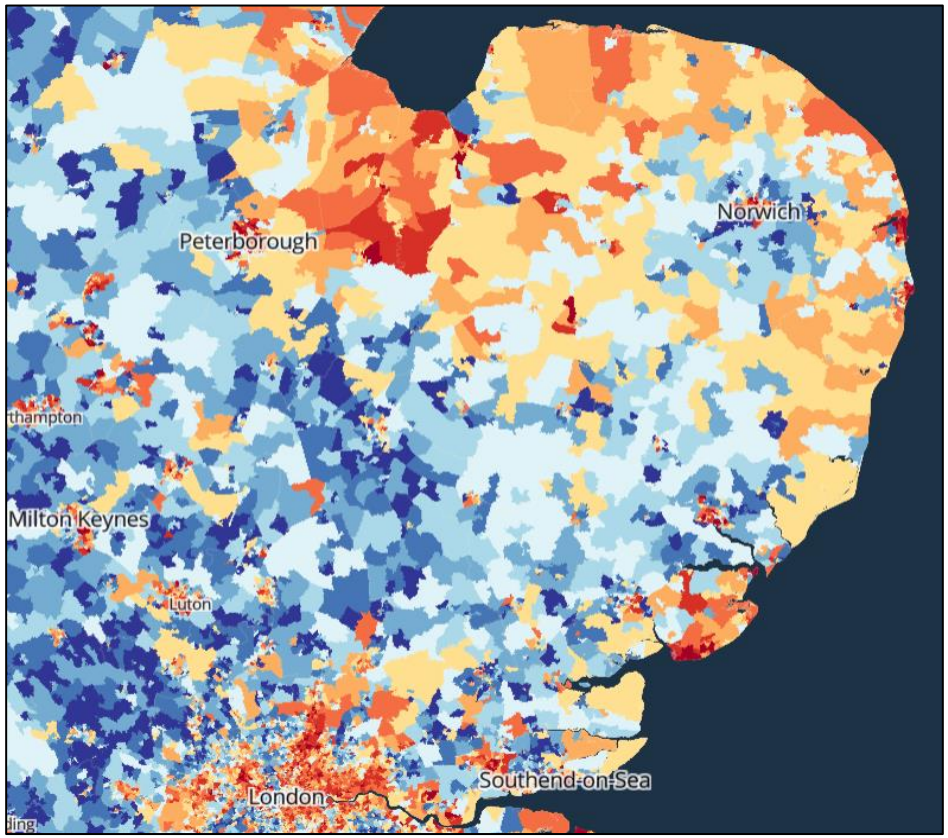


Figure 2 – Visual depiction of the Indices of Deprivation.[33]

[32] Lower Layer Super Output Areas (LSOAs) are small geographic portions of local authority areas which contain around 1,000 – 3,000 residents. The data shown is a processed version of the English Indices of Deprivation, 2019, File 2: Domains of Deprivation.
[33] Image from the interactive map provided by the Consumer Data Research Centre.

Local Authority	Decile (where 1 is in the most deprived 10% of LSOAs)							
	Index of Multiple Deprivation (IMD)	**Income**	**Employment**	**Education, Skills and Training**	**Health Deprivation and Disability**	**Crime**	**Barriers to Housing and Services**	**Living Environment**
Breckland	**5.3**	6.0	5.6	3.4	5.5	7.8	4.5	6.1
Broadland	**7.5**	7.2	6.6	5.7	7.6	9.0	5.6	6.6
Great Yarmouth	**3.7**	3.8	3.3	2.8	3.4	5.6	5.5	5.0
Kings Lynn & West Norfolk	**4.6**	5.2	4.7	3.4	3.7	7.7	4.5	5.1
North Norfolk	**4.8**	5.4	4.9	4.2	5.4	9.0	3.2	4.4
Norwich	**4.2**	4.2	4.5	4.1	3.0	4.4	7.6	5.6
South Norfolk	**6.9**	6.9	6.7	6.0	7.9	8.7	4.6	5.3
Ipswich	**4.5**	4.9	4.8	3.8	3.9	4.0	6.2	4.8
East Suffolk	**5.7**	5.8	5.5	4.8	5.9	6.9	6.3	5.6
Average across study area	**5.2**	**5.5**	**5.2**	**4.2**	**5.1**	**7.0**	**5.3**	**5.4**

Table 1 – Summary of Deprivation Deciles across study area local authorities.

Assessing the data above;

- Most local authority areas, on average, have a level of deprivation close to the national average (an IMD of 5), as shown by the bold numbers in the second column.
- Broadland and South Norfolk tend to have the highest scores, representing the least deprived areas. Conversely, Great Yarmouth tends to have the lowest scores.
- Education, skills and training appears to be the greatest driver of deprivation, followed by health and employment.
- Crime (except in Ipswich, Norwich and, to a lesser extent, Great Yarmouth) appears to not be a strong driver of deprivation.
- Averages across all local authority areas, shown along the bottom row, come close to the national average, other than in education (slightly worse) and crime (better).

These findings are supported by people's responses to the 2021 census, which are outlined in the sections below.[34]

7.1.3. Economic activity

Figure 3 overleaf shows the proportion of people aged 16 or over at a local authority level identified in the 2021 census as economically inactive, i.e. not in employment or education, with the darker shades of blue indicating a higher percentage of economically inactive people. This shows that a higher than average proportion of people in this area, particularly along the coast are not in employment or full-time education when compared to areas further west and south west.

[34] Each of the data and map extracts in parts 8.1.3 to 8.1.5 below are from the Office for National Statistics' census map.

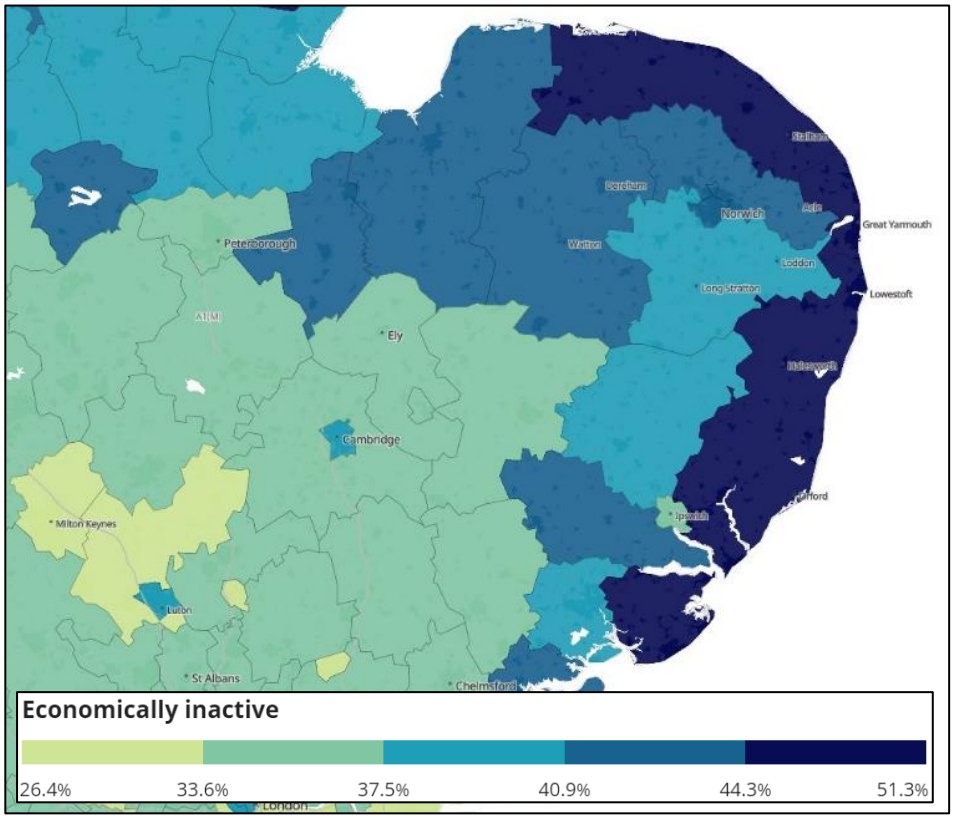


Figure 3 – Proportion of economically inactive people from the 2021 census.

Analysing the census data further shows that the economic inactivity level is driven by two main factors – retirees and ill health. The proportion of retirees in Norfolk and Suffolk, especially in coastal areas is much higher than in neighbouring areas in Essex and Cambridgeshire. Around 28-34 % of respondents across most of Norfolk and Suffolk (and up to 37.3 % in the North Norfolk local authority area) were retired in 2021, contrasting with 21-23 % typical in nearby Essex and Cambridgeshire.

7.1.4. Health

Several responses are recorded by the census regarding health.

- In the same coastal areas of Norfolk and Suffolk which record higher levels of economic inactivity, a lower proportion of respondents described their health as "very good" at an average of around 42-47 % versus 48-52 % more typically nearby in parts of Essex and Cambridgeshire.
- A slightly higher proportion of people report a disability under the Equality Act, again, particularly in coastal areas.
- These same coastal areas also have a slightly higher proportion of those out of the labour market due to long-term ill health at around 4-6 % versus 2-3 % more typically, as shown below in Figure 4 with the blue shades indicating a higher proportion.

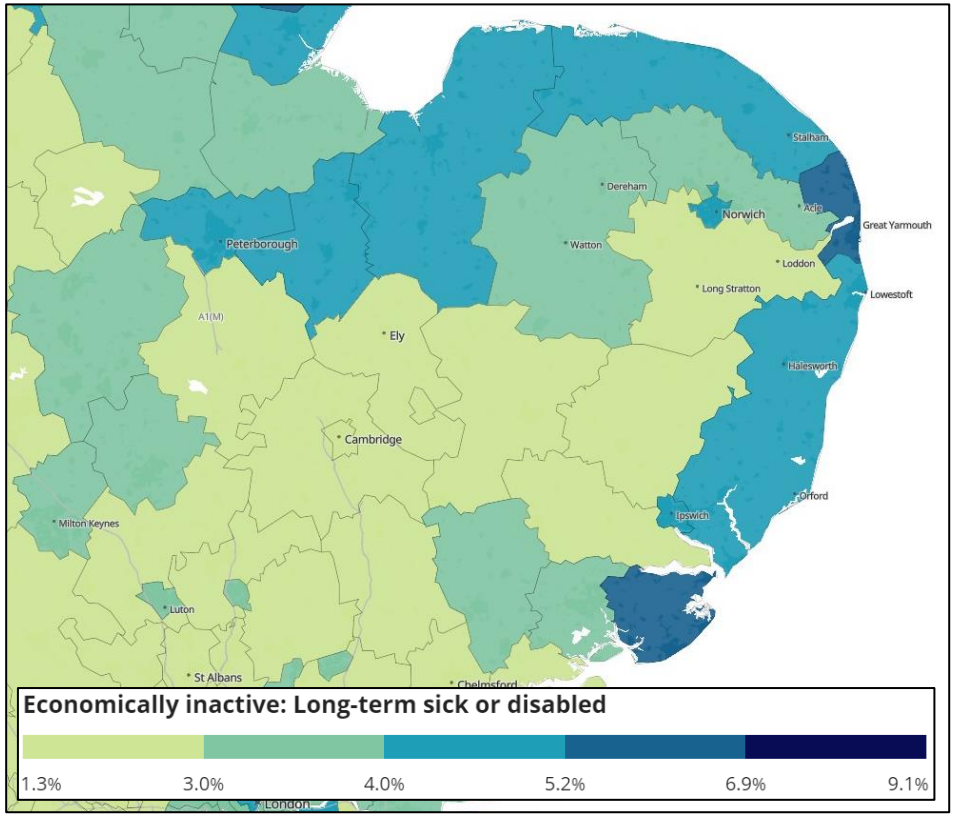


Figure 4 – Proportion of people economically inactive due to ill health.

7.1.5. Education and work

On education, much of the study area has a lower proportion of people achieving higher levels of education, as well as a higher proportion of people with no qualifications. Cambridge, with its prominent academic and science-based economy stands out strongly with 56 % of people having a degree or equivalent qualification, as shown in Figure 5 below, with the darker blue shades showing where more people have higher qualifications. Great Yarmouth appears to be among the most polarised areas with 26.5 % with no qualifications, and 18 % with a degree level qualification.

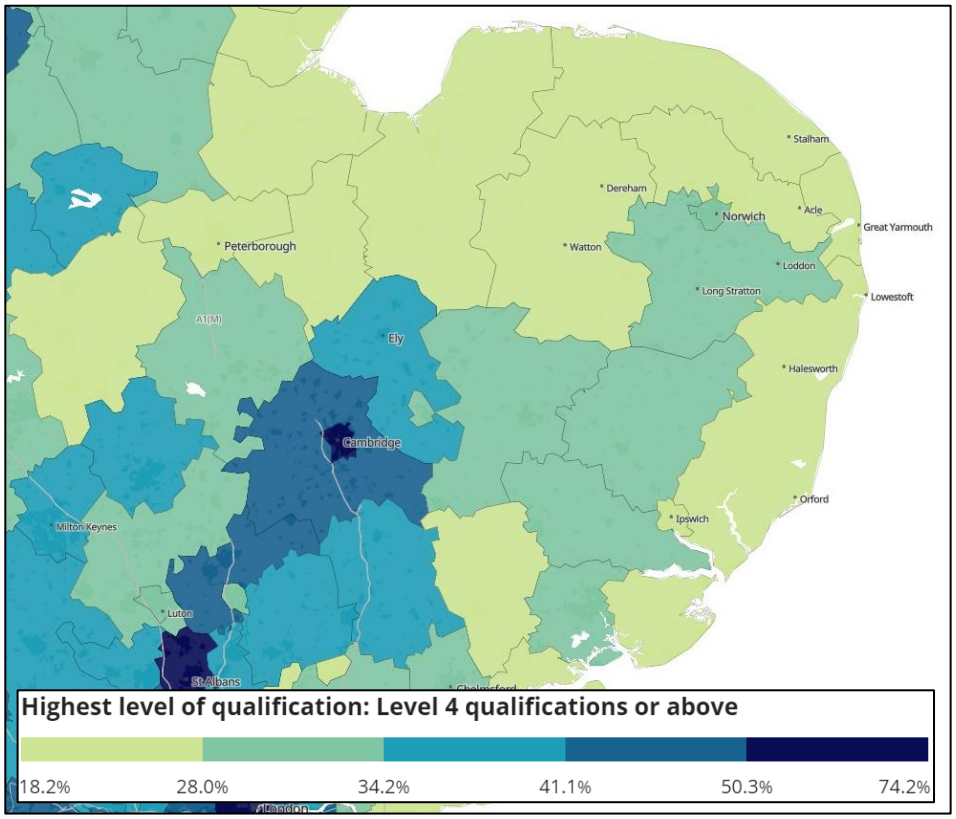


Figure 5 – Proportion of people achieving a Level 4 qualification.

On work, census data suggests a higher proportion of workers performing routine occupations and conversely a lower proportion of managerial and professional workers across much of the study area.

7.1.6. Transport-related social exclusion

Transport for the North (TfN) has undertaken research into transport-related social exclusion (TRSE) across the whole of England,[35] which is defined as;

> **"being unable to access opportunities, key services, and community life as much as needed, and facing major obstacles in everyday life through the wider impacts of having to travel to access key destinations",**

and caused by

> **"the combination of fragmentation, unreliability, and high costs in the public transport system; poor conditions for walking, cycling, and wheeling in car dominated environments; and the high levels of car dependency that result from this".**

TfN argues a "vicious cycle" ensues whereby poor access to key services, employment opportunities and so on, combined with car dependency means people are more likely to remain in a disadvantaged environment.

The analysis shows that some areas of Norfolk and East Suffolk are amongst the highest areas nationally that are at risk of TRSE, as indicated by the orange and red LSOAs in Figure 6 overleaf. This includes some areas along railway lines within the study area, including Thetford, Great Yarmouth, Lowestoft and Felixstowe.

[35] Transport-related social exclusion data and report, Transport for the North.

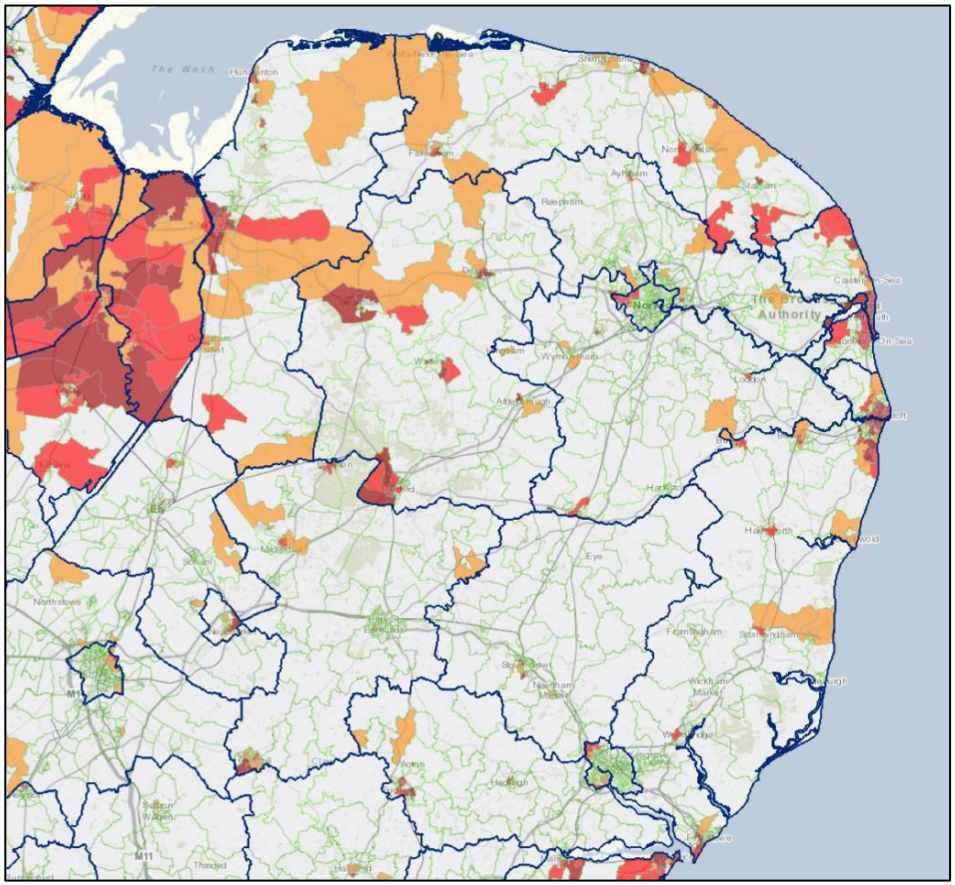


Figure 6 – Areas at highest risk of TRSE, shown in orange and red.

7.1.7. Demographics summary

The factors highlighted above reveals parts of the study area are disadvantaged and have poorer socioeconomic outcomes compared to other parts of the country, which may be exacerbated by suboptimal rail services, as explained by TfN's research into TRSE.

Overall, parts of the study area, particularly coastal areas;

- Have a higher proportion of people who are economically inactive;
- Have a higher proportion of people with poor health and disabilities, and;
- Have a lower level of qualifications and higher tendency to perform routine work;

There is therefore a potential for rail improvements to play a key role in improving the social outcomes of people in this area to reduce the negative effects of TRSE. While improvements to rail services alone are unlikely to vastly improve the demographic profile, they would nevertheless give people more public transport options when seeking access to education, training and employment opportunities that tend to be concentrated in larger economic centres, such as Norwich, Ipswich and Cambridge, as well as greater opportunities to access leisure activities.

It should be noted that the census data and Index of Deprivation explained above has been described at a local authority level to show overall trends. At more local levels, significant variances exist, particularly within towns and cities, and can be explored in more detail using the footnoted links above.

8. Appendix 3 – Indirect Norwich <> Cambridge connectivity

As explained in section 4.2.2, in some hours good connections are available using the EMR, XC and GN services to make journeys between Norwich and Cambridge. In other hours poor connectivity results in longer journey times. This appendix shows where timetable amendments could be investigated to improve journey times.

Norwich to Cambridge

Departure time from Norwich	Arrival time at Cambridge	Journey time	Routing	Interchange time
05:33	06:50	01:16	DIRECT	
05:49	07:33	01:44	CHANGE	00:29
06:33	07:53	01:20	DIRECT	
06:51	08:08	01:17	CHANGE	00:08
07:26	08:47	01:21	DIRECT	
07:55	**09:35**	**01:40**	**CHANGE**	**00:27**
08:33	09:49	01:16	DIRECT	
08:56	**10:37**	**01:41**	**CHANGE**	**00:29**
09:27	10:45	01:18	DIRECT	
09:55	11:08	01:13	CHANGE	00:07
10:33	11:49	01:16	DIRECT	
10:56	12:12	01:16	CHANGE	00:07
11:27	12:44	01:17	DIRECT	
11:56	13:12	01:16	CHANGE	00:07
12:28	13:44	01:16	DIRECT	
12:56	14:12	01:16	CHANGE	00:07
13:27	14:44	01:17	DIRECT	
13:54	15:12	01:18	CHANGE	00:08
14:27	15:44	01:17	DIRECT	
14:56	16:12	01:16	CHANGE	00:07
15:27	16:45	01:18	DIRECT	
15:48	17:10	01:22	CHANGE	00:09
16:27	17:44	01:17	DIRECT	
16:56	18:13	01:17	CHANGE	00:09
17:27	18:56	01:29	DIRECT	
17:50	19:08	01:18	CHANGE	00:07
18:23	19:46	01:23	DIRECT	
NO EMR SERVICE IN THE TIMETABLE DEPARTING NORWICH AT APPROX. 18:55				
19:28	20:45	01:17	DIRECT	
20:08	21:37	01:29	CHANGE	00:20
21:12	22:27	01:15	DIRECT	
22:40	23:56	01:16	DIRECT	

Table 1 – Norwich to Cambridge journey options

As can be seen in Table 1 opposite, in all but four instances, there is a short connection time leading to a relatively even 2tph service frequency between the 07:26 and 18:23 departures from Norwich.

A desktop analysis of the timetables of these services shows that in two of these instances a shorter connection time could be made, but these are not published journey options on the National Rail Enquiries website. In the Cambridge direction, these connections would be made across an island platform, with no need to use the subway at Ely station. Consideration should be given as to whether the two connection options shown in Table 2 below should be shown in journey planners, or whether small timetable changes could be possible to allow a circa 7 minute connection like other trains throughout the day.

Departure time from Norwich	Published arrival time at Cambridge	Potential arrival time at Cambridge	Journey time (saving)	Interchange time
07:55	09:35	09:10	01:15 (00:25)	00:04
08:56	10:37	10:11	01:15 (00:26)	00:05

Table 2 – Potential improved connections in the Cambridge direction.

The other two journeys highlighted red – the 05:49 and 20:08 departures from Norwich – have no clear option to improve the connection. In addition, there is no EMR service in the timetable departing Norwich around 18:55. If one could be pathed, a connection with an XC service at Ely could also be possible similar to other hours.

Cambridge to Norwich

Departure time from Cambridge	Arrival time at Norwich	Journey time	Routing	Interchange time
06:01	07:25	01:24	DIRECT	
06:35	08:11	01:36	CHANGE	00:15
07:00	08:26	01:26	DIRECT	
07:39	09:15	01:36	CHANGE	00:19
08:19	09:40	01:21	DIRECT	
09:00	10:14	01:14	CHANGE	00:08
09:13	10:29	01:16	DIRECT	
09:35	**11:10**	**01:35**	**CHANGE**	**00:25**
10:14	11:31	01:17	DIRECT	
11:00	12:14	01:14	CHANGE	00:08
11:21	12:39	01:18	DIRECT	
11:35	**13:14**	**01:39**	**CHANGE**	**00:24**
12:20	13:37	01:17	DIRECT	
13:00	14:20	01:20	CHANGE	00:13
13:20	14:40	01:20	DIRECT	
13:35	**15:09**	**01:34**	**CHANGE**	**00:23**
14:20	15:40	01:20	DIRECT	
15:00	16:11	01:11	CHANGE	00:06
15:20	16:37	01:17	DIRECT	
15:35	**17:11**	**01:36**	**CHANGE**	**00:25**
16:16	17:37	01:21	DIRECT	
NO EMR SERVICE IN THE TIMETABLE DEPARTING ELY AT APPROX. 17:15				
17:29	18:47	01:18	DIRECT	
18:00	19:12	01:12	CHANGE	00:07
18:30	19:48	01:18	DIRECT	
19:00	20:18	01:18	CHANGE	00:08
19:27	20:44	01:17	DIRECT	
19:35	**21:11**	**01:36**	**CHANGE**	**00:26**
20:20	21:36	01:16	DIRECT	
21:20	22:35	01:15	DIRECT	
21:35	23:15	01:40	CHANGE	00:24
22:57	00:13	01:16	DIRECT	

Table 3 – Cambridge to Norwich journey options.

In the Norwich direction, there are more poor connection times, but there are several with 6-8 minute connection times, indicating that it might be possible in some hours with some timetable changes. There are five trains in the Norwich direction shown below in Table 4 where a connection is theoretically possible but is not shown on National Rail Enquiries. However, connections in this direction require the crossing the tracks via the subway at Ely station, so each of these would require retiming of one or both services to ensure that passengers could make the publicised connection.

Published departure time from Cambridge	Potential departure time from Cambridge	Arrival time at Norwich	Journey time (saving)	Interchange time
09:35	10:00	11:10	01:10 (00:25)	00:04
11:35	12:00	13:14	01:14 (00:25)	00:04
13:35	14:00	15:09	01:09 (00:25)	00:02
15:35	16:00	17:11	01:11 (00:25)	00:04
19:35	20:00	21:11	01:11 (00:25)	00:05

Table 4 – Potential improved connections in the Norwich direction.

There is no clear way to reduce the interchange times of the 06:35, 07:39, or 21:35 departures from Cambridge. Additionally, there is no EMR service passing through Ely towards Norwich at around 17:15 so there is no interchange option at this time.

April 2025

Network Rail – Eastern Region