

Cambridge Approaches’ Response to EWR Co.’s Making Meaningful Connections Consultation

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1. Introduction

This document contains the response of Cambridge Approaches Limited (CA¹) to Question 1 in the Making Meaningful Connections consultation feedback form [7], which states:

“1. Please share your view on

Because EWR alignments closer to north Cambridge are now being considered, we have looked again at whether we were right to have favoured Route Option E and approaching Cambridge from the south as we confirmed after our last consultation. In particular, we have reviewed our previous assessment that concluded approaching from the south was the better option taking account of a Cambourne North Station outside of Route E to see if we would have made a different decision. We consider that the advantages of approaching Cambridge from the south continue to support this conclusion and that a number of challenges remain for a northern approach even with a Cambourne North station. We’d welcome your comments on our assessment.”

In order to make the most useful and constructive response to your consultation, we have sent a number of letters and requests for information. We have also attended several of the consultation meetings.

We sent a letter to Simon Blanchflower on the 20th May 2021 pointing out some missing items in the consultation which have made it harder for us to respond. This followed a letter from Leigh Day on 10th May 2021 requesting further information using a series of freedom of information requests. We also sent three more questions via our MP, Anthony Browne, and we understand from his office that these were sent on the 20th May 2021.

At the time of writing this consultation response we have received no replies to these. This has made providing an appropriately informed response difficult, not least because we lack a sufficiently full picture on some of the complex and technical issues involved. However, we have produced the best response we can with the information available to us.

Our view is that the northern approach to Cambridge supports the case for the EWR better than the southern approach, and that it presents fewer and more readily surmountable challenges than does the southern approach. This response sets out why.

There is considerably more work to do in several areas, which we set out, to get the best outcome. This response is the result over the past year of research by and discussion with people who know the Cambridge area well. We hope that you find it useful in choosing right approach to Cambridge for EWR.

¹ All terms are defined in the Glossary

EWR Co. have raised some perceived problems with the northern approach in [5, Appendix F], as set out in Table 1, in which we give forward references to where we address them in our document. These are not the only issues raised by EWR Co., but many of the others stem from them.

Perceived problem	Section reference in our document	Summary
4-tracking is required on the WAML with a northern approach and this will lead to demolition of between 40 and 85 properties	<u>4.4.1</u>	4-tracking is not necessary and anyway Options 3 and 4 in [5, Appendix F] do not necessarily require demolitions.
Railways built in flood plains must be elevated and this should be avoided	<u>5.1</u>	Where necessary CBRR have proposed a trench railway for the fen crossing section as used in Holland and elsewhere.

Table 1 EWR Co's perceived problems with the northern approach to Cambridge

Section 2 of this response explains why the wider benefits of the railway are important to the decision about the approach to Cambridge and sets out our research in the matter. Our point here is that the business case for the railway should have a strong influence on the best approach to Cambridge and we do not feel that the narrow remit given to EWR Co. by the DfT and the level of collaboration with other relevant bodies locally and nationally has allowed EWR Co. to bring out all the significant issues. For example, there is no integration with a housing, economic, local transport or freight plan. Therefore, it is unlikely that the optimal solution has yet been reached. Benefit-to-Cost Ratios (BCRs) are sufficiently important to merit a separate section, Section 3.

Section 4 studies specific route alignments and we draw a distinction between CBRR's proposed northern approach and EWR Co.'s northern approach contained in the Consultation Materials. Although EWR Co. have come to the same conclusion as CamBedRailRoad (CBRR) about the best horizontal alignment, there are several differences between the engineering solutions for the vertical alignment which we explain. We make comparisons of the approaches sometimes using different measures for the residential impact because we believe that freight trains will be more of a noise issue than passenger trains and that a distinction needs to be drawn between the impact on currently very quiet rural areas and on areas in the city of Cambridge where people have chosen to live near the existing railway.

We talk about how the concerns that EWR Co. have about the construction of the northern approach can be addressed both for the NA1 and NA2 sections. We also elaborate some issues with the southern approach which will be more problematic than EWR Co. have presented in the Consultation Materials.

In section 5 we talk about civil engineering aspects of the railway including a comparison between the scale of the infrastructure proposed by EWR Co and by ourselves.

In section 6 we summarise our conclusions and make some recommendations.

Section 7 contains references to some more detailed material created by Cambridge Approaches Limited which supports this consultation response. They are appendices to this document.

Section 8 contains numbered references to third party material. References to these in the main document are in [squared brackets] and the full numbered references are given in the References section 8. For example [1, §2] would mean section 2 of the of the NIC report “Partnering for Prosperity”.

In this response we use the terms defined in the Glossary in section 9.

2. The Business Case for the EWR Central Section

2.1. Wider Benefits and the OxCam Arc

Local residents are at least as concerned about the impact of housing and employment site development as they are about the railway and yet nothing concrete is presented. Our families will have to live with this decision for the next 100 years. It is also funded with our taxes.

The route of the railway will be a major influence on development going forwards and we fear that if it is not part of EWR Co.’s remit to collaborate with the relevant stakeholders to get a joined-up plan then (a) the public will only see the tip of the iceberg of the impact and (b) the route and the business plan will be sub-optimal. The list of relevant stakeholders includes, but is not limited to, MHCLG, SCDC, Cambridgeshire County Council and the Combined Authority,

The case for the EWR is based on that for the OxCam Arc, see references [1], [2] and [3]. The Preferred Route Option Report [4] sets out the BCRs for the Option E route using the DfT Transport Analysis Guidance (TAG) model [23]. The BCRs are lower than would normally be acceptable to the Treasury. Perhaps the only way to make a business case for the EWR central section is through the “wider benefits” of the OxCam Arc – new houses and new jobs. The plans for “transformational growth” in the Arc involve 1 million new houses and 1.1 million new jobs by 2050 [1]. In Cambridgeshire and North Hertfordshire there are planned to be 271,000 houses by 2050, presumably clustered around the multi-modal spine of the A428 and the EWR.

It has been remarked in the Consultation Materials that Oakington is some way from Northstowe. This is the small part of Northstowe that has been built so far. Those of us who have driven past the 10,000 home Northstowe site recently and down to Oakington have an idea of how vast it will be when fully built. The OxCam Arc is calling for 27 Northstowes to be built in our area with their associated employment sites.

Reference [1, pp. 28-29] suggests that this level of housing growth cannot only be secured through incremental development on the fringes of existing towns and cities because they:

- are deeply unpopular with existing communities;
- fail to deliver supporting infrastructure; and

- reduce potential land value uplifts to fund infrastructure because of speculators acquiring the land beforehand.

However, we are seeing significant new development both for housing and employment sites being proposed on the edges of Cambridge, land being bought speculatively for example by banks and considerable push back from existing residents. In some cases, this has been stimulated by the EWR Co. proposals.

Since we could find nothing substantial in the consultation material about the wider benefits, we asked EWR Co. about it in a 'live chat' session on the 13th May 2021 with 'Joseph'. We were referred to Appendix F of the Technical Report [11, starting at page 55]. This states that the economic benefits are better to the south and includes a description of the Cambridge Biomedical Campus (CBC). There is also a reference to an EEH Regional Transport Strategy document [18] which contains practically no information on this subject. A word search for "biomedical campus" or "Addenbrooke's" in the EEH report returns nothing. In response to a follow up question, EWR Co. stated that these wider benefits were not part of the remit of EWR Co. and referred us to the draft GCSP Local Plan and the MHCLG. However, SCDC see EWR as a central government project [19] and MHCLG have yet to produce any detailed spatial plan for the wider benefits of the EWR in the approaches to Cambridge area. They are due to consult on a draft Vision Statement in respect of the Ox-Cam Arc Spatial Strategy.

EWR Co. need to reach consensus with bodies responsible for housing development, the development of employment sites and indeed plans for what happens east of Cambridge. This will help develop the wider benefits of the scheme around Cambridge. This means at least the County Council, the South Cambridgeshire District Council, Cambridge City Council, the Combined Authority and MHCLG for the Development Corporations around EWR stations. This is a big co-ordination role, but clearly a necessary one.

As an example of the lack of co-ordination, Cllr Peter MacDonald who is now responsible for transport on the Cambridgeshire County Council, told us that the county will not now support the expansion of the CBC; that the employment sites to the south of the city in the CBC, Babraham and the Genome Campus are full. Future growth of employment sites outside of the city is likely to come as part of the new towns being developed outside the Green Belt to the north and west of the city. This contradicts the previously mentioned position in the Consultation Materials.

Further, the associated local transport schemes are the responsibility of some combination of Cambridgeshire County Council and the Combined Authority. The political control of each authority changed midway through this consultation. Much more needs to be said by EWR Co. about the integration of their railway with local transport schemes and this needs to take account of, in particular, the new Mayor's cancellation of the CAM in favour of a bus service run by the Combined Authority and his cancellation of the railway scheme to connect Wisbech to March (the latter due to its impact on rail traffic into Cambridge North). We should of course also mention the Greater Cambridge Partnership here.

We want to maximise the economic benefit from the railway and therefore further consideration of matters beyond the engineering issues of building the railway are critical. EWR Co. can best achieve this by working with local partners as discussed above. Without this the realized BCR will be low, but also the impact on residents and the environment generally will be worse than it needs to be.

We put this “wider benefits around Cambridge” question to EWR Co.’s Strategy Director at a meeting with local parishes south-west of Cambridge on 27th May 2021 and although he had no answer we were pleased that he did acknowledge the issue.

Our conclusion is that EWR Co. needs to come back with a much more coordinated and collaborative proposal which justifies the EWR Central Section project. We also believe that the wider benefits of a northern approach to Cambridge are likely to be better than those to the south for the reasons that we will outline in this document.

It is one thing to accept significant damage to our communities for the greater good of the country and the area. However, the lack of coordination poses a significant risk to both local communities and the greater good that can come of the project.

Cambridge Approaches remain persuaded that the proposals made by CBRR are better thought through than those presented in the Consultation Materials. In what follows, we compare some aspects of the proposal from EWR Co. and CBRR to illustrate why. We also need to distinguish between CBRR’s northern approach and EWR Co’s northern approach.

2.2. Major Employment Sites

The choice of approach into Cambridge should be informed partly by the location of employment sites around the city. The information presented in the Consultation Materials is far from clear on this point. Simple assertion that one approach is better than another is not evidence. Our investigation, summarised below, shows that there are a similar number of jobs to the north in science parks as to the south and the opportunities for growth without further compromising the Cambridge Green Belt are greater to the north.

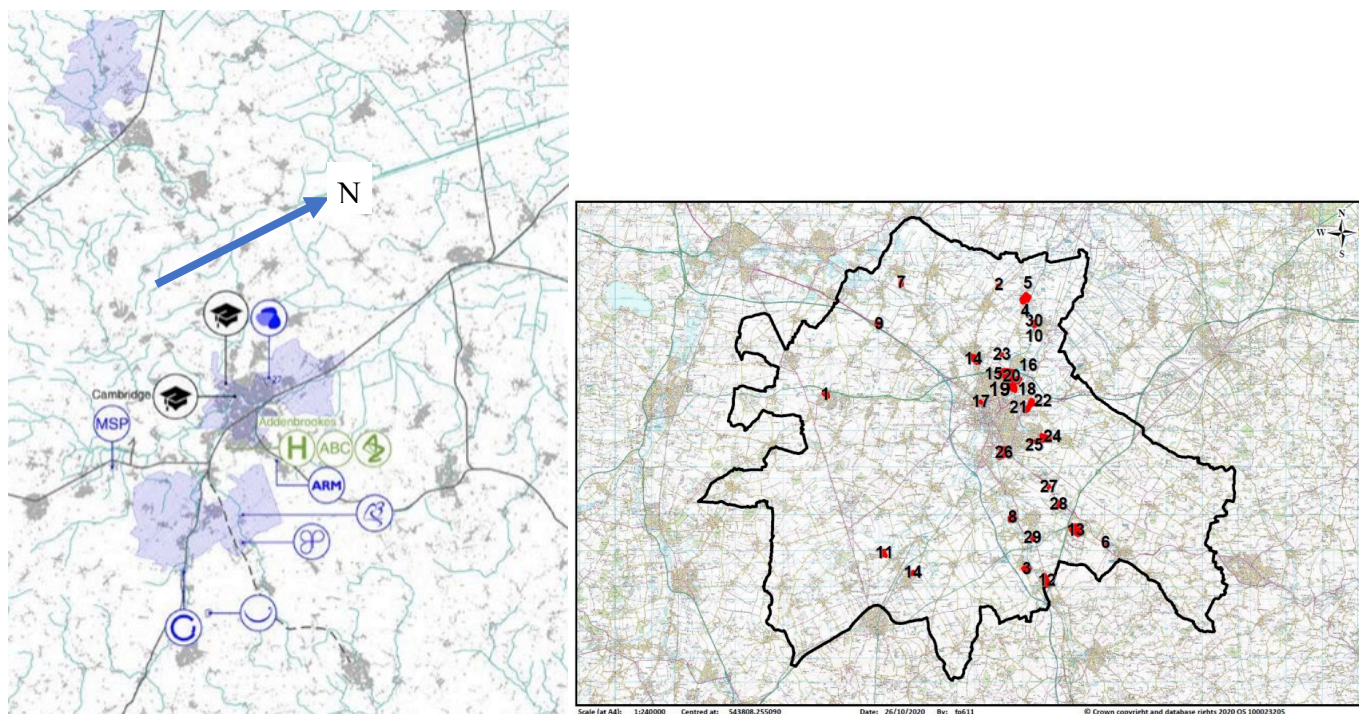


Figure 1 Two Maps of Major Employment Sites in Cambridge (a) on the left and (b) on the right

During the consultation, EWR Co. referred us to the spatial planning material contained in [2]. The map in Figure 1 (a) [1, p. 116] purports to show the major employment sites in Cambridge and we can see Addenbrooke's Hospital, the Cambridge Biomedical Campus (CBC), AstraZeneca and ARM all at the bottom of the map. This map makes it look obvious that if you want to bring in another rail connection to Cambridge then a southern approach is the way to go. We presume that this map has been viewed by high-level decision makers for this project since reference [2] was a key input to the NIC report [1] and "Joseph" from EWR Co. referred us to it during a 'live chat' session on the 13th May 2021.

However, if you look a bit more closely at the Figure 1 (a), north is not pointing straight up the page (we have added an arrow pointing north) and there is a thin, hard to see green line showing where the CBC etc. is located. This is nowhere near ARM in Cherry Hinton and AstraZeneca is one of the companies on the CBC.

A more detailed and recent map from [6, p.51] is shown in Figure 1 (b) and we have attached the accompanying key as Appendix 9. Now we see a whole cluster of science parks to the north of Cambridge. CBC is marked as number 26. This map shows how important the sites to the north of Cambridge are. This point was acknowledged in paragraph 16.25 of the Preferred Options Report [4] which states *"The economic and employment opportunities provided around Cambridge North station and the proposed Cambridge South station are considered to be similar in nature and scale"*.

To reinforce this point, [Cambridge Ahead's Cluster Insights online database](#) currently shows 238,500 employees in the Cambridge cluster. The aggregate company turnover in the south Cambridgeshire district at £17bn is much higher than that of the city itself at £9bn. It is also growing faster. This shows that good

connectivity to employment sites around the city is at least as important as to the city itself. As the previous Mayor James Palmer pointed out on BBC Radio 4's Rethink Cities, Cambridge has already "flipped". See reference [25, from 6 minutes 11 seconds]. The employment sites are around the city and the centre is more about leisure activities.

Reference [3] is concerned with attracting high Gross Value Added (GVA) jobs to the OxCam Arc. There are 12,400 presumably high GVA private sector employees in the CBC. In addition, there are 21,200 public sector employees, including those working at the hospitals on this site.

As regards the north of Cambridge, excluding Marshalls (the largest employer in this area), and focussing on the various science parks shown in the north in Figure 1 (b) we estimate that they contain 20,500 private sector jobs. There are proposals in place for the Cambridge North East Fringe [26] which will provide a further 7000 jobs.

Reference [26] has been prepared for the next local plan for Cambridge and South Cambridgeshire and looks at 8 options for the development of this area. It concluded that Options 1 (Densification in North East Cambridge) and option 7 (Southern Cluster) performed best.

Marshalls will vacate the Cambridge Airport site and move to Cranfield which will release a lot of space to the north [15].

Beyond this, development on the northern and southern fringes of Cambridge will encroach on long protected Green Belt land. For example, there is a proposal to extend the Cambridge Science Park just to the north of the A14 and create space for 7500 jobs.

There are also recent proposals to further develop the CBC on the southern fringe of Cambridge, which it appears that EWR Co may have had some advance notice of [5, Appendix F §2.3.10]. During the EWR Co. consultation period we have seen promotion of these plans in the local press [7, p.1, 6-7]. Ref. [8] also appeared during the consultation and gives much more detail about the proposed transport plans.

2.3. Land Value Uplifts

EWR Co. commissioned a study of the Land Value Uplifts associated with routes A to E for the EWR Central Section. No assessment was done for a northern approach to Cambridge. The study report was referred to in [4] and some relevant paragraphs from [4] are reproduced below (our emphasis):

"9.19 Following the consultation EWR Co also commissioned analysis of the potential uplift in land values around EWR stations.

9.20 This analysis was used primarily to understand how land values might evolve over time as the project progresses and local authorities consider allocating sites for development. However, it was also used to confirm that the opportunities for seeking to capture a share of the uplift in land values were broadly comparable across route options and therefore not a key differentiating factor. "

As a result of a freedom of information request EWR Co. published the study as part of the Consultation Materials [24].

Table 5.13 from [24] is reproduced below in Table 2. It can be seen that the preferred Route Option E had the lowest land value uplift of the 5 options A to E.

EWR Land Value Uplift and Capture Assessment

2nd Draft Report (Confidential)



Table 5.13 EWR Route Announcement: Potential Value of Land by Route Option (£m)

Planning status	Route Option A	Route Option B	Route Option C	Route Option D	Route Option E
No Hope Value	£0	£0	£0	£0	£0
With Hope Value	£1,142	£1,157	£1,603	£1,451	£1,005
Draft Allocated	£0	£0	£0	£0	£0
Allocated	£121	£160	£124	£3	£39
With Planning Permission and not Serviced	£53	£58	£53	£40	£45
With Planning Permission and Serviced	£20	£44	£28	£29	£44
Total	£1,336	£1,418	£1,808	£1,523	£1,133

Source: Savills, 2019

Table 2 EWR CS Land Value Uplifts by Route Option

There was a spread of about £700M between option C and option E (see Table 2). This is a significant difference which should have been included in the Route Option Report [4]. There are significant differences between routes and such an assessment should be performed for the CBRR approach to Cambridge North.

2.3.1. Cambridge Biomedical Campus Extension

As regards to making Cambridge South station a stop on the EWR, Savills [24, p.2] state “*Cambridge South offers opportunities if there were to be an EWR station in this location, though Green Belt designation of much of the land is a major question on future uplift potential.*”

However, EWR Co. [5, Appendix F §2.3.10] present the situation as follows “*and the potential of the southern fringe of the city, already an international centre of excellence for patient care, biomedical research and healthcare education, has long been recognized as having potential to expand.*” Unfortunately, reference to the Green Belt issues has been omitted from this comment.

At a meeting on the 31st May 2021, Councillor Ian Sollom from SCDC felt it was unlikely that SCDC would approve development in the Green Belt South of Cambridge and also reported from a source that AstraZeneca were against such an extension of the CBC. At a meeting on the 15th April 2021 the Director of

Planning Stephen Kelly who is in charge of planning at SCDC also could not see how such a development in the Green Belt could be approved.

At a meeting on the 1st June 2021 with Councillor Peter MacDonald who is responsible for transport on the new county council, stated that before the 6th May 2021 election officers had been asked to pause the County Council support for the CBC extension and this had been re-confirmed after the election.

Reference [2, p27, para. 1] which fed into the NIC report [1] also points out the problem with assuming development in Green Belt land.

So, it seems unlikely at the moment at there will be an extension of the CBC around Cambridge South.

Figure 2 shows a plan of the proposed extension to the CBC [8, p.27]. Houses for a long stretch along the A1301 in Great Shelford would be enveloped, two access roads would be punched through existing housing and there appear to be some proposals for overpasses to the railway line. This is also at a point on the WAML where EWR Co. are proposing a long grade separated junction.

This is an example of the profound impact on local residents that is potentially associated with this railway, but not explicitly presented in the Consultation Materials.

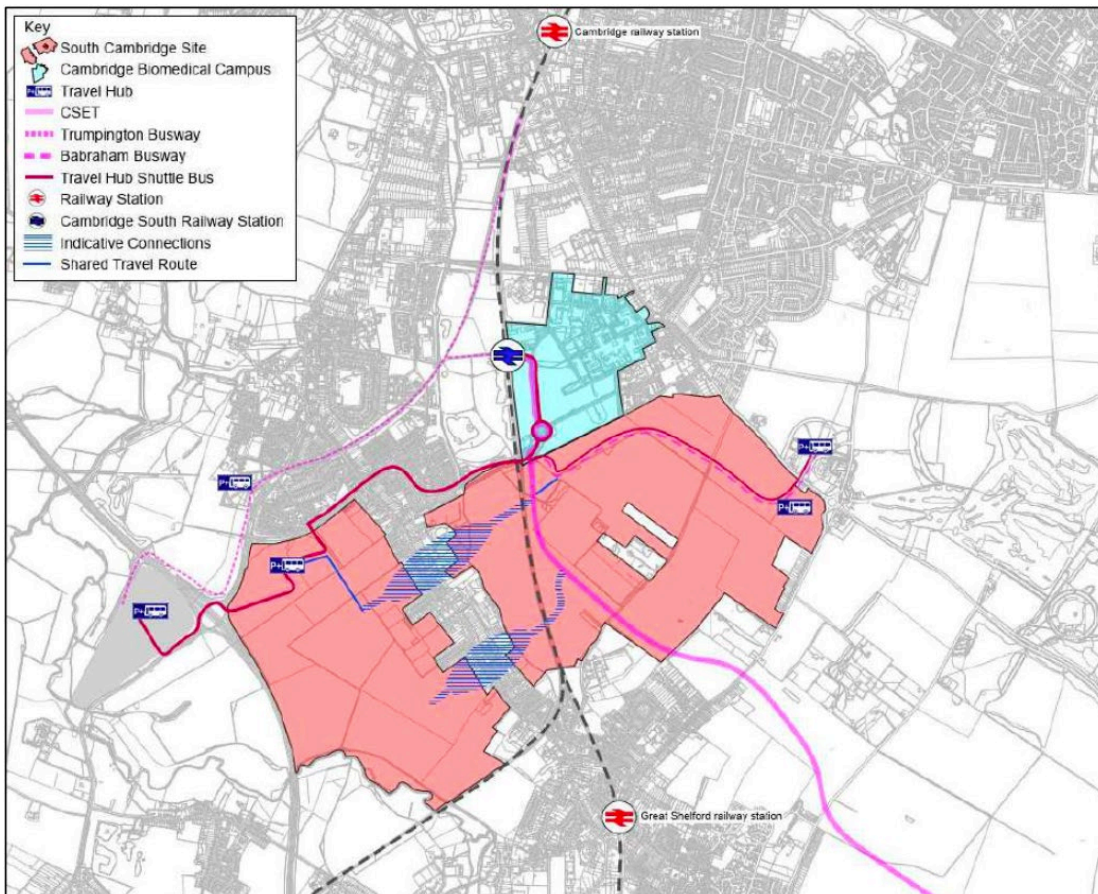


Figure 2 Proposed Cambridge South Site from Vectos Report April 2021 [8, p.27]

2.3.2. Conclusion

The current major employment sites to the north of Cambridge are at least as significant as those to the south and the growth opportunities without disturbing the Green Belt are greater to the north. These include the North Cambridge Area Action Plan [26], the airport when Marshalls move to Cranfield [15] and new employment sites in the large towns developing outside the Green Belt to the north as suggested to us by Councillor MacDonald.

2.4. Major Housing Developments

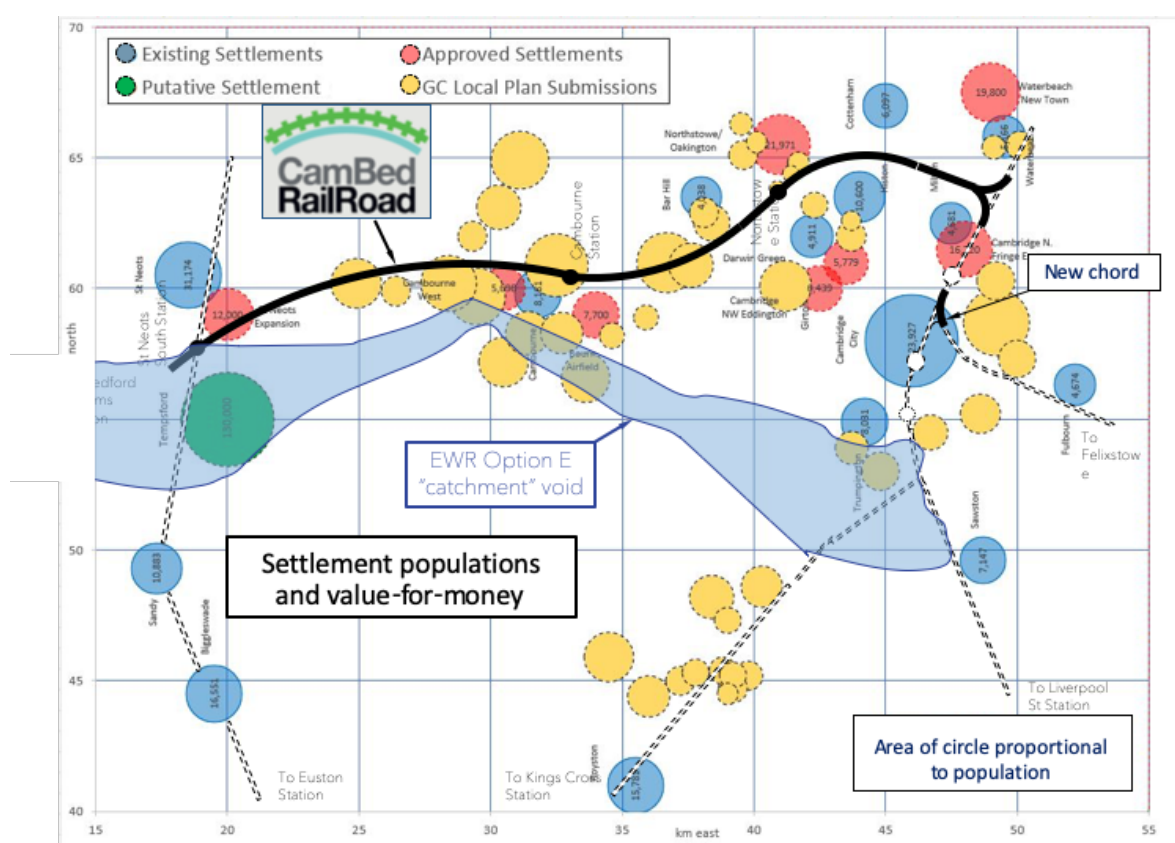


Figure 3 CBRR's Analysis of Current and Proposed Housing Developments

Figure 3 shows the locations and sizes of existing housing sites, approved sites and those in the 2020 call for sites associated with the development of the new GCSP local plan. The call for sites locations may or may not be developed, but there will be no development if the sites are not put forwards. There is clearly a better alignment with the EWR northern approach than the southern approach to Cambridge shown in Figure 3. Simply put, more GC Local Plan Submissions (and, indeed, Approved Settlements) are close to, and would benefit from, a northern approach alignment.

Large developments have already been signed off on the edges of the Cambridge Green Belt at Cambourne, Northstowe and Waterbeach and the populations of each of these sites will grow significantly

in the years to come. Consider Northstowe, when phase 3 is complete, it will have a larger population than Ely, but (with EWR adopting a southern approach) no railway. The cancellation of the CAM by the new Mayor rather throws any plans for the further development of the guided busway into doubt. The guided busway is already at capacity even though the build-out of Northstowe is only 7% complete. Cambridge bound buses are often full before they get to Longstanton. The timetabled journey time from Oakington station to Cambridge central is 28 minutes [27]. Looking at the indicative timetables in [5, Fig.7.6] a train on EWR, if it called at Northstowe, would only take around 11 minutes.

In the Consultation Materials, it is suggested that EWR is best placed to serve “new” settlements, rather than ones which have already been approved but (as in the case of Northstowe) are not yet built. We see this as a denial of already identifiable benefits for the chance of vague future benefit. Provision for Northstowe is already deficient, which risks the next stages of its development, and the railway could remedy this in a way desirable for the community living there, and Cambridge as a whole. Indeed, on the southern approach EWR would stop at Cambridge South and Cambridge Central, suggesting that some benefit in serving already provided for settlements is seen as desirable. We see the northern approach as a way of facilitating, indeed maximising, already approved growth, while also encouraging further GC Local Plan Submissions. The southern approach puts any benefit at significant risk. We think EWR Co. would be best served by doing further research into the proposed and approved (but not yet built) settlements to the north of Cambridge. It is better to prefer the “probability” of growth rather than the “possibility” of growth. Further, if you consider the new town of Crawley, it has increased in size way beyond the original plan due to the presence of good transport infrastructure [28].

Despite the sponsor’s requirements [5, Appendix A, §1.2] calling for the EWR to be an attractive commuter service, we find it odd that EWR Co. state that a stop at Northstowe (which was slated as the largest new town in England since Milton Keynes) is not beneficial to their plans. It seems that the emphasis is much more on inter-urban connectivity than local commuting. Simon Scott, Engineering Director of EWR at a talk given in December 2020 [16, at 23 minutes 40 seconds] indicated that the 100 mph requirement comes from the DfT, but that EWR Co’s own traffic model shows that 70-75% of the journeys are from villages into the local city and that therefore speed is not critical. This comes as no surprise to local residents in Cambridgeshire, where demand for local commuting is higher than for inter-urban trips (with the exception of London). Local commuting allows people to work at employment sites around Cambridge, but live in a place where they can afford to buy a house. The northern approach has more scope for serving this local commuter demand. We need to see the forecast transport patterns in EWR Co.’s traffic model to judge this – origin destination pairs and number of trips for each. Unfortunately, while we have requested this information, it has not been provided in time for the consultation. We understand the arguments for inter urban transport made for example by Bridget Rosewell at the Westminster Social Policy Forum in March 2021, but do not find them compelling. This needs to be based on proper researched market forecasts, not conjecture.

The lines from London to Cambridge solve this commuter vs inter-urban dilemma by running a slow, semi-slow and fast service with lots of stations and it works well. This market driven pattern has evolved over a number of years. We feel that EWR Co.’s innovative clock face timetable is probably more appropriate for urban railways. Although we believe that the northern approach does not require 4-tracking of the WAML,

this clock-face timetable does consume more line capacity than a more traditional approach. Surely, regular users will remember the timetable after a few days. If EWR Co. are looking to reduce costs, this would be a good area to look at.

EWR Co. have not demonstrated much inter-urban demand and the figures given for Oxford to Cambridge journeys per year in the 2019 consultation amounted to less than one passenger per train [11]. Given this low level of traffic, surely this journey pair should not be the driving design constraint, however it does seem to be.

Local residents are understandably concerned about major housing developments at Northstowe and indeed to the north of Cambourne. But if they are going to be built anyway surely it is much better that the transport infrastructure is in place than to see grid-lock on the roads.

One of the Sponsor's objectives is to achieve modal shift for passengers. [5, Appendix A]. The northern approach facilitates the interchange with the major east-west highways the A428 and A14. This will allow more mode switching between car and rail than would be the case for east west transit with a southern approach. This northern approach is closer to the multi-modal spine called for in [1].

As more employment sites build out in Cambourne people in Northstowe and Waterbeach new town will want to travel west to Cambourne as well and going to the employment sites around Cambridge.

2.4.1. Conclusions

There is much more housing growth to the north of Cambridge than to the south. It is better to secure transport infrastructure for Northstowe, than to speculate that it might be needed to support development in the Green Belt to the south. East and west local commuting is likely to develop if EWR goes north. Modal shift of passengers between the A14 and EWR is more likely to occur with a northern approach.

2.5. Wider Impact of the OxCam Arc

It bears stating again that the NIC report [1] calls for 1 million new homes and 1.1 million new jobs across the OxCam Arc by 2050. According to [14], this corresponds to an 81% increase in the number of houses over 2014 levels in an area defined in [1] which includes Cambridgeshire and parts of North Hertfordshire. That's 271,000 houses or 27 fully built Northstowes. We expect that the focus of this growth will be around the "multi-modal spine" consisting, in our area, of the EWR central section and the new A428/A421 dual carriageway from Bedford to Cambridge. For reference the population growth predicted by the ONS between 2014 and 2050 is 16% and the OxCam Arc represents only around 5% of the area of the area of the UK [14]. Thus, one third of all the housing growth in the UK would be in the OxCam Arc [14].

If the EWR is part of this plan, we need to see the full story, not just the railway. We fear that very little of the Cambridge Green Belt will be left by 2050. The CO₂ emissions from the construction of the railway will be dwarfed by the housing and employment site construction. The impact on local biodiversity through the loss of so much habitat will be considerable.

The environmental impact of these huge levels of growth are touched on in Appendix 7 and discussed more fully elsewhere (see for example [14]).

3. Costs and Benefit to Cost Ratios (BCRs)

#	Date	Item	Amount £bn (2010 prices)	Source	Comment
1	January 2019	Capex - Option A	1.7	[11, §9.1, Table 3]	
2	January 2019	Total Cost Option A	1.9	[11, §9.1, Table 3]	
3	January 2020	Capex - Option E	3.2	[4, §15.13, Table 15.15]	2x increase vs #1
4	January 2020	Total Cost -Option E	5.6	[4, §15.13, Table 15.15]	3x increase vs #2
5	January 2020	Level 2 BCR	0.64	[4, §15.18, Table 15.6]	DfT Business as Usual Scenario
6	January 2020	Level 2 BCR	1.31	[4, §15.18, Table 15.7]	NIC High Growth Model

Table 3 Costs and BCRs Recap

It seems that the large increase in total cost from option A in January 2019 to the preferred route option E in January 2020 shown in Table 3 was as a result of a detailed study by Atkins referred to in the Faithful and Gould cost estimates compiled in August 2019 [12]. The figures given to the public in the 2019 consultation were optimistic but they also ranked the options in a different order of cost. The effect was that many people discounted Option E as too expensive in the 2019 consultation and were then surprised that it became the preferred option in January 2020. The level of engagement in the Option E area at the Cambridge end was very low partly because of this. This description of events has been corroborated by talking to many people in the area over the last year for example during presentation and webinars given by CA.

3.1. Cost Comparison of Option B and CBRR Route

Let us assume that the CBRR northern approach does not need to be 4-tracked on the WAML while the southern approach does.

An Atkins study referred to in the Faithful and Gould cost estimates [12] includes an analysis of a northern approach to Cambridge which referred to it as Option F. We assume this costing applies to a similar route to the one proposed by EWR Co. in [5, Appendix F]. Option B and Option F differ only in their approach to

Cambridge and on page 8 of [12] it is stated that the civil engineering cost for Option F is £1786m compared with £1368m for Option B1A or B1B. This is a difference of £418m. We also note that Atkins assumed that no modification to Cambridge North station would be required and no 4-tracking either (see track section FC3). This supports the conclusion we reached independently in Appendix 5.

1	#	Bill Description	B1A - Atkins	F - Atkins	F-B1A
2	51	Viaducts	£ 253,464,911.00	£ 448,007,143.00	£ 194,542,232.00
3	52	Viaducts - Complex	£ 217,612,165.00	£ 365,527,567.00	£ 147,915,402.00
4	45	Earthworks: Fill[>10m]	£ 205,985,226.00	£ 335,866,133.00	£ 129,880,907.00
5	56	Overbridge (Highways)	£ 62,520,831.00	£ 132,659,235.00	£ 70,138,404.00
6	46	Discount from re-used cutting volumes	£ (175,949,128.00)	£ (118,568,135.00)	£ 57,380,993.00
7	44	Earthworks: Fill [5-10m]	£ 321,238,093.00	£ 355,394,184.00	£ 34,156,091.00
8	43	Earthworks: Fill [0-5m]	£ 14,021,720.00	£ 22,021,759.00	£ 8,000,039.00
9	37	Park and ride provision - multi storey	£ 20,727,791.00	£ 28,082,813.00	£ 7,355,022.00
10	12	E/O for Slab Track (New)	£ 8,613,693.00	£ 15,475,810.00	£ 6,862,117.00

Table 4 Atkins Direct Cost Estimate Items EWR Co.'s Northern Approach [12]

Table 4 compares the items in Option F (EWR Co.'s northern approach) with Option B which we understand are similar at the Bedford end. The data in table 4 is taken from [12] and sorted in order of decreasing cost difference. Top of the list are viaducts which account for most of the cost difference between options B and F. However, although EWR Co.'s northern approach uses viaducts, the CBRR[20] route does not. This means that claims about the additional cost for the northern approach made in [4] cannot be applied to the CBRR route.

As a sanity check on [12] from July 2019, we looked at reference [39] from March 2019. Reference [39] explains that *"The increase in costs of a Bedford Midland option over a Bedford South option, in this geographic area, is therefore considered to be in the order of c£800-900m for route D, and c£650-750m for Route E based on the upper limit of the ranges"*

We note that [12] states that the Expected Final Cost of option E at £3836m is less than option B1A or B1B and £4136m and £4184m, respectively. This report is dated July 2019.

So [39] is saying that traversing the long hilly route out of Bedford north is more expensive than the flat straight route from the south. This makes sense. However, we do not understand why [12] says the opposite.

In January 2020, cost was a significant factor in EWR Co's rejection of a northern approach [4, §16]. However, as shown above, the Faithful and Gould cost estimates do not, on close examination, support this conclusion. We have also requested, but have not received in time to support our consultation response, any appropriately updated cost estimates. We first asked these questions in December 2020.

3.2. BCRs for the Central Section

No new BCRs have been produced for either the northern approach or the southern approach to Cambridge in the Technical Report [5]. Capital costs for the Clapham Green to Eversdens section are given in it, but this does not include the expensive sections approaching Bedford and Cambridge. We make no comment on the likely cost changes since the Preferred Route Option Report was published for the significant engineering works associated with leaving Bedford to the north, however, there do seem to be some changes for the southern approach to Cambridge.

[4, §16.4 states] *“some of the additional tracks south of Cambridge are likely to be required anyway to provide capacity for the proposed new Cambridge South station”*. In fact, in round 2 of Network Rail’s Cambridge South Consultation in October/November 2020, the amount of 4-tracking turned out to be minimal and restricted to the few hundred metres of Cambridge South station itself. The EWR project will have to pay for the remainder of the 4.3 km of 4-tracking from the SBJ to Cambridge Station. In view of the dominance of the civil engineering costs in [12] we expect this will have had a significant impact on the upfront capital expenditure for the southern approach since 4-tracking from the SBJ to Cambridge Station will now form part of the capital costs of the EWR project. It seems to us this is a significant omission in the consultation documents.

Furthermore, if the major employment sites to the north of Cambridge are to be served directly with the southern approach, then by EWR Co.’s assumptions this 4-tracking has to be extended to Cambridge North station. This extension of the southern approach to serve Cambridge North directly is proposed as an advantage of the southern approach in [5, Appendix F §1.1.10] and elsewhere in the Consultation Materials. The Sponsor’s Requirements also specify that EWR Co should consider the EWR eastern section which will inevitably go through Cambridge North. The case for 4-tracking of the northern approach was not identified prior to the Faithful and Gould cost estimates and has not been justified by EWR Co. See also appendix 5 and §4.4 of this document.

As pointed out by South Cambridgeshire MP Anthony Browne and many others, the benefits of the EWR CS are likely to have been negatively impacted by long term behaviour change following the pandemic with more people working from home. We are pleased to see that EWR Co have been asked by the rail minister to start “testing the possible impact a long-run rise in working from home could have on the route [32].” The Williams Shapps Review [31] acknowledges the collapse in rail passenger numbers during the pandemic and expresses the hope that “much of it will come back”. However, the BBC recently reported on a large-scale survey of UK employers [30] and confirmed the conclusion that people would continue to work from home long term and describes how companies are reducing office capacity. BCRs are discussed further in appendix 7.

3.3. Conclusions

EWR Co. need to collaborate with those developing the plans for housing, employment sites, local transport and plans east of Cambridge and then come back with a much more co-ordinated scheme for the

approach options to Cambridge. Existing and future housing plans, as far as they are known, fit much better with a northern approach to Cambridge.

EWR Co. need to serve local commuter traffic as best they can. This is more likely to happen with a northern approach.

If the EWR is only justified on the basis of the OxCam Arc and the presence of this infrastructure will be a focus for growth, then we need to see the environmental impact of that growth.

4. Alignment and Impacts

4.1. Comparisons

One of the tests of a satisfactory route for a railway is an impact assessment on the geography of the landscape through which it passes. Primarily it would need to avoid settlements as far as possible (except where there are stations) to reduce the effect of the railway on noise and, where diesel locomotives are used, air quality. Environmental impacts also need to be assessed – see §2.4.

In our commentary, we have compared a northern and a southern approach into Cambridge for a range of attributes. The northern approach is that proposed by CBRR but with an additional option for freight. The first and original option (Option A) is to allow freight traffic turn south at Milton and then eastwards to Newmarket at Coldham's Lane Junction on the same existing line that EWR Co. intend to use for freight. The second option (Option B) is to allow freight to travel north from Milton and join the Felixstowe to Nuneaton freight line via a new chord just south of Ely. Both options with similar horizontal alignments are referred to by EWR Co in [5, Appendix F §2.1.4].

The southern horizontal alignment is the section of EWR Co.'s emerging preference Route Alignment 9 [5, §9] between Cambourne North station and The Eversdens combined with their single option proposal between The Eversdens and Cambridge station [5, §10,11]. Our Option B and EWR Co.'s preferred alignment are shown in Figure 4.

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Figure 4 Proximity of each freight line to residential properties within 200m (CA's Option B shown)

We have compared northern and southern approaches against a range of impacts as shown in Table 5 below. It is based on our measurements and, in brackets, EWR Co's measurements (where available) from [5, Appendix F]. It assumes that there will be no 4-tracking of either the section of a northern approach between Milton Junction and Cambridge Station or of a southern approach between Hauxton and Shepreth Branch Junctions. Our rationale for 4-tracking being unnecessary on a northern approach is set out in section 4.4.1 of this report. Further comparisons are shown in Appendix 2.

Impact on:	Northern	Southern	Notes
Residents			
Freight route Option A (to Coldham's Lane Junction)	800 (-)	6800 (-)	Number of residential properties within 200m of track between Camboorne to Coldham's Lane Jn
Freight route Option B (to Chippenham Junction)	1000 (-)	10300 (-)	Number of residential properties within 200m of track between Camboorne to Chippenham Junction near Newmarket

Impact on:	Northern	Southern	Notes
Passenger route	3600 (4600)	3100 (3800)	Number of residential properties within 200m of track between Cambourne North Station and Cambridge Station
Environmental sites			
SSSIs	0 (1)	4 (4)	Within 2km of alignment. Note that EWR Co appear to have mistakenly counted Madingley Wood in their assessment – this is 2.3km from the alignment.
SACs	0 (0)	0 (0)	Within 2km of alignment. However, Barbastelle bats in Wimpole & Eversden Woods will be affected by the southern approach as they forage about 5-7km from their roosts.
Priority habitat area	2200 (-)	5800 (-)	Takes area of habitat into account
Heritage sites			
Scheduled monuments	0 (0)	3 (2)	Within 10m of track (i.e. physical impact)
Listed buildings (Gd 1 & 2*)	4 (-)	9 (-)	Within 500m of track. Cambourne to Coldham's Lane Jn
Listed buildings (Gd 2)	22 (-)	90 (-)	Within 500m of track. Cambourne to Coldham's Lane Jn

Table 5 Comparison of impacts between approaches (EWR Co figures are shown in parentheses)

Table 5 shows that:

- a) EWR Co have counted the number of properties within 200m of the track between Cambourne North and Cambridge stations. Their results in a table, in [5, Appendix F §3.1], showed that there were 800 or 21% more properties on a northern approach than a southern approach. Our counts using a similar basis to EWR Co were different but still showed about 500 or 16% more properties on a northern approach than a southern approach. This difference is probably due to the methodology and the databases used in counting. We have counted only residential properties rather than include commercial properties as EWR Co as we believe this is a more representative measure of impacts on people.

Cambridge Approaches, but not EWR Co, have also counted the impact on residences by freight trains for both of our options. We consider this is a more representative measure than impacts caused by passenger trains as they are more likely to run at night when people are more sensitive to noise impacts. Because freight trains are likely to be much longer (up to 775m for freight compared to about 80m for a 4-car passenger service) their impact would occur over a longer period than passenger trains. Finally, freight trains are expected to use diesel locomotives for many years before switching to quieter alternatives: we expect that passenger trains used in

Configuration State 3 (applicable to this section of the route) are likely to use locomotives that are quieter than diesel.

Using these counts of the impact of freight trains on residents close to the different approaches, we have found that, for our Option A (via Coldham's Common), there are over 8 times more residential properties within 200m of the line using a southern approach than a northern approach. If freight uses the alternative option proposed by Cambridge Approaches of travelling north towards Ely from Milton Junction and then onto the main freight line just south of Ely, **there would be over 10 times more residential properties within 200m**. This is indicated in Figure 4.

EWR Co has stated, [5, Appendix F §3.1.8], that: *'It is in relation to impacts on properties that a strong distinction [between alternative approaches] can be drawn. The northern approach affects dramatically more residential and commercial properties than a southern approach.'* Critical to this statement is the potential need EWR Co has identified for the first time in the Technical Report for 4-tracking of section NA2 of EWR Co's northern approach. As noted in §4.4.1, we believe this conclusion to be flawed.

- b) EWR Co have also provided in [5, Appendix F §3.1] the counts of the number of natural environment sites within 10m and separately within 2km of the northern and southern alignments. Their table shows that the environmental sites are broadly similarly affected by each approach with the exception of SSSIs where the northern route has a lower impact.

We question the methodology EWR Co. have used in counting the SSSIs, SACs and Priority Habitats. There are no SSSIs within 2km of the northern route and believe that EWR Co may have mistakenly counted Madingley Wood which is 2.3km away. We discuss at 4.2.2 the impact on the Barbastelle bats living in the SAC at Wimpole & Eversden Woods which will be affected by the southern approach as they forage about 5-7km from their roosts. EWR Co have counted the number of each Priority Habitat, however large or small they are. We take the area of each Priority Habitat into account and show that there is more than a two and a half times greater impact from a southerly approach than from a northerly approach.

- c) EWR Co conclude in [5, Appendix F, §3.1.7] that *'Heritage does not assist in distinguishing between the northern and southern approaches.'* We have counted heritage sites such as Scheduled Monuments and listed buildings within 10m and within 500m of the alignments compared to EWR Co's respective distances of 10m and 2km. We believe that 500m is a more relevant measure than 2km as sites within that zone would be impacted to a significantly greater extent than those 2km away. We conclude that these counts do assist in comparing the routes and that the impact by a southern approach is greater than from a northern approach. For example, there are over four times more grade 2 listed buildings and more than twice the number of grade 1 and 2* buildings within 500m of the southern approach than the northern approach and there are no Scheduled Monuments within 10m of the northern approach but three within 10m of a southern approach.

4.2. Wildlife Impact

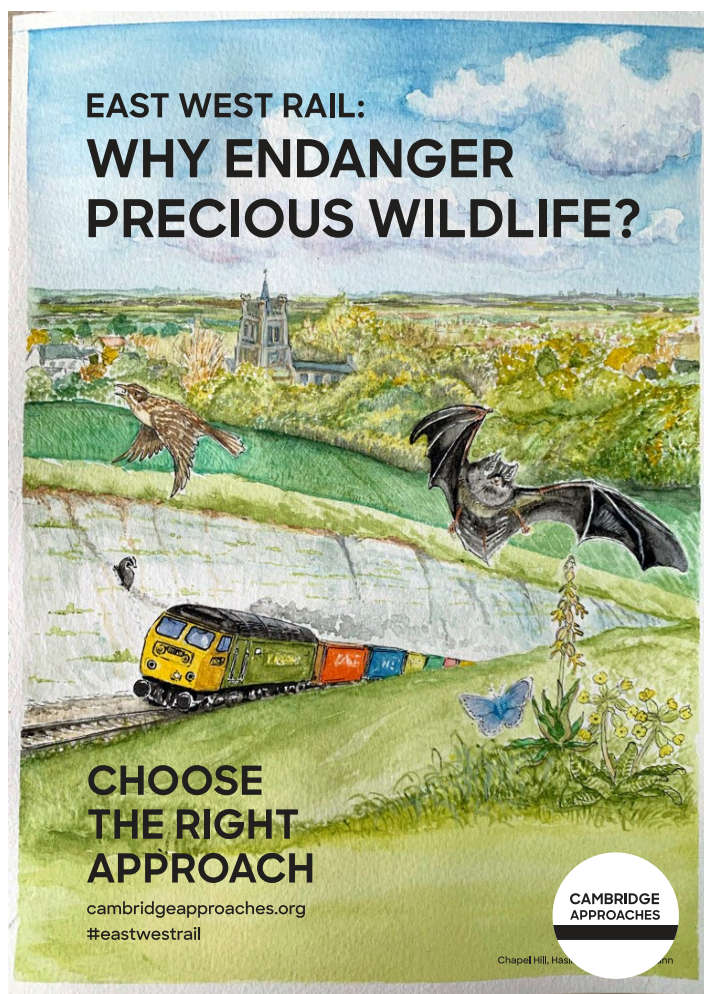


Figure 5 Watercolour depicting the proposed Cutting through Chapel Hill and its impact on rare flora and fauna. See Appendix 6 for more details

Natural England's Consultation response in 2019 [10, pp.245-254] stated that "At this stage, there is a lack of relevant or detailed environmental information within the present consultation to enable us to form an opinion on a route option."

And they go on:

"A key component of this consultation is a request for opinions on the overall approach EWR Co. have taken to developing route options. Whilst Natural England have not undertaken its own environmental analysis of alternative route options to the North of Cambridge, these options may offer reduced environmental impacts compared to the five put forward within this present consultation. It is essential, and a priority, that a comparative environmental assessment is completed prior to selecting route options for consultation, and that the least-impact route on the environment is prioritised. **We are concerned at the apparent lack of an environmental justification for the discounting of route options to the North of**

Cambridge. At this stage, alternative options with a reduced environmental impact should not be discounted and we look to EWR Co. to consider these as a matter of urgency. Pending a comparative environmental analysis of all possible route options, Natural England cannot express a preference on the route options currently proposed."

It would appear that EWR Co. has not performed a comparative environmental assessment of the northern versus the southern approach to Cambridge in the ensuing two and a half years, possibly as a result of other concerns about the northern approach. We still await provision of even the "high-level environmental appraisal" referred to by EWR Co. in the Consultation Documents, which we have not been provided by the time of this response was prepared. However, we believe that these other concerns can be addressed as described in this response.

Natural England (NE) also commented on the "avoid-mitigate-compensate" hierarchy as EWR Co. does not seem to have followed this advice:

"1.9 suggests that ERW (sic) Co will consider measures to reduce, mitigate and compensate adverse environmental effects, whereas A.23 it is suggested that environmental effects will be identified. Natural

England advises that environmental effects should be identified as a priority, and that the avoid-mitigate-compensate hierarchy is followed as stated in paragraph 118 of the National Planning Policy Framework (NPPF). In addition, 1.9 suggests that measures may have the potential to provide environmental improvements, whereas A.23 suggests measures can potentially remedy significant adverse effects. We understand that a commitment to net gain has been made by EWR Co e.g. 9.4 states that EWR Co intends on "... ensuring that the EWR central section aligns with the government's policy on biodiversity net gain". Natural England therefore advise that the mitigation hierarchy is applied consistently, and suggest it is not possible to comment on the likely conclusion of an EIA prior to screening and scoping."

In [5, Appendix F §2.4.3], EWR Co. states:

"a northern approach to Cambridge is less likely to interact with bat populations associated with the Wimpole and Eversden Woods SAC. Nevertheless, EWR Co considers that such interactions as may occur are likely to be capable of being mitigated. Therefore, it is expected that the interaction with the northern approach would not be likely to perform materially better than the southern approach. EWR Co currently expects the southern approach to require an assessment under the Conservation of Habitats and Species Regulations 2017 prior to any decision to grant a DCO and/or to proceed with the scheme".

As such, EWR Co. has failed to properly appraise the northern option (which could enable it to avoid impacts on the SAC) before considering mitigation. This is contrary to the jurisprudence of the Court of Justice of the European Union ("CJEU") (*People Over Wind and Sweetman* (C-323/17)) and para 118 of the NPPF as NE points out.

The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire (WT BCN) also responded to the 2019 consultation although we cannot find their response in [10]. It is however set out in the attachments to [33].

The WT BCN is concerned about the lack of a Strategic Environmental Assessment (SEA).

"A legal challenge was brought to the lack of SEA for the HS2 phase 1 proposals. That challenge failed largely because the Courts considered the decision not to have been made until the Parliamentary process was completed, a process not necessary for East West Rail. The Wildlife Trusts, together with other parties, complained to the European Council. In July 2014 the Council stated that:

'We remain of the view that large transport infrastructure developments such as this should be best addressed, in particular with regard to the question of alternatives, through the process foreseen in the SEA Directive (a matter which we will continue to raise with the UK authorities).'

The Wildlife Trust would also urge that a Habitats Regulations Assessment (HRA) is carried out to assess the potential impacts [of] route alignment development within the alternative route options."

They are also concerned about dropping the northern approach to Cambridge:

"The Wildlife Trust is very concerned at the approach taken by EWR in only considering options into Cambridge South and not presenting a similar level of information for route options into Cambridge North.

The northern options (B & E) including St Neots and Cambourne are far better aligned with current and potential future growth and will ensure there is just one major East-West transport corridor in which both East West Rail and the Oxford to Cambridge Expressway sit. This will cause less damage to local ecological networks than two corridors, not least from having one concentrated corridor for future housing growth rather than two separate corridors.

However, by not considering coming into Cambridge North on an equal footing to Cambridge South, the consultations propose route options from Cambourne into Cambridge South, which are potentially extremely damaging for the natural environment. They will cut through the West Cambridgeshire Hundreds ecological network, potentially affect more County Wildlife Sites (see appendix A to this letter), and almost inevitably pass through the Trumpington Meadows country park and nature reserve. This latter site is part of the Cambridge southern fringe sustainable urban extension, providing a strategic natural greenspace and significant area of newly created lowland meadow, priority habitat. Natural features put in place to ensure the sustainable growth of Cambridge must not be partially destroyed or damaged by EWR."

We cannot find the CPRE response in [10] either however we were sent a copy by the CPRE [34], they also called for a Strategic Environmental Assessment and supported the northern approach to Cambridge as proposed by CBRR.

"We support a route via Cambourne as this would serve the existing new town there and also the new settlements proposed for Cambourne West and Bourn Airfield. EWR should have an interchange in the Cambourne/ Bourn area with any new 'Cambridge Metro' service that is proposed.

We believe that the route east from Cambourne would provide a more integrated and sustainable solution if the suggestions of the group CambBedRailRoad (CBRR) were considered and instead of routing south east, the route from Cambourne were routed north-east. This would enable it to provide a service to the Northstowe new development to the Cambridge Science Park and to the St John's Innovation Centre, by approaching Cambridge via the new Cambridge North station."

4.2.1. Cambridge Approaches Research

Cambridge Approaches commissioned an eminent independent ecologist, Kevin Hand MSc MCIEEM, to conduct an appraisal of the Wildlife and Landscape Impacts of EWR's Preferred Southern Route into Cambridge versus CBRR's Northern Route (Appendix 6). A summary of the main points of the study are reproduced below:

"If the project does go ahead, the environmental impact of the Southern Route will be much greater, and will have negative impacts on:

- *Cambridgeshire's internationally important chalk streams, with their populations of Brown Trout, Water Vole and Otter, and the River Cam itself, already severely under pressure from water extraction for other new developments. There are only 200 chalk streams in the world and five will be affected by the Southern route:*
 - *The River Cam at Hauxton*
 - *The Rhee or Cam at Harston*

- *The Riddy at Hauxton*
- *Coldhams Brook*
- *Hobson's Brook which flows from the Nine Wells Local Nature Reserve into the city and beside the Botanic Garden, and was the first source of fresh drinking water for the people of Cambridge.*
- *The West Cambridgeshire Hundreds Living Landscape, where the BCNWT is linking ancient woodlands like Hardwick Wood that have survived for hundreds of years. The proposed route will form a barrier for wildlife, and for people from Cambridge and its many new developments, no longer able to walk and cycle from the city to explore these areas or the associated Cambridge Boulder Clay & Woodland Priority Area identified as part of the Cambridge Nature Network by BCNWT and CPPF.*
- *Our chalk hills and grasslands, one of the UK's Priority Habitats, and in particular Haslingfield Chalk Pit and its associated landscape, which has thousands of orchids, including the nationally rare Man Orchid, and is widely valued and used by local communities.*
- *The Bourn Brook, a site internationally famous for its success in restoring rare water vole populations and reducing introduced American mink, and the work of the Countryside Restoration Trust at Westfield Farm, where over 20 years of research work have resulted in growing populations of rare farmland birds and plants.*
- *Many species of rare and endangered wildlife, including Barn Owls, Lapwings, Otters, Water Voles, Badgers and Bats. As just one example, the globally rare Barbastelle bat has a maternity colony centred on the Wimpole Hall estate and the Eversden Woods. This area has been awarded one of the UK's highest levels of protection, a Special Area for Conservation. Feeding flights for the breeding mothers will be blocked, and bats may be killed, during the construction and operation of the Southern route. Many more less mobile mammals and birds will be greatly affected too. Mitigation for the Barbastelles suggested by EWR includes methods that have been shown not to work elsewhere, such as nest boxes and bridges.*
- *Elms are a rare tree in the British landscape, and recent research has found 35 species in Cambridgeshire, many growing in woods and hedges that will be destroyed, including one found nowhere else in the world, *Ulmus cantabrigiensis*, the Cambridge elm. Rare black poplars are also to be found along the southern route.*
- *As well as the Special Area for Conservation at Wimpole, the Southern route will destroy or damage 2 Sites of Special Scientific Interest (SSSIs), at least 11 County Wildlife Sites and 3 City Wildlife Sites, vitally important green spaces for the growing population of Cambridge.*

The Northern route is much less damaging to wildlife and landscapes, as it would cross the area already affected by the A14 upgrade, and a small part of agricultural fenland. It would not need to cross the River Cam. It should not affect any SSSIs, one or possibly 2 County Wildlife Sites, and no City Wildlife Sites."

In light of these findings, CA urges EWR to conduct a full Environmental Impact Assessment (“EIA”) and a Habitats Regulation Assessment (“HRA”) before discounting a northern approach into Cambridge. We also support the views of WT BCN in relation to an SEA (see above).

4.2.2. Eversden and Wimpole Woods SAC

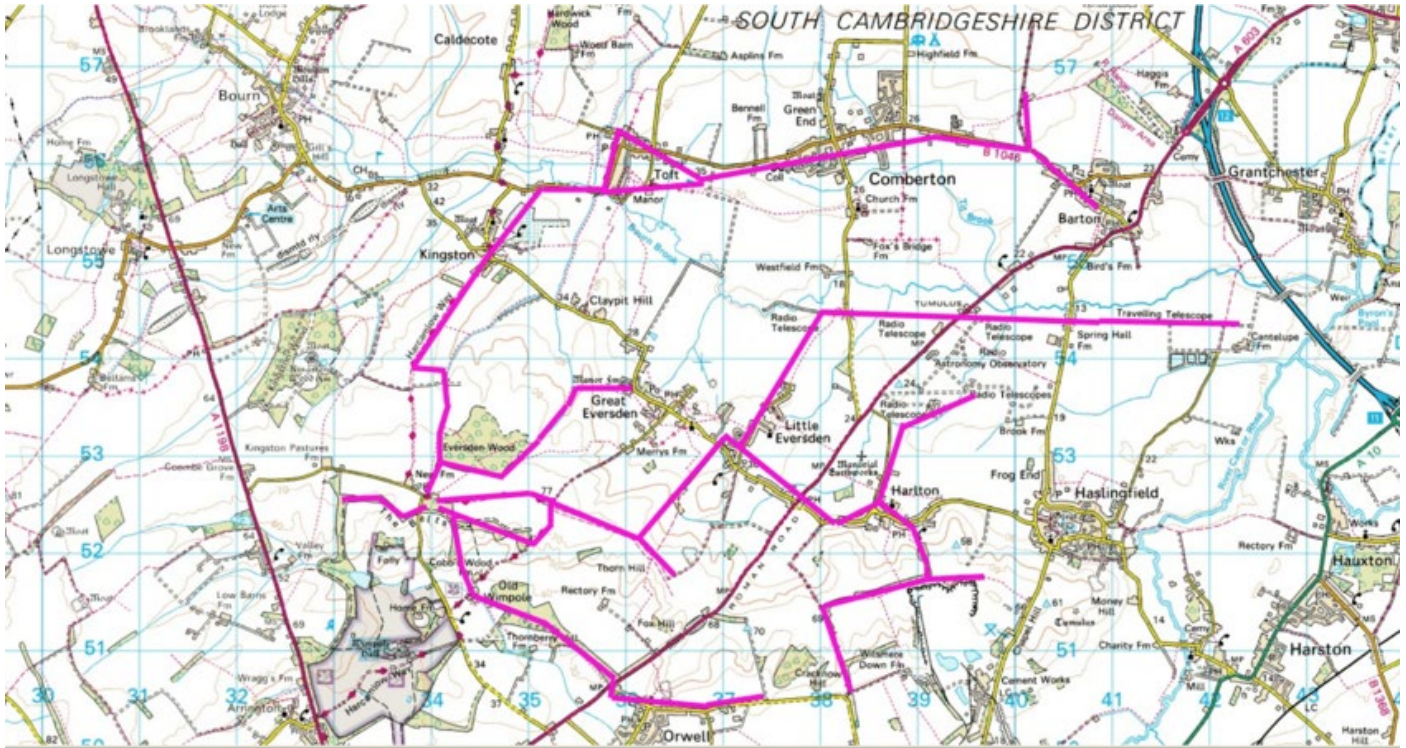


Figure 6 Pink denotes the main routes of radio-tracked Barbastelle bats see Appendix 8 and [35].

The SAC comprises a mixture of ancient coppice woodland (Eversden Wood) and high forest woods of more recent origin (Wimpole Woods). A colony of barbastelle bats (*Barbastella barbastellus*) is associated with the trees in Wimpole Woods. These trees are used as a summer maternity roost where the female bats gather to give birth and rear their young. Most of the roost sites are within tree crevices. The bats also use the site as a foraging area. Some of the woodland is also used as a flight path when bats forage outside the site.

It is clear from Figure 6 that the proposed southern route will impact the flight lines to foraging sites for the Barbastelle bats from the Wimpole SAC maternity roost - one of only 6 such sites in the UK [36]. High embankments will block the bats and Appendices 6 and 8 make it clear that traditional mitigations like bat bridges and boxes do not work.

Further information about the effectiveness of bat bridges has been obtained from private correspondence with Professor William Sutherland at the Cambridge University Department of Zoology. He indicates that bat bridges are a classic example of consultants moving an idea to best practice without any testing and

even continuing to use them when it is shown that they do not work. Further information about this group's assessment of the evidence can be found in [22].

In the Consultation Documents, EWR Co. say that they are "confident" that they can mitigate any impact on the SAC. Unfortunately, the analysis underpinning this conclusion, and the mitigations to be taken, have not been provided before we had prepared our consultation response. This makes it necessarily difficult to comment usefully on EWR's proposed mitigations. To support their southern approach, EWR Co. need to be clear about what mitigations they will apply and the evidence that they will work.

The requirement for an HRA cannot be ruled out on the basis that it may be possible to mitigate adverse impacts on the features of importance of the SAC. The Habitats Directive establishes a hierarchy for decision-making that starts with appropriate assessment and embodies the precautionary principle (see above). CA urges EWR Co. to conduct a full EIA and HRA before making any decision on the approach into Cambridge (and specifically discounting a northern approach).

4.3. Mullard Radio Astronomy Observatory (MRAO)

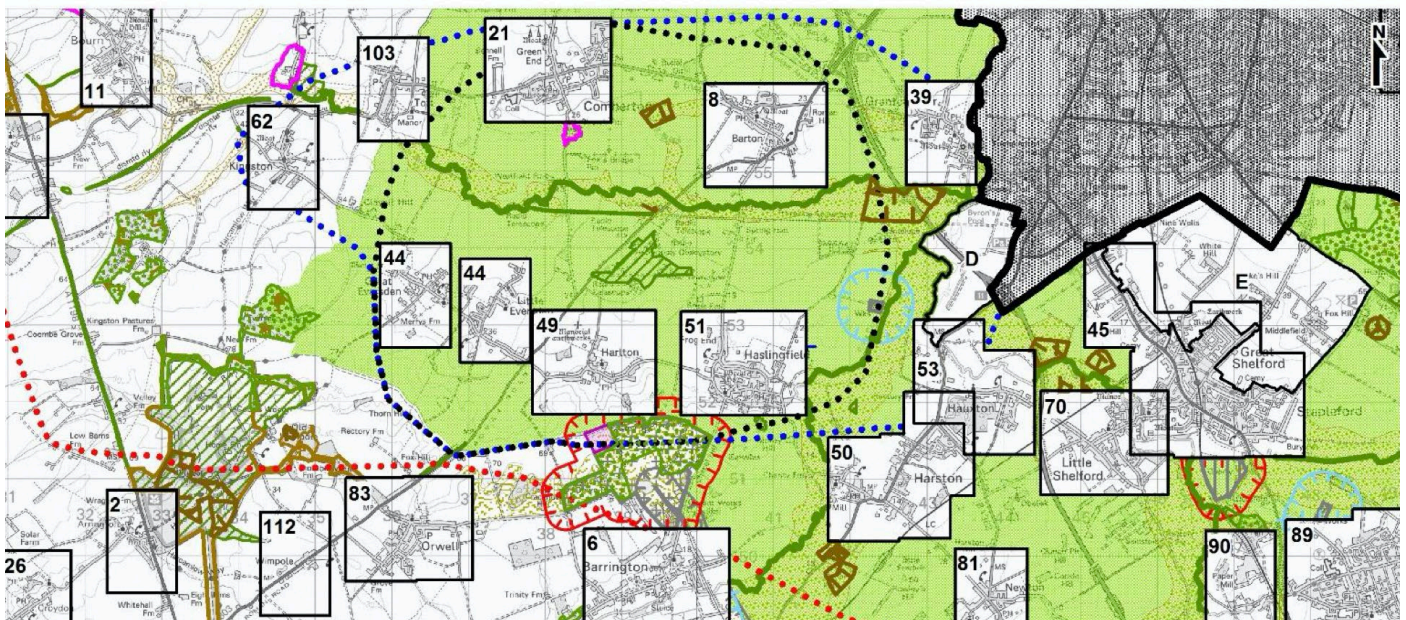


Figure 7 2018 Adopted Local Plan Policies Map showing the MRAO Exclusion Zones. Black Dots indicate the Restricted Area.

Policy TI/7 from the 2018 South Cambridgeshire District Council local plan [37] states "Within the 'Lord's Bridge Restricted Area' (defined on the Policies Map), planning permission will only be granted for development that would not result in any risk of interference to the Mullard Radio Astronomy Observatory at Lord's Bridge." Figure 5 shows this area.

The M11 motorway was built in 1980 and passes the edge of the restricted area in a trench. There are high metal shields on one side to protect the MRAO from interference. These are designed such that the telescopes are in the first zero of their edge diffraction pattern at the wavelength of interest. The proposed southern approach is well within the restricted area and mostly on high embankments. If electrified, the

overhead line equipment will be 4-5 metres higher than that. It will be a much more significant source of electrical interference than vehicles on the M11. This is because the trains are closer and will have an unobstructed line of sight to the telescopes. As a nationally significant infrastructure project, the EWR is not obliged to respect local plans. However, the laws of physics still apply. We understand from private correspondence with the University that no solutions have yet been proposed to them by EWR Co. We assume that if EWR Co. persist with the southern route then they will have to pay to move the site elsewhere at significant cost. However, we understand that there are no known sites surrounded by low ridges in the UK that are suitable. The other possibility would be huge shielding embankments and EWR Co. know how unpopular those are with local residents – see appendix 3.

In the Consultation Materials, EWR Co. say that the impacts on the MRAO are “predicted to be capable of mitigation, subject to design”. We have requested the information which informs this conclusion, but it has not been provided before we had prepared our consultation response. This makes it necessarily difficult to comment on the mitigation strategies. EWR Co. need to be clear about the MRAO mitigations they propose. The impact on the MRAO could be significant and serious. On the other hand, the northern approach removes entirely the need to mitigate; it avoids this problem entirely. That is desirable from the perspective of the avoid mitigate compensate hierarchy.

4.3.1. View from the American Cemetery

EWR Co. flag the American cemetery and Madingley Hall as sensitive receivers to the north [5, Appendix F §2.4.9 and 2.4.10] The text there has been lifted exactly from Historic England 2019 consultation response [10, pp. 125-6] before EWR Co. proposed a specific northern route alignment. Madingley Hall is low lying and GIS studies [9] confirm that Madingley Wood obscures the view of even a 12m high A14 bridge from the high ground at the American cemetery. These are therefore non-issues and the information in the 2021 consultation could confuse to consultees. On querying this during the consultation, we were told that the concern was actually the preserved view towards Ely. This would be a view of the line north of Histon over the top of the new grade-separated Girton interchange at a distance of over 7km. It would be hard to see even EWR Co’s embankments and viaducts at that distance, let alone a CBRR trench.

4.4. 4-tracking

4.4.1. Northern approach

One of the main planks of EWR Co’s argument for their preference for the southern approach is their assertion that the northern approach NA2 section between Milton junction and Cambridge station using the existing WAML would need to be 4-tracked [5, Appendix F]. No details of the assessment that EWR Co have undertaken have been provided as part of the Consultation Materials. Yet this conclusion feeds into their rejection of a northern approach. We have requested the “operational analysis” which has been undertaken, but this was not provided by the time we had prepared our consultation response. This makes commenting on the analysis undertaken very difficult.

We have carried out our own assessment of track capacity compared to reasonable worst-case traffic and refute the need for 4-tracking of this section. Our approach to the analysis is based on the overall capacity of the track compared to the number of trains likely to use it. An alternative approach is to consider the

current timetable and assess whether it could accept the required services. We consider that the timetable-based approach is not appropriate for a number of reasons including:

- i) The timetable in current use is unlikely to be the one used in 10 years' time when EWR is planned to become operational. Pressure on the existing timetabling arrangements will increase with the recent announcement of a new central body responsible for timetabling in the UK (Great British Railways) rather than the current fragmented approach
- ii) Other new non-EWR services are likely to require changes to the current timetable
- iii) It would be expected that there would be flexibility of other services to accommodate the incorporation of a new main line operating on the same section of track. This is especially true for services north of Cambridge where there are fewer constraints imposed by other services.

Table 6 shows the reasonable worst-case number of trains using the track between Milton Junction and Coldham's Lane Junction. We have assessed this section of track because additional track capacity could be provided in the section between Coldham's Lane Junction and Cambridge station substantially by track changes rather than by major changes to infrastructure.

Service	Northern approach	Notes
Existing passenger	6	Using Dec 18 peak times timetable as PWOS 5.3.1. Services: Cambridge North (2tph), King's Lynn (2tph), Norwich (1tph), Birmingham (1tph)
Planned EWR passenger	4	PWOS 5.4.1 Configuration State 3. We consider that 6tph mentioned in Configuration State 3.5 is unlikely to be realised.
Other planned	3	EWR Sponsor's Requirements 4.1 specify EWR to be capable of meeting forecast passenger growth anticipated as part of Ox-Cam Arc. Services: Possible growth for Norwich (extra 1tph) and Wisbech (2tph). Wisbech trains could join/split at Ely which would reduce rail traffic in section. Note that the new Mayor has questioned the need for the Wisbech service.
Freight	0	We have assumed freight will use our Option B (via a new chord near Ely) in this table so there will generally be no freight on this section of track. Exceptional freight would operate during non-peak hours.
Total	13	

Table 6 Reasonable worst-case rail traffic scenarios (trains per hour (tph) in each direction) for northern approach into Cambridge

The assumptions and data sources used in compiling Table 5 are discussed below.

- (a) We have not assumed any long-term change in the pre-pandemic forecasts for growth and 'existing' services due to impact of COVID, even though this is likely to reduce the amount of rail traffic in the short and perhaps the medium term.
- (b) For consistency and independence, we have used Network Rail's 2019 Cambridgeshire Corridor Study [17] for assessing passenger and freight growth forecasts on the existing network.
- (c) Future demand for freight on EWR is taken from a scenario suggested by Network Rail in the EWR Co's [5, § 3.10.7].
- (d) For a northern approach, EWR freight is taken as using Option B previously described via a new chord to the south of Ely.

The capacity of an 'open track' is about 15tph based on the International Union of Railways (UIC) codes using traditional signalling and mixed traffic lines. This capacity is enhanced because of EWR's use of digital signalling. While there is no general enhancement figure that can be applied to a specific location, based

on a report from UIC [38] and Network Rail's estimates, this enhancement could be up to about 40%. We recognise that the capacity is affected by a number of other factors, most notably timetabling of other services and any crossing movements between tracks, and so have used 20% for the enhancement. This results in a capacity of about 18tph.

The foregoing assessment shows that there is a general track capacity excess of about 5tph (capacity of 18tph less reasonable worst-case demand of 13tph) for the existing twin track WAML south of Milton Junction. This excess capacity could be used if ever EWR ran an additional 2tph as specified in the Programme Wide Output Specification [5, Appendix B §5.4.2.2].

EWR Co's argued need for 4-tracking to the north of Cambridge is based on two main concerns. The first is stated in [5, Appendix F §2.2.4]:

'...there would be several conflicting movements between EWR and other services. These would include:

- *Trains towards Ely and eastbound EWR services conflicting where EWR services join the WAML...*

This conflict may be based on the current timetable which, as already stated, may change before EWR becomes operational. If there is a persistent potential conflict, it could be overcome by providing a grade-separated junction. This would be cheaper to construct than EWR Co's infrastructure proposals for 4-tracking into Cambridge.

The second concern has been obtained from an EWR 'live chat' session on 31 May 21 between a member of the public and Paul Sparrow from EWR Co about interfacing with current operations. The issue appears to be caused by the Greater Anglia service to Liverpool Street: although based on a half-hourly timetable, the 'fast' train waits approximately an extra 10 minutes before departing from Cambridge North. This could be easily remedied by having the fast train depart Cambridge North a few minutes earlier and dwelling at Cambridge station for the further time required to maintain the half-hourly timetable. Although a slight service reduction for Cambridge North, the station would benefit from a regular direct EWR service under the northern approach scenario. Further improvements could be made, if necessary, with tweaks to timetables for the Norwich train and station dwell times on the Great Northern route.

4.4.2. Southern Approach

Conversely, we believe that EWR Co's conclusion that a southern approach does not require to be 4-tracked on the SBR line between Shepreth Branch Junction and Hauxton Junction is difficult, and arguably does not meet the Sponsor's Requirements [5, Appendix A] regarding isolation of any disruption between EWR and the wider rail network and the limitations for rail traffic growth on this section of the SBR line.

We show in our post on this subject (see Appendix 5) that the expected rail traffic on this line by 2043 is 12tph using the London growth figures in the Cambridgeshire Corridor Study [17] and 4tph for EWR. However, because EWR trains would share the track with Thameslink where, because of the great number of those trains converging in Central London, there is very little flexibility in the timetable. This effect will be exacerbated by the slow trains using the route (2tph) and expected slower freight trains (1tph). It is not expected that any further growth in London traffic (beyond the 1tph anticipated by Network Rail) or potential demand for six EWR trains per hour (Configuration Option 3.5 [5, Appendix B §5.4.2.2]) would be possible.

It is this restriction due to running alongside Thameslink services and with slow trains that is likely to lead to shared disruption between the wider network and EWR services. This is contrary to the Sponsor's Requirements [5, Appendix A, §5.3 and §5.4]. A fair comparison between the northern and southern routes should be based on the same basic operational requirements – if this were done, it is clear that the northern route could fully comply but there is serious doubt whether the southern approach could. We have requested further information about the Thameslink services, and the conclusion not to four-track this line more generally, but, unfortunately, this was not provided by the time we had prepared our consultation response.

4.5. Reversing

EWR Co have placed considerable weight on the fact that a reversing move (i.e. the driver changing ends of the train) would be needed in Cambridge for onward eastbound traffic.

Four points are worth highlighting here. Firstly, there is little time penalty in reversing. A train approaching Cambridge from the south would need to stop in the station for approximately 3 minutes before proceeding. For a train using a northern approach, the maximum time for the driver to change ends is about 5 minutes – a difference of some 2 minutes.

The second point is that all EWR trains returning westwards (i.e. to Oxford or Bedford) would need to reverse at one of the Cambridge stations whether the approach was from the south or from the north. There are only two additional services that would need to reverse (those between Oxford and Norwich and between Oxford and Ipswich). Conflicts from reversing movements may be mitigated by using platforms in the middle of a station. A simple swap of platforms at Cambridge North station would facilitate that. At Cambridge Station, platform 7 would be made the terminus and add a new platform pair to the east for Ipswich-bound trains. This is made easier by the planned use of digital signalling which will allow bi-directional running on tracks.

Thirdly, it should be noted that onward eastbound passenger services are currently excluded from EWR Co's remit. Although they need take such provision into account (the Sponsor's Requirements [5, Appendix A §1.6] state that *'Consideration should be given to the provision of or integration with services beyond the Oxford Cambridge sections...'*), we consider that the uncertainty of whether such requirements will ever be required should not drive the decision in a comparison between northern and southern approaches.

Lastly, a southern approach would also require similar mitigation measures if future EWR services to Stansted and even London are required. We recognise that while current track configurations may make this difficult, these constraints may be removed within the lifetime of the railway and Stansted is a popular destination for other routes. We also understand that EWR Co themselves once considered a chord south of Great Shelford to accommodate journeys to Stansted in their early design options.

4.6. Allowance for Freight

Efficient running of freight requires:

- Low or flat gradients
- Straight or very large radius curves
- Short route

These would enable heavy freight trains to maintain a near constant speed, minimise power consumption and increase the reliability of service. Freight should also impact as few people as possible and so be located as far as possible from settlements. The difference in straightness and proximity to settlements between the two approaches, using our Option B on a new chord south of Ely, are shown in Figure 4.

	Northern approach	Southern approach	Notes
Gradients	1 low gradient	1 low gradient 1 moderate gradient	Northern between Childerley Gate and Dry Drayton Southern Highfields Caldecote to Toft/Comberton and S of Haslingfield
Straightness of line	Moderate	Poor	Northern 1 extremely large radius curve to Milton & chords at Milton and S of Ely Southern Sharp changes of direction at Childerley Gate, Harston, Shepreth Branch Junction & an extremely small radius curve at Coldham's Lane Junction
Length of track (km)	50.7	51.9	
Number of residential properties within 200m of the line	1000	10300	

Table 7 Comparison of the northern and southern approaches for freight traffic between Cambourne North station and Chippenham Junction (using northern approach Option B for freight via an Ely chord)

In all categories shown above, the northern approach has greater benefits in terms of attractiveness as a freight route than the southern approach. This would lead to more trains using the route and lower operational costs.

It is hard to comment much further on freight issues currently as limited information has been provided on the issue.

5. Civil Engineering Aspects of the Railway

5.1. Embankments and Trenches

5.1.1. Description

The defining difference between CBRR's northern approach and EWR Co's approaches, both northern and southern, into Cambridge is the level of the track relative to the adjacent ground. CBRR's track would be placed in a trench/trough below ground level over much of its length, whereas both EWR Co's proposed approaches envisage the track being placed on viaducts and significant embankments. EWR Co's proposals would have a much greater adverse effect on visual impacts, noise propagation and land take. Schematics of these contrasting options are shown below. [Figures 8 (left) and 9.]

The trench construction is ideally suited to crossing flat waterlogged ground. The trench would be designed to have neutral buoyancy under its own weight, taking reasonable flood predictions into account with an adequate factor safety against flotation: as trains pass, their transitory additional weight is taken by a combination of soil strength beneath the base of the trench and the adhesion of the ground to the trench's sheet-piled walls. The level of the walls would match maximum flood level and water courses collected and directed over the trench by aqueduct, supplemented by inverted siphons at suitable intervals. As an alternative for shallow trenches, built in 'open cut', the sheet-piles can be omitted and the base slab can project beyond the walls before backfilling.

No damage would be expected to flood plains by the use of trenches. 'Green crossings' would be incorporated at 500m centres to allow for roads, public rights-of-ways, wildlife crossings and agricultural access. Trench construction for railways have been used on the high-speed line between Brussels and Amsterdam and the CBRR design has been used for the HS1 near Dagenham.

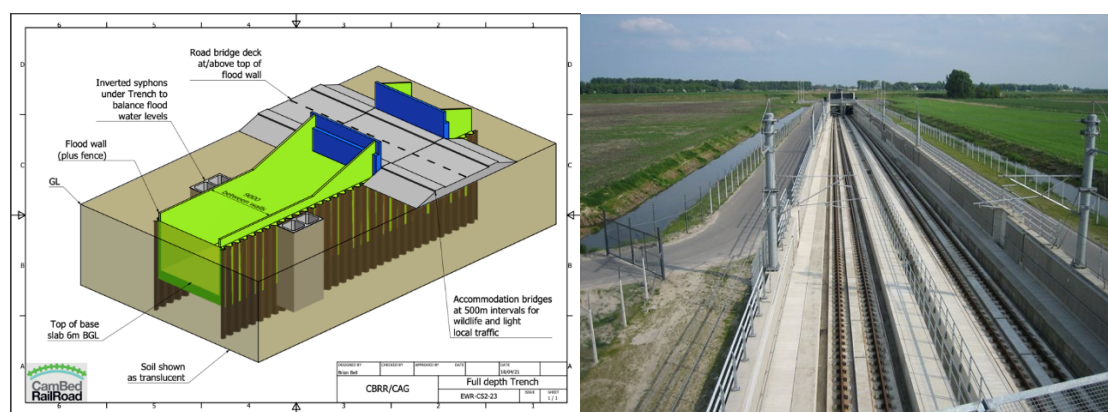


Figure 8 Typical schematic of trench construction for fenland crossings and its use on high-speed line in South Netherlands

By contrast, embankments would require a large volume of imported fill, and their weight may well require piles to reduce their settlement. Some of the spoil from the tunnel or cutting south of Haslingfield could be used but there is still a colossal discrepancy in the volume required. Other cuttings to the west of Cambourne may also provide material but these may be further away than is economically viable to be used.

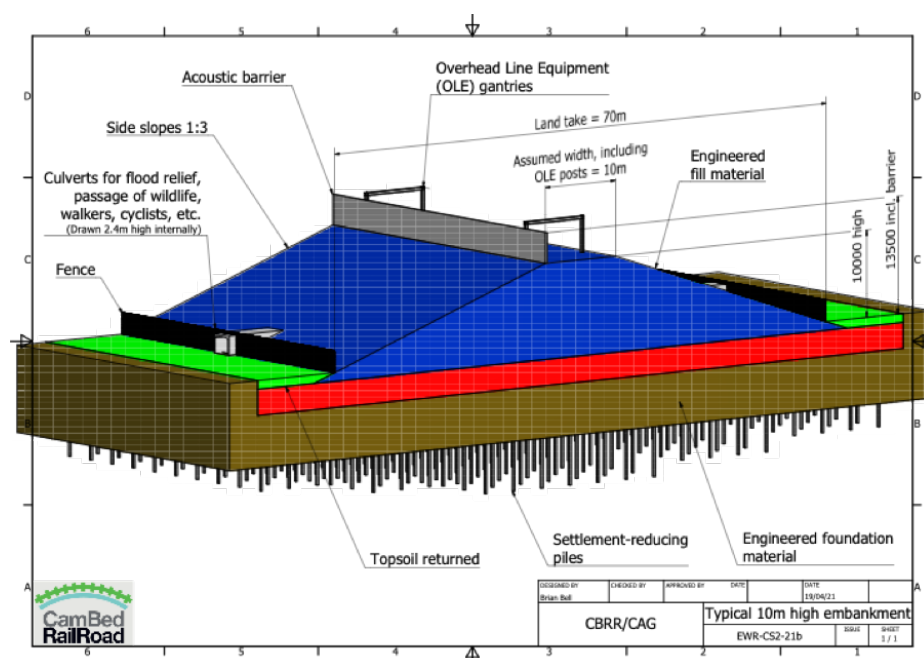


Figure 9 Cross Section of typical 10m high embankment

5.1.2. Scale of Construction

The infrastructure proposed for both of EWR Co's approaches would be on a massively different scale from that for CBRR's northern approach. To allow clearance for any road vehicles under the railway, embankments would need to be at least 7m high above the road surface, resulting in a base width of at least 52m. The highest embankments and viaducts have a rail level 12m above ground, with a base width of about 82m. The combined length of embankments between Cambourne North station and Hauxton Junction would be 13.7km and a maximum individual length of 6.3km (greater than 1m in height and between chainages 37+300 and 43+500 as shown on EWR Co's longitudinal sections). The intrusive effect of these combined features on a southern approach is in stark contrast visually to the trenches proposed by CBRR allowing the railway to pass virtually invisibly and silently through the landscape.

In relation to EWR Co's proposals for the northern route, they state [5, Appendix F §2.4.12] '*... the railway is expected to be elevated in locations, for example on viaducts or embankments, which would be likely to result in [adverse] visual impacts.*'

By comparison, in the description of the southern route, EWR Co state [5, §10.4.13] '*The alignment runs southeast on an embankment, crossing over Cambridge Road and Harlton Road before entering into open cutting and crossing under Chapel Hill. The alignment then returns to an embankment on its approach to Harston. The alignment crosses over the River Cam and floodplain on a viaduct of approximately 240m in length. The alignment continues on an embankment..*' There is no mention of '[adverse] visual impacts' in

this case. While EWR Co. accept that there would be visual impacts as a result of the new railway for the residents of Harston, Newton and Little Shelford, these impacts are in relation to grade-separated junctions rather than embankments, viaducts and road crossings.

EWR has provided engineering long sections for the southern approach as part of the consultation documents. For example, there is provided a long section showing the proposed rail level against existing ground level for the Hauxton Junction Alignment 10. No similar long section drawing is provided for the proposed northern approach. This information is needed to better understand the assessment which EWR Co. has undertaken to reach its conclusions about the northern approach. Such long section drawings provide relevant information about the requirements and placement of infrastructure, the height of the railway in the landscape and the crossing of significant places of interest. All of these matters are of significant environmental importance to construction, impact on views, impact on ecology, and impact on heritage sites and are relevant to noise impact. To rectify this, we have provided Figure 10 which demonstrates the magnitude of the differences.

Commenting on these embankments has been difficult because of the lack of information provided by EWR Co. in the Consultation Material about how high and long they will be. While we have managed to derive this from the long section drawings, this information is far from easily accessible. We have also requested length details for these structures on EWR Co's proposed northern approach, but have not received them in time for our consultation response. We have also not seen artists' impressions of these embankments. It is hard to provide further useful comment without this information, which makes producing a consultation response difficult.

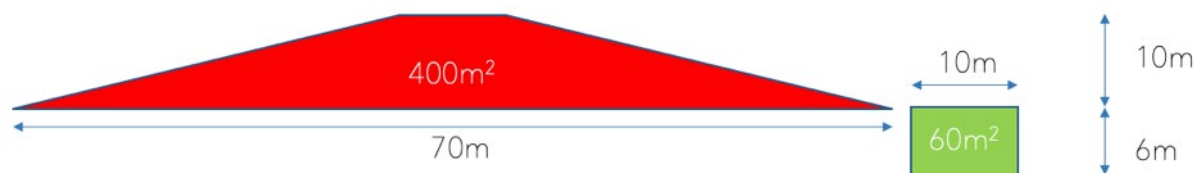


Figure 10 Size Comparison of Embankment and Trench

5.1.3. Comparison between trenches and embankments

We have carried out an indicative assessment of the comparative construction costs of embankments in relation to trenches. We have considered areas of fenland and flood plains as this represents much of the route. Clearly the cost of embankments increases the higher they are. Our initial assessment shows that embankments over about 7m high are more expensive than the cost of CBRR's full depth trench. Between Cambourne North station and Hauxton Junction, the average embankment height is about 7m. This comparison does not include any noise mitigation measures which could be significant for embankments near sensitive receivers, but much less so for trenches which, by their configuration, transmit less noise.

Ease-of-construction comparisons are not straightforward without a detailed analysis. In general terms however, both embankments and trenches could use tried-and-tested construction techniques and this is not considered a differentiating factor. Where the railway passes beneath a major road, a box can be

jacked into position very close to the road surface without diverting or stopping the traffic, whereas working over such a road is likely to require both.

Trenches are expected to require less ongoing maintenance and operational costs than embankments. Water from the trenches, such as from rain, would be removed by pumping, possibly using solar power, from sumps at low points along the trench. By comparison, the sides of embankments would require regular vegetation control with associated drainage maintenance. The trenches are not expected to settle, whereas the embankments are, depending on the effectiveness of their piles.

	CBRR's Northern Approach (typically trench)	EWR Co's Southern Approach (typically embankment)
Visual impacts	Good Low in landscape	Very poor Elevated up to 12m (average 7m) above ground
Noise	Excellent Walls of trench will act as noise barriers. Can be shaped or covered in absorbent material to reduce noise levels further.	Very poor Elevated source of noise increases noise propagation. Especially significant for nearby properties
Road/water crossings	Pass beneath road or guided busway or water course. Minimal disruption during construction.	Elevated viaducts and bridges. Significant disruption to major road and busway during construction
Pedestrian crossings	10m length of crossing above ground	70m length of tunnels/culverts beneath embankment
Land take*	29 acre / 12 ha	206 acre / 83 ha

Table 8 Summary of benefits of trench construction over embankment solution

*Direct land-take shown. Indirect land-take due to uneconomical areas of land left by railway crossing land not measured but is expected to be higher than the direct land take. Cambridge Approaches have worked with 5 local farmers who estimate that the land lost to farming will be at least double that which falls under the embankments for the southern approach around Harlton, Comberton and The Eversdens, for many reasons, including shading.

5.1.4. Carbon assessment

While EWR Co's aspiration is to deliver a net zero carbon railway, we do not see in the consultation documents either a comparison of the northern and southern approaches, or even an assessment of their preferred southern approach. Against a backdrop of increased concern about climate change, the Kyoto Protocol (1997), the Climate Change Act 2008 and the commitment by UK Government within its Carbon Plan (2013) to decarbonise rail travel, it seems nonsensical that important decisions about the scheme are

being made without even an indicative comparison of carbon footprints of the approaches. The business case for such a large scheme with potentially massive impacts upon the UK's carbon budget should only be considered alongside an appropriate assessment of the climate related impacts that the scheme would potentially cause. It is interesting to note that the case for HS2 has been made upon the electrification of the entire route and is accompanied by detailed carbon assessments, which cover construction and operational impacts over 60 years and include consideration of modal shift from road to rail.

5.2. Disruption and Roads

	Northern Approach	Southern Approach	Notes
M or A road crossings	3	4	
B road crossings	3	1	
Minor road crossings	11	18	Inc farm tracks
River/lake crossings	0	1	

Table 9 Road and River Crossings (assumes no 4-tracking on either NA2 or SBR sections of track and includes new crossings or major works to existing crossings)

Table 9 shows that there are fewer road and river crossings, and hence less traffic disruption during construction, for a northern approach compared to a southern approach. But that is not the whole picture. A trench solution can use jacked box construction techniques for major roads, allowing the road to remain open during construction. As many of the bridges and viaducts will take years to construct, this can play a major part in keeping traffic flowing smoothly and the consequent reduction in air pollution. We have requested information about road severance but, unfortunately, this was not provided by the time this consultation document was prepared.

6. Conclusions

The business case for the EWR should influence the route chosen for the Bedford to Cambridge section. Since EWR Co. have chosen not to publish their Strategic Outline Business Case, it is not easy for us to comment definitively in respect of a business case on the proposed route alignments for a northern or a southern approach to Cambridge. From previously published information, we know that the BCR for this section is low and that the business case will rely on “wider benefits” from additional housing and employment enhanced by the railway. The information presented on these is insufficient to show that there is a case to build this railway or to show how it should approach Cambridge. We believe that this paucity of analysis of the wider benefits comes from lack of effective collaboration between EWR Co. / DfT and the organisations responsible for the housing and economic development. However, with the information available so far, we have shown that there is a good case for the wider benefits of a northern approach over a southern one.

There are indications that the railway requirements are weighted too heavily towards inter-urban journeys rather than local commuting – this seems to be a central government requirement rather than anything coming from EWR Co.’s market research. EWR Co. need to publish their transport model for different approaches to Cambridge and show why the emphasis on inter-urban journeys is justified noting that the agglomeration benefits claimed for the OxCam Arc have been strongly challenged on both economic and environmental grounds [14]. If the business case is about connectivity rather than capacity [16], then this odd conclusion needs to be justified both from an economic and a climate change (modal shift) point of view.

We have shown that the wider benefits from housing and employment are at least as good to the north as to the south. Growth to the south seems to rely on a huge expansion of the CBC into the Green Belt [8]. This proposal will encounter strong opposition from local people.

The CBRR proposal [20] demonstrates how a railway can be built with low impact on the residents and the Cambridge green belt. The CBRR proposals are in line with best practice elsewhere in Europe and are in stark contrast to the “worst case” proposals from EWR Co. in this consultation for the southern approach (see appendix 3).

CBRR proposed a northern approach to Cambridge in 2018 and their excellent solution has been widely discussed locally and with EWR Co. However, EWR Co. have created their own northern approach and then pointed out the flaws with it. Similarly, the recently released cost models from Atkins [12] show that the additional civil engineering attributed to the CBRR route presented in [4, §16], stem largely from viaducts by added by EWR Co. but not present in the CBRR proposal [20].

In this document we have shown that 4-tracking the WAML with a northern approach is unnecessary on capacity grounds and have indicated how it can work even with minor localised changes to the existing timetable.

For the southern approach EWR Co. have not proposed a solution for the following substantial issues (amongst others):

- Low impact railway design (see appendix 1)
- The Wimpole SAC
- Freight impact on residents
- Plausible wider benefits without building on the Green Belt
- Severe wildlife impact
- Impact on MRAO
- Capacity of existing SBR line to take future growth as required by Sponsor’s Requirements and expected growth of OxCam Arc.

That we have not had this information, along with some of the other significant omissions that we have discussed throughout our response, has made it difficult to provide a properly informed consultation response. Had sufficient information been provided, we (and other consultees) could have better engaged with EWR Co.'s proposals, and been able to provide more valuable input. In the spirit of cooperation to get the best outcome for Cambridge and the surrounding area, we have tried our best in providing this consultation response. However, it is our view that we, and others, will have been at significant disadvantage in providing our response. We hope that EWR Co. consider this problem when they analyse the consultation responses.

Feature/Approach Route Option	CBRR Proposal (1)	EWR Co. Northern Approach (2)	EWR Co. Southern Approach Cambourne North (3)	EWR Co. Southern Approach, Cambourne South (4)
4-tracking	None	On WAML	On WAML and probably SBR	
Impact on residents from freight trains	Low	Housing demolitions due to 4-tracking	High, 8x that of (1)	Similar to (3)
Impact on wildlife	Low	Medium/Low	High	High
Civil Engineering	Trenches and rail under road	Bridges, viaducts and 4-tracking	Bridges, viaducts and 4-tracking	Bridges, viaducts and 4-tracking
Freight gradient	1:125	1:80	1:80	1:80
Cambridge freight bypass possible	Yes		No	
Wider benefits (Housing)	Directly serves towns developing north of Cambridge: Cambourne North, Northstowe.		Cambourne North	None?
Wider Benefits (Employment Sites)	Science parks, Cambridge NE development, Cambridge Airport area Science park expansion into green belt.		CBC + CBC expansion into green belt.	
Residential Impact on Cambridge City	Low	Medium	High (4-tracking and freight)	
Residential Impact on Cambridge to Newmarket line	Medium or None	Medium	High	

Feature/Approach Route Option	CBRR Proposal (1)	EWR Co. Northern Approach (2)	EWR Co. Southern Approach Cambourne North (3)	EWR Co. Southern Approach, Cambourne South (4)
Civil engineering costs excl. 4-tracking	Medium	High due to Northstowe Travel Hub and Sporting Lake mitigation	Medium	

Table 10 Summary of Cambridge Approach Routes

Table 10 Contains a summary of the various routes discussed in this document and demonstrates how well the CBRR route performs.

6.1. Recommendations

Before proceeding further with this publicly funded project² the government (including whichever parts are necessary) and especially EWR Co. need to do the following:

- A fair consultation on the CBRR proposal at the same time and to the same degree as other proposals from EWR Co. The petition requesting this now (early June 2021) stands at about 11,650 signatures [21].
- Present to the public a viable business case for the central section of the railway including wider benefits and options for approaches to Cambridge north and south. This will mean collaboration with people developing housing, economic, local transport plans and plans for the eastern section of the EWR.
- Prepare a jointly agreed plan between those responsible for all aspects of the business case, not just a transport project. We expect this to include DfT, MHCLG, Greater Cambridge Planning, Cambridgeshire County Council and Combined Authority, direct representation from local residents.
- Present an assessment of the impact on local people and the environment for all options, noting that the approaches to Cambridge for this railway and any economic, housing and local transport plans will be largely built on the Cambridge Green Belt which is a precious legacy handed down from previous generations.

7. Appendices

- 1 [In Search of a Low Impact Design for the Cambridge Approaches](#) 16/5/2021
- 2 [EWR's 'Comparison of Factual Data' Tables](#) 9/5/2021
- 3 [The Great Wall - Part 2](#) 26/4/2021
- 4 [Rebuttal of Appendix F](#) 24/4/2021
- 5 [Do EWR Cambridge Approaches Need 4-Tracking?](#) 23/5/2021
- 6 [Wildlife and Landscape Impacts of East West Rail's Preferred Southern Route into Cambridge versus CamBedRailRoad's Northern Route](#) 21/5/2021
- 7 [Weighing up the costs and benefits of East West Rail, Cambridge Independent](#) 24/5/2021

² CA have estimated that every household in the area between Bedford and Cambridge would pay around £9,000 to build this railway. Many would also suffer uncompensated loss in value of their properties.

8 [Barbastelle Bats: are they important when considering the EWR route?](#) 30/11/2020
 9 Key for Figure 1(b).

8. References

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- [3] Cambridge Econometrics, [“Cambridge, Milton Keynes, Oxford, Northampton Growth Corridor, Final Report for the National Infrastructure Commission”](#) 8/11/2016.
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[33] WT BCN, East West Rail Needs to Change Track 8/2/2021

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9. Glossary

BCR	benefit-to-cost ratio
CAM	Cambridge Autonomous Metro, championed by the former Mayor of the Combined Authority
CBC	Cambridge Biomedical Campus
CBRR	CamBedRailRoad
CBRR's approach	The EWR approach to the north of Cambridge proposed by CBRR.
"Cambridge Approaches", "CA", "we" or "us"	Cambridge Approaches Limited
The approach to Cambridge	collective term for approaches of EWR through the geographical area around Cambridge and referred to separately as "northern approach" if arriving at Cambridge North station and "southern approach" if arriving at Cambridge South station
Combined Authority	Cambridgeshire and Peterborough Combined Authority, headed by Mayor Dr Nik Johnson
Consultation Materials	The Making Meaningful Connections consultation materials published by EWR Co on this webpage - https://eastwestrail.co.uk/consultation
DfT	Department for Transport

Cambridge Approaches Ltd Consultation Response to EWR Co. June 2021

EEH	England's Economic Heartland
EWR	East West Rail Main Line
EWR Co.	East West Railway Company Limited
EWR Co.'s northern approach	the EWR approach to the north of Cambridge comprised in NA1 and NA2 as set out in more detail in Appendix F to the Technical Report
GCSP	Greater Cambridge Shared Planning
SBJ	Shepreth Branch Junction
MHCLG	Ministry of Housing, Communities and Local Government
PWOS	Programme Wide Output Specification see [5, Appendix B]
SAC	Special Area of Conservation
SCDC	South Cambridgeshire District Council
WAML	West Anglia Main Line
WT BCN	The Wildlife Trusts for Bedfordshire, Cambridgeshire and Northamptonshire.

10. Appendix 9 – Key for Figure 1(b) Major Employment Sites in Cambridge [6].*Table 20: Major Employment Areas*

Ref	Employment Area
1	Cambourne Business Park
2	Brookfield's Business Estate, Cottenham
3	Land at Hixton Road, South of Duxford
4	Cambridge Research Park
5	North of Cambridge Research Park
6	Daleshead Food Ltd, Linton
7	Norman way Industrial Estate, Over
8	Former Spicers Site, Sawston
9	Buckingway Business Park, Swavesey
10	Covent Drive/ Pembroke Avenue, Waterbeach
11	Eternit Site, Meldreth
12	Wellcome Trust Genome Campus, Hinxton
13	Granta Park, Great Abington
14	Regus Cambridge Vision Park
15	Cambridge Science Park
16	St Johns Innovation Park
17	Citi Base Cambridge
18	Cowley Road Industrial Park
19	Nuffield Road Industrial park
20	Cambridge Business Park
21	Marshalls of Cambridge
22	Marshalls Industrial Park
23	Evolution Business park
24	Capital Park, Cambridge
25	Peterhouse Technology park
26	Addenbrooke's Hospital / Cambridge Biomedical Campus
27	Copley Hill Business Park
28	Babraham Research Campus
29	Sawston Trade Park
30	Cambridge Innovation Park

Source: Cambridgeshire County Council