

Your Questions Answered

# Approaching Cambridge

**In the non-statutory consultation that we held in 2019, we consulted on five route options for the Central Section of East West Rail between Bedford and Cambridge. All five of them approached Cambridge from the south based on engineering, operational, economic, and environmental reasons.**

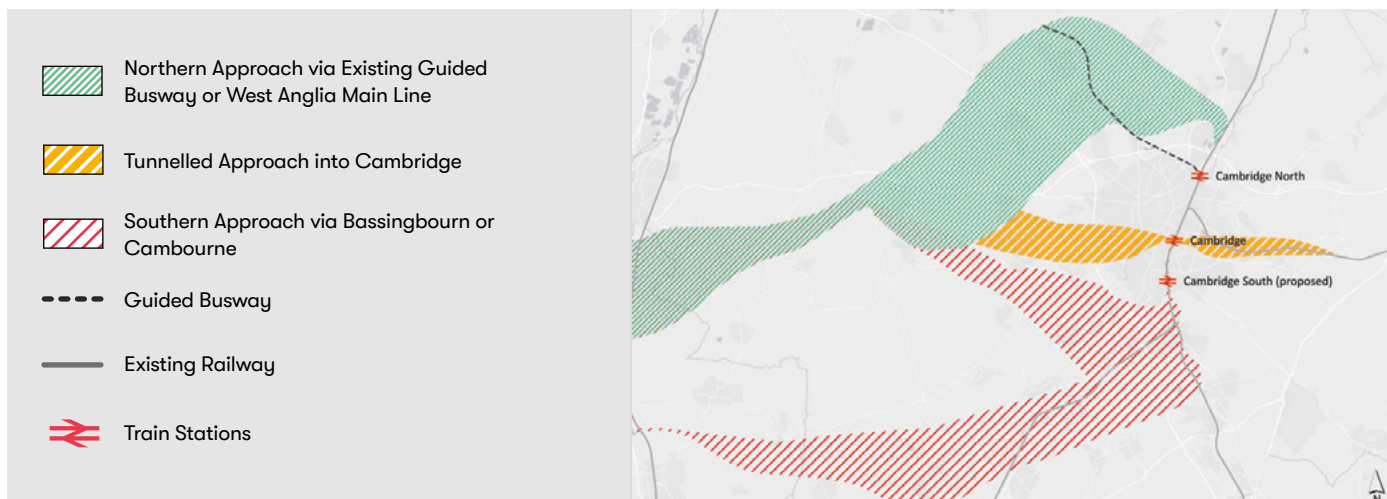
In that consultation, we asked whether people felt we had been right to prioritise routes which approached Cambridge from the south. While a number of responses stated a preference for approaching Cambridge from the north, our overall conclusion was that approaching Cambridge from the south remained preferable and this was included in the announcement of the preferred route option in January 2020. Feedback from communities and stakeholders during the 2019 consultation was central to our decision to recommend route option E as the preferred route option.

However, we know this is an area which interests people, so we have published answers to some of the most frequently asked questions we get about a northern approach to Cambridge.

## What do you mean by “approaching from the north/south/west”?

As part of this 2021 non-statutory consultation we are currently consulting about alignments for the section of East West Rail between Bedford and Cambridge. As this section will be a new-build railway line (rather than an upgrade to an existing line), there is more flexibility as to how it approaches and connects onto the existing network at the Cambridge end.

The Technical Report published as part of our 2019 consultation set out the three options of approaching Cambridge from the north, west and south.



Main options considered for approaching Cambridge

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### Why was an approach into Cambridge from the south preferred in 2020?

The reasons for preferring an approach from the south included:

- i. Providing the opportunity to support growth and development around the proposed Cambridge South station
- ii. Enabling EWR services to be extended to Ipswich, Norwich and other destinations in future without requiring them to reverse at Cambridge station
- iii. Upfront capital costs of an approach from the south were estimated to be around £0.6 billion lower than if EWR were to approach Cambridge from the north (at 2019 prices)
- iv. The considerable number of significant features and constraints that would be affected by an approach from the north meant that it could require a higher level of effort, complexity and expense to mitigate potential impacts than approaching Cambridge from the south.

### How do the northern and southern approaches compare?

The table below summarises some of the key differences between a northern and southern approach into Cambridge to enable their potential impacts to be easily compared.

<b>Cambourne North station to Cambridge station</b>	<b>Southern approach</b>	<b>Northern approach</b>
Total route alignment length	23.7km	24.6km
Built length in flood zones 2 and 3 (areas identified by the Environment Agency as being at risk from flooding)	830m	4735m
Total length of viaducts	1.1km	3.4km
Number of built-up areas within 500m of alignment	9	4
Length of railway in Cambridge City Council wards	2.8km	4km
Number of properties within 200m of alignment	3,800	4,600
A road crossings (new infrastructure required)	4	5
B road crossings (new infrastructure required)	2	1
Minor road crossings (new infrastructure required)	11	9
Guided busway crossings (new infrastructure required)	0	1
Properties that would need to be demolished (residential and commercial)	5	39-84

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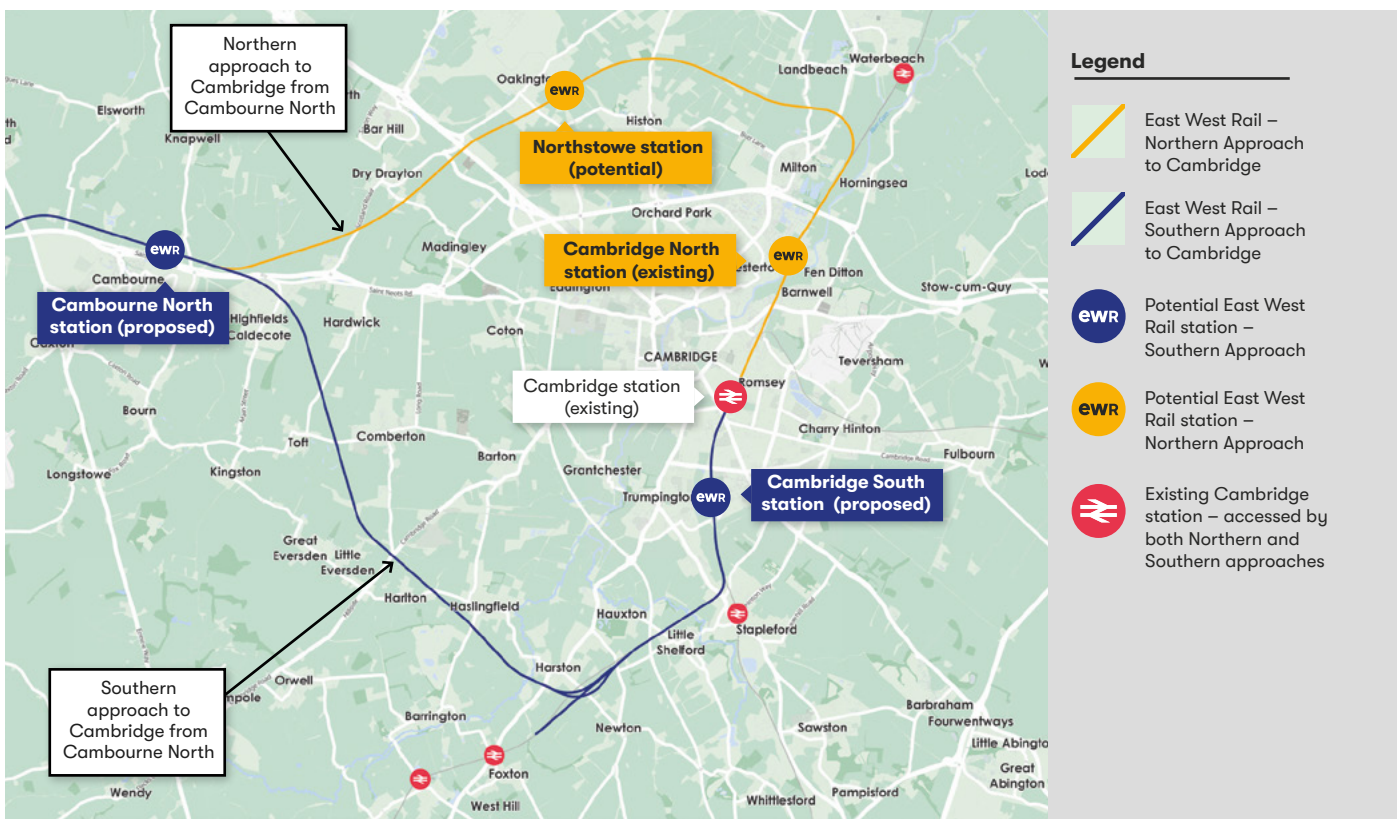
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In summary, a southern approach would have:

- Shorter distance and journey times
- Less infrastructure on flood plains with fewer embankments and viaducts, which would mean less substantial foundations and earthwork stabilisations are required
- Fewer property acquisitions and demolitions: five for a southern approach compared to between 39 and 84 for a northern approach, including the homes of Cambridge residents
- Greater additional benefits associated with a new Cambridge South station in terms of service provision and unlocking additional housing and economic benefits when compared with a new station at Oakington.

### What are the northern and southern approaches in the table based on?

The northern and southern approaches in the table above are based on alignments from a new station located north of Cambourne to the existing Cambridge station. These are shown on the map below.



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The southern approach alignment is the same as the dark blue and purple alignments east of Cambourne. The northern alternative was identified by our engineers in order to allow the comparative analysis to be carried out.

### **Why have you carried out a comparative analysis of a northern approach when all of the route alignment options in the current consultation approach Cambridge from the south?**

In Section D of the Consultation Document we have identified emerging route alignment options between Bedford and Cambridge. Of these, some run to the north of the alignment for the proposed A428 Black Cat to Caxton Gibbet improvement scheme between Wyboston and Cambourne and would serve a potential new station to the north of Cambourne. The location of the station north of Cambourne would be more-or-less equidistant from Cambridge station, whether taking a northern or southern approach into the city – about 24 km.

Consequently, because certain alignments closer to north Cambridge are now being considered, we have looked at an alignment approaching Cambridge from the north via Oakington and Milton to see how it compares to the alignment options approaching Cambridge from the south. This is described in more detail in Appendix F of the Consultation Technical Report, which is available via the website.

We have done this in order to check whether we were right to have favoured a preferred route option - Route Option E - approaching Cambridge from the south in 2020. We consider that the advantages of approaching Cambridge from the south continue to support this conclusion and that a number of significant challenges remain for a northern approach, even with a Cambourne North station.

### **Would approaching from the north be shorter – and therefore quicker?**

No. The northern approach is slightly longer than the southern approach, and journey times between a station north of Cambourne and the existing Cambridge station would be approximately the same.

Some members of the public have suggested that approaching Cambridge from the north would allow an additional station stop to be provided at Oakington for Northstowe: if that extra stop were included, journey times when approaching Cambridge from the north would be longer.

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### **Would a northern approach into Cambridge be cheaper to build?**

No. Due to the number of roads and flood zones in this area, a railway approaching from the north would need to be built on viaduct (a type of railway bridge) for significant sections between Cambourne and Milton, where it would join the existing railway. A northern approach would require 3.4km of viaduct whereas a southern approach would require only 1.1km. The northern approach would have greater embedded carbon and require far more imported materials as a result.

The low-lying ground north of Cambridge is also known to be wet, prone to flooding and difficult to build on, which would lead to a requirement for more substantial foundations and increased earthworks. This would increase construction and maintenance costs compared to a southern approach.

Once a northern approach joined the existing railway, we would need to increase the number of tracks between Milton and Cambridge Station to four from the current two. This would be expensive, complex and potentially require:

- i. Between 39 and 84 property demolitions, including the homes of Cambridge residents – this property impact is significantly higher than for a southern approach
- ii. Significant modifications at Cambridge North station, including new platforms
- iii. A complex level crossing closure
- iv. A new railway bridge over the River Cam and, potentially, a new road bridge as well
- v. The modification, demolition and re-building of every road bridge that crosses the existing railway between Milton and Cambridge station.

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### But wouldn't a northern approach require fewer road crossings in total?

We've produced a table for a quick comparison below. These numbers relate to the stretch between a new station located north of Cambourne and the existing Cambridge Station. They were compiled using geospatial information systems and count the number of new road crossings that would be required.

Type of Crossing	Southern Approach	Northern Approach
Guided busway crossings	0	1
A road crossings	4	5
B road crossings	2	1
Minor road crossings	11	9
<b>Total</b>	<b>17</b>	<b>16</b>

As shown in the table, a northern approach could require one less road crossing than a southern approach, but it is also important to consider the type and complexity of the crossings as well. For example, a northern approach would require:

- i. A lengthy new viaduct near Bar Hill to cross the A1307 and A14 (which is an eight-lane dual carriageway at this location)
- ii. Several new crossings on the low-lying ground and flood zones to the north of Cambridge
- iii. Alterations to the existing A14 road crossing near Milton
- iv. The rebuilding of several important road bridges in central Cambridge on key routes in and out of the city.

The overall cost, complexity and disruption associated with the construction of road crossings on a northern approach are therefore likely to be higher than for a southern approach.

### Why would a northern approach into Cambridge need extra tracks?

The existing twin-track railway does not have sufficient capacity to accommodate the additional EWR services that we have been tasked to deliver. This is because the new EWR services would conflict with the services already provided by the existing train operators.

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Therefore, in order to run the extra EWR services, it would be necessary to alter the existing infrastructure between Milton and Cambridge station by building new tracks. This would then provide the additional capacity needed to allow the new EWR services to operate without conflicting with the existing services.

For comparison, the southern approach into Cambridge also requires an additional two tracks from Shepreth Junction into Cambridge station. However, there is space available to accommodate most of these additional tracks within the existing railway boundary and, where this is not possible, the area next to the existing railway is generally less built-up which means that they would be cheaper and less disruptive to construct. From the new Hauxton Junction to the existing Shepreth Branch Junction, there would not need to be additional tracks, which means that a new bridge under the M11 is not needed either.

### **Would there be less impact on neighbouring property if EWR approached from the north?**

No. Between a new station north of Cambourne and the existing Cambridge station, an approach into Cambridge from the north would require the demolition of at least 39 properties (and potentially up to 84), including the homes of Cambridge residents, whereas in a worst-case scenario an approach from the south would directly affect only 5 properties with no homes in Cambridge requiring demolition.

An approach into Cambridge from the north would pass within 500 metres of a smaller number of built-up areas than a southern approach (four versus nine), but it would have a longer route length within Cambridge City Council wards (4km versus 2.8km) and also pass close to a higher number of properties.

For example, data from Ordnance Survey indicates that roughly 4,600 properties would be within 200 metres of a northern approach whereas there are roughly 3,800 for a southern approach. This does not mean that every property in this area would in fact be affected, but the higher total number for a northern approach means that there is potential for more extensive indirect impacts to arise compared to a southern approach.

### **How would the City of Cambridge be affected by the northern approach?**

In addition to the impacts summarised above, every road bridge in the city that crosses the railway north of Cambridge station – the A14, Newmarket Road, Coldham's Lane and Mill Road – would require modification or demolition. Rebuilding these bridges would cause significantly more disruption to Cambridge and increase the cost of building the railway. These bridge works would be complex due to the difficulty of providing road diversions and construction areas in the built-up city area, whilst maintaining highway links in the city.

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In addition, Cambridge North station would require significant infrastructure and systems modifications, including new platforms. This will result in greater service disruption at Cambridge North station and on the wider network whilst works take place, as well as higher costs to compensate the existing operators, passengers, residents and businesses.

For comparison, if the new EWR services approach Cambridge from the south then only one bridge -Long Road - would need to be replaced, the surrounding area next to the existing railway is less built up and the new Cambridge South station would require only minimal modifications to accommodate EWR services.

### **Would a northern approach provide better connectivity for Northstowe and Cambourne to north Cambridge?**

If a new station was provided at Oakington for Northstowe as suggested by some members of the public, this would be around 3km to 4km away from most of the new settlement - roughly a 40 to 60 minute walk for most people.

In addition, Northstowe is already served by public transport in the form of the guided busway which will have services passing right through the new town with fast, frequent journeys available to the northern part of Cambridge, Cambridge North station and the city centre.

At the moment, there is a busway service to Cambridge North station every 20 minutes during the week, which is timetabled to take 12 mins, and, from Northstowe to the Science Park, door-to-door journey times would be quicker on the busway than by rail. There are also existing bus services from Cambourne to north and west Cambridge.

Cambridgeshire County Council and the developers of Northstowe themselves have also confirmed that public transport infrastructure provision is already in place or planned to address the needs of housing and economic growth north and northwest of Cambridge, including at Northstowe.

Consequently, an EWR service which called at Cambourne and Oakington, before continuing to Cambridge North and Cambridge, would be duplicating existing and planned public transport, not complementing it.

By comparison, a southern approach into Cambridge would provide fast, frequent links between the Cambourne, Cambridge South and Cambridge stations, supporting new connections and development around the biomedical campus, with the opportunity for services to be extended further north and east, including to Cambridge North station, in the future.



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### **One reason given for not approaching Cambridge from the north is that trains would need to reverse at Cambridge: why would that be a problem?**

We are designing resilience into our infrastructure, and robustness into EWR operations. We want to minimise the possibility of delayed trains and create reliable, convenient services which connect communities and provide competitive journey times. Reversing moves at stations – where a train enters the station in one direction and then reverses towards the direction from which it came, on the same journey – greatly undermine these aims.

By approaching Cambridge from the north, passenger trains would need to reverse at Cambridge station in order to be able to head further east to Norwich, Ipswich and other destinations in the future. This would lead to significant increases in journey times for through journeys (that is, those not ending or starting at Cambridge station), uses up more capacity as trains have to pass over the same section of track twice, cross lines used for other services, reducing their capacity, and occupy platforms for longer, which increases the risk of delays as timetabling is more complex.

Some members of the public have suggested that trains would not need to reverse if new connecting lines (called ‘chords’) were built near Milton, Ely and on Coldham’s Common in Cambridge. However, this would mean that these trains would not serve Cambridge station at all and this would not meet the Project Objectives that we have been set by Government.

In addition, the practical effect of this type of service pattern would be to use up extra capacity on the new East West Rail line whilst diluting the benefits and attractiveness of the new service by significantly reducing potential choice and convenience for passengers. This would undermine our goal of providing a railway that unlocks opportunities to improve connectivity across the region.

### **Can’t trains approach Cambridge from the north and continue to London or Stansted Airport instead without having to reverse?**

In theory, yes. However, Stansted Airport railway station is very unlikely to have sufficient capacity to accommodate the extra EWR trains on top of the existing services because it is reached by a single track tunnel under the runway and already has limited platform availability. The station is located underneath the main airport terminal building which means that it would be very complex and expensive to increase the number of platforms.

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Similarly, capacity on the lines to London King's Cross and Liverpool Street is limited which will constrain the possibility for East West Rail services to be extended and expanded in the future to King's Cross and Liverpool Street. Inter-working EWR services with the existing trains between Cambridge and London would also increase the risk of delays on the busy rail network in the London area being transmitted onto the core EWR services.

By comparison, approaching Cambridge from the south would allow services to be extended to a greater choice of destinations in the future such as Norwich, Ipswich, King's Lynn and, potentially, a reopened rail link to Wisbech, without requiring trains to reverse at Cambridge. This means that an approach from the south offers greater opportunities and potential to improve connectivity for the wider region than a northern approach.

### **Could a new 'chord' across Coldham's Common allow trains to continue east without reversing if not stopping at Cambridge?**

It is feasible - in engineering terms - to provide a new chord that starts south of Newmarket Road, avoids Barnwell Lake and joins the existing railway line between Cambridge and Newmarket. However, this results in the demolition of properties at the northern end of Coldham's Road.

Moreover, Coldham's Common is designated as 'common land' which enjoys special legal protections. As such, we would need to go through a Special Parliamentary Procedure to get permission to build on this land. This is a lengthy process and it would be difficult to get permission to build this chord because these works are not required if services approach Cambridge from the south. These factors greatly increase the risk of delay to the Project and to delivering the new railway for local communities across the whole route.

### **We hear there would be a 15km embankment from Highfields Caldecote to Hauxton. Is that true?**

No. Depending on the surrounding land levels and topography, the railway would either be at ground level (referred to as 'at grade') or on a mixture of embankments, viaducts and cuttings, over the approximate distance of 15km from Highfields Caldecote to the M11 near Hauxton. The embankment sections will vary in height and will be reviewed at the next stage of design to see if improvements can be made and to blend them with the existing landscape as much as possible.

There is significantly less scope to make such improvements if a northern approach is used because of the flatter topography north of Cambridge. In order to cross the A14 west of Girton - which is an eight-lane dual carriageway in this location - and the guided busway near Oakington, the railway would need to be significantly elevated above the level of the road surface and the surrounding land.

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The short distance in between those two crossings means that the track here would also need to be elevated as it passes Oakington. An embankment in this location would pose a serious risk of exacerbating flood risks for Oakington residents - the village is already in a location identified by the Environment Agency as being at risk of flooding - and a viaduct would be a substantial structure adding significantly to both construction and maintenance costs, as well as embedded carbon.

Any embankment or viaduct here would also be more visually prominent and intrusive than a comparable structure further south due to the flatter prevailing land levels north of Cambridge.

### **Isn't a northern approach better for the environment?**

No. A northern approach would be closer to more priority habitats and Local Nature Reserve sites whereas a southern approach is closer to more designated Sites of Special Scientific Interest (SSSI) and the Wimpole and Eversden Woods Special Areas of Conservation (SAC). These interactions are likely to be capable of being mitigated.

However, a northern approach would pass through significantly greater lengths of flood plain – 4,735 metres compared to only 830 metres for a southern approach. Due to the low-lying land north of Cambridge which is prone to flooding, as happened earlier this year, the railway would need to be elevated on embankments or viaducts for almost the entire length between Oakington and Milton.

Embankments can cause serious issues in flood plains because they trap floodwater, which can exacerbate flood risk nearby as well as having detrimental effects on water flow and ecological sites downstream. It would also be necessary to import a greater amount of material to construct the embankments due to the smaller amount of material that could be excavated compared to a southern approach. This would lead to a higher number of HGVs on the local road network during construction. Longer viaducts would have greater embedded carbon and increase both construction and maintenance costs.

### **What about the impact on heritage features?**

A southern approach would be closer to more scheduled ancient monuments, whereas a northern approach would be closer to more listed buildings, including the Grade I listed Leper Chapel.

In particular, a northern approach would affect the setting of the American Cemetery which is a Grade I Registered Park and Garden with a Grade II\* listed memorial chapel. Historic England has highlighted that the Cemetery is a designated heritage asset of the highest significance, not only for its inherent heritage and landscape value, but also reflecting an important international and historic relationship between the United Kingdom and the United States.

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The Cemetery is subject to a 1954 international agreement between the United Kingdom and the United States which restricts development on land in its vicinity. As set out above, a northern approach would require a substantial viaduct across the A14, the flood plain and the guided busway to be built between Bar Hill and Oakington which would be a highly visually intrusive new feature in the surrounding landscape.

The tranquillity of the Cemetery and its setting would not be affected at all if a southern approach into Cambridge is used.

### **Get in touch**

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