# Appendix\_A

## Baseline analysis

This appendix covers the baseline and key considerations relating to delivering an extension to Cambourne.

Cambourne Growth Strategy Programme

## Area of Study

#### **Study area surrounding Cambourne**

The Area of Study sets the extent of land to be considered as part of technical evidence gathering and identification of spatial options through the Cambourne Growth Strategy Programme.

An Area of Study of 10 kilometres by 10 kilometres centred around the existing town of Cambourne was identified in the early stages of the commission. These distances were chosen in response to the scope of the project (to consider the shape and size of an expansion to Cambourne), the need for any expansion to be underpinned by the use of sustainable transport modes, and site-specific spatial patterns. The distances enable a full consideration of environmental and other factors effecting Cambourne, surrounding villages and rural areas. The distances also allow a range of different spatial options to be considered for expansion/growth of the existing settlement.



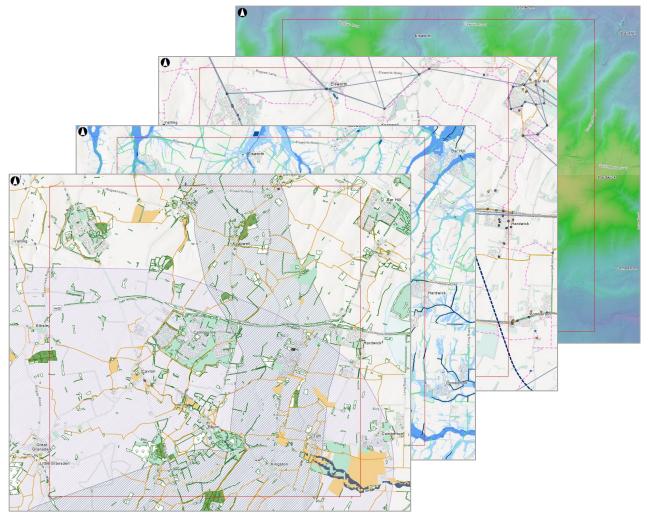
## Key considerations

#### Initial mapping of relevant constraints

This section contains a mapping exercise was undertaking to understand relevant constraints in the following themes:

- Environmental Constraints Flooding
- o Environmental Constraints Green Infrastructure
- Land Use and Activity
- Utilities and Infrastructure
- Topography
- Heritage and Character
- Planning
- Agricultural Land
- Archaeology \*
- Connectivity
- Place assets

## Cambourne Growth Strategy Programme

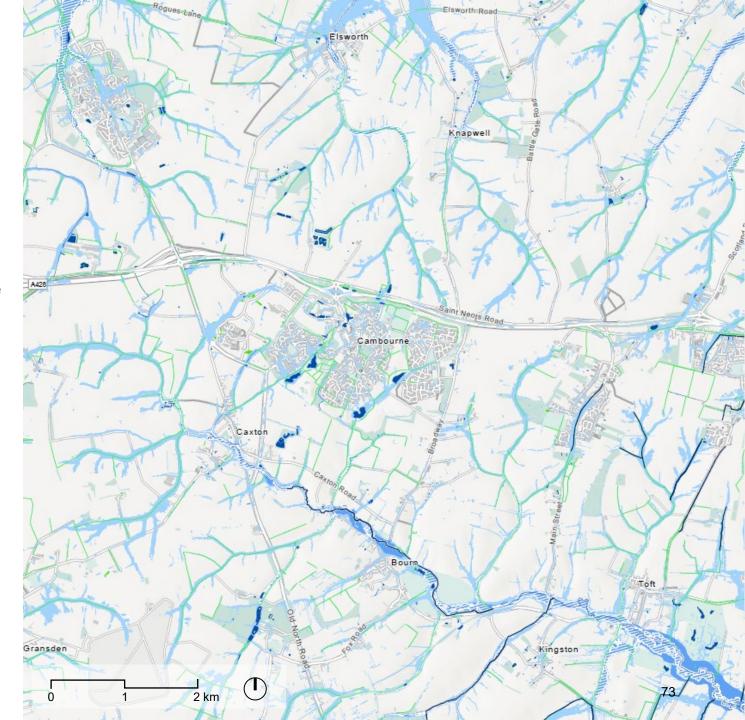


<sup>\*</sup> Information from Archaeology report not included.

#### **Environmental Constraints - Flooding**

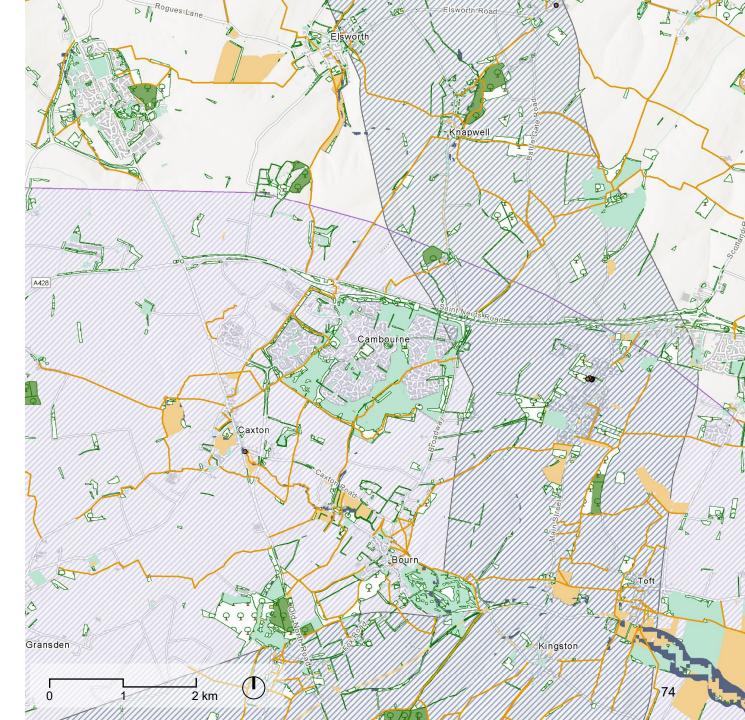
- The area presents flood risks from a series of connected water courses and catchments relative to the distinctive topography of the area. These courses present localised flood risks including Bourne Brook to the south.
- Future development for an extension in Cambourne could be informed by the rich water structure, integrating water management solutions with development and continuing the approach set out in the original Cambourne masterplan to link water management and nature conservation strategies.





## **Environmental Constraints - Green Infrastructure**

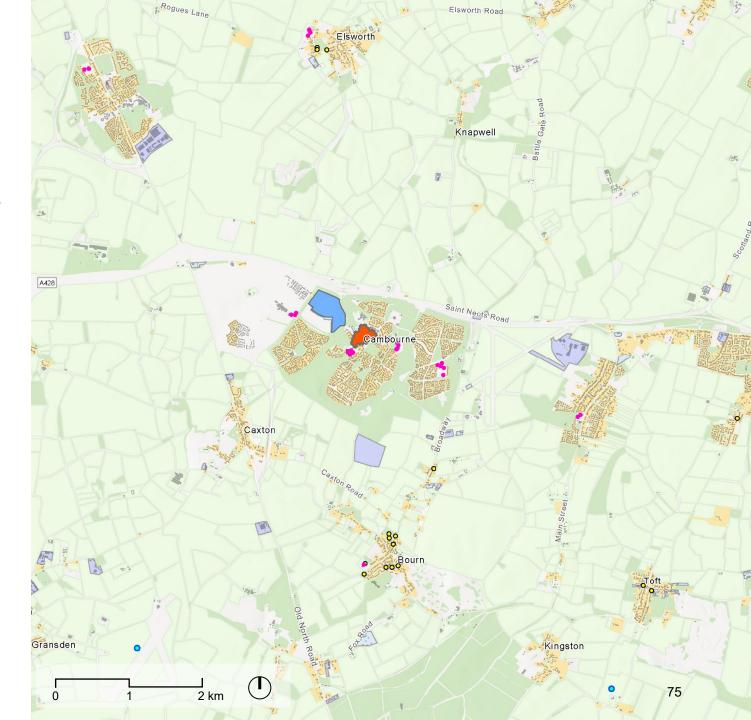
- Refer to the LUC Green infrastructure study for detailed review of constraints and opportunities.
- It is notable that existing green and heritage assets are dispersed as both ancient woodland and mature agricultural field patterns, featuring significant clusters that could be incorporated into a framework or potentially evolve into hubs for new development clusters.
- The green areas surrounding the current Cambourne dictate an overall settlement typology of 'villages' separated by green and ecology.
  - Tree preservation orders (TPOs)
  - Public Rights of Way
  - Green spaces Existing
  - Protected nature sites, reserves and priority habitats
- Woodland Existing
- \_\_ Woodlands Protected
  - Working with natural process
- (Proposed GI) Accessible Natural Green Space
- (Proposed GI) Buglife Pollinators Corridor
- (Proposed GI) NESSSI
- (Proposed GI) Non designated accessible natural green space
- (Proposed GI) West Cambridge coton corridor
- (Proposed GI) Western Gateway



## **Land Use and Activity**

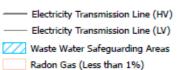
- Cambourne is comprised of four residential neighbourhoods (including Cambourne West) that revolve around a common local centre, with significant planned public open spaces, including woodlands, grasslands, and waterways.
- Employment is largely focussed on the Business Park and the small retail centre / high street. Social infrastructure including school and leisure provision is spread throughout the town.

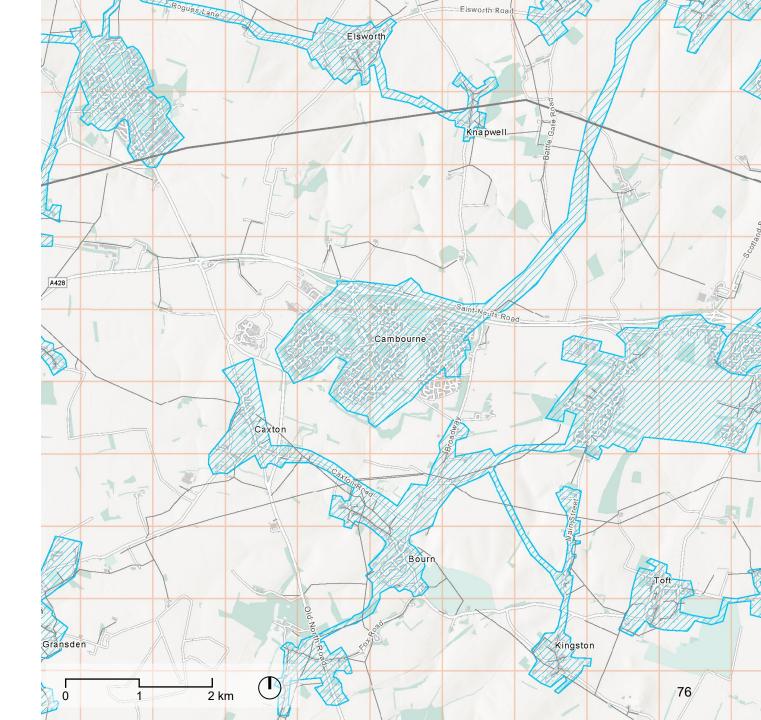




#### **Utilities and Infrastructure**

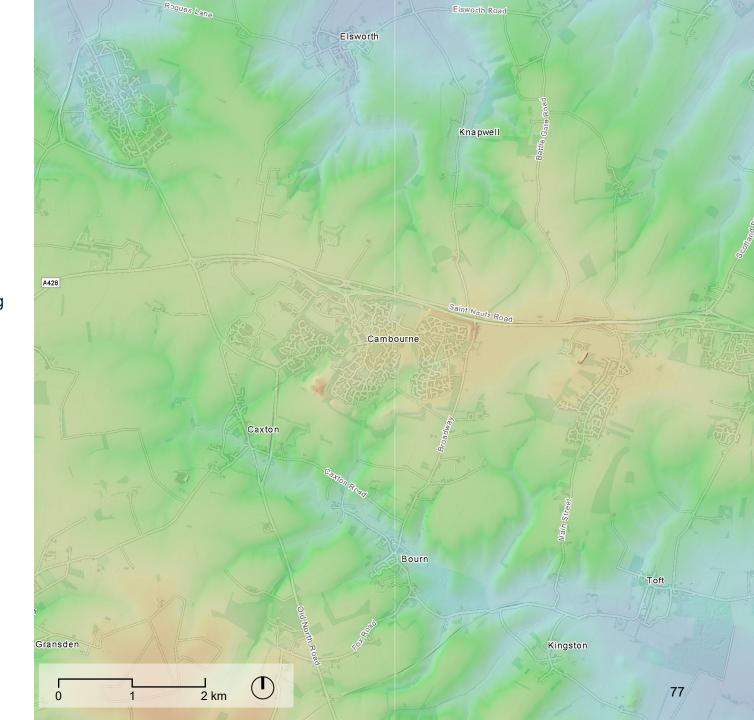
- Cambourne is located within a waste water safeguarding area.
- The site is crossed by various low voltage (LV) electricity transmission lines.
- A high voltage (HV) electricity transmission line runs along the northern part of the site.
- Detailed capacity analysis has not been carried out but should be studies as part of future phases of work.





## **Topography**

- Cambourne sites adjacent too a ridge line which the A421 and proposed EWR alignment follows.
- Steep sided river valleys and rolling topography create a significant landscape character.
- The topography and views will play a crucial role in deciding the types of buildings or developments of the settlement expansion, as well as their density and grain.



### **Heritage and Character**

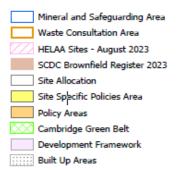
- Significant clusters of heritage buildings, landscapes and structures are found across the AOS
- The historic villages of Knapwell, Bourne and Caxton have multiple features including churches and listed buildings reflecting their age and significance to the landscape and townscape character
- Detailed review of assets, impacts and opportunities for integration within the growth program will be carried out via the Spatial Framework

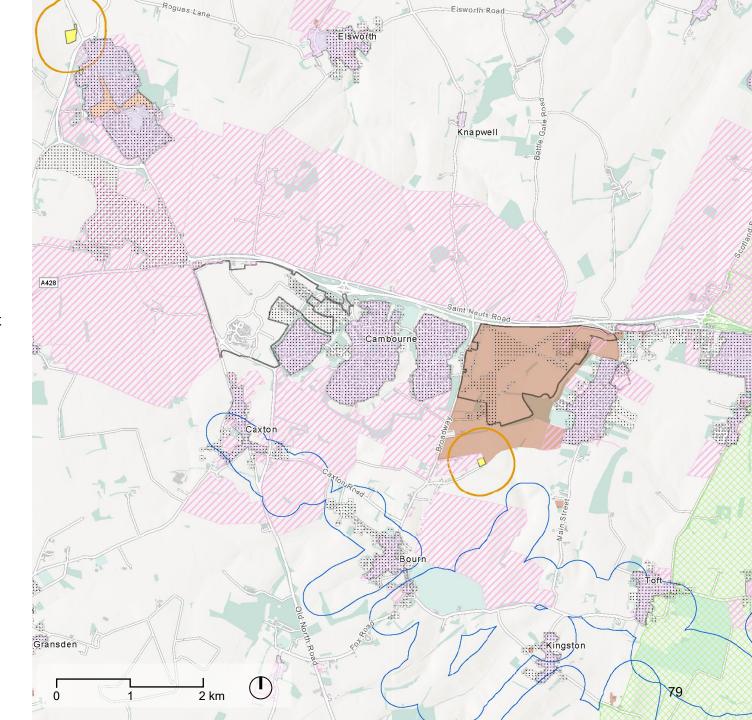




#### **Planning**

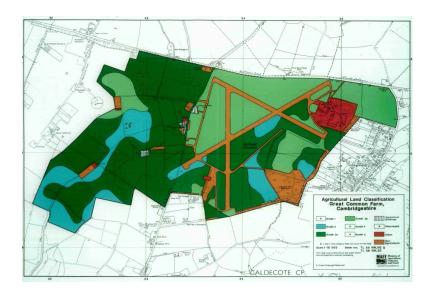
- Locations designated for development are planned to the east and west of the current town including the continued delivery of Cambourne West and the Bourne Airfield site to the East.
- A variety of sites proposed for the HELAA \* call for sites.
- This mapping analysis does not incorporate the most recent version of HELAA sites as it was done before the data was issued. To see the latest HELAA sites submission, please see the spatial options chapter of this report.

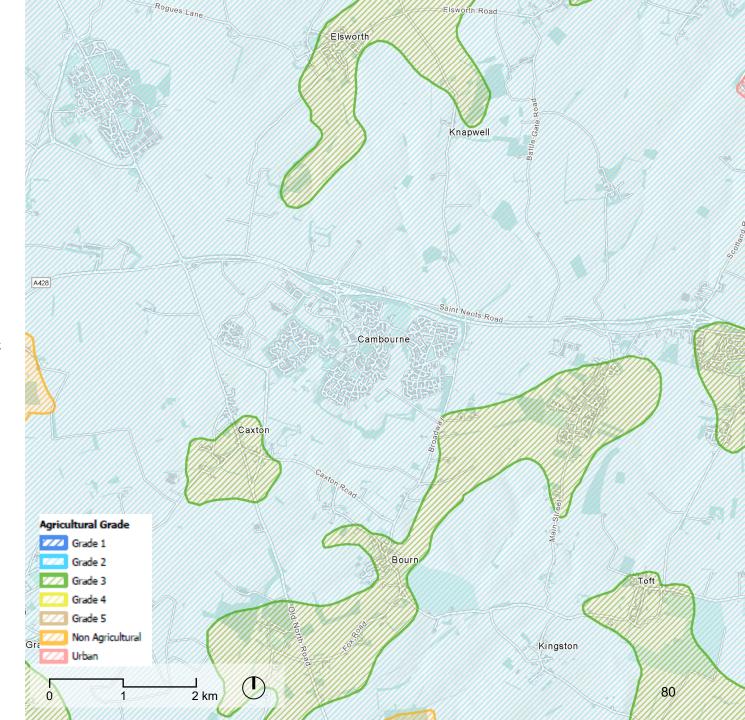




#### **Agricultural land**

- The ALC dataset depicted on the map to the right was originally created in the 1980s, before Cambourne was established, which is why the settlement is not represented.
- Additionally, an updated version of the ALC, reflecting conditions post-1988, is shown below. At that time, the settlement was considerably smaller than it is today. Both maps are included to assist in evaluating agricultural land considerations. It may be beneficial to utilize the original ALC dataset and overlay it with a settlements layer or an urban area layer for better analysis.

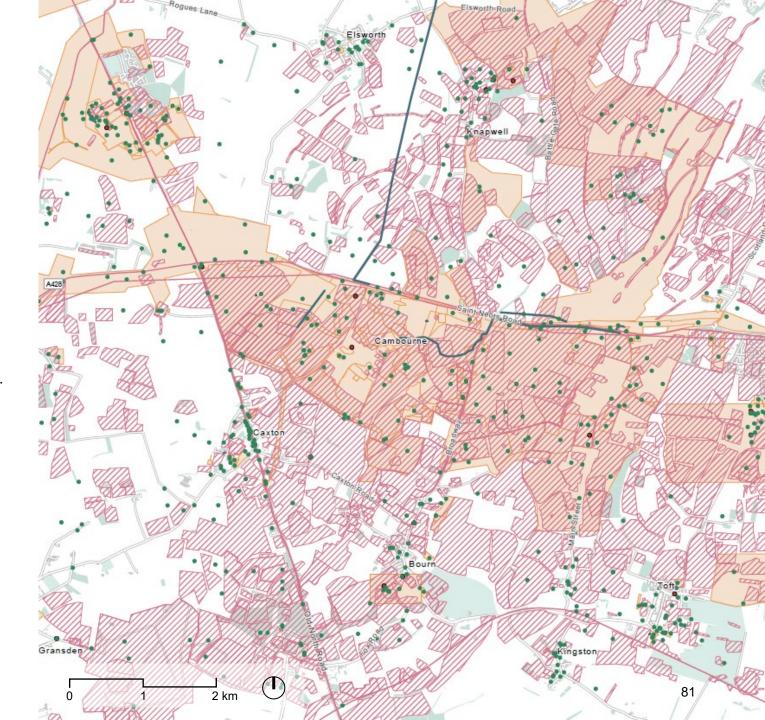




### **Archaeology**

- The map depicts key archaeological events (such as archaeological digs / finds) and historical monuments and areas of interest.
- An assessment of the potential heritage impact of development has been carried out separately by Chris Bamford Associates.
- This study informs the appraisal of spatial options at both long list appraisal (deliverability criterion) and short list appraisal (heritage criterion) in the Spatial Options Report.
- Further analysis is required to review the impact or requirements which this analysis has identified.

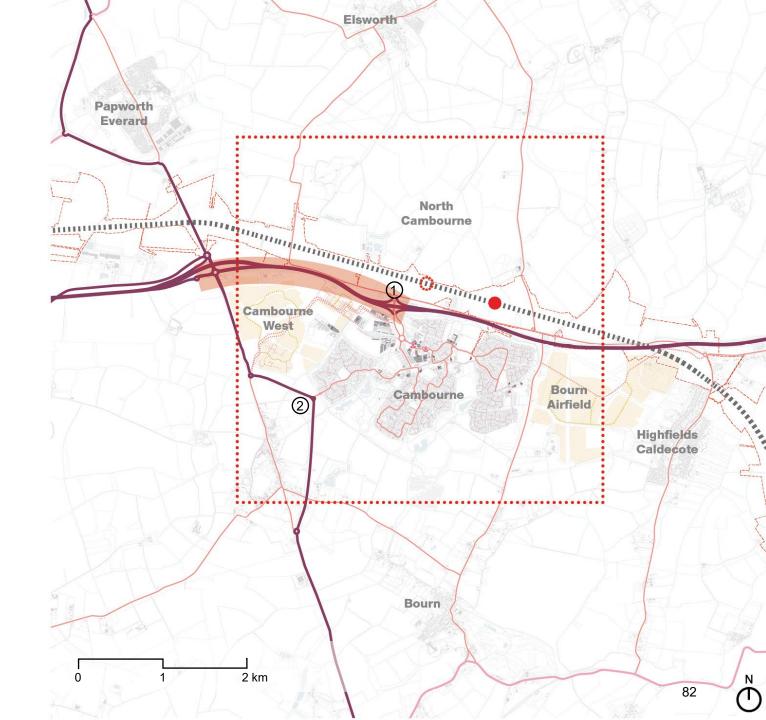
- Monument Points e.g. historic buildings or monuments
- Event Points e.g. archaeological finds
  - **Event Lines**
- Monument Polygons e.g. historic ridge and furrow field patterns
  - Event Polygons e.g. archaeological excavations



#### **Connectivity – Vehicular network**

- Cambourne is primarily served by the A428 to the north, which provides the main access into Cambourne via a dumbbell roundabout (1). The only other entry point from the surrounding road network is from the southwest, through the A1198 (2).
- St Neots Road, situated parallel to the A428 to the north, operates as a local route. Within Cambourne itself, the road network is characterised by winding streets and residential cul-de-sacs, intentionally designed to reduce through traffic. Current proposals include limited connections to West Cambourne and Bourne Airfield.
- The wide A428 dual carriageway creates a significant barrier between the existing town and the proposed EWR alignment and station.

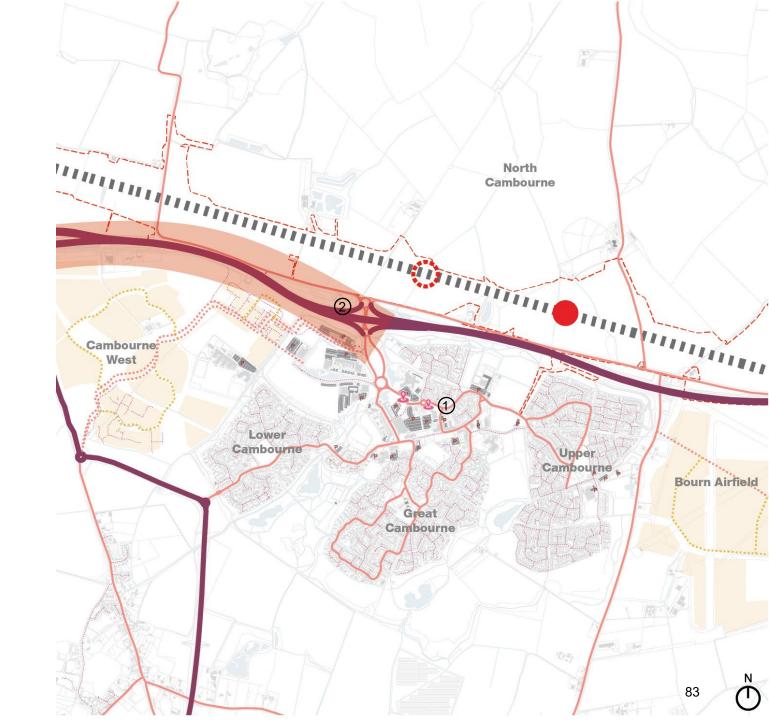




#### **Connectivity – Vehicular network**

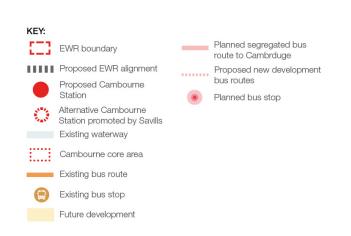
- The town centre of Cambourne is primarily dominated by car parks surrounding the retail areas (1).
- During peak hours, traffic congestion is a common issue, particularly along Cambourne Road and at the dumbbell roundabout, as vehicles enter and exit the town (2).
- Cambourne was planned to have limited connections for vehicles and does not connect to the network in a easterly direction.

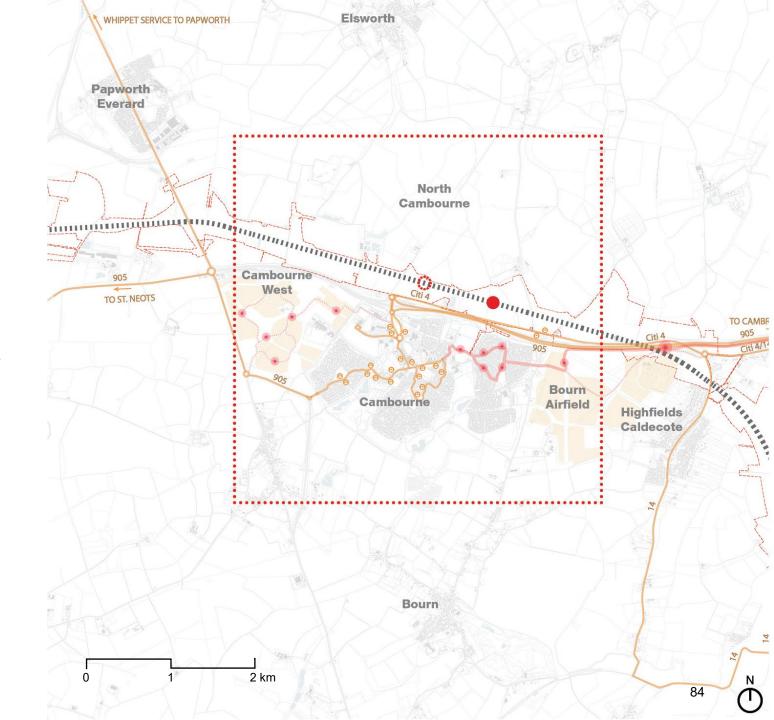




#### **Connectivity – Bus network**

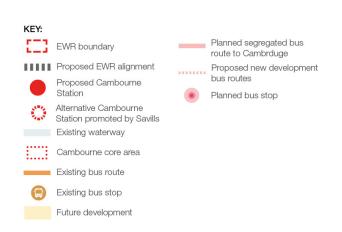
- Currently, public transport in Cambourne consists solely of local buses which serve Great, Lower and Upper Cambourne.
- Plans are in place for a new Cambridge to Cambourne rapid transit system, featuring a segregated busway, which will link Cambourne from the east and serve Bourne Airfield.
- There are ongoing discussions about how to connect the busway to a station, with the option of using St Neots Road as the main access route to the station being considered.

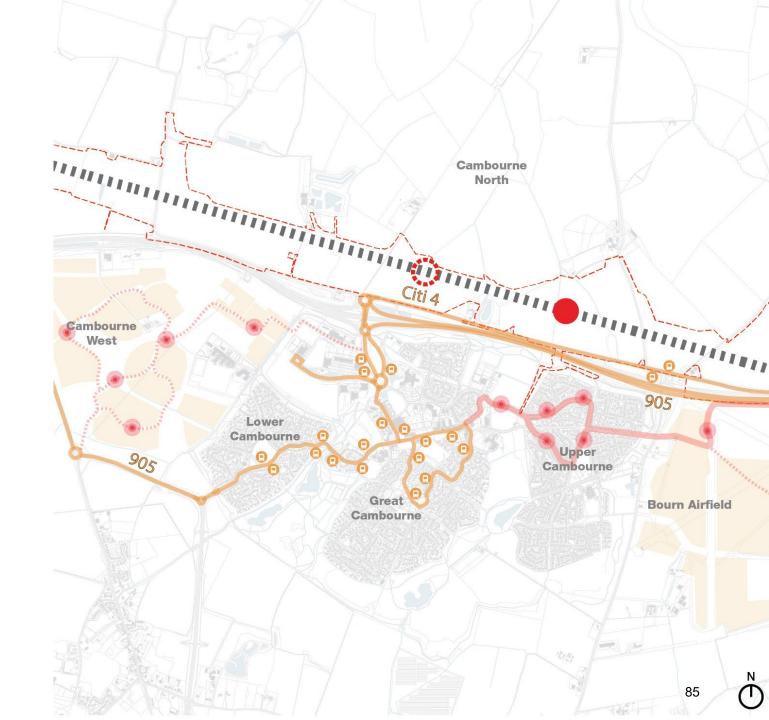




### **Connectivity – Bus network**

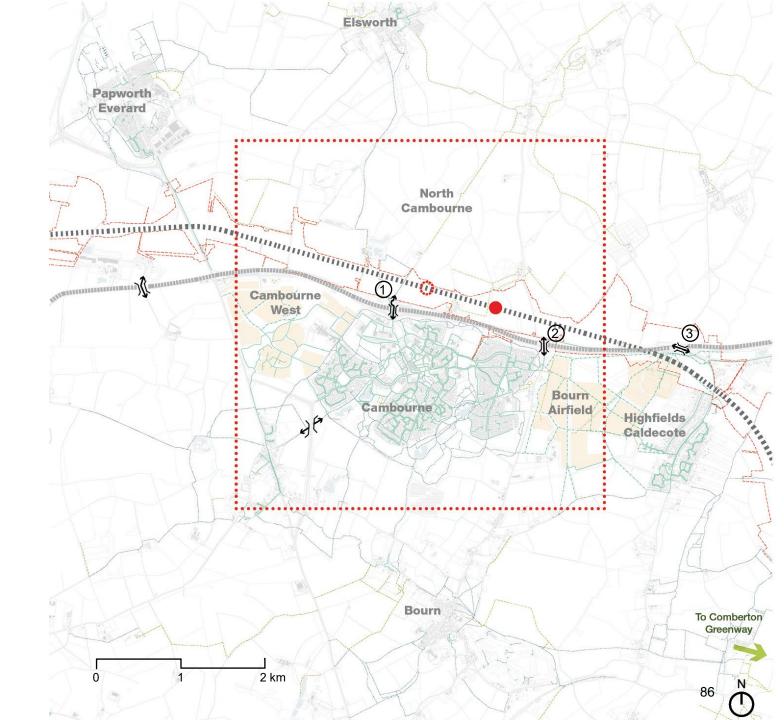
- Bus 14 weekdays every 30 minutes to an hour, weekends every 1 to 2 hours
- Bus Citi 4 Monday to Saturday approximately every 30
   20 minutes, Sundays every hour
- Bus 18 Monday to Saturday, approximately every hour
- Bus 18A, Monday to Saturday, approximately 4 per day
- Bus X3 (Whippet coaches) approximately every 30 minutes to an hour





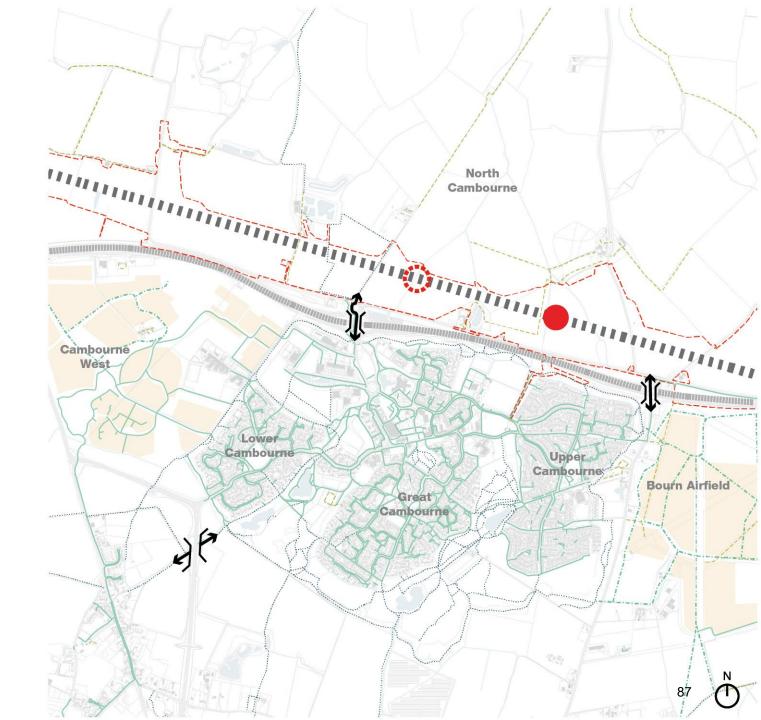
- Pedestrian movement in Cambourne is typically associated with footways alongside roads and through its many green links.
- There is also an extensive network of bridleways and tracks that connects to surrounding villages.
- Pedestrian connectivity across A428 is limited to 3 crossing points (1), (2) and (3).



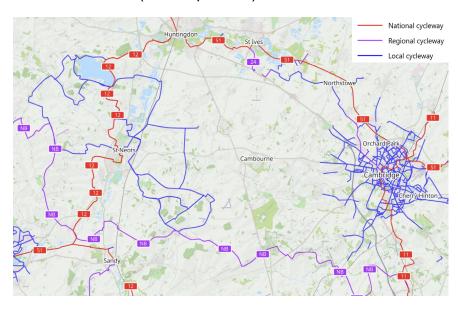


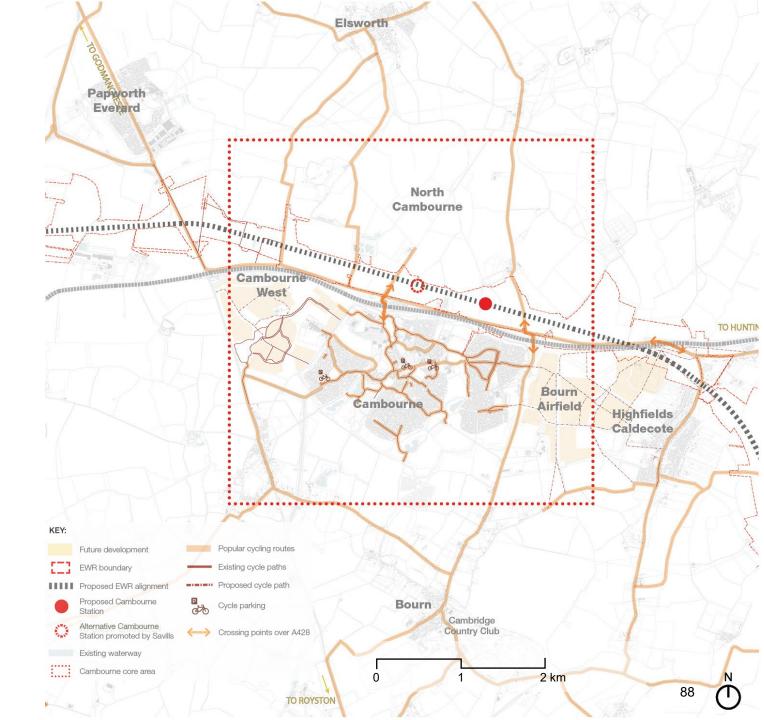
 There is a clear potential to enhance and develop specific routes for pedestrians and active travel purposes from the station area towards the existing town centre and surrounding future development.



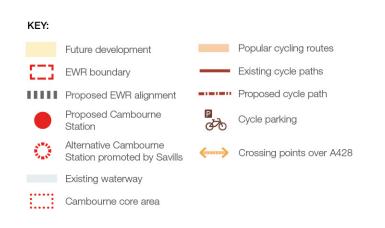


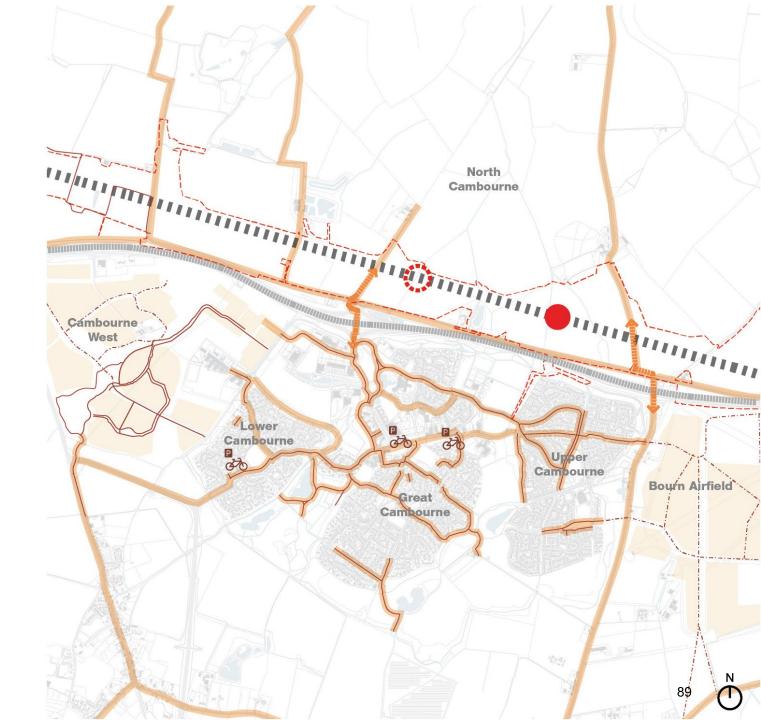
- Cambourne features a high-quality cycling network, offering well-utilised routes that link the town to nearby villages and ensure convenient access throughout Cambourne itself.
- These cycle routes are not all official (popular routes according to Strava data) and there seem to be a gap in both the national and regional cycle network around Cambourne (see map below).



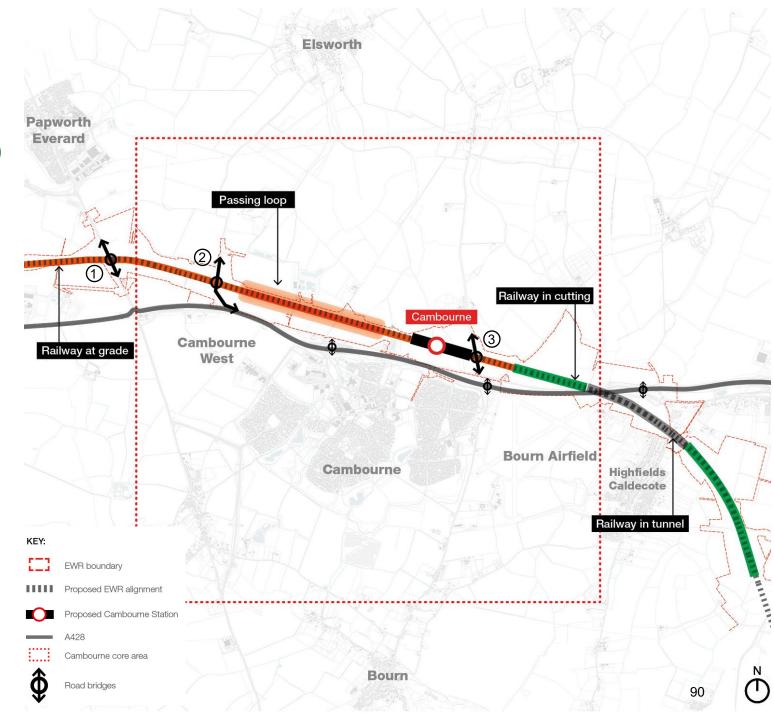


- Within the town itself, there is a good-quality cycle network, with well-used cycle routes frequently used by residents, including schoolchildren.
- However, there is some misalignment between official cycle routes and popular routes identified through Strava data, highlighting certain desire lines across the town that are heavily used.
- St Neots Road is also utilised by cyclists, despite the high speed of traffic, as it remains the only available route to access quieter, northern routes, though it is not considered the safest option.

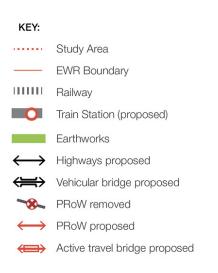




- An analysis of the future EWR railway corridor was undertaken to understand the impacts on the existing networks and the adjacent surrounding land.
- The railway corridor, as currently planned in DD5.1b, is mostly at grade, with the section to the east of Cambourne (near Bourne Airfield) gradually descending into a cutting before going underground.
- East West Rail (EWR) plans to provide three vehicular overbridges to replace existing crossings: one along the A1198 connecting to the new Caxton junction (1), another over St Neots Road (2), and a further link to the east connecting to Knapwell (3).
- Passing loops are planned along the railway line to the north of the dumbbell roundabout to accommodate freight operations, with four tracks.
- The proposed station is located to the east of these passing loops, just north of the Cambourne Sports pitches.



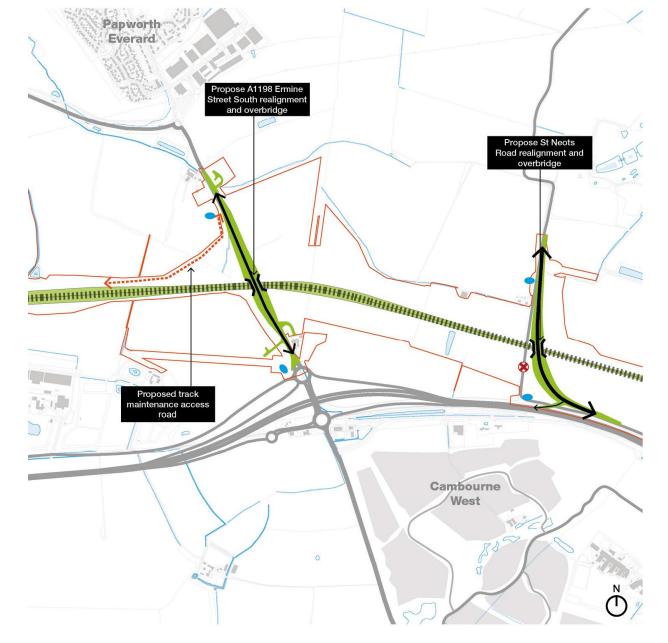
- Overall, EWR is planning to reprovide 3 road bridges, as well as 2 active travel bridges (1) (2) to compensate for the PRoW removed and ensure that north-south connections across the railway are maintained.
- The A428 will also be temporarily realigned above Bourne Airfield to facilitate the construction of the cut and cover tunnel (3). Several track maintenance access roads are also planned along the railway.



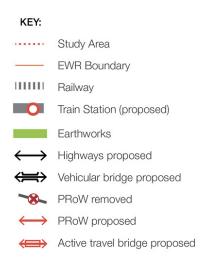


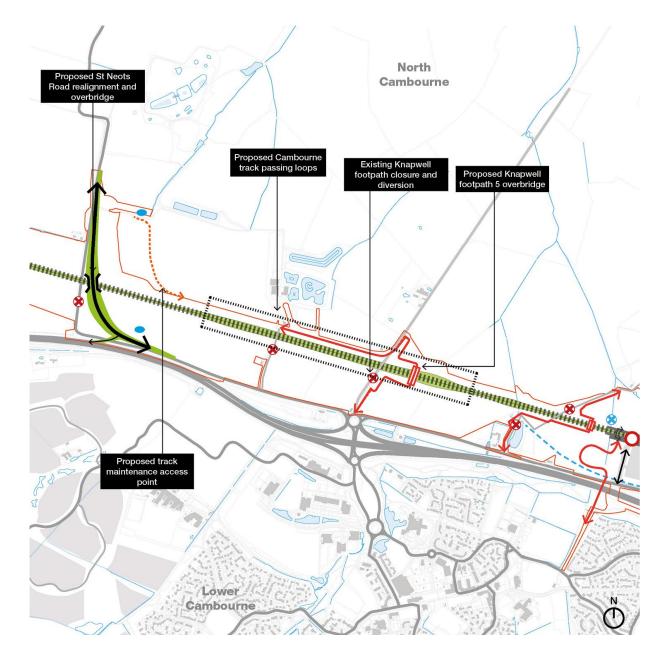
Zoom 1 (Papworth – Caxton Junction)





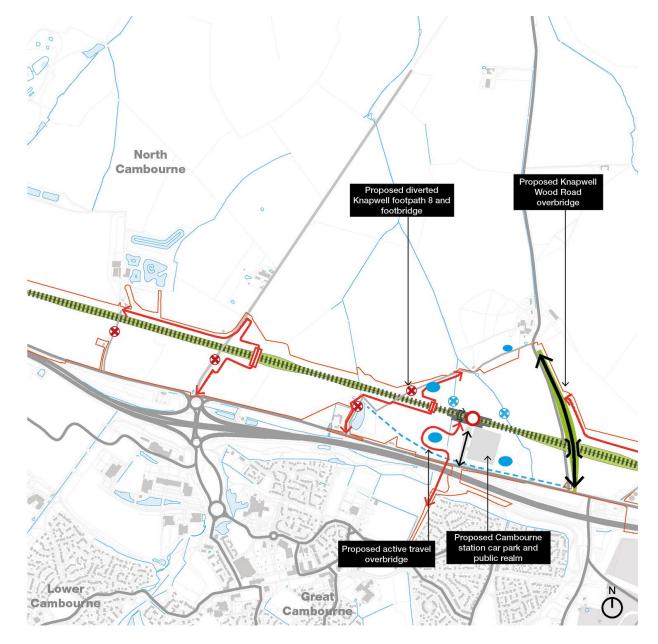
Zoom 2 (West Cambourne – Great Cambourne – North Cambourne)



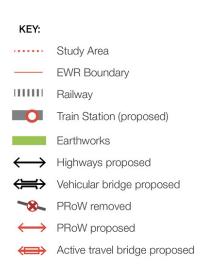


Zoom 3 (Great Cambourne – North Cambourne)





Zoom 4 (Bourne Airfield – North Cambourne)

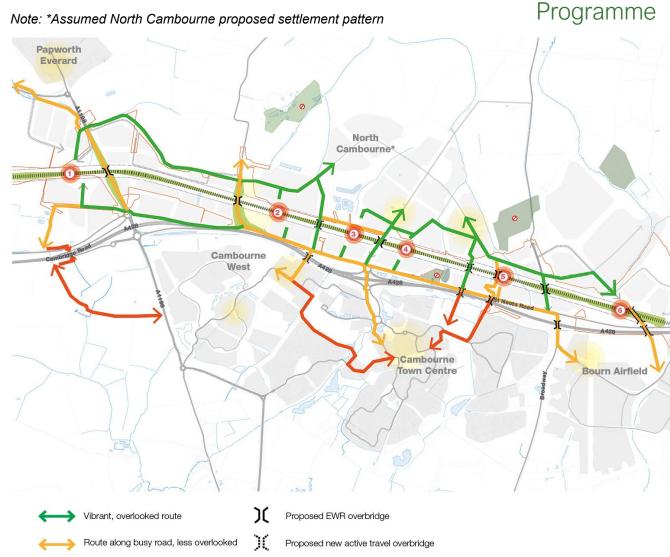




## **Connectivity – EWR Integration Study**

- The very high-level study, which was based on DD5.1b, explores 6 station location and the quality of routes to respective options.
- The study identified a number of opportunities to improve on the current station location or in relation to growth opportunities and improved connectivity to the existing Cambourne and potential future growth to the north of Cambourne, with those locations closer to the dumbbell roundabout performing best.
- However, although these appear to have advantages, the advantages are not clear differentiators and further testing is required for a more detailed analysis, supported by greater planning, engineering and environmental considerations.
- Furthermore, the study has identified the clear dependency of the station location and unlocking growth to the north, and without further clarity on this development, a location will be difficult to determine at this point in time.

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Route along quiet paths, not overlooked

## **Connectivity – EWR Current Station Design**

- The current station arrangement (DD5.1c) includes a gateline on the primary entrance side, a footbridge and lifts between platforms and passive provision for a northern entrance.
- The current scheme utilises St Neots Road for vehicular station access. An active travel bridge is provided above St Neots Road and the A428 to provide access for pedestrians and cycling from Cambourne town centre (bridge connects to Cambourne sport pitches, approx. 1km to the northeast of the town centre)
- The station is supposed to become a community hub.
- The land within EWR boundary surrounding the station is to be used for construction and logistic, earthworks, drainage, PRoW and highways diversions and habitat creation.



### **Connectivity – Priorities**

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#### 1. Station Location

Current station location includes poor active travel routes to town centre (not direct and not overlooked), no clear concept for bus connections (local bus routes + segregated busway). It is also located near Knapwell Wood (environmental sensitivity), which restricts future growth at this location.

A station location further west would be preferred by developer/landowner but presents some challenges including:

- · Railway on a 2-3m high embankment
- Rail passing loop (4 tracks for freight operations)
- Potential constraints for accessing the highway network

Opportunity/Priority: Identify most suitable station location from a development perspective (that works both with existing Cambourne and future Cambourne); Align active travel routes with EWR diversion/reprovision of highways and PRoW; Explore relationship to Papworth, Bourne Airfield and Highfield Caldecote and connections to the station.

#### 2. Rail/Road Corridor Severance

The parallel routes of the A 478 and the proposed tracks create severance between existing and future Cambourne through levels, noise and pollution, as well as development constraints within residual space.

Opportunity/Priority: Explore what suitable use could make the space safe and activated (car parking, park, light industrial?). Mitigation measure to overcome severance.

#### 3. 'Fixing' Cambourne from a connectivity perspective

Town centre dominated by car parking + traffic and congestion at the around 'gateway' roundabout. Missing dedicated wider cycle network.

Opportunity/Priority: Create a comprehensive road, pedestrian and cycle network including West Cambourne, Bourne Airfield and connections to North Cambourne future development (enabling infrastructure).

#### 4. Intermodal components, place making and 'onward travel' from station

Station orientation, location and floormat prioritises access by car from existing Cambourne. Alternative modes are convoluted, not safe after dark, or not present (bus). No reference to future development context beyond passive provision of northern entrance.

Opportunity/Priority: Prioritise active travel modes (including bus) in the station location and design. Consider station design in the context of future growth regarding access, forecourt design and active travel connections.

#### 5. Capacity and future proofing

Streets and space are primarily perceived in the context of existing Cambourne and the future extensions of Cambourne West and Bourne Airfield, as well current mode share.

Opportunity/Priority: Future proofing the infrastructure and network designs to enable planned growth, climate change resilience and net-zero transport, living and economies.

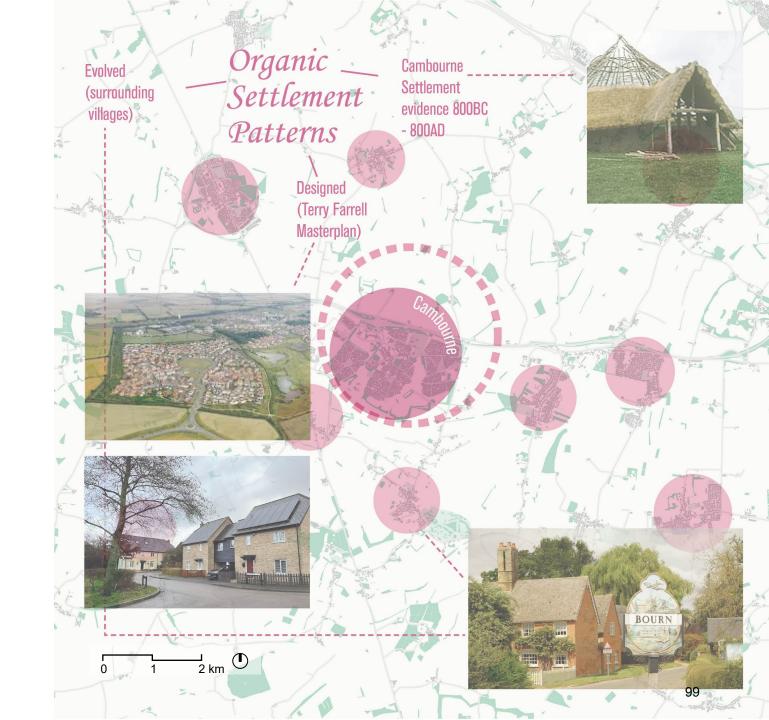
#### **Settlement Patterns**

The settlement patterns within and around Cambourne are largely organic, though they arrive at this point both by natural evolution and intentional design. Although we think of Cambourne as a relatively new place it is noteworthy that there is long standing evidence of a settlement in this location.

- The surrounding villages evolved through a range of environmental and social factors into organic clusters embedded in the landscape.
- Cambourne's organic patterns are formed by design via the Terry Farrel Masterplan, which, if anything creates even more sinuous forms than in the surroundings.
- Through extensive archaeological works we know there were iterations of a settlement on the site between 800BC and 800AD.

#### What does this mean for the spatial options:

Some degree of fluidity and organic form will likely be appropriate in the macro spatial configuration of the expansion. However, the place has a long history and there may be new ways to iterate the interpretation of such forms.

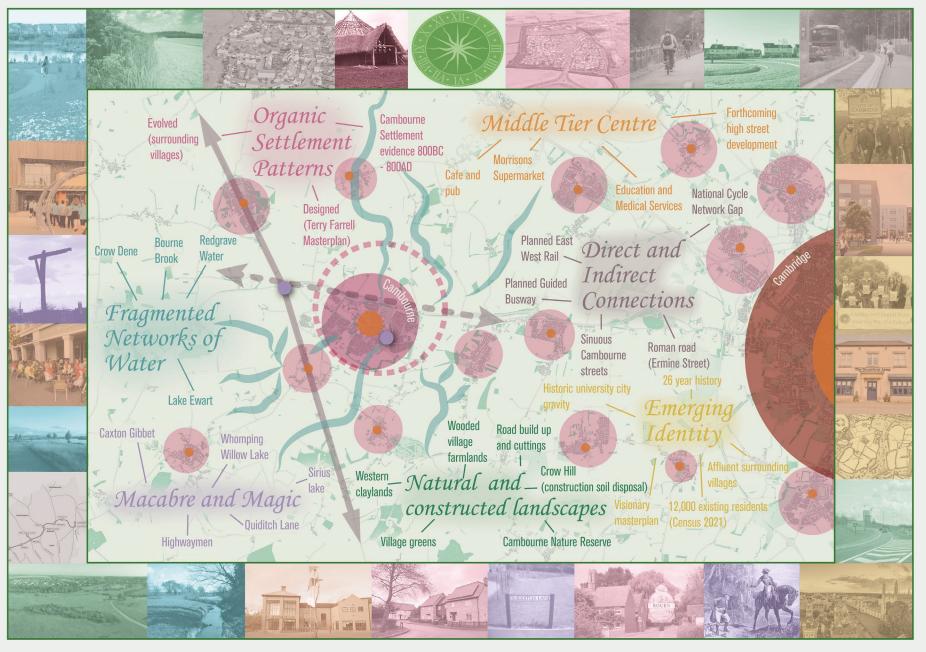


#### **Place assets**

The "place assets" analysis seeks to look at the components of the surrounding context that might have a bearing on the development and analysis of the spatial options.

As an adjunct to the technical analysis this exercise aims to combine qualitative and spatial analysis, macro and granular information to paint a thematic picture in bold strokes.

It is worth noting that though this has been informed by site visits and desktop analysis it has not been fed into by the community and is therefore a starting point for reflection rather than a complete picture.



#### **Hierarchy of Centres**

Cambourne functions uniquely as a middle tier settlement in the surrounding area; larger and more well provisioned than the surrounding villages, but subservient to Cambridge.

- The villages all have small centres with some combination of local amenities (a pub, a village shop etc) but nothing that meets supermarket to day needs of the community.
- Cambridge has a much larger and more varied centre with larger cultural and educational offerings as well as conventional high street retail.
- Cambourne meets the majority of day to day needs of the community, but it is not as vibrant as it could be.
   There is a large Morrison's supermarket, a pub, café, educational facilities and medical services along with a range of other amenities and commercial uses.

#### What does this mean for the spatial options:

Whatever centre or centres that come forward via the expansion of Cambourne should have a unique role that does not detract from the existing centre. Measures should be taken to ensure the existing centre can benefit from increased catchment population via strong transport connections.



### **Identity**

Cambourne is only 26 years old. It has passed through its "awkward teenage years" and is now starting to develop a sense of itself as a place.

- Having begun with pioneer residents occupying a visionary masterplan,
   Cambourne now has around 12,000 residents, so is truly beginning to feel "inhabited" as a place.
- Cambourne's Parish Council has evolved into a Town Council and there is an established group of charities and community groups active in the town.
- Cambourne's identity is informed by the surrounding context it sits within the
  gravitational pull of a world-famous historic university city and is surrounded by a
  network of affluent villages. Cambourne has been seen as a more affordable
  location compared to the surrounding area, attracting young families.

#### What does this mean for the spatial options:

The spatial options can capitalise on the strength of the existing identity AND the opportunity of a place that is not yet fully formed/solidified. There is an opportunity to retain the attraction of affordable family housing along with potential to broaden the offer with innovation/aspiration.

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#### Landscape

Cambourne's landscape is a fascinating combination of the natural and the constructed, with a strong spatial relationship between built form and open space.

- Cambourne sits within gently undulating topography and patches of natural forest surrounded by the more managed character of farmlands.
- Many of Cambourne's landforms are constructed from the road build up and cuttings to Crow Hill which is formed from construction soil disposal.
- Natural features include existing watercourses, forest and grasslands. Much of the landscape has been designed and dramatically enhanced through the creation of new water bodies and significant planting between the defined neighbourhood edges.
- Cambourne's more central landscape spaces (like village greens) are highly regular and manicured.

#### What does this mean for the spatial options:

This creates an opportunity to take a playful approach to the spatial strategy from a landscape perspective, mixing the wild with the manicured, the natural with the constructed and exploring interesting interfaces with built parcels.



#### Water

Cambourne sits within a fragmented network of small waterways, both natural and constructed that contribute to its character and spatial configuration.

- The surrounding area includes a network of small watercourses, natural and manmade, connected and fragmented, often with footpaths running alongside.
- Cambourne itself contains numerous lakes and waterbodies that provide leisure, amenity and biodiversity and flood prevention benefits.
- Watercourses, waterbodies and drainage features have a strong role within the pattern of the existing masterplan, flowing through and animating the larger green spaces and running along key routes, drawing the surrounding landscape in.

#### What does this mean for the spatial options:

The area of potential expansion around Cambourne contains other characterful watercourses and features that could be incorporated into the spatial approach. Integration of lakes is a strength of the existing plan that could be replicated within the future expansion.



#### **Mythology**

As a new place Cambourne could be seen as not having a defined history or mythology in the way that older places might. But new layers of meaning are being added all the time.

- We have already established in the Settlement section that there was human presence around this site hundred of years in the past.
- To the west is Caxton Gibbet, a macabre symbol of historic punishment, with accompanying tales of murderers and criminals, including highwayman on the "Great North Road".
- More recently a misunderstanding has given rise to a
  Harry Potter mythology within Cambourne. Quidditch
  Lane, despite being named after an old English word for
  a dry ditch has prompted homeowners to re-name their
  houses (e.g. "The Golden Snitch") and may have
  precipitated the naming of Whomping Willow Lake.

#### What does this mean for the spatial options:

These small threads of strangeness and curiosity may not have a significant impact on the spatial configuration of place but could inform new chapters in Cambourne's story as it expands.



#### **Connections**

Cambourne currently has a combination of direct and indirect connections with the prospect of dramatically increased connectivity on the horizon.

- Cambourne currently has no rail connectivity, but this exercise is motivated by the arrival of East West Rail which will connect Cambourne not just to Cambridge but the wider area.
- Plans remain for a guided busway between Cambourne and Cambridge along with an accompanying cycleway, but currently bus and dedicated cycle connectivity in the wider area is poor.
- Cycle use within Cambourne is high, particularly among children and younger people. Residents regularly use the networks of walking routes for leisure, but they are less suitable for day to day practical trips, especially in winter and in poor weather.

#### What does this mean for the spatial options:

There is an opportunity to improve sustainable transport connectivity, while being mindful that such infrastructure can in itself create issues of severance that must be overcome. There is scope for the expansion to evolve and improve the approach to walking and cycling connectivity.



## Key locations and views

Views of the surrounding rural landscape, and of green and residential areas

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## Key locations and views

Views of Cambourne's green assets and Nature Reserve









## Rail assumptions, aspirations and requirements

#### **EWR GCSP Technical coordination meetings**

- A number of technical workshops have been conducted to align this commission with the station design progress and to explore how the scheme can be refined for optimal results regarding the Cambourne extension.
- The optimisations under consideration involve adjustments to the station's location and type, rail alignment, and connectivity to the station.
- The results of these discussions must be assessed and comprehended as a framework is established.

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