

RD/FM/013

**Additional Evidence Relating to Bourn Airfield
New Settlement Major Development Site
Boundary**

*Appendix 1 Bourn Airfield – a landscaped-led settlement (Chapters 1 -3) (Part
2 of 8)*



Bourn Airfield a landscape - led settlement

October 2016



COUNTRYSIDE
Places People Love

Rummey design

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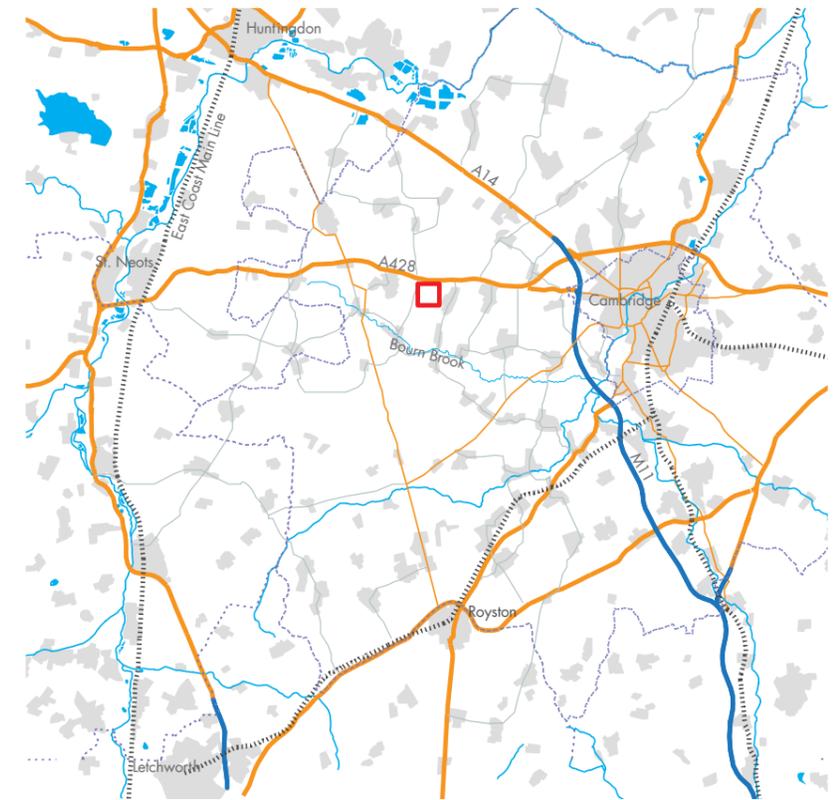
airiel view from the south west

1 The site location

Site location and information



Existing site plan (NTS)



Site location plan (NTS)

The site location

The land at Bourn Airfield commands the highest point of a clayland plateau, 9km to the west of Cambridge. It was laid out as a strategically important bomber airfield in the second world war and its attributes of openness and elevated space continue to be an advantage for its use as an airfield today.

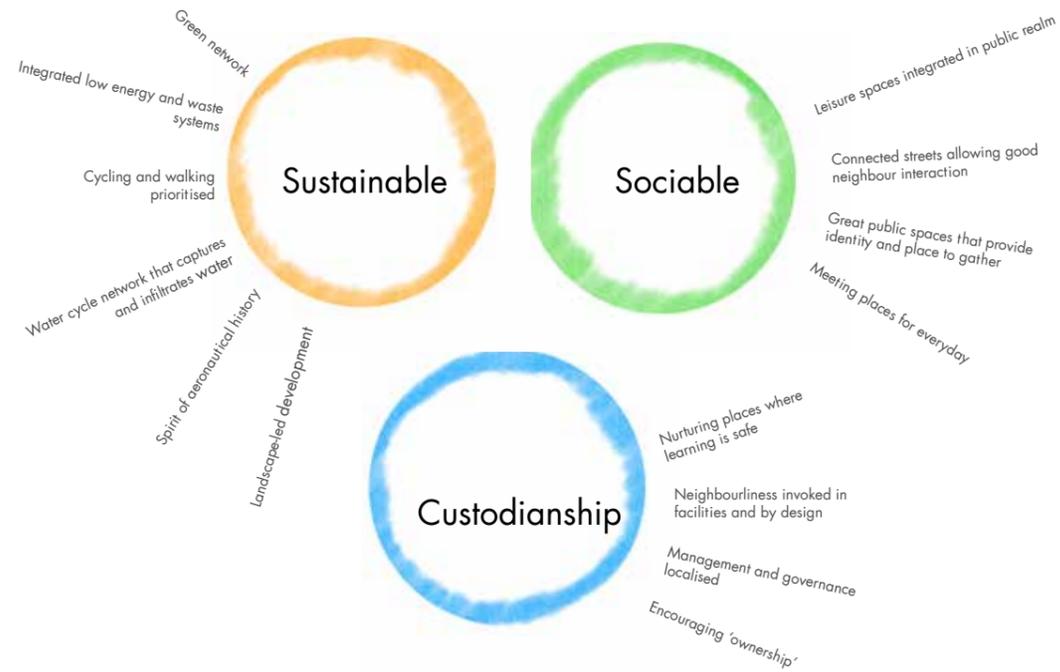
The site is 50% brownfield (or previously developed) and is marked to its east and west by industrial, small business and farm buildings. The hinterland between the runways continues to be farmed with wheat and oil seed crops currently being cultivated. An isolated stand of woodland and wooded boundaries encloses the south eastern and southern part of the site. The new east – west A428 bounds the northern part of the site.

2 Place-making strategy



Our vision

“urban convenience with a rural sensibility”



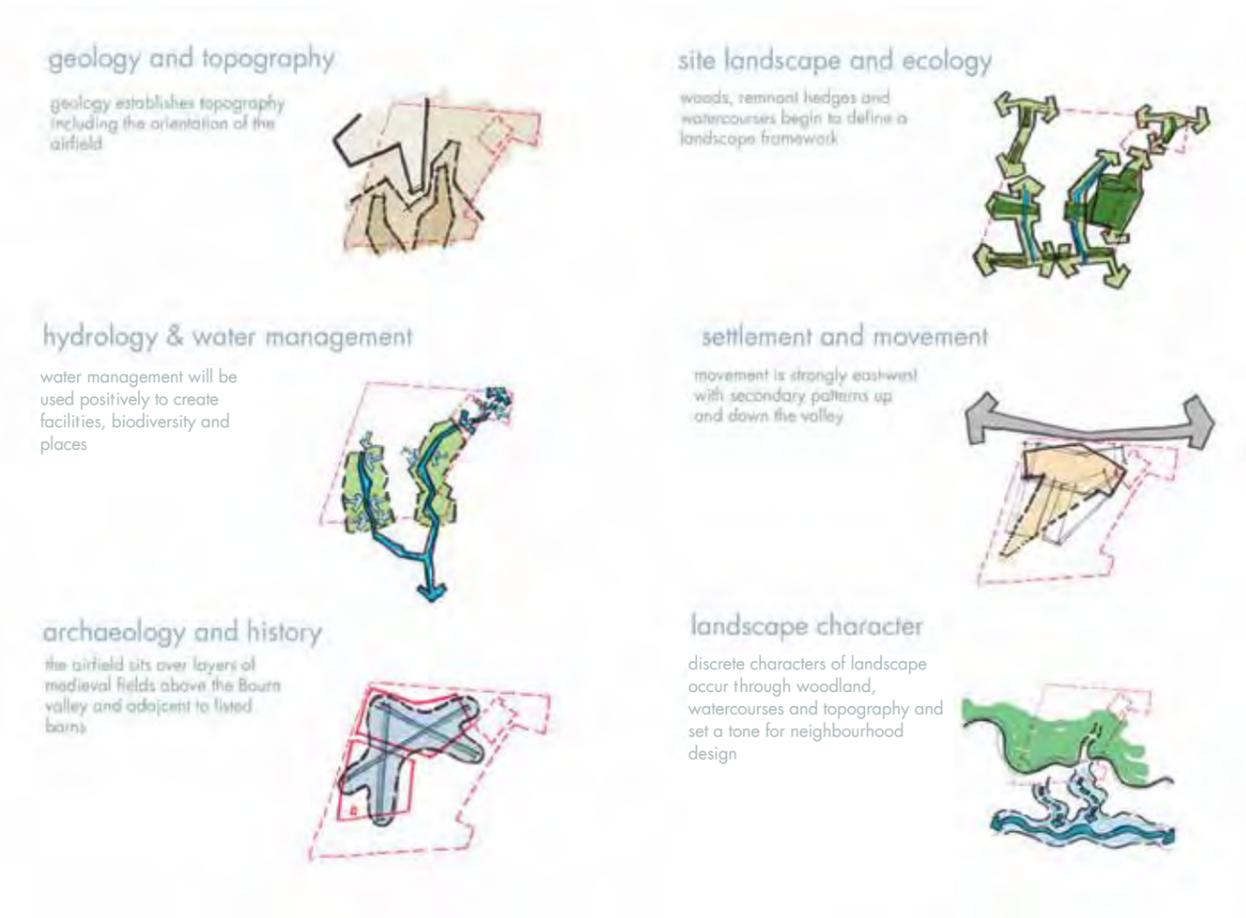
character, climate, community, connectivity

... our aspirations for the scheme align with the Cambridge Quality Charter key principles ...



the residential environment, education, workspace, community buildings, and the natural world, all connected ...

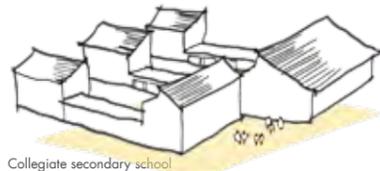
a landscape-led development



Our aim is to create a vibrant new settlement, complementing Cambridge, maximising the opportunity to live, work and play in a place of outstanding landscape and design quality ..

... a new village with its own identity, learning the lessons of history and its landscape ...

Community



Collegiate secondary school
Through primary school
Independent and green primary school



Village outdoor green and paved social spaces with good lighting and seating in parks and social spaces



Playing space and sports fields



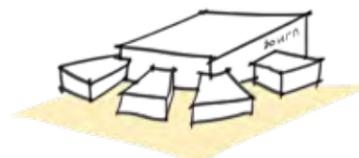
Youth linked cycle hub and hacker space - capturing both creativity and skill training in a leisure environment. Community spaces spread across site.



Work barns with modern, light, well serviced and connected flexible spaces

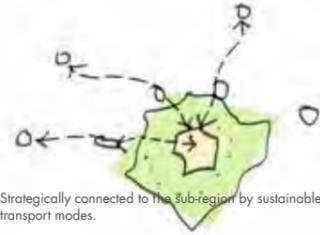


Productive landscapes; community orchards, apiaries and composting points.



Community service front desks integrated with non institutional service centres
Flexible multifunctional shed for business, arts and performance space

Connectivity



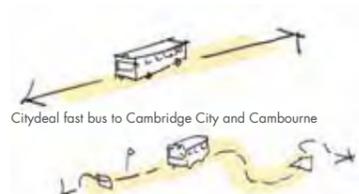
Strategically connected to the sub-region by sustainable transport modes.



Well connected to neighbouring Cambourne and Caldecote by quality pedestrian and cycle routes.



Hierarchy of streets and lanes making connections clearly legible for all users.



Citydeal fast bus to Cambridge City and Cambourne

Local bus connections



High quality cycle network with on-street lanes, mini Holland junctions, smooth off street leisure paths - designed for all abilities with toucan crossings where busy roads are crossed.

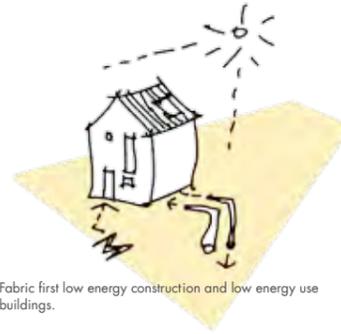


Recreational walking, cycling and equestrian trails linked to country park and wetlands, to rural path network and treasured local routes.

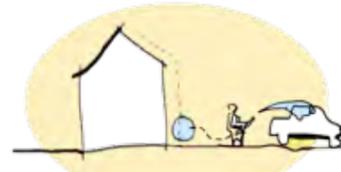


Every street connects to two other streets. The connected street network really works.

Climate



Fabric first low energy construction and low energy use buildings.



Sustainable drainage systems might allow systemised collection and re-use of roof runoff.



Communal energy farming for schools, community buildings and facilities.

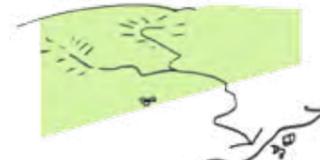


Shading street trees to reduce heat impacts.

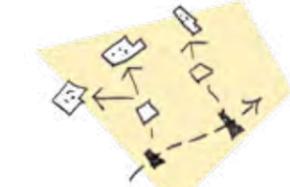


Rainwater harvesting to capture and recycle surface water.

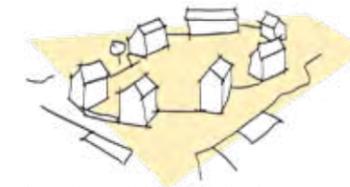
Character



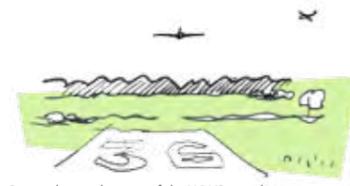
Responding to the local Cambridgeshire Claylands landscape.



A settlement form reflecting the historic development pattern of tertiary clay ridge top communities.



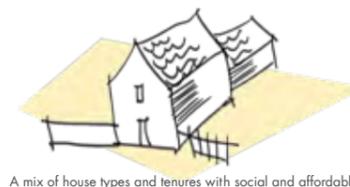
Colours and materials that belong in this place



Responding to the spirit of the WW2 aerodrome.



Developing townscape that reflects the east of Cambridge village form - greens and peripheral houses set back from watercourses and streams.



A mix of house types and tenures with social and affordable housing pepper potted and indistinguishable from open market housing.

Collaboration



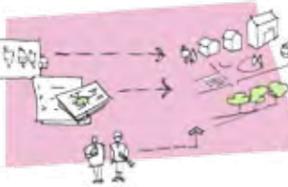
Working with local people to understand the issues, connections, facilities, etc to make the most of opportunities.



Being transparent in the way design and management of the development is shared with communities and neighbours



Sharing ideas with young people who will see this place develop around them.



Maintaining the vision with strong masterplan, developer selection and quality control, working with local authorities and stakeholders



Key views to protect or respect

Runway Corridor

Runway Corridor - heritage and a key landscape feature



3 Landscape strategy

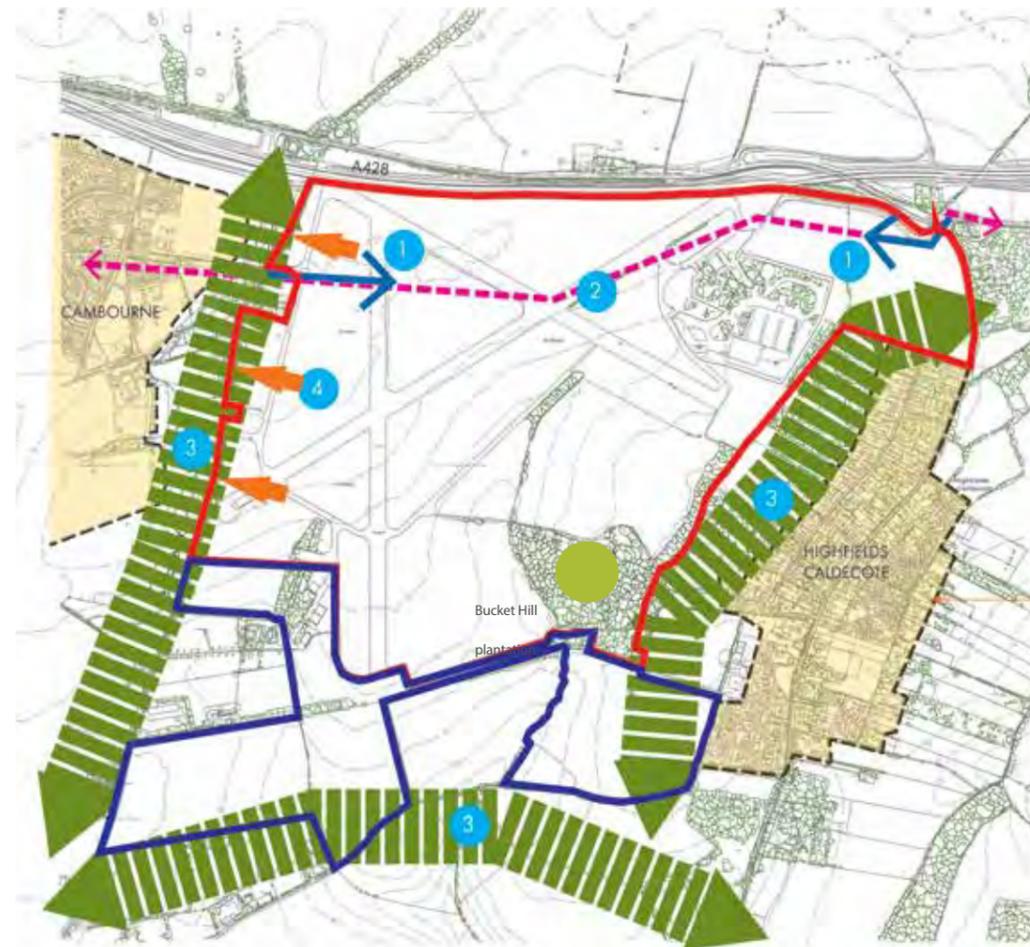
In 2013 landscape studies were initiated by Countryside Properties to understand the nature of this large and important site, and to allow future masterplanning and design to work with the 'spirit' of the landscape. All development relates to the character of its landscape and its underlying geology, and it is from these qualities that distinctiveness has traditionally been produced. The landscape studies produced clear constraints and opportunities which have been translated into the proving masterplan design as set out on the following pages.

The following section is taken from work undertaken from 2013 onwards. There might be minor discrepancies with currently proposed boundaries.

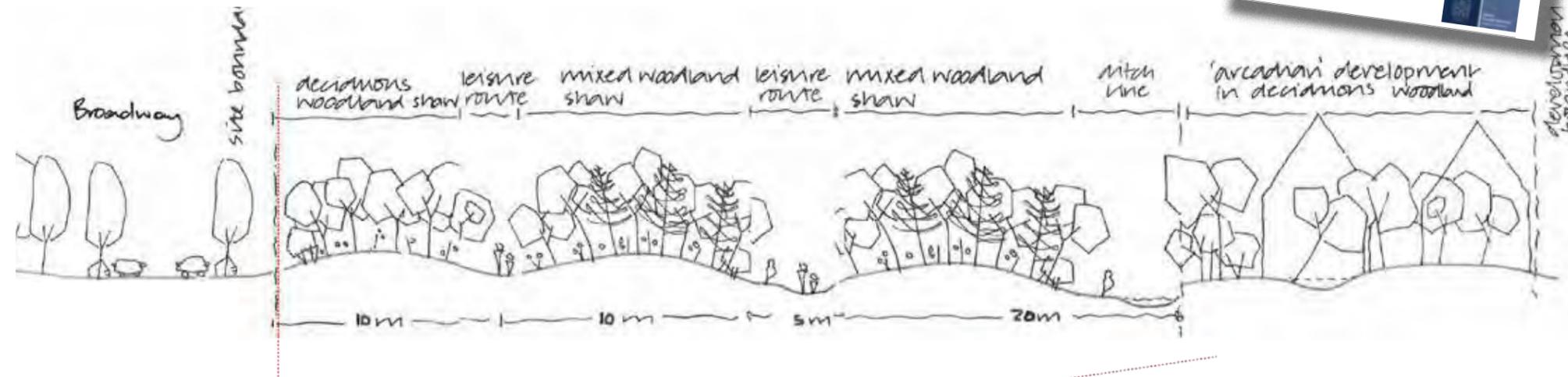
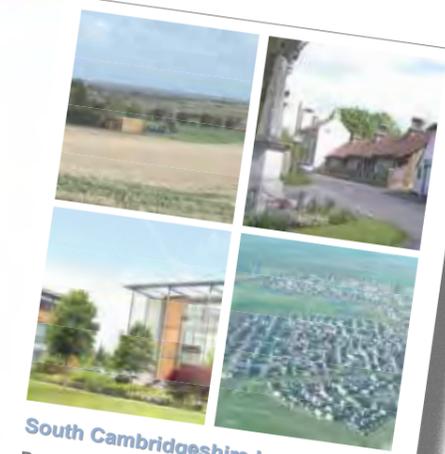
Planning policy position (policy SS/6)

The submitted South Cambridgeshire Local Plan proposes the development of a new village of approximately 3,500 dwellings at Bourn Airfield. As part of the new village, the proposed policy requires the Bourn Airfield development to:

- maintain the rural character and separation of Cambourne, Caldecote, Highfields and Bourn
- include employment development within class B1 incorporating the existing ThyssenKrupp employment site
- include community services and facilities, including health, primary school and second school education
- deliver a high quality landscaped setting around the boundary of the settlement through strategic landscaping
- ensure the retention of existing woods, hedges and water features which would contribute to the character and separation of the village
- include a segregated bus link from Cambourne to Bourn Airfield through the development to the junction of St Neots Road/Highfields Road
- provide at least two separate vehicular access points to the north-west and north-east of the site
- ensure no direct vehicular access onto the Broadway (except for buses & bicycles)



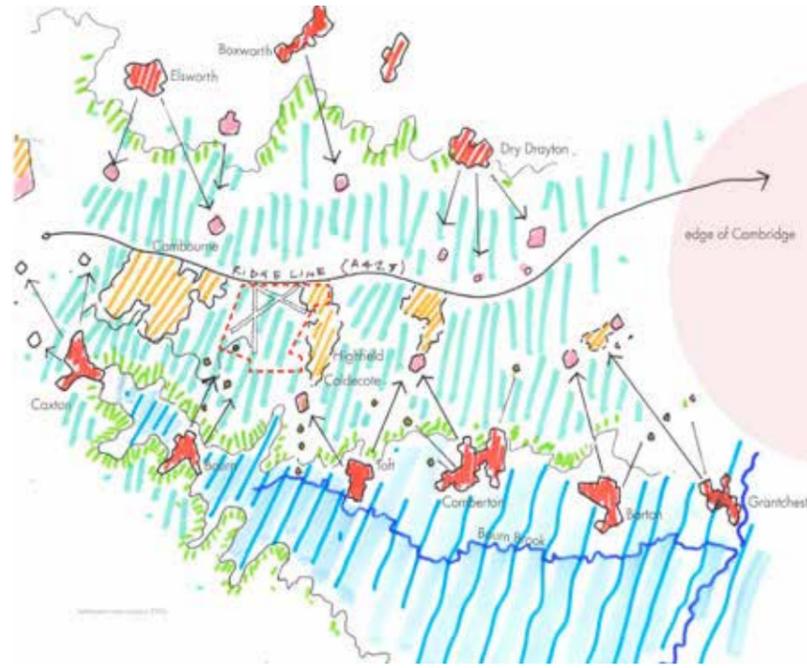
- 1 2 separate vehicular accesses
- 2 provide segregated bus link
- 3 maintain rural character and separation
- 4 only bus and cycle access to Broadway



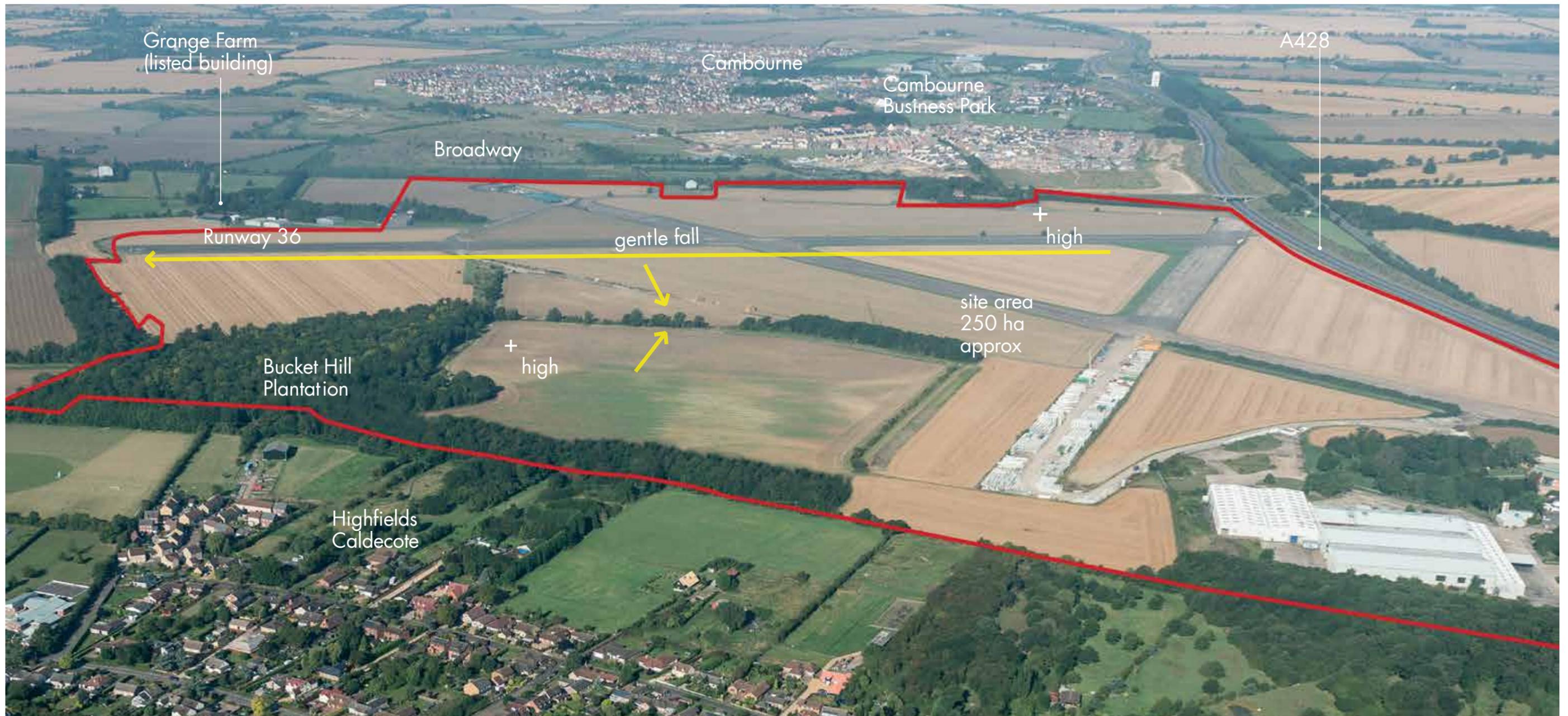
The avoidance of coalescence is a key driver for a masterplan. Structural landscape in the form of woodlands, open spaces and water are required and will inform development character.

Context

Cambridge sub-regional connections



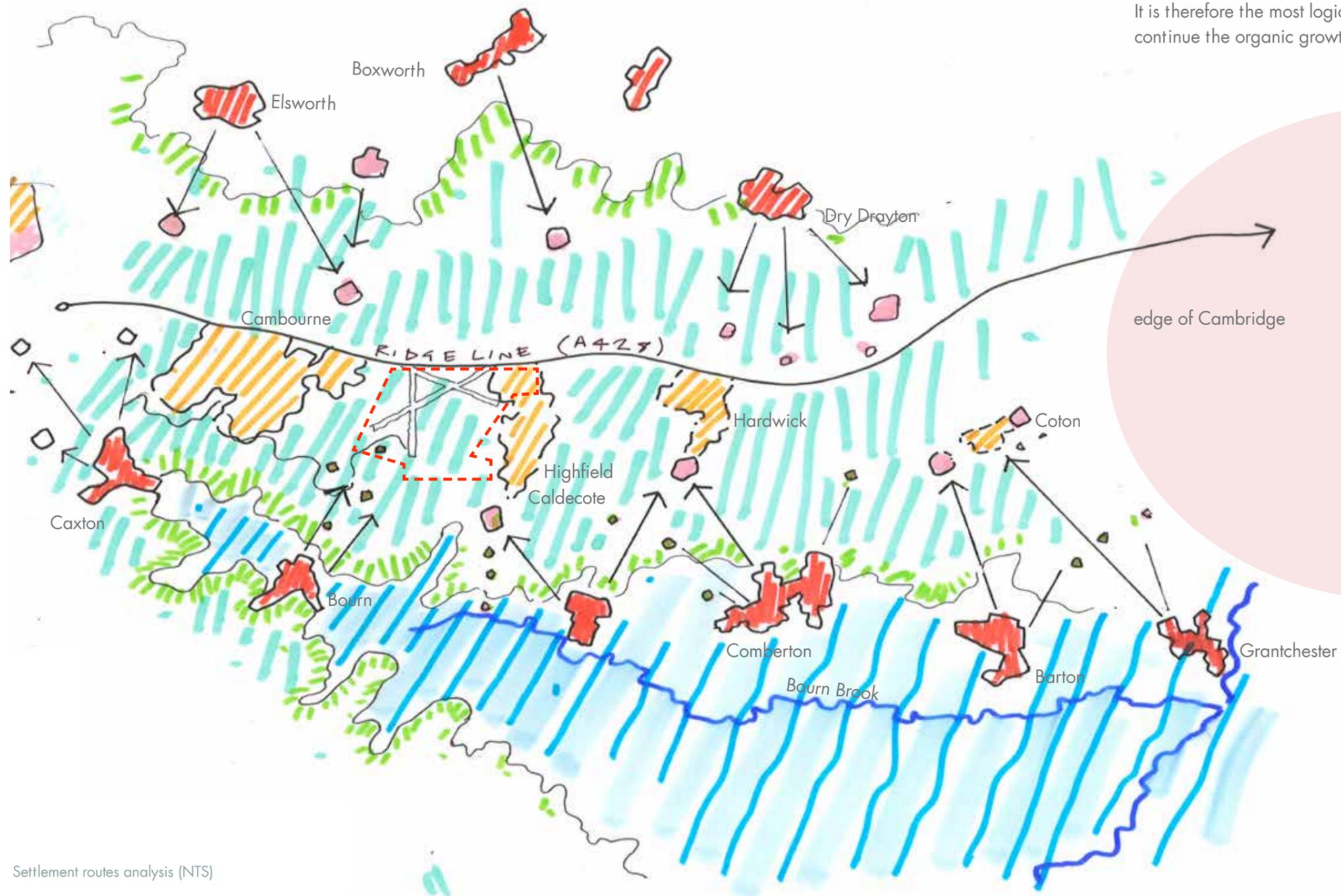
The original villages were in the fertile Bourn Valley. Historically, the settlements spread to the ridgetop as farming methods and water distribution improved to create 'daughter' settlements.



Historic landscape pattern

The analysis shows that settlement grew historically along the Cam valley into the Bourn valley and up to the ridge line, eventually to connect to the east/west trade route between Cambridge and St. Neots. This growth also came along Parish boundaries with a linear route connecting the primary village and its secondary settlement.

This growth did not occur with Bourn, northwards along Broadway. It is therefore the most logical location for a new settlement to continue the organic growth of settlement in this area



Settlement routes analysis (NTS)



0 100m

A428

Broadway

Highfields Street

Aerial photo showing local landscape structure

Geology and topography

Geology and its interface with a changing climate = 'landscape' in the broadest sense of the word and this influences the settlement within it.

geological build up of the area

The bedrock comprises waves of gault and chalky clays creating landscape diversity in the lowland areas around the site as acidic and alkaline materials coincide. This bedrock in the Bourn airfield area has been obscured by the actions of glacial retreat; a large deposition of boulder clay has created a locally distinctive upland area. This heavy clay was densely forested and was unattractive to early settlers due to the heavy ground that discouraged early methods of farming.

The plateau site gently undulates where drainage lines have carved through the superficial geology. The shallow, watery valleys are often marked by 'treed' hedgerows and grassland banks that create a sense of green and wooded enclosure to the airfield.

The surface soils are inevitably heavy, often waterlogged and hard to work. Post assarting and the almost total extirpation of the woodland in the area, the ground has only been worked with some efficiency following the advent of more modern farming techniques. As a result the plateau was colonised much later than the surrounding 'wet-point' settlements and few historic precedents for settlement exist on the clay 'uplands'.

RESULTS: heavy and impermeable geology has discouraged the settlement of the plateau, little Roman settlement

site landform

The landform of the site ranges between 71m AOD and 54m AOD with gentle cross falls of between 1:7 and 1:140. The land gently shelves to the south, incised by north-south radial drainage lines that create two noticeable, vegetated valley features in the site.

climate change

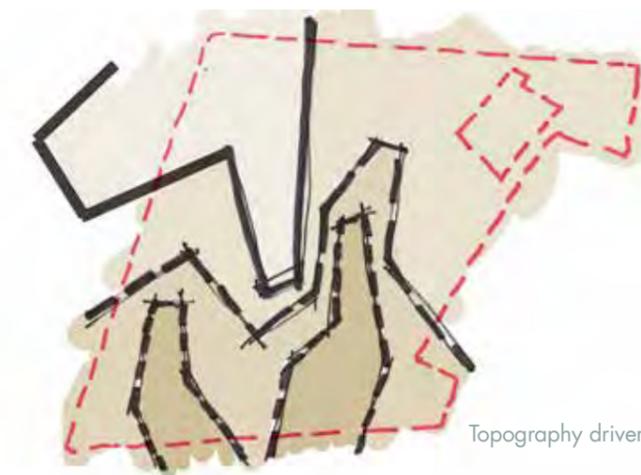
The 'Bourn plateau' has been created by the dramatic actions of glacial climes, but gently sculpted by water. As rainfall patterns fluctuate, water management is a primary focus for development. Climate change figures for the area indicate that while summers will be significantly warmer with a 60% reduction in rainfall, winter months will see a 30% increase in rainfall with heavier and more concentrated storms, causing flooding and erosion where water cannot be managed appropriately.

conclusion for site justification

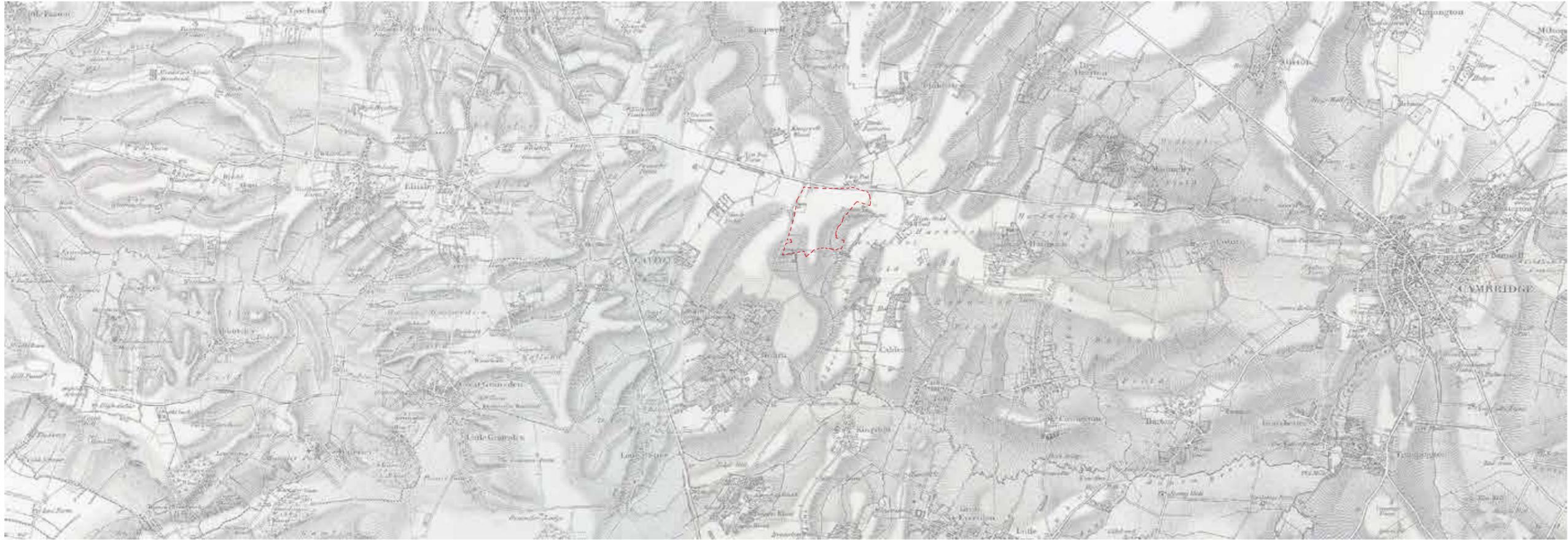
- There are no geological designations on and around the site
- The gently undulating topography creates a sheltered landscape that is adaptable to change
- The arrangement of the geology and its shaping by the changing climate, determines the landscape infrastructure and land use
- The open upland plateau creates a platform for larger scale development
- The heavy clay soils are less attractive for arable crop production and therefore the agricultural value of the landscape is relatively low

drivers for the masterplan

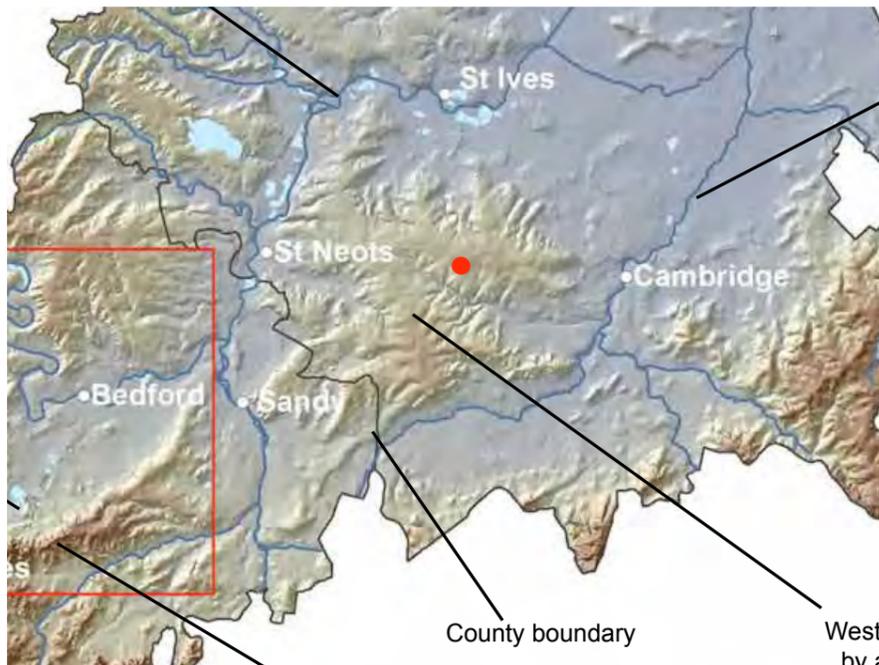
- The gently folded landscape creates orientation and features for the new development and its infrastructure
- The folds and valleys limit views and therefore settlement can be nestled into its topography with reduced impact
- The impervious soils and subsoils create a strong foundation for a 'wet' landscape creating a distinctive character and identity for new development



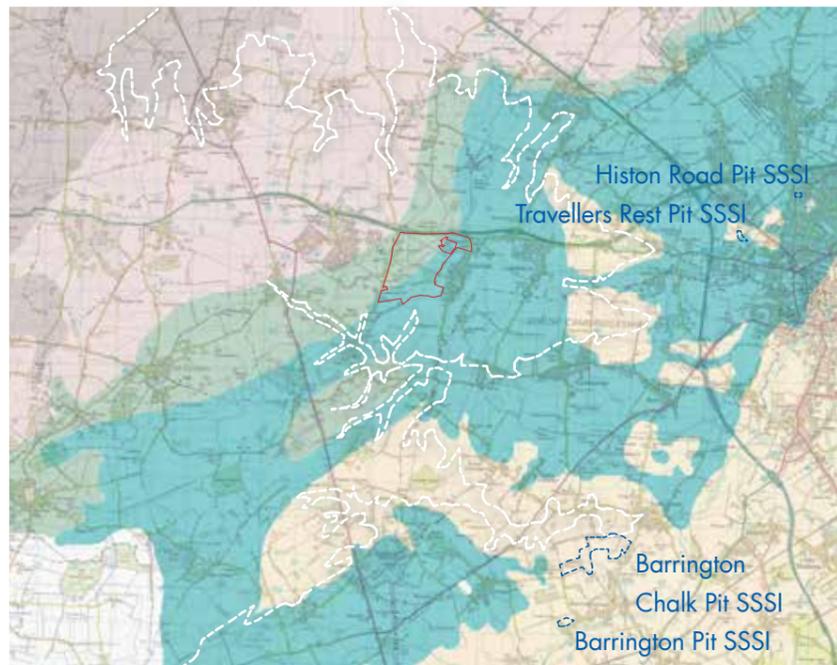
Topography driver diagram



1836 area map of South Cambridgeshire (Reference: © Crown copyright 2012 all rights reserved license no. 100020449)



Regional topography plan (Reference: <http://www.cambridgeshiregeologyclub.org.uk/images/map1.jpg>)



SSSI designated site location plan (NTS)



Existing site contours plan (NTS)

Hydrology and water management

hydrology of the site and area

The superficial boulder clay cap has been shaped by radial drainage patterns, creating a distinctive undulating upland landscape. Folds in the plateau are generally marked with linear tree rows and hedgerows and are often settled. These natural drainage lines tend to be bournes or brooks from one metre to 5 metres wide with steeply incised banks as the stream margins are regularly cut and cleared, to assist with land drainage and peak flows.

It is understood that Bourn Brook is prone to flooding. It will therefore be a key objective of the masterplan to ensure that surface water run off is attenuated through integrated swales and wetlands to ensure that the flows into the Bourn Brook are no worse than greenfield rates.

Water 'features' such as clay pits and watering points are scattered through the landscape. The landscape is also marked with many moated large isolated dwellings, many buildings being outlived by the moats.

The majority of homestead moats, as they are known, were constructed during the twelfth and thirteenth centuries and are a common feature of the Midlands and Eastern Counties. Their form, although varying considerably, mitigates against the explanation that they were constructed for defensive or drainage purposes. They are narrow, a great number have only two or three sides and many have entrances formed by permanent causeways. Most are constructed so that water runs into them: by siting them adjacent to streams or by means of complex waterworks. Having considered possible practical explanations, the motive, as suggested by Christopher Taylor (*The Cambridgeshire Landscape*) is that they were built because it was the fashionable thing for local lords and wealthy farmers to do: 'Moated sites presumably reflect the general prosperity of the their owners and the desire the show of this prosperity by imitating the moated castles of the higher ranks of contemporary society.'

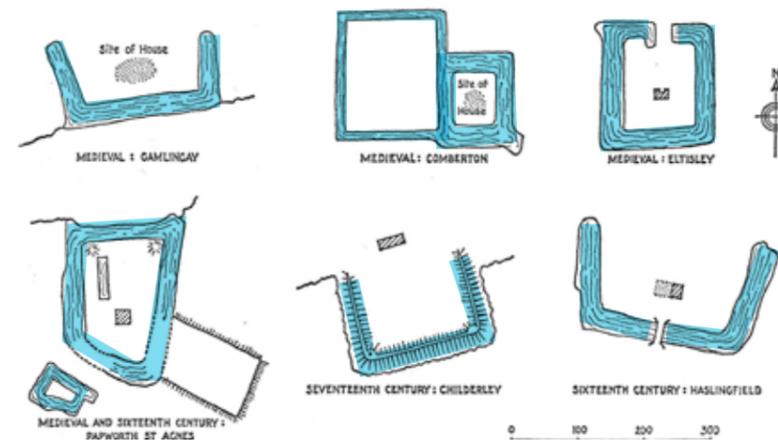
RESULTS: the drainage patterns have created a distinctive north east – south west - valley and ridge pattern, helping to create an upland, geometric but largely enclosed landscape.

conclusion for site justification

- There is a lower ratio of natural and planned water bodies on the site than the surrounding slopes and valleys
- There are no recorded incidences of flooding on the site
- The current airfield is presently well drained
- There are opportunities to enhance the existing water system on site to accommodate improved drainage water management and habitat diversity

drivers for the masterplan

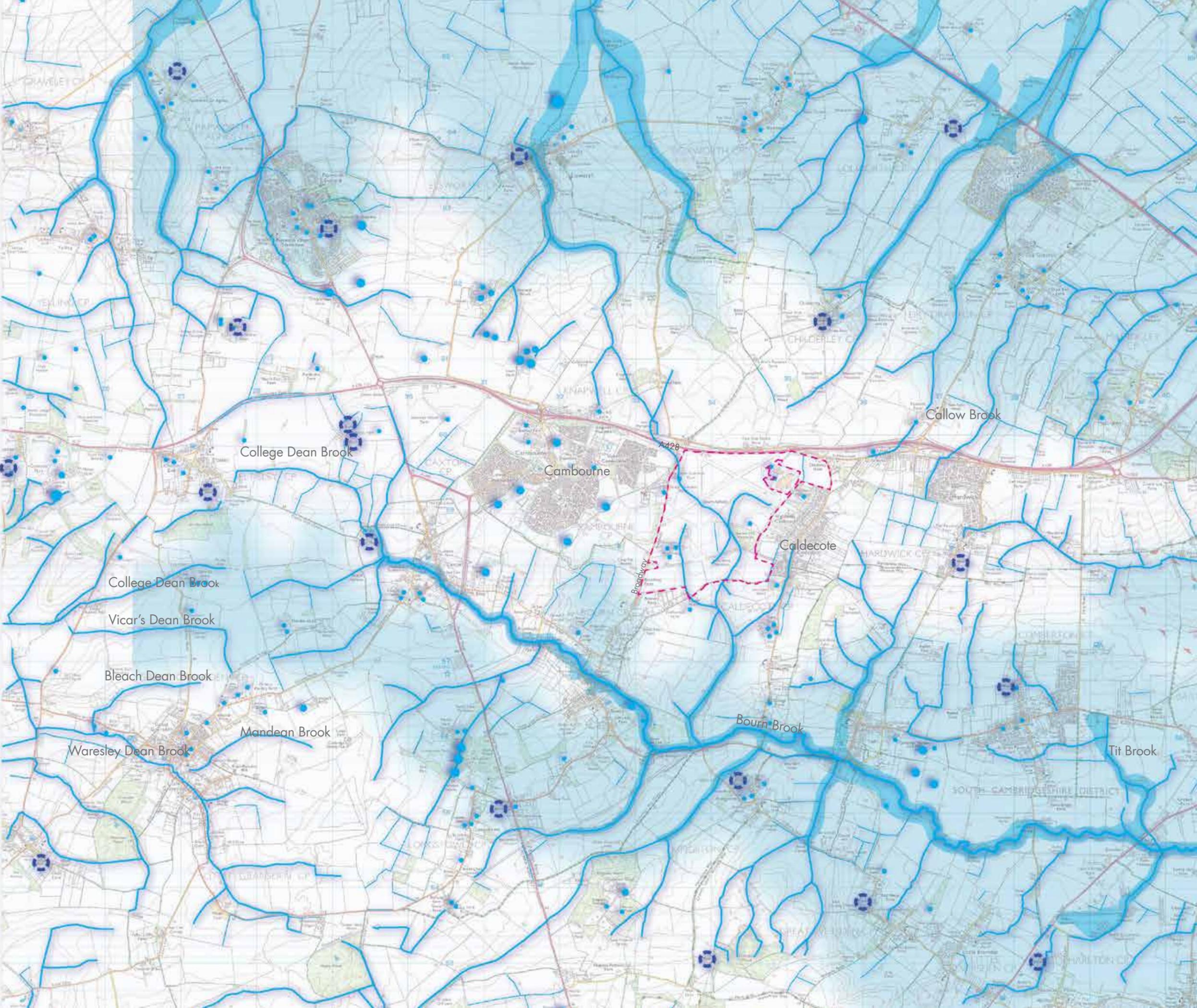
- The 'Y' shaped natural drainage pattern creates a structure for a new, broad wetland landscape that enhances the biodiversity of the region
- The precedent for moats and water holes on the edge of the plateau are an important influence on the character of the local area. These can be brought into the design to create distinctive characteristics to the development.
- Opportunity to attenuate surface water run off into Bourn Brook



Diagrams of domestic moats found in Cambridgeshire
(Reference: 'The Cambridgeshire Landscape' by Christopher Taylor)



Hydrology driver diagram



-  water features
-  drainage, streams and brooks
-  flood mapping
-  moat locations
-  area lower than 50m (above sea)

Hydrology analysis diagram (NTS)

Biodiversity

“Cambridgeshire has a diversity of habitats and species, but we have less wildlife per hectare than most counties in Britain” (Biodiversity Partnership for Cambridgeshire and Peterborough).

Maps showing valuable sites of county and national importance reinforce this conclusion, showing a fragmented distribution which is identified as a key threat to biodiversity by South Cambridgeshire DC’s Biodiversity SPD.

Changes in land use and intensification of farming practices have led to the significant loss of habitats including hedgerow, flower rich meadows and wetlands with increased pressure on species such as barn owl, house sparrow and great crested newt which were once prevalent. Reduced habitat potential and poor habitat connectivity further threaten populations. Planning policy seeks to ensure new development enhances existing assets through buffering, connecting, augmenting habitats and ensure appropriate management.

Within approx. 8km area around Bourn Airfield, eight Sites of Special Scientific Interest (SSSI) were identified (with seven shown on the plan opposite), comprising mainly woodland and ancient woodland habitat with one example of herb rich grassland at Caldecote Meadows. An internationally designated Special Area of Conservation exists at Eversden & Wimpole Woods where one of the UK’s strongest populations of Barbastrelle bats is located. Other sites of importance included county Biodiversity Action Plan Habitats, designated mainly for woodland value with numerous small and fragmented old orchards that are known to support high biodiversity.

Across the county, priority habitats include hedgerows, ponds, rivers and streams, neutral grasslands and old orchards with action plans in place for their protection and enhancement. Individual species of importance include otter, skylark, water vole, barn owl, native black poplar, house sparrow and great crested newt.

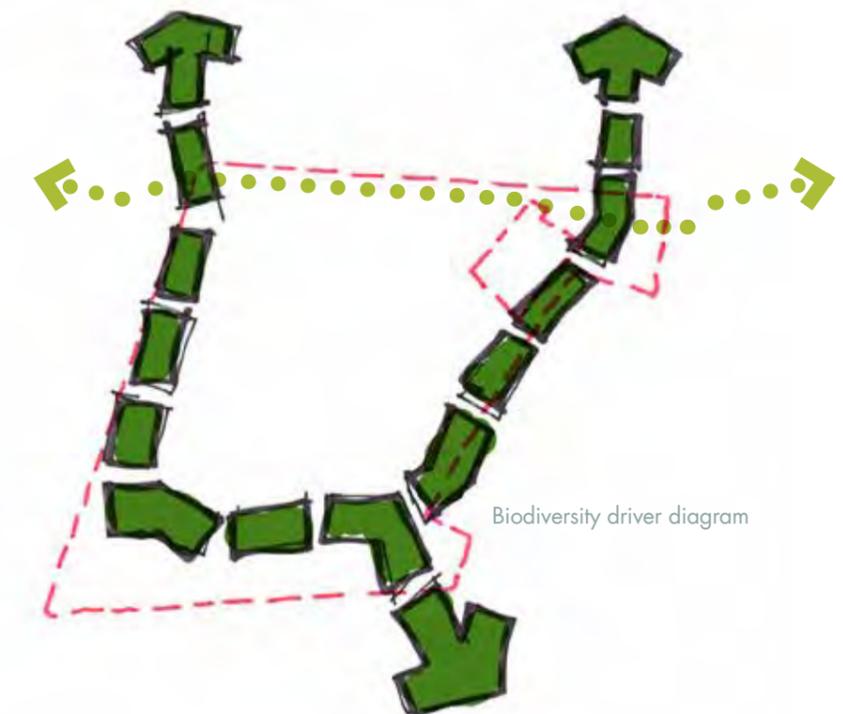
Key Wildlife corridors & landscape enhancement areas are identified within the Biodiversity SPD to catalyse the preservation of habitat linkages and foster areas of important or damaged landscape areas.

conclusion for site justification

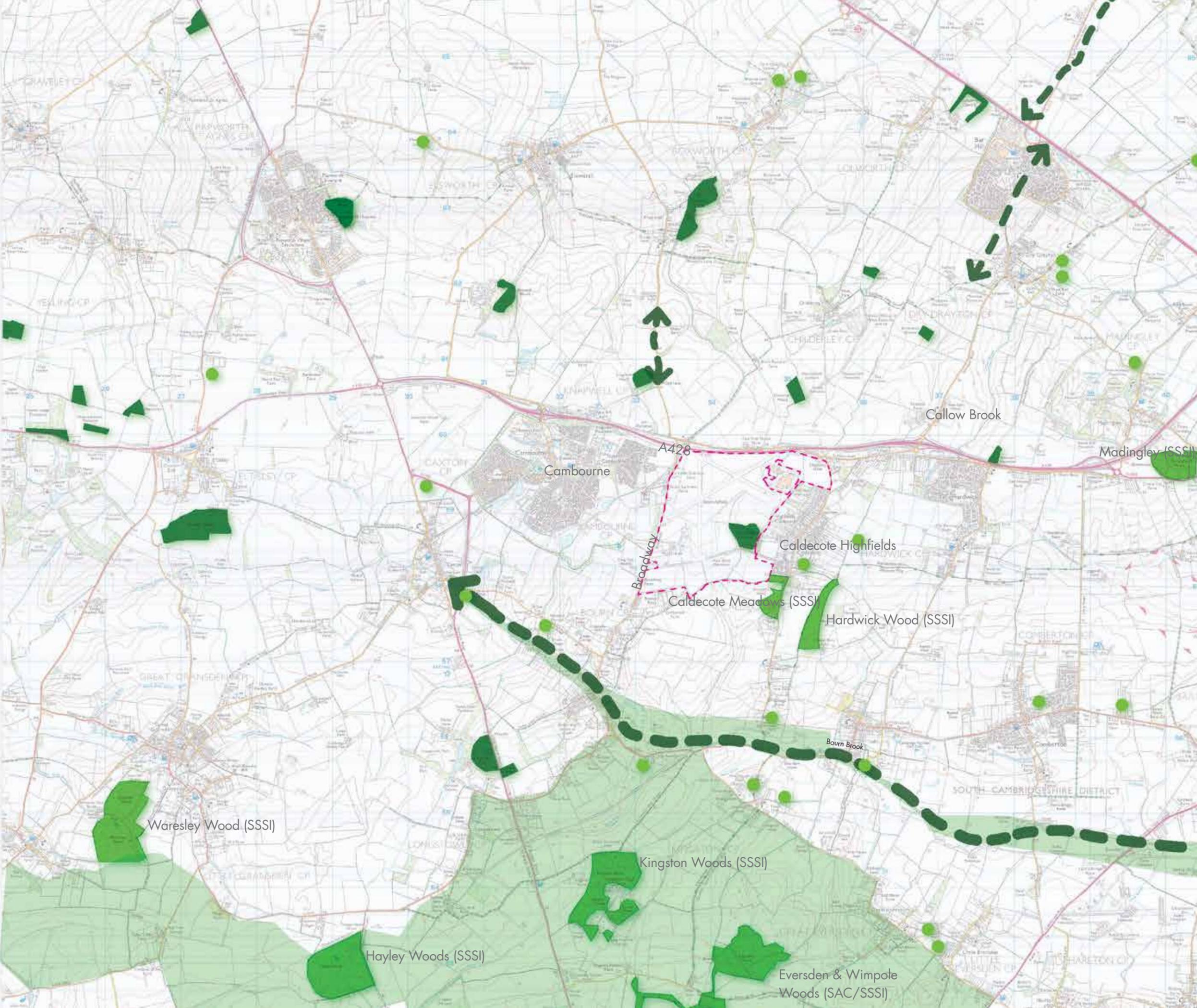
- There are no statutory habitat designations covering any part of the site
- The site is not thought to support ancient woodland

drivers for the masterplan

- Potential to extend existing designated county wildlife corridors to and from the site
- Significant opportunity to enhance the site’s biodiversity, in line with county wide policy and objectives to create new priority habitat of county level importance.
- Species of county priority can be supported and promoted to strengthen populations
- Opportunity to create a sub-regionally important wildlife site
- Improved east/west biodiversity along transport/cycle corridor



Biodiversity driver diagram



-  Biodiversity Action Plan Habitats
-  SSSI sites
-  Woodland (BAPH)
-  Key Wildlife Corridors
-  Special Area of Conservation
-  Biodiversity analysis diagram (NTS)

Landscape character

National landscape study

The national assessment of landscape character designates the landscape around Bourn as the 'Western Claylands' or the 'Bedfordshire and Cambridgeshire Claylands', National Character Area Number 88. This broad scale designation describes the area as typically being made up of large scale fields of varying pattern with many of the hedgerows having been lost, as fields were amalgamated to suit modern farming practices. Dutch Elm disease also resulted in considerable hedgerow tree loss. Likewise woodland cover tends to be fragmented and intermittent with isolated small woodlands in an area dominated by arable land. Woodland and tree cover is more extensive in the shallow valleys, especially in the Bourn valley to the south.

The site is located on the top of one of the plateau areas which has a distinct viewshed. The A428 runs approximately along the viewshed with areas to the north having views over land which slopes gently northwards towards the fens. The site itself and areas to the south of the A428 tend to have views southwards for 6-7km as far as the shallow ridge on which the Wimpole Estate (National Trust) is located.

Historically settlements were located along linear routes or on crossroads in the landscape, tended to be small and distributed relatively evenly throughout the landscape, especially the valley sides and bottoms. The plateau area has seen more recent development of larger settlements including Cambourne, Caldecote and Hardwick, taking advantage of the flatter lands and changing the character of the landscape in these areas.

This character is typified by:

- Heavy soils which deterred farming = little Roman settlement
- Significant growth of settlements in the area during the Medieval era = Cambridge became an important trading post for carriage of goods across the fenlands
- Ridge and furrow, deserted medieval villages and earthworks are typical of the area.

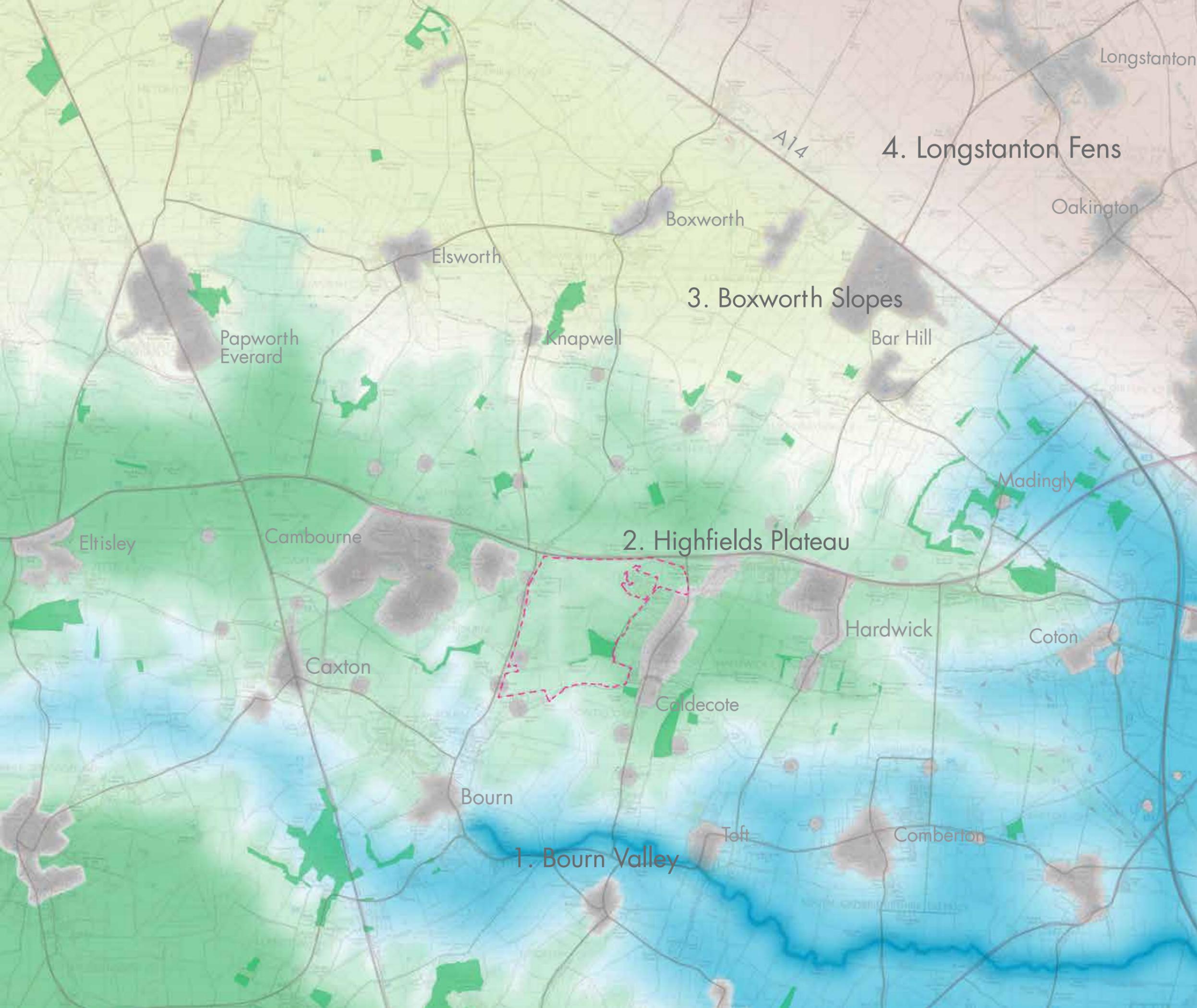
- Remnants of scattered woodlands which are semi-ancient
- Open farmland stripped of hedgerows
- Landscape divided by valleys and drainage works
- Village bound by grazing land and often centred on common land as part of a defensive settlement.

local scale character assessment

By using the same field surveys techniques for the National Character Assessment, the landscape around the Bourn Airfield site has been studied in further detail and there are variations in the landscape character, experienced at a local level. The visual differences when driving through the area are sometimes too subtle to initially comprehend, but by overlaying a series of desktop studies and the field survey data, distinctive character patterns have emerged that can be described as follows:

1. Bourn Valley - this enclosed vegetated valley landscape divides the two upland plateaus of Bourn airfield to the north and Wimpole Hall to the south. This linear area is punctuated by village settlements of Danish and Roman origin that focus on the Bourn Brook and the east west connection road. The settlements are marked by churches, barns and historic buildings. The valley supports diverse and rich established vegetation and is the focus of landscape management targets for the area.
2. Highfields Plateau – a broad area of upland stretching between Cambridge and St Neots in the west. The A428 marks the highest point of the plateau and this new road combined with the larger scale 20thC settlements of Cambourne and Caldecote have a significant impact on the character of the area. Radial drainage lines have created an undulating edge to the plateau and arable crops in large open field dominate the view.

3. Boxworth Slopes – These broad, northern facing slopes are marked by scattered farmsteads, isolated post medieval villages and broad open fields. Field hedgerows and hedgerow trees dominate the horizon. The villages typically nestle in the folds of the slope, focusing on a water source, such as the village of Elsworth.
4. Longstanton Fens – This broadly level landscape is patterned with a geometric grid of field drains and hedgerows. There are former inland ports and trading points scattered across the area as settlements.



Site landscape and ecology

The ecological condition of the Bourn Airfield site reflects the county level wildlife condition; whilst there is habitat of value, with important species supported, connections and abundance is seen to be low with great opportunity for enhancement.

The Phase One Habitat survey assessment undertaken in autumn 2012 identified the key types and areas of habitat as woodland, grassland, hedgerow, scrub and pond with the largest site area being occupied by arable farmland between and around the airstrips. Potential for several regionally and nationally important species was highlighted, including barn owls, bats, badgers, great crested newts, harvest mouse, brown hare, skylark, golden plover and lapwing. Several of these species and habitat types are acknowledged to be important at the county level, with priority action plans in place.

The report highlights the importance of habitat management to ensure quality and longevity as well as to maintain value to importance species. The County Wildlife Site north of Bucket Hill Plantation is described as suffering from bramble colonization which should be addressed, where as a return to traditional grazing management at Caldecote Meadows SSSI has helped restore this herb-rich grassland.

The potential for skylark and barn owl use of the site and ancillary buildings provides an opportunity for the site to contribute to reversing the decline in farm bird populations seen over the last 25 years. Potential for other priority species to use the site also exists such the black hairstreak butterfly, dormouse, grey partridge and great crested newt which all form part of the fifty year wildlife vision of The Biodiversity Partnership for Cambridgeshire & Peterborough.

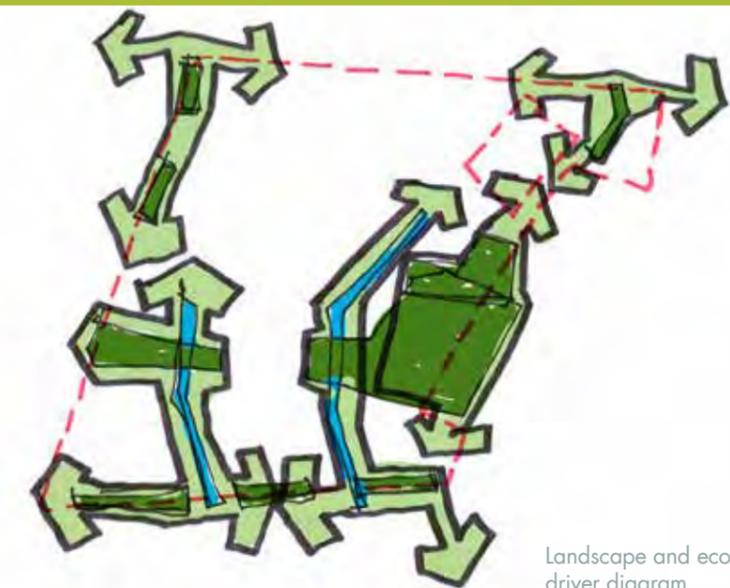
A large part of the site is occupied by concrete landing strips with farmed land between. The 5m edges of the strips sometimes contain grass verges with some ecological value. The rest of the cultivated land is farmed. This land has been given two classifications, grade 2 to the upper area, grade 3 to the lower areas.

conclusions

- The site's biodiversity is understood and with further surveys to inform sensitive design and management, appropriate development can be supported.
- Habitat value has been eroded as a result of varying land uses with arable crop production covering much of the site.
- Existing woodland belts are severed
- Management of existing habitats is limited, leaving 2.5 ha County Wildlife grassland site vulnerable (north of Bucket Hill Plantation)
- Existing habitats are often seen to be fragmented

drivers for the masterplan

- Opportunities to connect habitats both on and off site
- Strengthening of relict treed hedgerows and woodland plantations to the site's periphery for wildlife and local community benefit
- Enhancement to entrance from Highfields with the introduction of a new water-themed gateway at the north east of the site.
- Significant opportunity to increase biodiversity with new habitat types supporting a range of protected and BAP priority species.



Landscape and ecology driver diagram

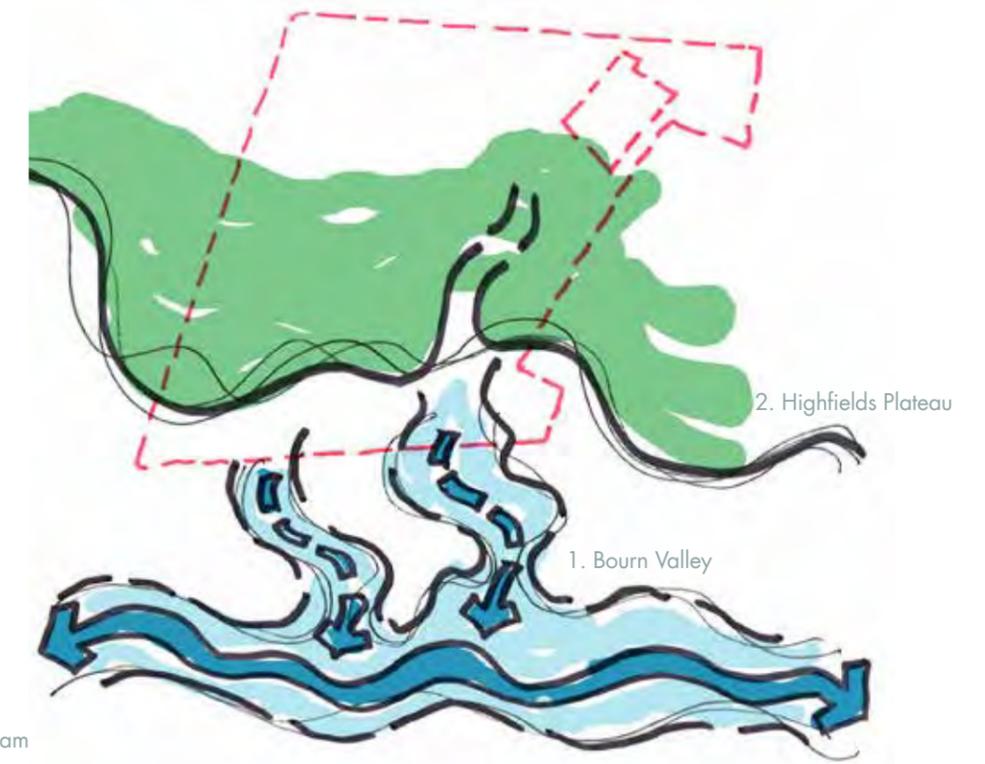
conclusions from the analysis

- The site is an open, largely brownfield area of land, of limited ecological and amenity value, but with high potential to create a sub-regional resource of valuable green infrastructure providing a setting for high quality housing
- The undulating terrain with overlaying linear vegetation belts makes the landscape character relatively robust to change and development. The skeleton of landscape structure creates a defining shape and pattern to the land and its existing enclosure provides a green margin for development, immediately defining it as separate from existing plateau settlements
- Opportunities to further define the plateau landscape by retaining key views and the open character of the land will define the character of the Bourn Airfield development. Existing open view corridors are valuable to adhere the elements of the plateau landscape and should be retained where possible.
- There is an established precedent for larger scale 20th C settlement on the plateau but there is more to learn from the historic settlements in terms of orientation, connections, size and form.

drivers for the masterplan

The landscape management objectives (as contained in the Cambridgeshire Landscape Guidelines 1991) for the Western Claylands include:

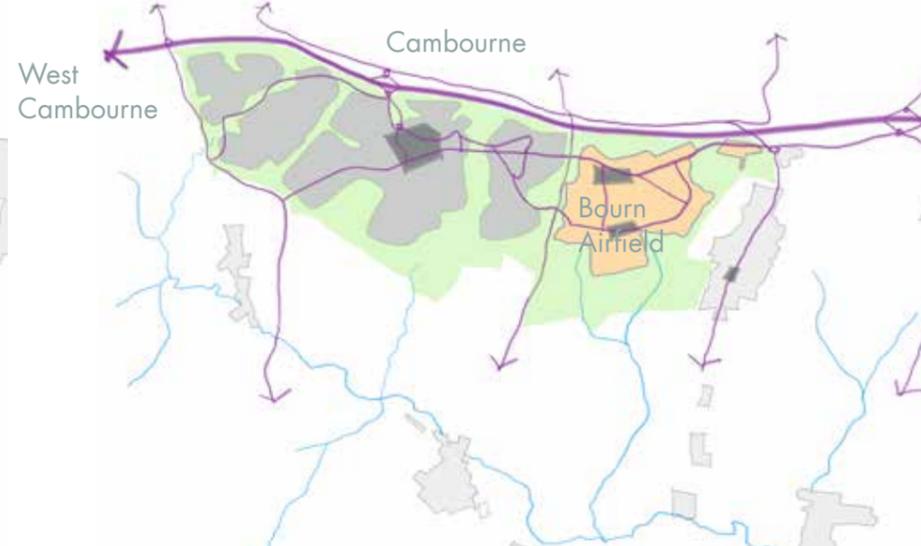
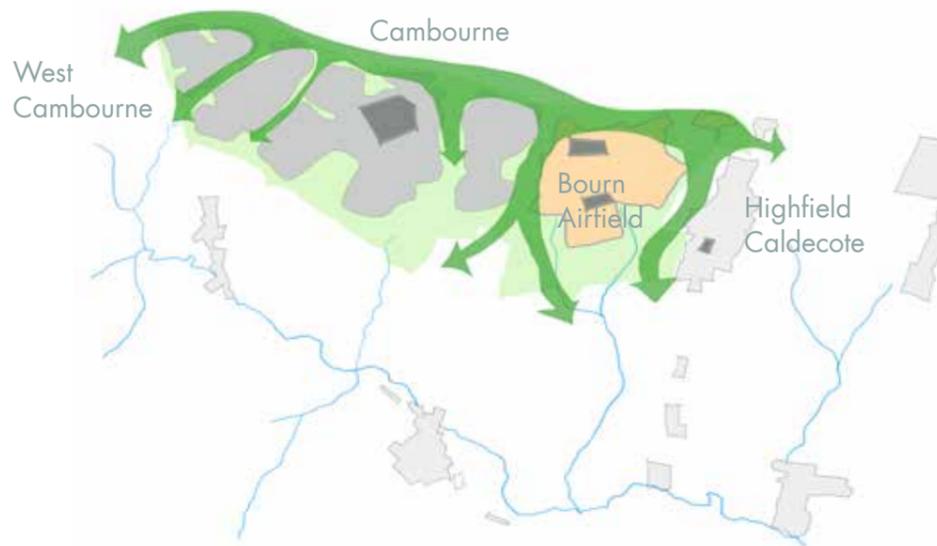
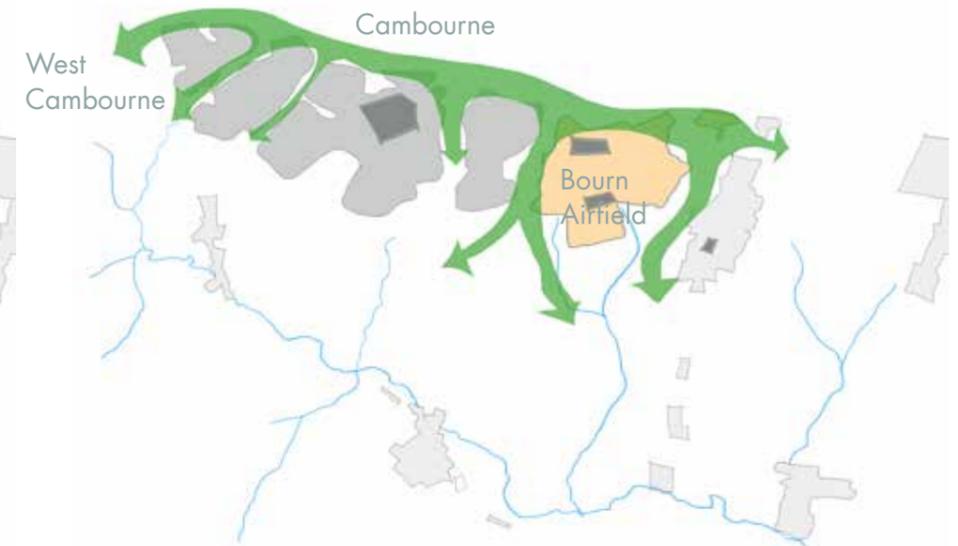
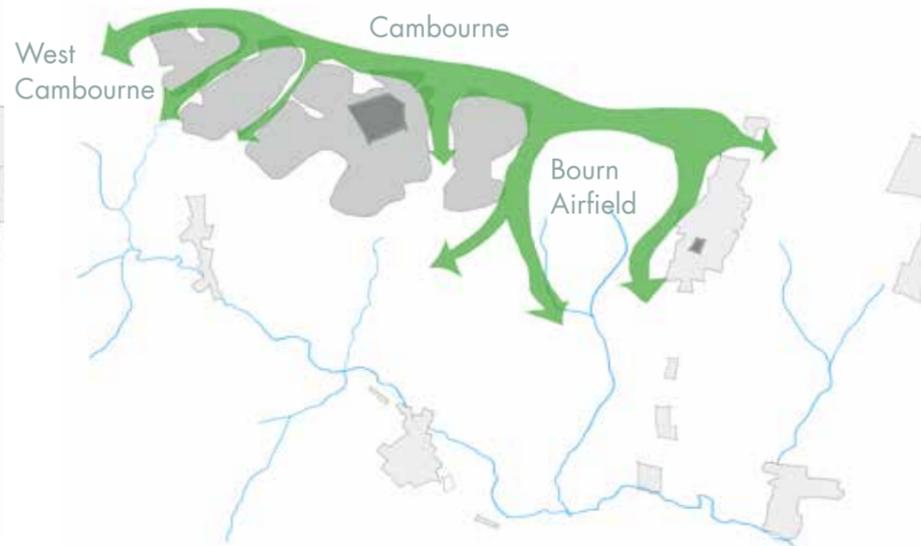
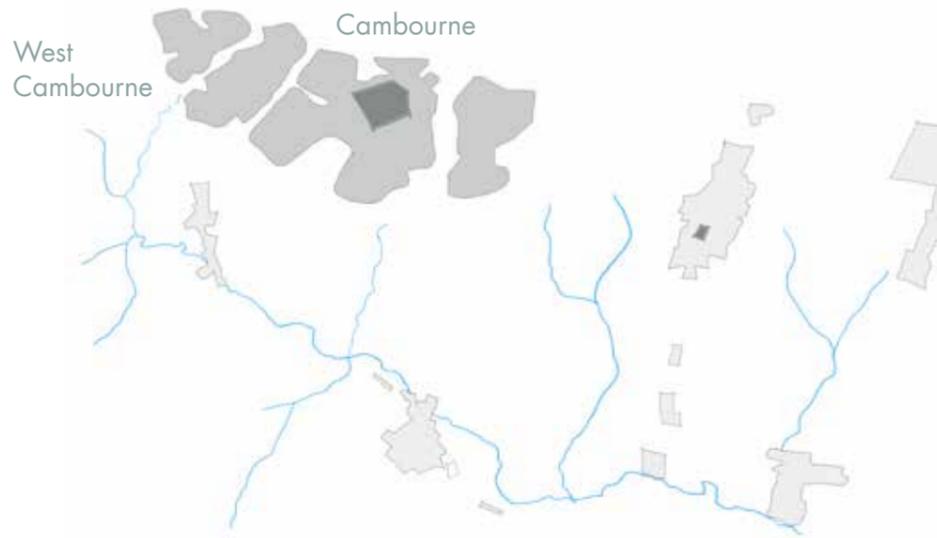
- management of existing and creation of new woodlands;
- planting of woodland belts to link woodland blocks;
- creation of landscape corridors in valley bottoms;
- conservation and improvement of existing hedgerows and reinstatement of lost hedgerow lines to emphasise the landscape pattern; hedgerow trees to be replanted on valley sides and bottoms;
- footpath corridors to be improved;
- road margins managed to be managed for floral diversity;
- village approaches should have increased tree cover with trees and woodland belts along roads and planting and hedgerows at village edges.



Landscape character driver diagram

An overarching landscape

The new settlement is wrapped by a green framework, including some existing vegetation, that allows functional connections whilst retaining separate landscapes and identities. As set out in the following development strategy, the landscape framework performs a valuable function in terms of amenity, facilities, biodiversity as well as separation. Footpaths will run within this substantial green framework, water will be an important part of it and it will therefore connect neighbourhoods as well as partially separating them from each other.



The development strategy which follows (access, land uses, density, facilities and character, all relate to the initial landscape analysis and strategy).