

RIDGE

MULTIDISCIPLINE PROPERTY AND  
CONSTRUCTION CONSULTANTS

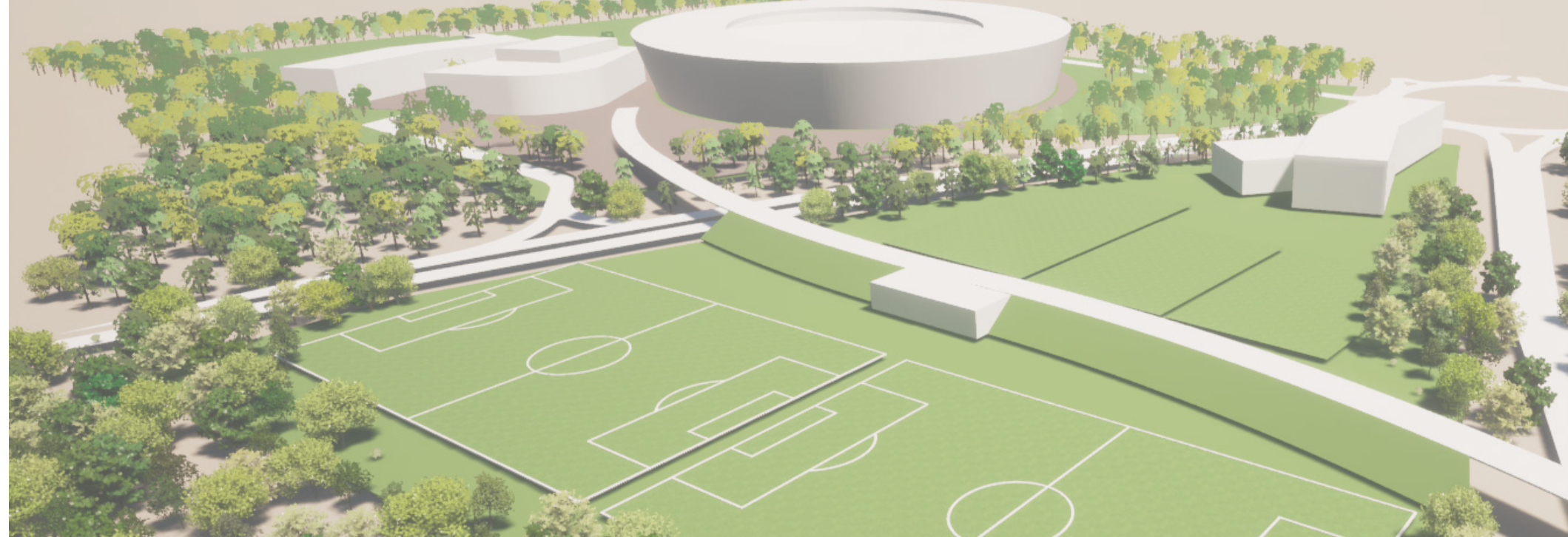
# Oxford United Football Club (OUFC) – End of Stage 0 Report



Oxford United Football Club  
11 October 2022







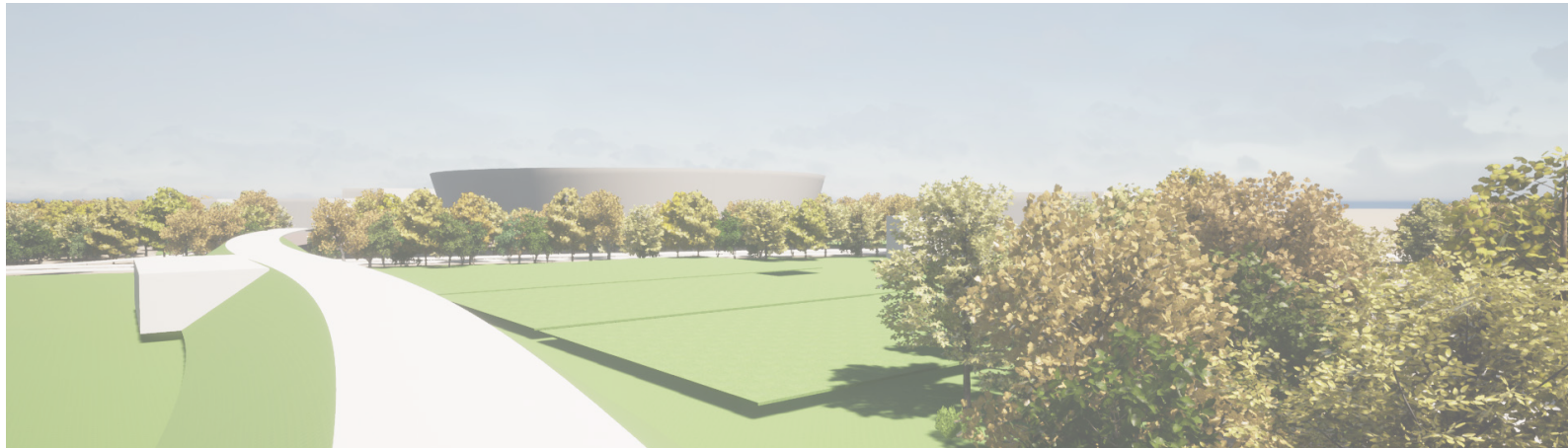
Acknowledgements



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## Executive Summary

### Purpose of RIBA Stage 0 Report

At present Oxford United Football Club has a licence agreement at The Kassam Stadium this licence agreement terminates in 2026. The output of the RIBA Plan of Work Stage 0 is the development of the strategic definition of the project, confirming the overall scope and brief of what the Client, Oxford United Football Club (OUFC), want to achieve. This report maps out the concept proposals that address the key challenges set out by Oxfordshire County Council, in order for the Stratfield Brake site to be secured and developed, with benefits to OUFC, their fans and the wider community. This report was preceded by an end of stage presentation to OUFC on October 2022 where a summary of the project development was shared.

### Oxfordshire County Council & The Challenge Board

A board was assembled with the purpose of testing OUFC's proposals for the Stratfield Brake development. There was specific information requested by the board. The 5 key challenges that the design and strategic planning have answered to, is the following:

1. The scale of OUFC's proposal – including identifying the land

required for the stadium, the ancillary commercial, the community sport clubs and the community land which will not be built upon.

2. OUFC support to local sports clubs – details on how OUFC will ensure that their interests are protected.

3. Access to the site – details on how OUFC will achieve an increase in the use of public transport from 20 to 90%.

4. Parking proposals – details on how OUFC propose to manage the risk of the impact of uncontrolled parking in residential areas on match days.

5. Biodiversity gain and the enhancement of the surrounding natural environment – details on how OUFC will achieve to these goals.

OUFC appointed its team of advisers and consultants 'the project team' to help shape the responses to the five critical issues above. The purpose of this document is to provide a formal record of work completed to date that addresses the 5 key challenges, since the project team were appointed, for sign off by the Client to provide formal confirmation and acceptance of the output at this stage. The design will then be developed throughout RIBA Stage 1 – 2, resulting in a formal planning submission, should terms on the land be agreed.



Brief Development

The design brief has been in development throughout the workstage, and has been refined and adapted through several design review workshops, carried out with internal client stakeholders. The outcome of this process is an indicative sitewide masterplan that considers the footprint and land requirements of an 18,000 capacity stadium, 3,000 capacity arena and 200 key hotel. Accommodating OUFC’s goal of a year round, multi-use venue, that both enables the stadium and enhances the local community facilities will be integral to the next stages of the project. Due to the evolving nature of the project the proposal is now a stadium only.

Designs have prioritised refining and efficiently reducing the massing to as minimal as possible, allowing for a site that supports the operation of the stadium, as well as facilitating larger greenfield areas that can be developed to support an ecologically rich site.

Both OUFC’s and the local authority stakeholders’ intention is for a sustainable development, both in practice and visually. This has been considered within the overall masterplan and will be developed throughout the next stage, where building materials and finishes will begin to be considered in further detail. This will be in conjunction with the development of a landscaping masterplan to compliment and enhance this objective.

The design has been influenced by all 5 challenges set out by the council, with an action plan developed at the outset of the workstage mapping out how the project will meet each point raised. This includes the minimisation of on site parking, encouraging users to engage in more sustainable modes of transport to access the site. Positive early engagement and options appraisals have commenced with local transport operators, strategising how the use of public transport can be maximised and accessible on both matchdays and non-matchdays. Further details of which can be found within this report.

Supporting the existing sports club currently based on the Stratfield Brake site have been key during this workstage, with the brief to provide

facilities that are equal to or greater than what is currently available to each. Stratfield Brake is currently home to Kidlington Cricket Club, Kidlington Youth Football Club, Gosford All Blacks RFC and Kidlington Running Club. For the purpose of the proposed Stratfield Brake Development OUFC had found suitable alternative locations for cricket, football and rugby clubs. The plan was to keep the running club on site.

Kidlington Cricket Club

- At the time of writing, OUFC have agreed Heads of Terms for the Cricket Club to be relocated from Stratfield Brake.

Football Club

- The Football Club will be retained on the ‘Diamond’ site adjacent to Stratfield Brake, with the development of a new club house included.

Gosford All Blacks RFC

- Subsequent to the issue of the Stage 0 report, OUFC through its ongoing site searches, successfully identified a relation site for the rugby club, to the south of Stratefield Brake.

Kidlington Running Club

- Remain on site.



RIBA Stage 0 Summary of Deliverables

To summarise the information provided in this report, we have aligned it to the 5 critical issues.

Item	Information Requested	Deliverables
1	The scale of OUFC’s proposal – including identifying the land required for the stadium, the ancillary commercial, the community sport clubs and the community land which will not be built upon.	■ RIBA Stage 0 Report (AFL)
2	OUFC support to local sports clubs – details on how OUFC will ensure that their interests are protected.	■ RIBA Stage 0 Report (AFL)
3	Access to the site – details on how OUFC will achieve an increase in the use of public transport from 20 to 90%.	■ Transport Strategy (Ridge)
4	Parking proposals – details on how OUFC propose to manage the risk of the impact of uncontrolled parking in residential areas on match days.	■ Transport Strategy (Ridge)
5	Biodiversity gain and the enhancement of the surrounding natural environment – details on how OUFC will achieve to these goals.	■ Sustainability Brief (Bioregional) ■ Biodiversity Net Gain assessment (Ecology Solutions)

This report also collates:

- Site selection report (Savills)
- Pre Planning Information document (Ridge)

Next Steps

Following approval of the RIBA Stage 0 Report, OUFC will instruct its project team to commence delivery of the project through to submission of a planning application to the Local Planning Authority.

- Finalise the design brief
- Agree the project budget
- Develop a master programme
- Appoint a Principal Designer and the full design team
- Complete the pre application planning process
- Undertake site investigations and surveys
- Develop a cost plan and test it against the budget
- Further the Sustainability Brief and incorporate its principles into the design development

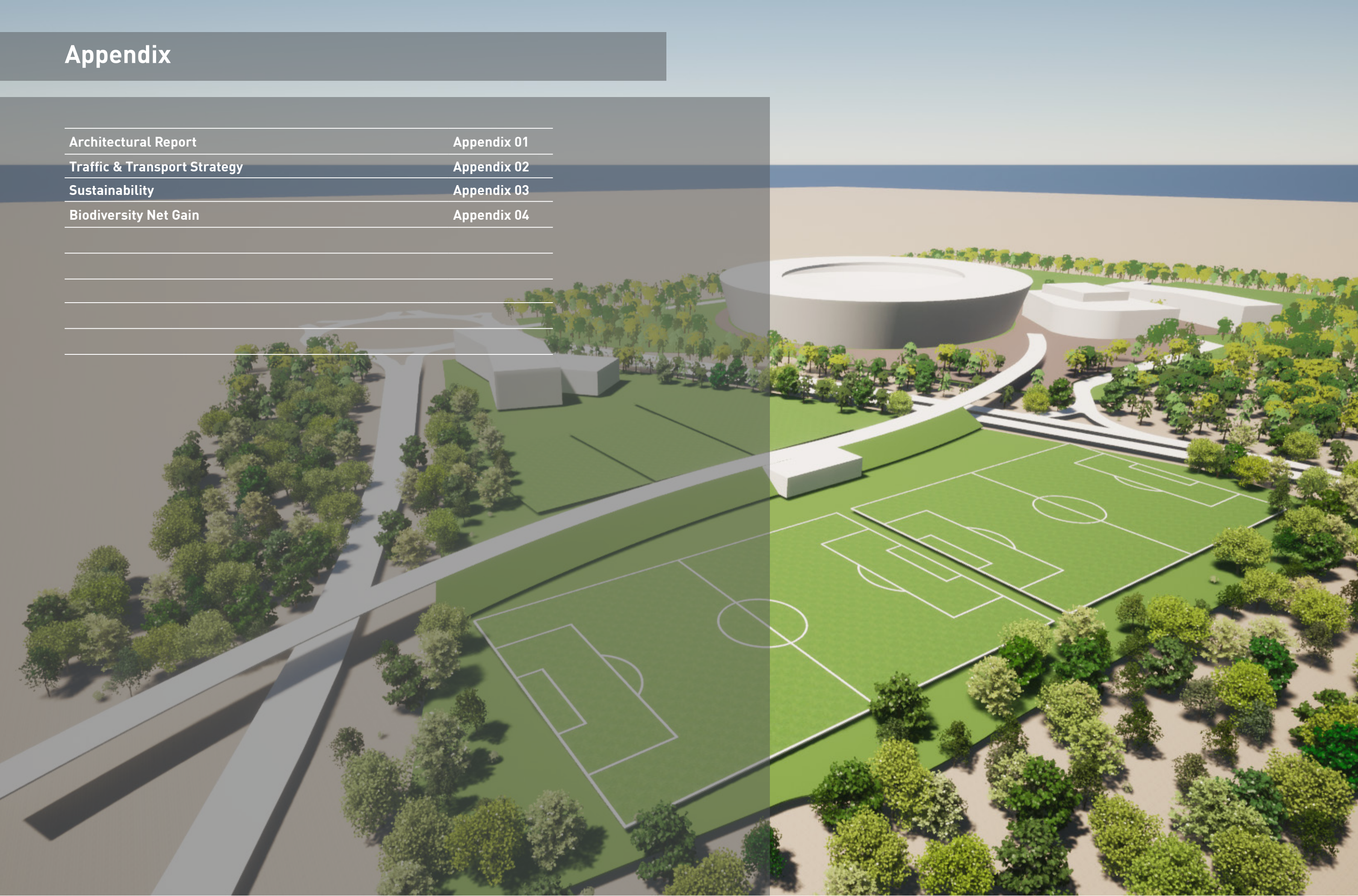






# Appendix

Architectural Report	Appendix 01
Traffic & Transport Strategy	Appendix 02
Sustainability	Appendix 03
Biodiversity Net Gain	Appendix 04







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Stratfield Brake Stadium  
Stage 0 Report - Strategic Definition  
October 2022 - Rev P03

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AFL Job No. 221524

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## Document issue History

### Report Signed off by Client: Oxford United Football Club

Signature.....	Date.....
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### Report Prepared by

AFL  
Architects



## Report Structure

### RIBA Stage 0 - Strategic Definition

**Outcome:** The best means of achieving the **Client Requirements** confirmed.

The primary goal of Stage 0 is strategic – to ratify that a construction project, or otherwise, is the best means of achieving the **Client Requirements**. For example, a client wishing to expand its workforce has a range of options for accommodating the additional staff, including implementing new ways of working, adopting a more efficient space plan, subleasing premises or desk spaces close by, carrying out a refurbishment, building an extension or commissioning a new building.

Stage 0 is not about design or the practical details. It focuses on making the right strategic decisions and capturing them in a **Business Case**. The stage involves considering the pros and cons, **Project Risks** and **Project Budget** for a range of options and, where necessary, carrying out **Site Surveys** and corresponding planning appraisals, before undertaking a comparative analysis and recommending and ratifying the best option for delivering the Client Requirements.





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## 1. Client Requirements

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## 1 Client Requirements

### 1.1 Designer Outline Deliverables Summary

- Delivery of design information in line with programme
- Weekly design progress meeting during initial stage
- Provision of relevant benchmark information (cost, programme, quality)
- Massing plans for the proposed site: Stadium, Hotel, Arena, Retail, Ancillary, Externals/Landscaping
- Consideration to structural building services requirements
- Accommodation schedules indicating net and gross areas
- Options on the arrangement of the key buildings in support of the business case
- Liaising with the professional team and client as required
- Output: Design Report

AFL's initial design brief was to design a development which includes an 18,000 seat Stadium, a 200 bed Boutique Hotel and a 3,500 seat Arena. However, the brief has now evolved to considering the Stadium only.

### 1.2 Oxfordshire County Council – Project Priorities

AFL's output will remain conscious of the Oxfordshire County Council requirements and wishes, highlighted below:

- Maintain a green barrier between Oxford and Kidlington and protecting and enhancing the surrounding natural environment, improving biodiversity, connecting habitats and supporting nature recovery.
- Improve public access to high-quality nature and green spaces.
- Enhance facilities for local sport groups and on-going financial support.
- Significantly improve the infrastructure connectivity in this location, improving public transport to reduce the need for car travel in so far as possible, and to improve sustainable transport through increased walking, cycling and rail use.
- Develop local employment opportunities in Oxfordshire.
- Increase education and innovation through the provision of a sports centre of excellence and facilities linked to elite sport, community sport, health and well-being.
- Support the County Council's net zero carbon emissions pledge through highly sustainable development.

### 1.3 Oxfordshire County Council – Issues to address

- The scale of OUFC's proposal - including identifying the land required for the stadium, the community sports clubs and the community land which will not be built upon.
- OUFC support to local sports clubs - details on how OUFC will ensure that their interests are protected.
- Access to the site - details on how OUFC will achieve an increase in the use of public transport from 20 to 90%.
- Parking proposals - details on how OUFC propose to manage the risk of the impact of uncontrolled parking in residential areas on match days.
- Biodiversity gain and the enhancement of the surrounding natural environment - details on how OUFC will achieve to these goals.





## 2. Stratfield Brake Context





## 2 Stratfield Brake Context

### 2.1 Kidlington

To the North of the site is a large village, named Kidlington. Considerations will be made throughout the design process with regards to the scheme's impact on and connectivity to the Kidlington village and its population.

### 2.2 Stratfield Brake Sports

Currently the site plays home to Gosford All Blacks Rugby Club, Kidlington Cricket Club, Kidlington Running Club and a Football Club. As discussed in section 4, the decision to relocate or retain the site's sports clubs, will play a huge role in shaping the scheme's scale, location and site aesthetic.

### 2.3 Woodland Trust

The site is flanked to the South and West by the Woodland Trust. Impact on and connectivity and accessibility to the Woodland Trust are will need careful consideration and design.

### 2.4 Oxford Parkway

The train station and 'Park and Ride' site is within 500m of the Stratfield Brake. Connecting our scheme to this site will be pivotal to the success of the New Oxford United development.



Figure 2.1





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### 3. Site Appraisal & Analysis





### 3 Site Appraisal & Analysis

#### 3.1 Area of consideration

The area that Oxford United FC are considering for the proposal sits 6km North of Oxford City Centre, in the area of Kidlington.

The area is well connected; sitting adjacent to Oxford Parkway Train Station, 4km from Oxford Airport and flanked by the A4260 and A4165.

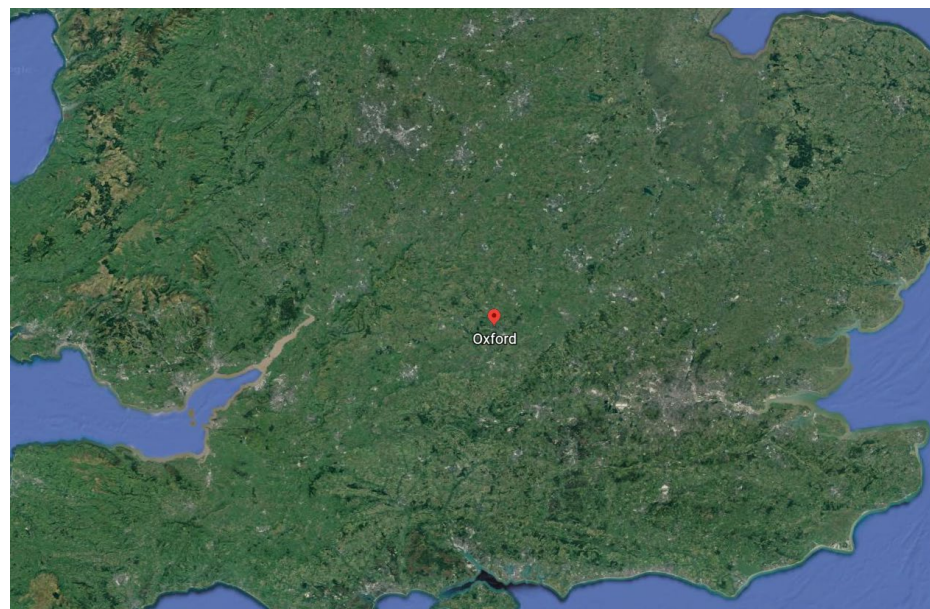


Figure 3.2



Figure 3.1





### 3.2 Site Photos

The following pages demonstrate the current site facilities as well as the condition of the surrounding roads and foot paths. These images, from a site walkaround, will form the basis of our wider site context and analysis.

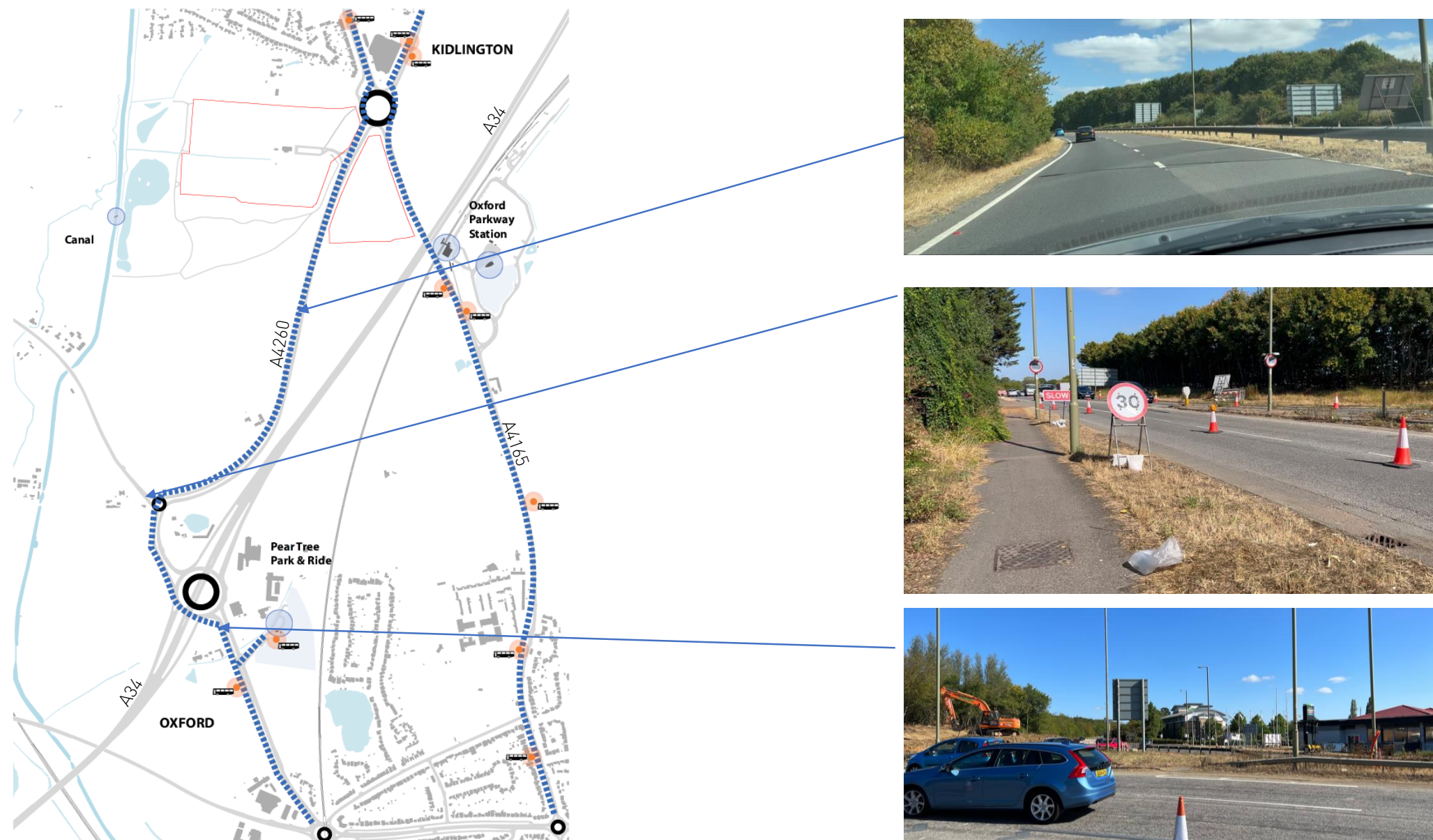


Figure 3.3



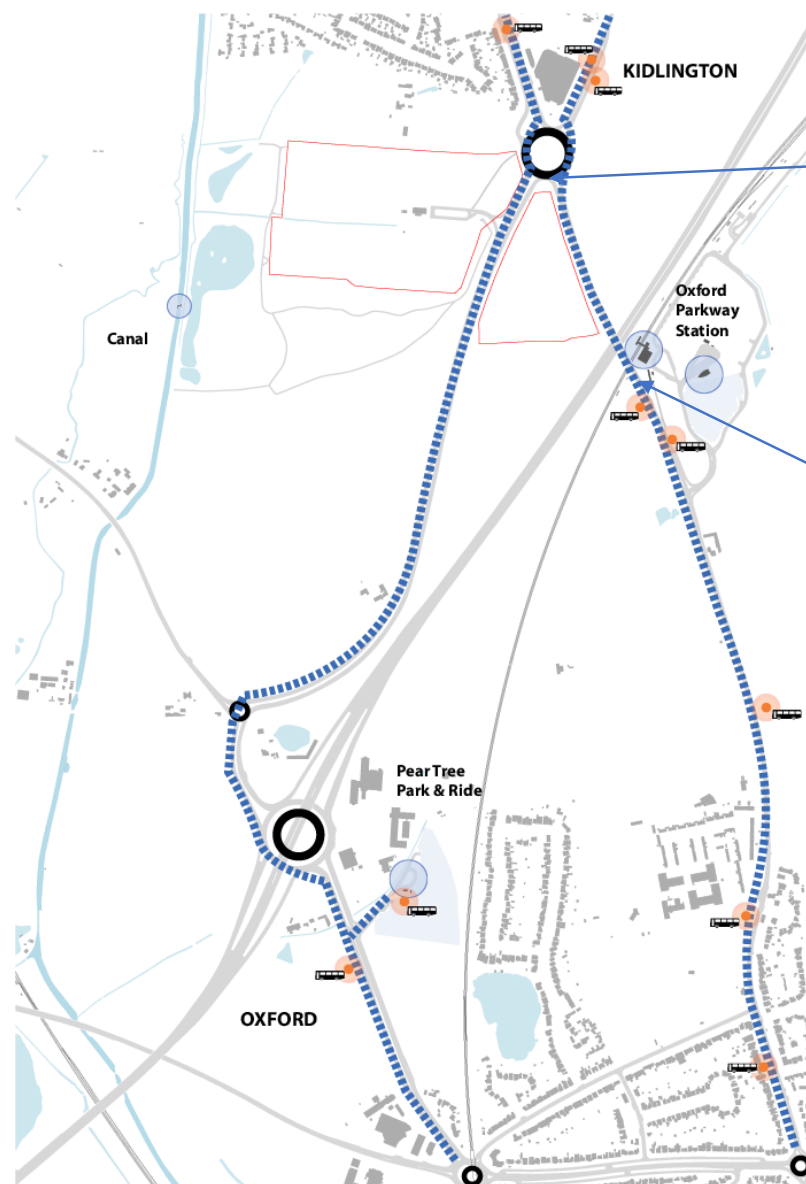


Figure 3.4



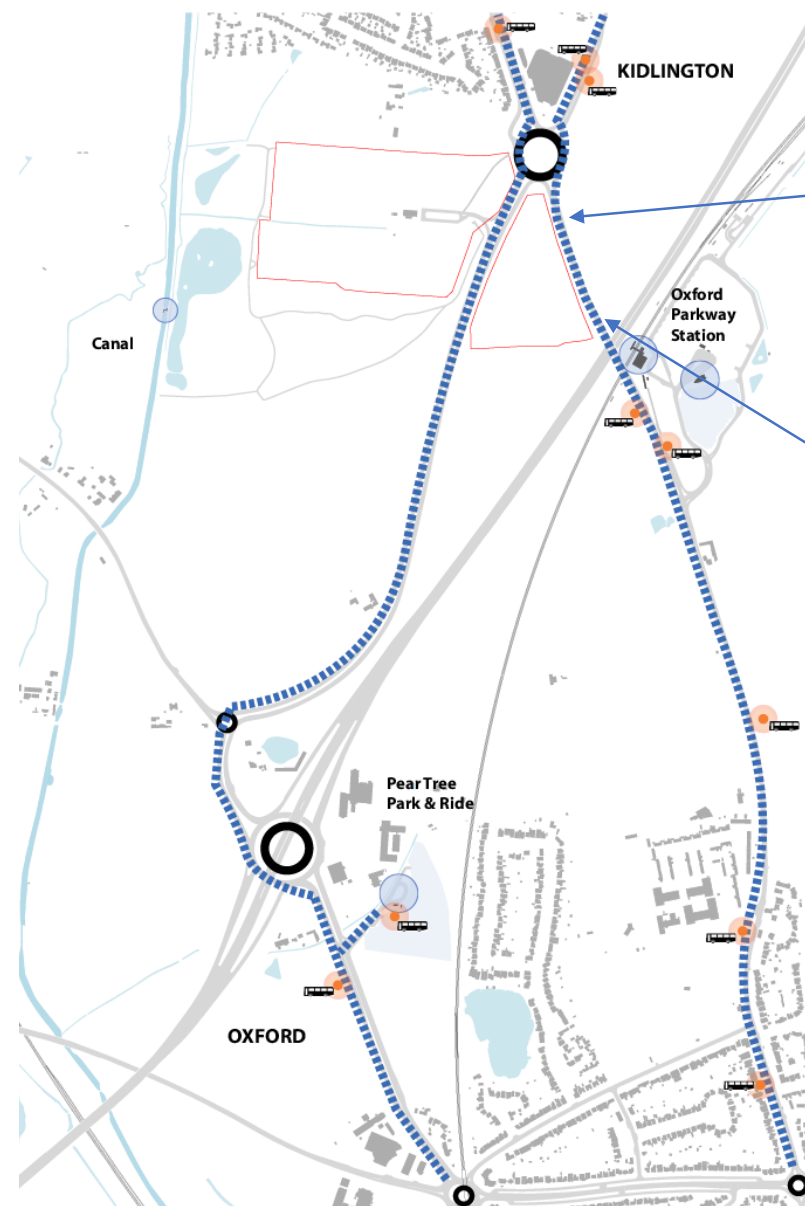


Figure 3.5



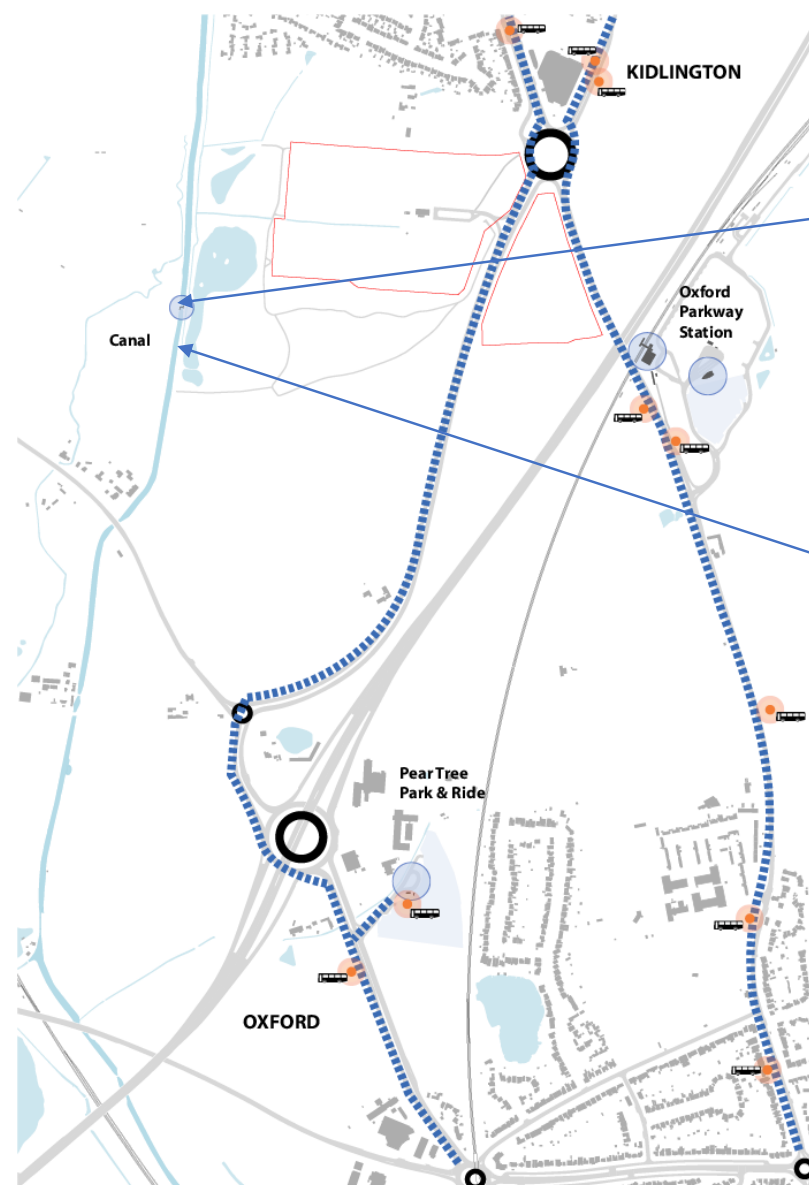


Figure 3.6



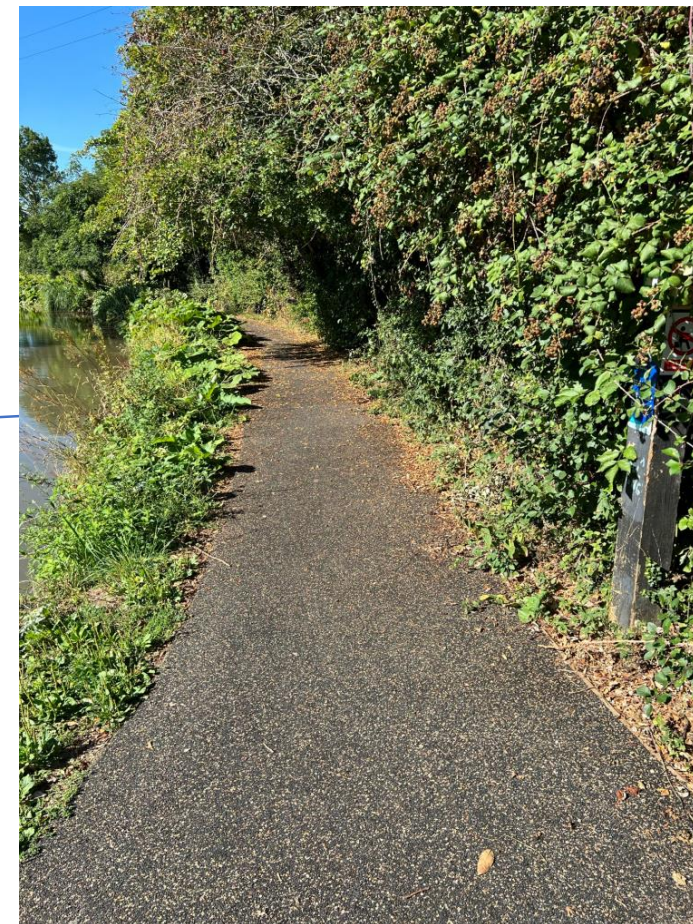
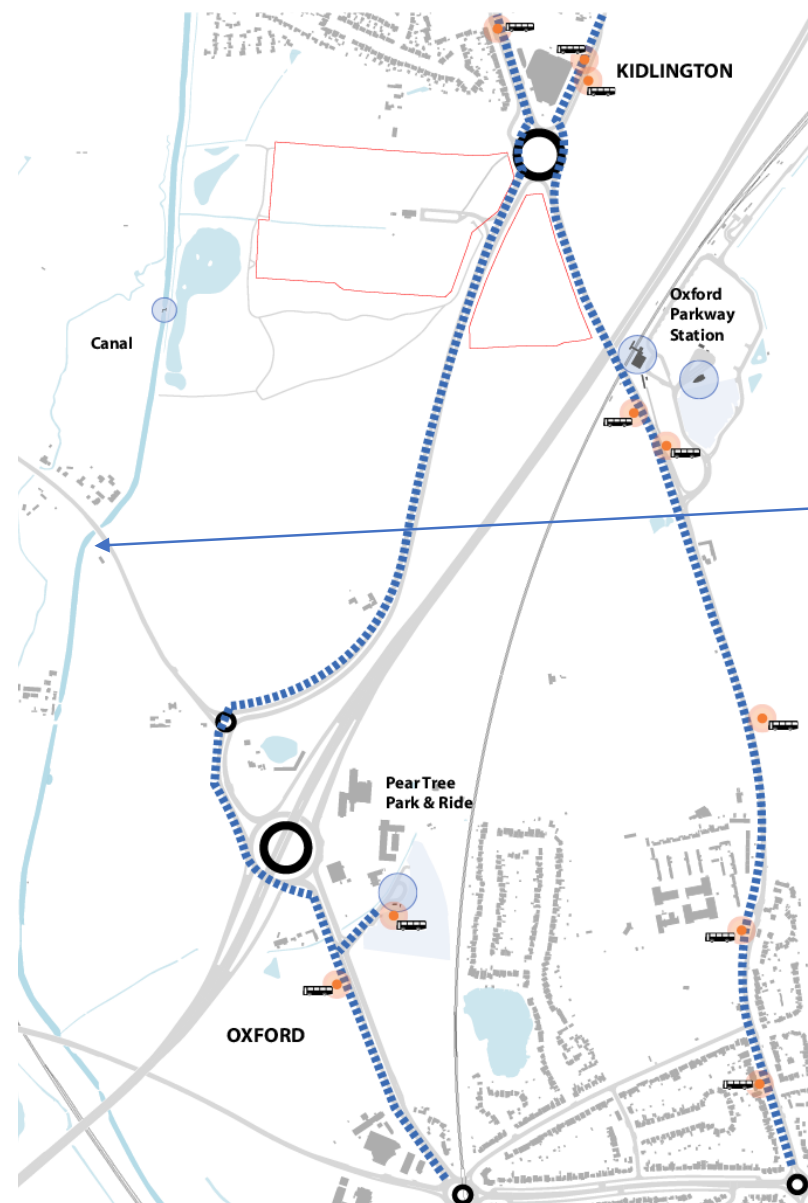


Figure 3.7



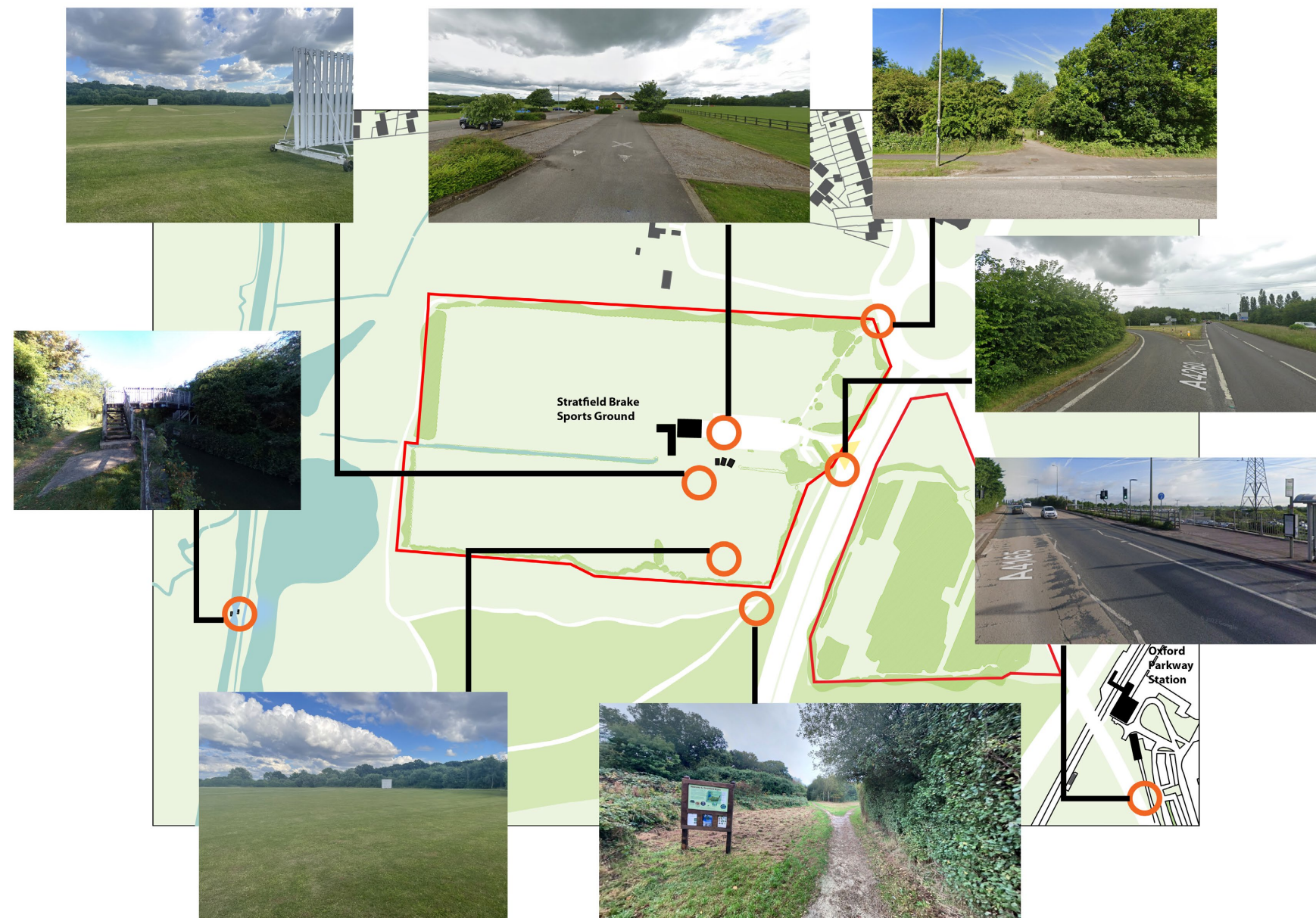


Figure 3.8





### 3.3 Land Use

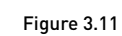
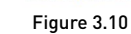
As highlighted, the vast majority of the surrounding area is taken up by Meadow, Woodland and Farm Land. This needs to be carefully considered when designing the site's development and its impact on its immediate context.



Figure 3.9



The site to the Northern border of Stratfield Brake is subject to a planning proposal for a housing development. The proposal will tap into the existing roundabout and play home to around 70 dwellings.







### 3.5 Existing Site Barriers

With the inclusion of a housing development to the North border, the site is surrounded on all four sides. Our proposal also needs to delicately respond to the roads to the East as well as the Woodland Trust to the South and West, whilst ensuring the vegetation barriers remain wherever possible.

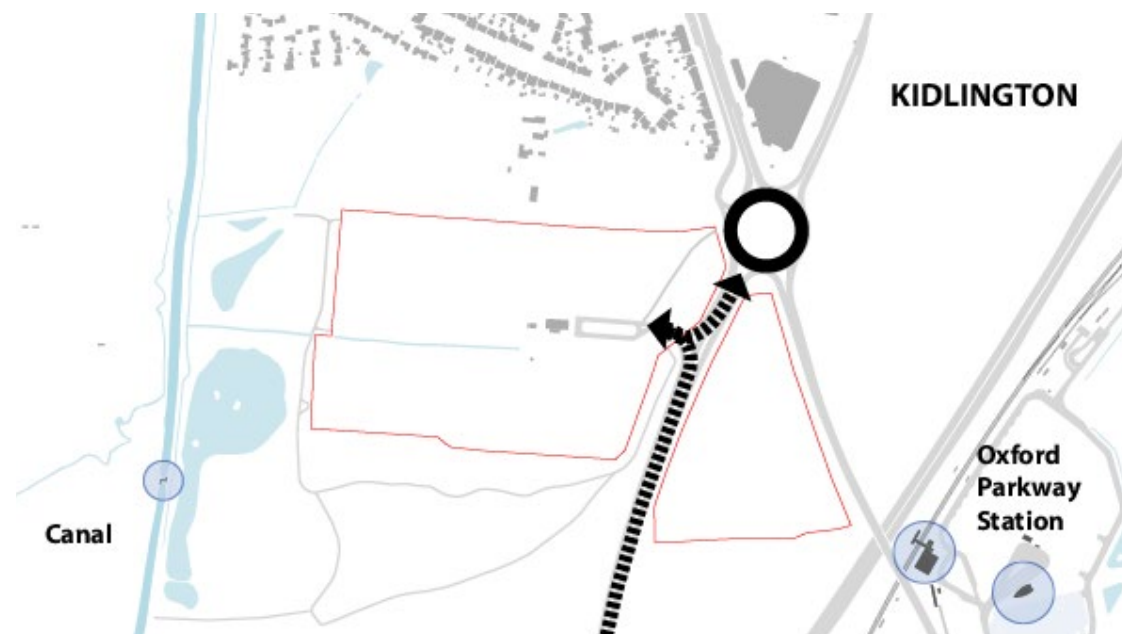


Figure 3.12





### 3.6 Existing Transport Links



Stratfield Brake can be accessed by car, public transport or on foot, with varying levels of difficulty.

The A4260 is the only way onto the site by car as it stands. Although the options are limited, the accessibility and connectivity to the A4260 is substantial and links well to the wider Oxford context, by the A34

#### Wider Context Existing Vehicle Accessible Routes

-  Site Boundary
-  Vehicle Routes
-  Roundabout

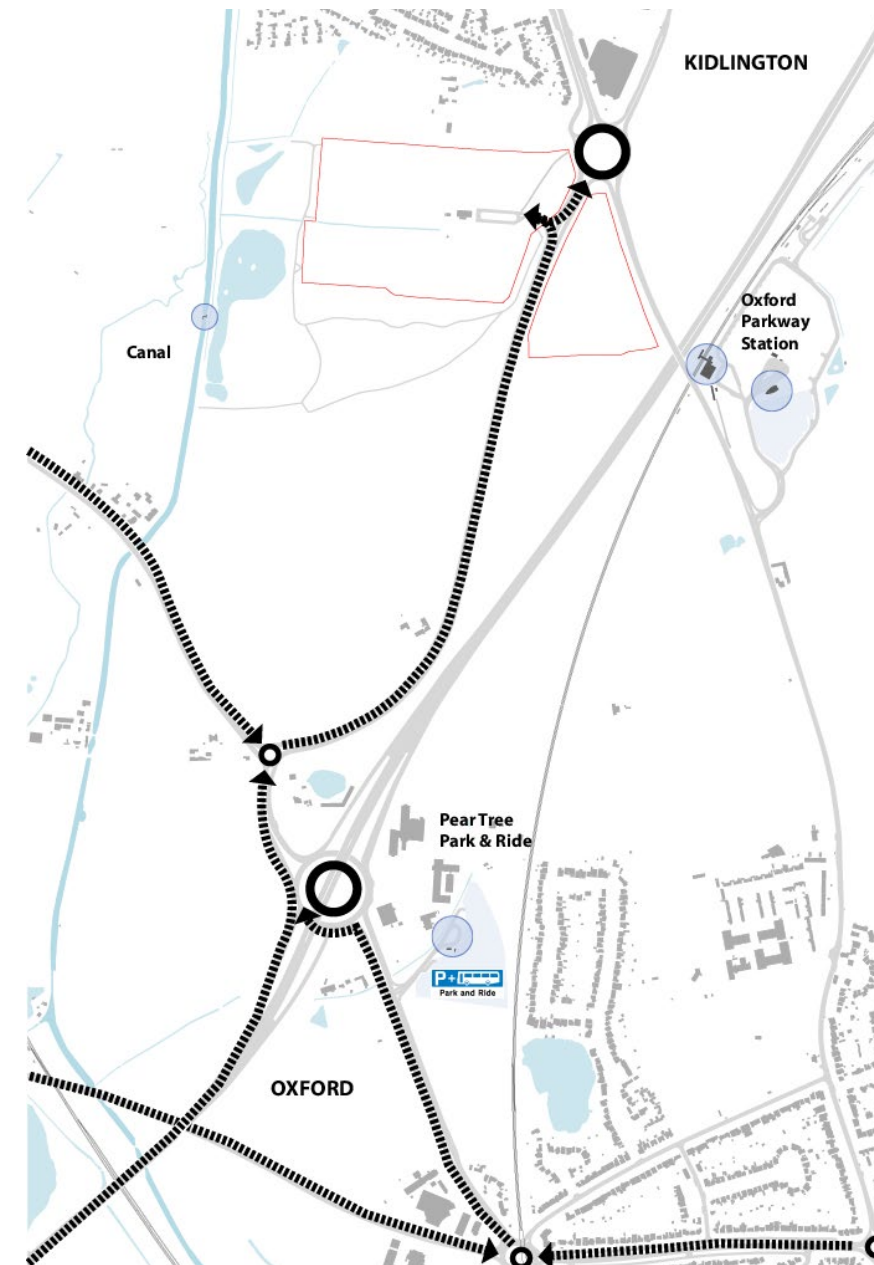
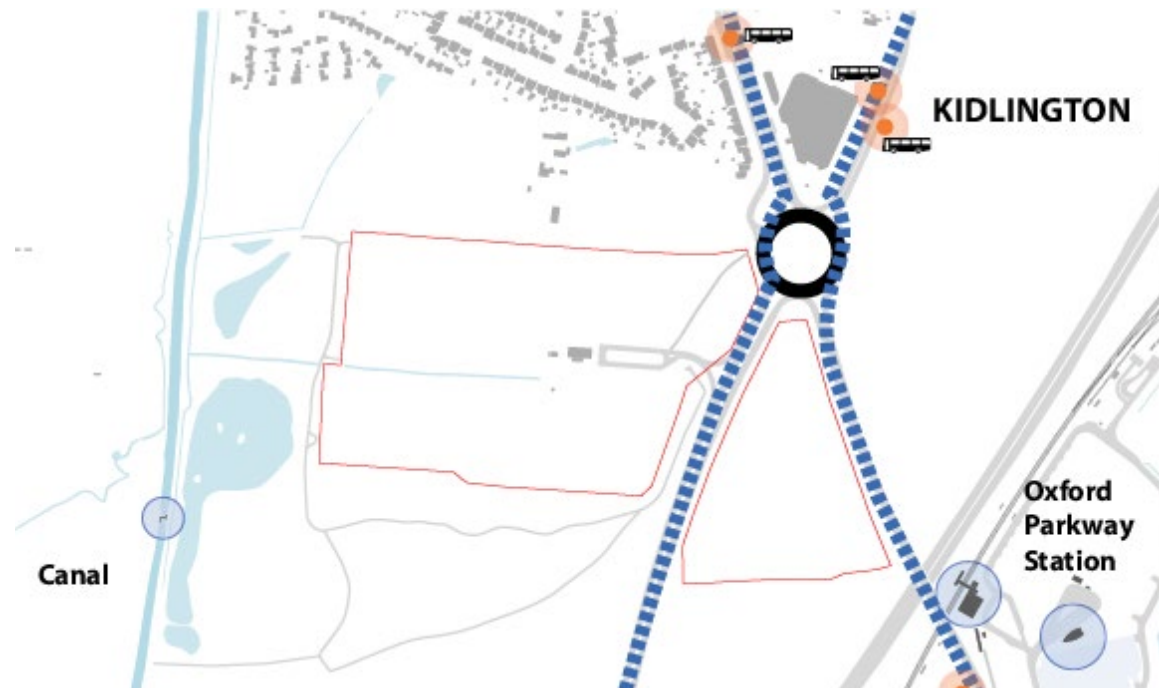


Figure 3.13





There are two main bus routes running past the site, both brushing the Northeast corner of Stratfield Brake. Linking to both Pear Tree and Oxford Parkway 'Park & Ride' sites provides the proposal with existing infrastructure to keep cars away from the immediate site.

### Wider Context Existing Bus Routes

- Site Boundary
- ▄▄▄▄▄▄ Pedestrian Routes
- Roundabout

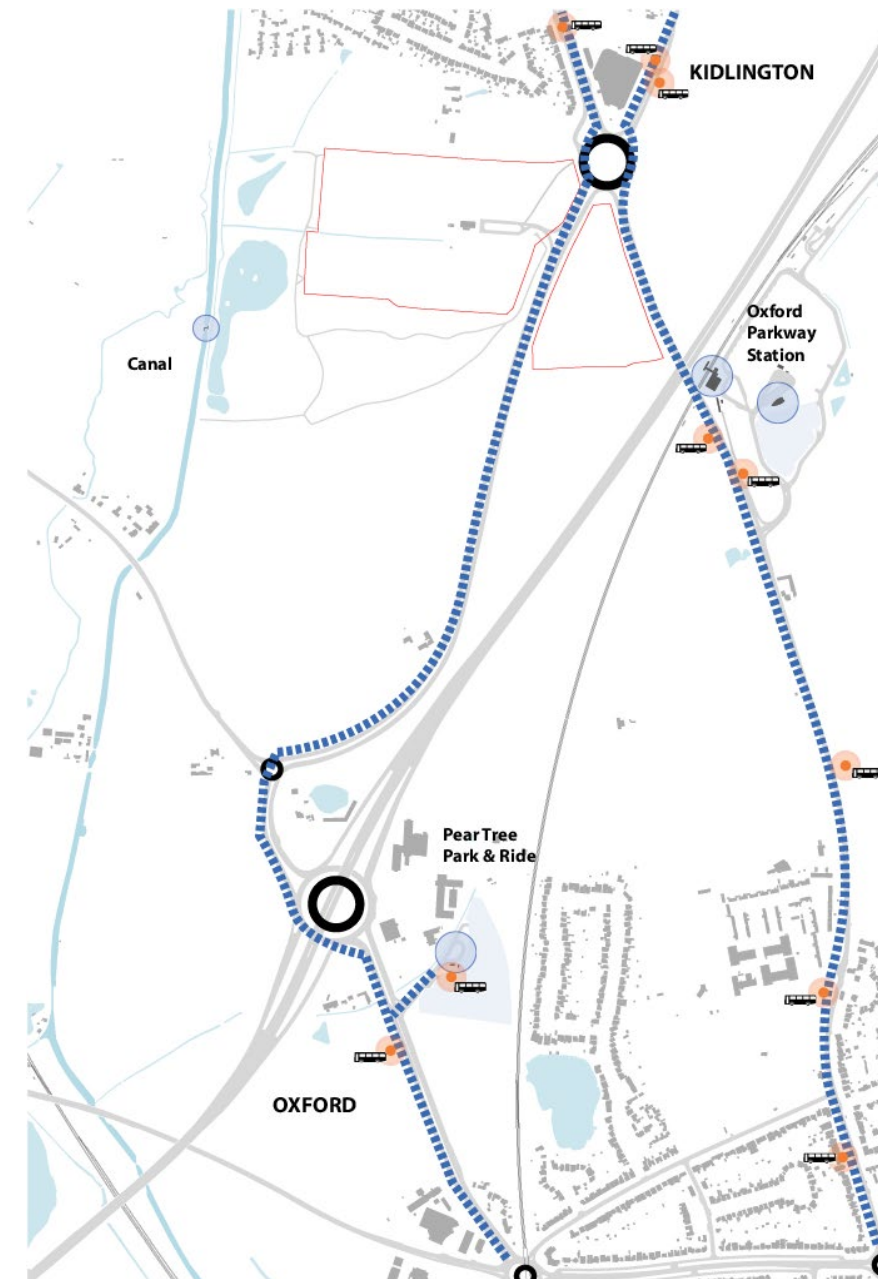
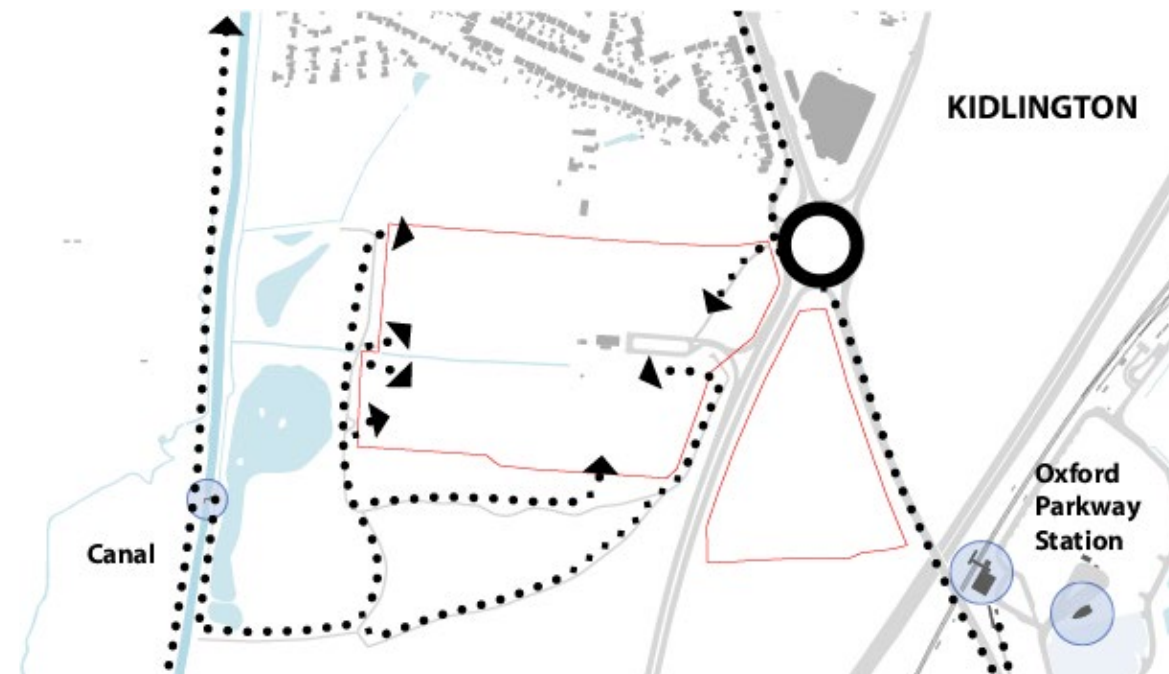


Figure 3.14





As highlighted on the following pages, you can access the site from the East or the West on foot. Unfortunately, the A4260 is not safe for pedestrians and the A4165 has varying footpath widths, none of which would be suitable for match day crowds.

### Wider Context Existing Pedestrian Accessible Routes

- Site Boundary
- Pedestrian Routes
- Roundabout

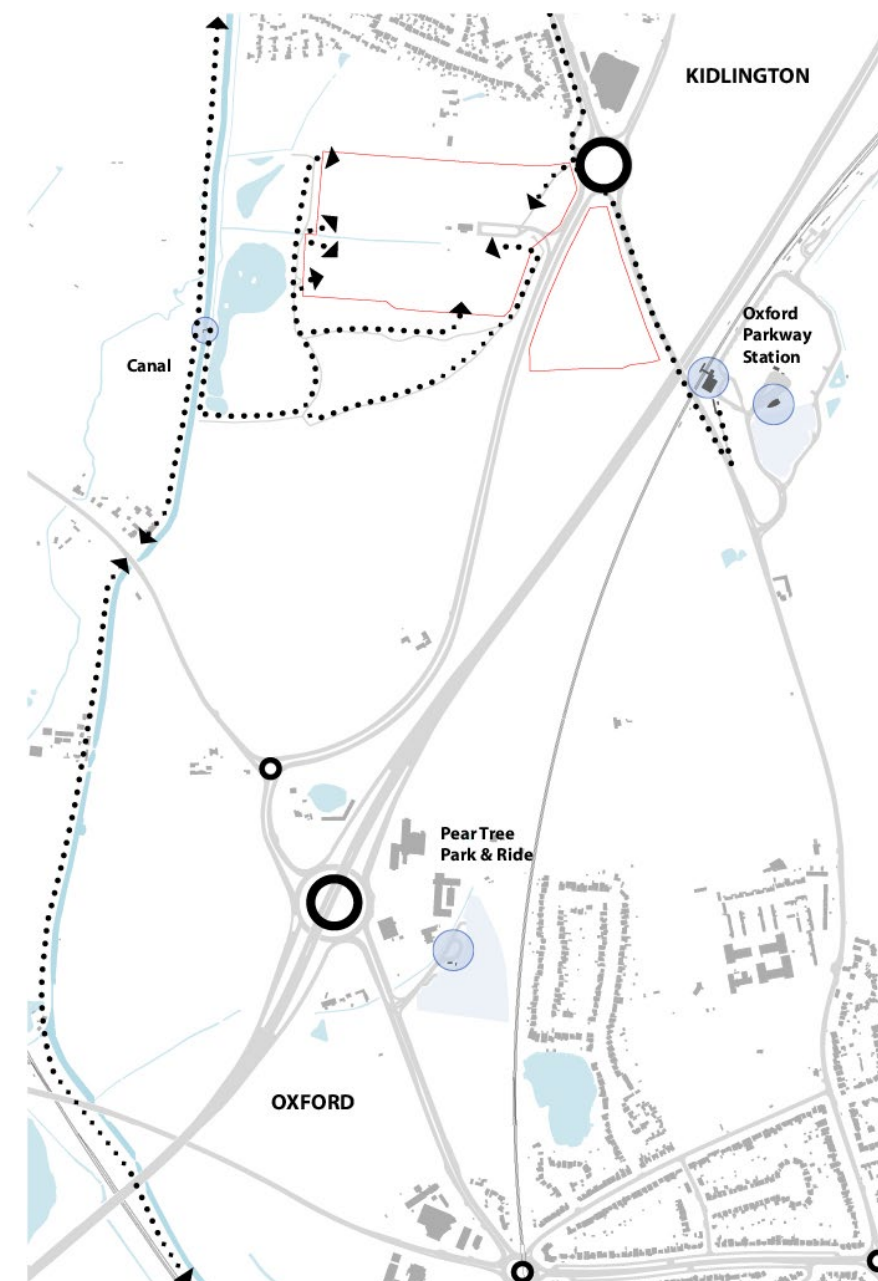


Figure 3.15





### 3.7 Potential Transport Links

Working alongside the transport consultants, we have highlighted the following points as ways in which we could increase the links to site:

- Providing a new pedestrian and cycle route through the re-provided football pitches (triangle site)
- Providing a new toucan crossing facility over the A4260
- Providing a new cycle friendly bridge to the north of the site away from the woodland
- Creating a formal route to Croxford Gardens to the north
- The land to the north and east will be developed for residential, therefore a pedestrian and cycle connections to these areas may need
- Some away fans coaches need to be considered in order to get most fans to the site by sustainable travel
- Bus routes to the site may need to include:
  - Extending the existing P&R services to the site on match days
  - Separate bus services on match days
  - AV shuttle buses from various P&R sites
  - Extending / improving the frequency of service buses that serve Kidlington

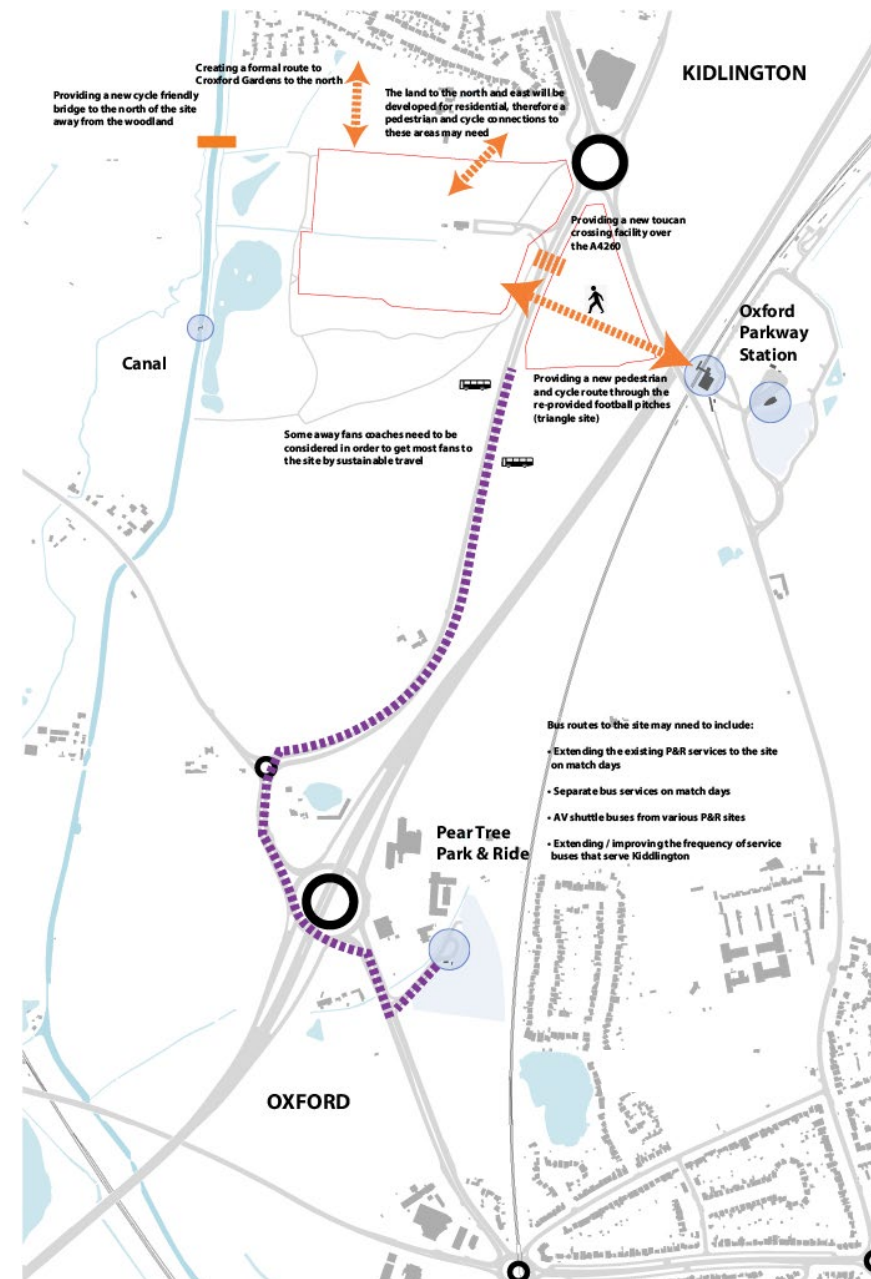


Figure 3.16

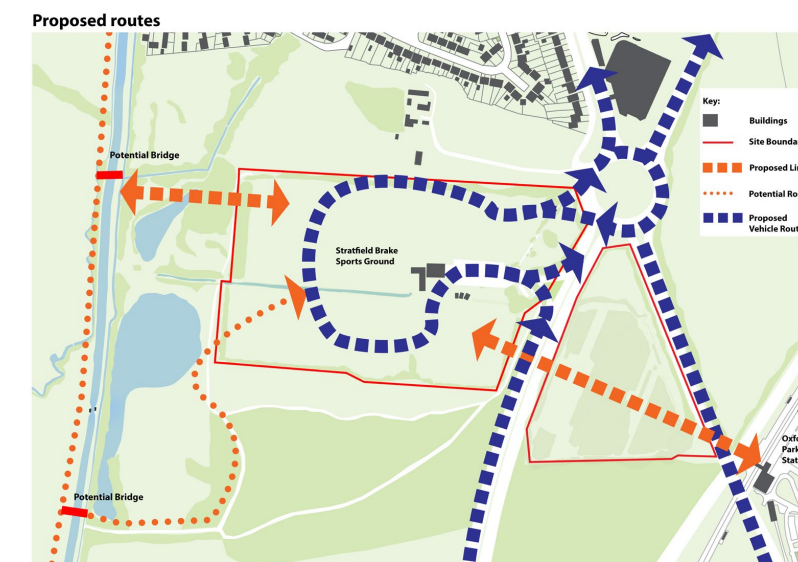


Figure 3.17

### Potential Transport Planning

- Site Boundary
- ▤ Potential Bus Routes
- Roundabout
- ↔ Potential Links
- ▬ Potential Bridge
- ▤ Potential Cross Facility





### 3.8 New Links from Oxford Parkway







**Option 1:**

Pros:  
Ideal solution as separates fans and traffic  
Most Direct Route

Cons:  
Most Expensive

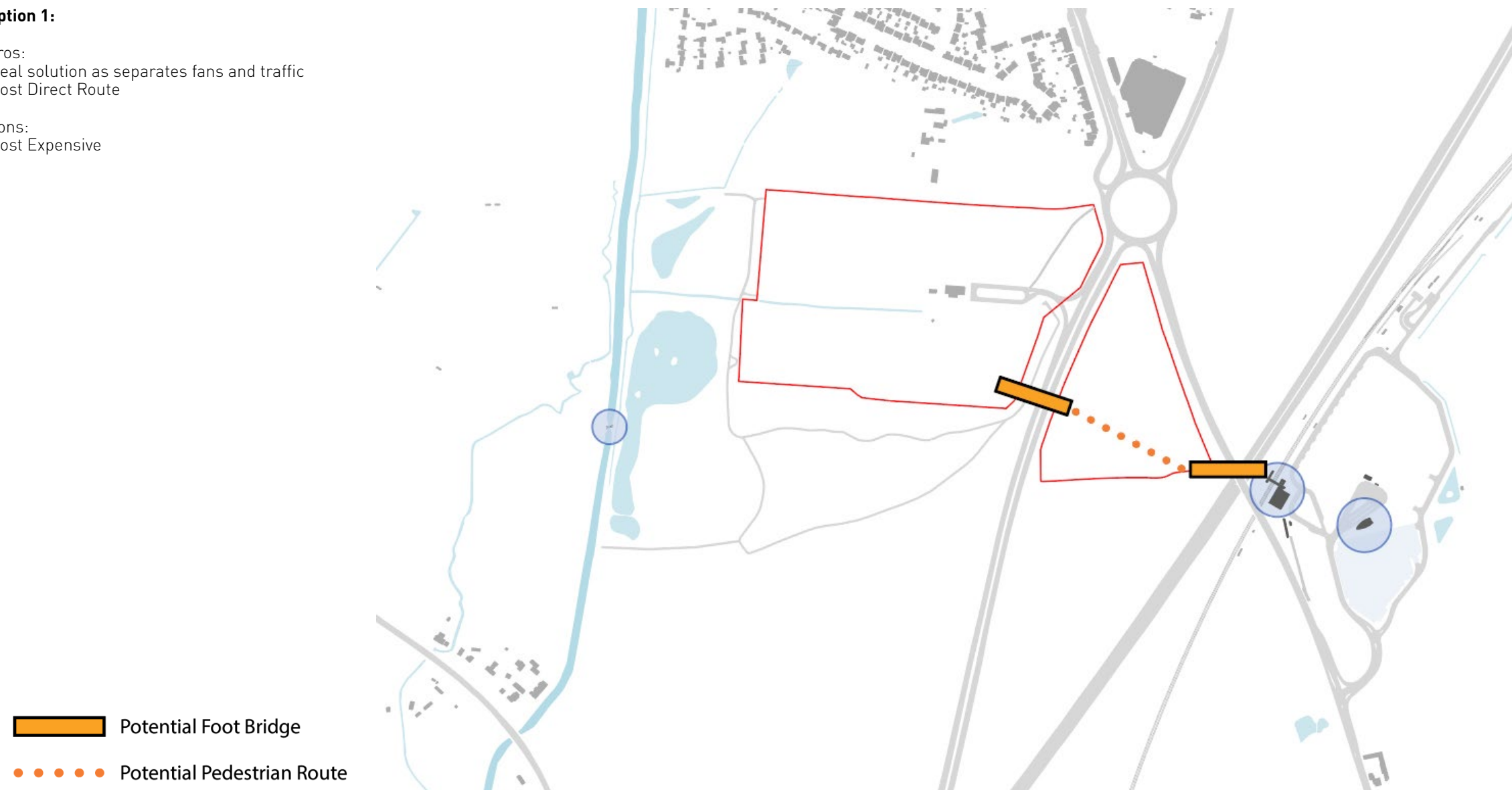


Figure 3.18





**Option 2:**

Pros:  
Utilises existing access and crossing from park and ride

Cons:  
Indirect  
Cost of new bridge  
Hazard and disruption of fans crossing one road using existing pelican crossing



-  Potential Foot Bridge
-  Potential Pedestrian Route



Figure 3.19





**Option 3:**

Pros:  
Most cost effective

Cons:  
Indirect  
Hazardous  
Disruption to traffic  
May require up-grades and widening to existing footpaths  
May require road closures or restrictions on match days



Figure 3.20





### 3.9 Stratfield Brake Area Breakdown

<b>Total Area</b>	<b>= 189,500 m<sup>2</sup></b>	
Stadium	= 25,200 m <sup>2</sup>	(13%)
Hotel & Arena	= 16,300 m <sup>2</sup>	[9%]
Rugby Club	= 48,500 m <sup>2</sup>	(26%)
Football Club	= 48,000 m <sup>2</sup>	(26%)
	= 138,000 m <sup>2</sup>	(74%)
Remaining Area	= 51,500 m <sup>2</sup>	(26%)
Main Site	= 40,000 m <sup>2</sup>	(21%)
Triangular Site	= 11,500 m <sup>2</sup>	(5%)







### 3.10 Parking Provision

Existing Parking Numbers:

Stratfield Brake = 113 spaces (+ 4 disabled spaces)

Kassam Stadium = 897 spaces

Oxfordshire County Council - Parking Standards for New Development (May 2022)

*Non – Residential Parking Guidance for Oxfordshire*

landuse	Vehicle standard	cycle parking standard
Hotels	1 space per bedroom	1 space per 5 car parking space provided
Commercial area	1 space per 20m <sup>2</sup>	1 space per 100m <sup>2</sup> for staff and 1 space per 100sqm for customers.
Outdoor sport/recreation area	1 space per 20sqm of public area	1 space per 100m <sup>2</sup> for staff and 1 space per 100sqm for customers.

After reviewing the Oxford County Council Parking Standards, the project's Transport Planning & Traffic Engineer has proposed the following provisions:

Proposed on site Car Parking - 330

Proposed on site Cycle Parking - 936

In addition to the on-site provision, we will be utilising the Park & Ride infrastructure in the surrounding area. In close proximity we have around 2,500 spaces and a further c.4000 spaces further afield.







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## 4. Sport Facilities Retention / Relocation





## 4 Sport Facilities Retention / Relocation

### 4.1 Stratfield Brake Sports

As it stands Stratfield Brake is home to four sports clubs:

- Kidlington Cricket Club
- Football Club
- Gosford All Blacks Rugby Football Club
- Kidlington Running Club

The site consists of:

- Clubhouse
- Carpark
- 2no. Cricket pitches
- 5no. Football pitches
- 4no. Rugby pitches
- External storage containers

Within the clubhouse we have:

- 10 Changing rooms
- Dedicated internal storage areas
- Bar, Cellar and Dry Store (ran exclusively by GABRFC)
- Commercial kitchen
- Function room (c.150 capacity)



Figure 4.1





## 4.2 Kidlington Cricket Club

Cricket facilities currently located on site:

- 2no. Full size cricket pitches
- 2no. Outdoor practice nets
- Shared sports pavillion
- Shared storage area
- Shared carparking

The intention is for Kidlington Cricket Club to relocate away from the Stratfield Brake site.



Figure 4.2





### 4.3 Football Club

Football facilities currently located on site:

- 1no. U15/16s football pitch
- 1no. U11/12s football pitch
- 1no. U9/10s mini soccer pitch
- 2no. U7/8s mini soccer pitches
- Shared sports pavillion
- Shared storage area
- Shared carparking

\*See Appendix "A-2 Sport England Pitch Sizes" for full table

OUTDOOR SPORTS		NGB
Level of play category	Community	
Area requirements	(L x W)	
Football		The Football Association (FA)
PPA	U11/U12: 73.0 x 46.0 m	
	U13/U14: 82.0 x 50.0 m	
	U15/U16: 91.0 x 55.0 m	
	U17/U18 100.0 x 64.0 m	
	& Senior:	

Table 4.3



Figure 4.4





The intention is for the Football Club to relocate onto the triangular site on the other side of the A4260.

Further studies are to be conducted into the exact football provision required on site, in particular whether 3G pitches would work better.

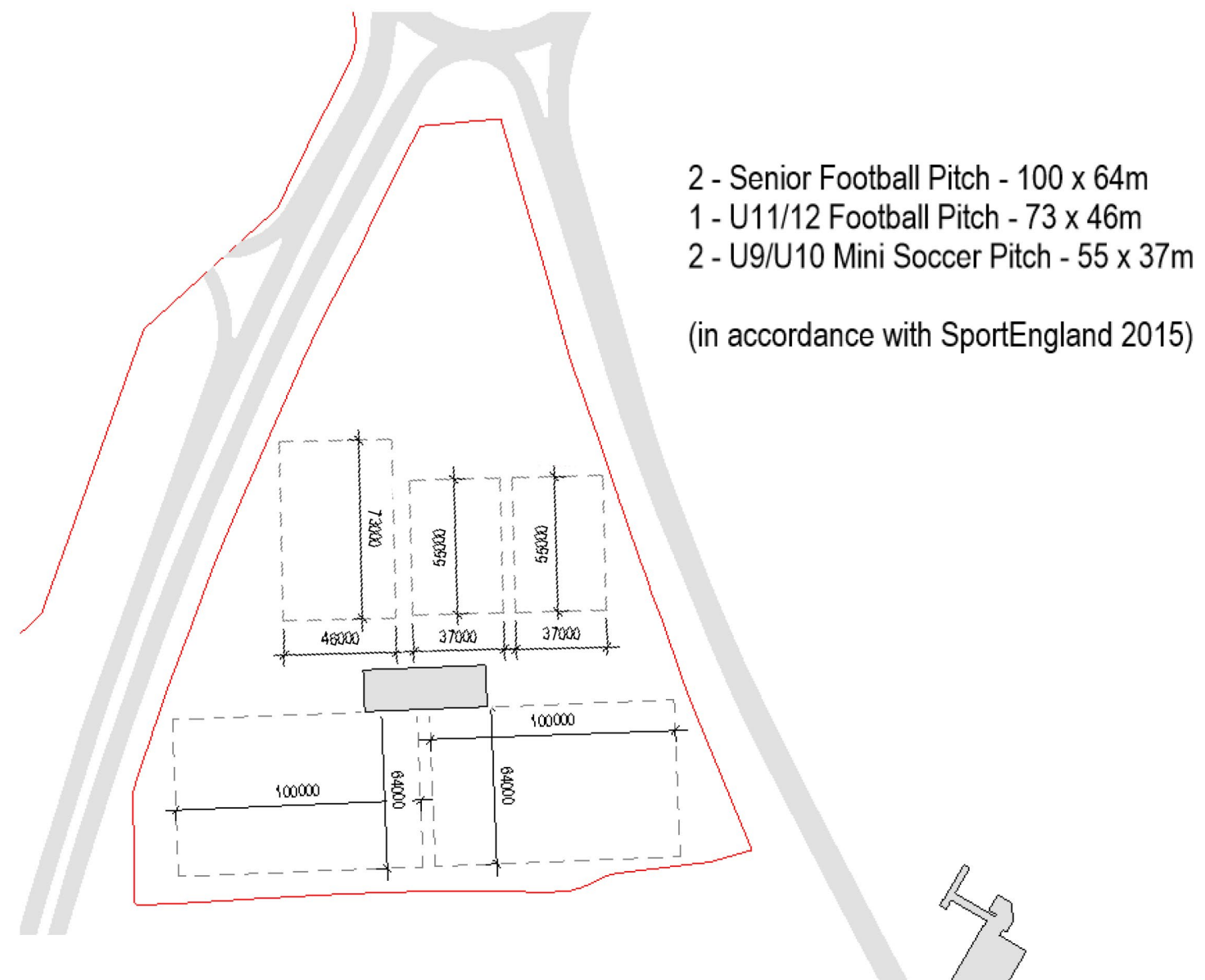


Figure 4.5





## 4.4 Clubhouse Design - Football Club

The following notes are based on the Sport England 'Clubhouse Design Guidance Notes - 2016 update'.

### 4.4.1 Understanding the Needs & Defining the Brief

The clubhouse should be able to facilitate the following uses and provide facilities for the following pitches:

- 2no. Adult pitches (potential 3G provision)
- 3no. Age group pitches (potential 3G provision)
- Match day hospitality
- Hireable community space
- Woodland Trust Office / Cafe

### 4.4.2 Locating the New Clubhouse

As defined on previous pages, the proposal is to relocate the football facilities to the triangular site opposite Stratfield Brake and to provide the club with a clubhouse of their own.

### 4.4.3 Clubhouse Accommodation

- Changing rooms
- WC / Showers
- Multi-functional function room/ community hub
- Woodland Trust Office / Cafe
- Kitchen
- Defined internal and external storage spaces

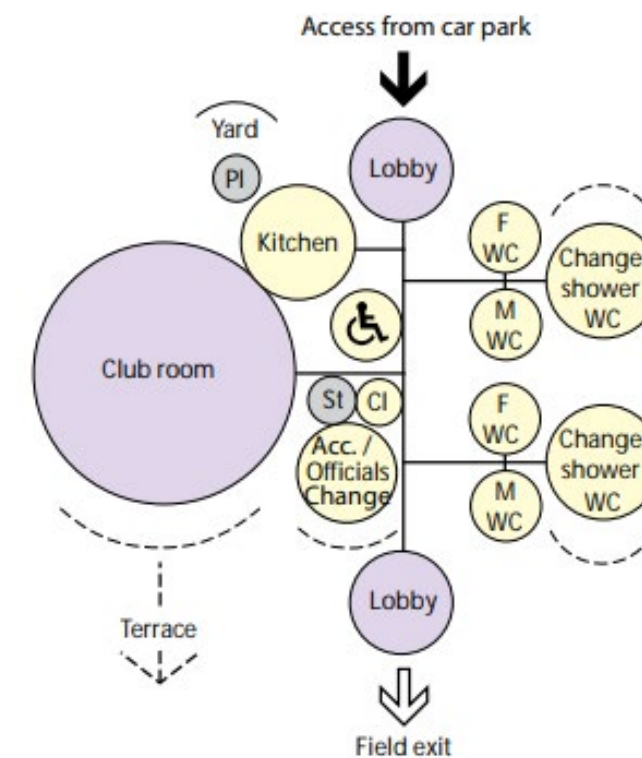
### 4.4.4 Layout of Spaces

The design of the clubhouse will obviously develop and adapt to the site & client's specific needs. For now, we have taken the Sport England adjacency diagram as a foundation to work from.

### 4.4.5 Outside the Building

Sport England advise recommends the following parking is provided:

- 1 space per 3 staff
- 1 space per 3 players
- 1 space per 3 spectators (with a minimum of 10 spaces)







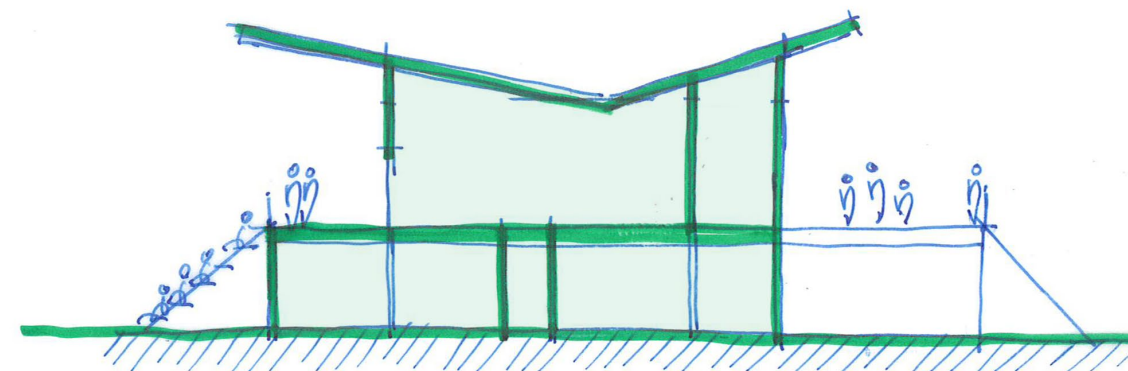
#### 4.4.6 Initial Design & Space Planning

The initial design thoughts for the 2no. pavillions are to separate the sports facilities from the community/social facilities on two levels.

As shown, changing facilities and sports storage will be on the Ground (Pitch) Level, with the community and hospitality areas on the Upper Level.

The sketch accounts for the following facilities:

- 10no. team changing rooms (with designated WC & Shower facilities)
- Officials change
- Store rooms
- Multi-functional community space
- Bar (with associated kitchen & cellar)
- Office (for either the club or the Woodland Trust)
- WCs
- Viewing terrace







## 4.5 Gosford All Blacks Rugby Club

Rugby facilities currently located on site:

- 4no. Rugby pitches of varying size & facilities:
  - 1no. 120 x 70m
  - 2no. 120 x 70m with 100lux floodlights
  - 1no. 120 x 60m
- 1no. U11/12s football pitch
- 1no. U9/10s mini soccer pitch
- 2no. U7/8s mini soccer pitches
- Shared sports pavillion
- Shared storage area
- Shared carparking

\*See Appendix "A-2 Sport England Pitch Sizes" for full table

OUTDOOR SPORTS NGB	
Level of play category	Community
Area requirements	(L x W)
Rugby Union	Rugby Football Union (RFU)
PPA	U7: 20.0 x 12.0 m max/pref
(Basic pitch) *	U8: 45.0 x 25.0 m max/pref
	U9: 60.0 x 35.0 m max/pref
	U10: 60.0 x 35.0 m max/pref
	U11/U12: 60.0 x 43.0 m max/pref
	Senior 7/10/15-a-side: 100.0 x 70.0 m max/pref
PPA plus In-goal (I/G) areas	U7: 30.0 x 12.0 m max/pref
(Playing area) **	U8: 55.0 x 25.0 m max/pref
	U9: 70.0 x 35.0 m max/pref
	U10: 70.0 x 35.0 m max/pref
	U11/U12: 70.0 x 43.0 m max/pref
	Senior 7/10/15-a-side: 144.0 x 70.0 m max

Table 4.7

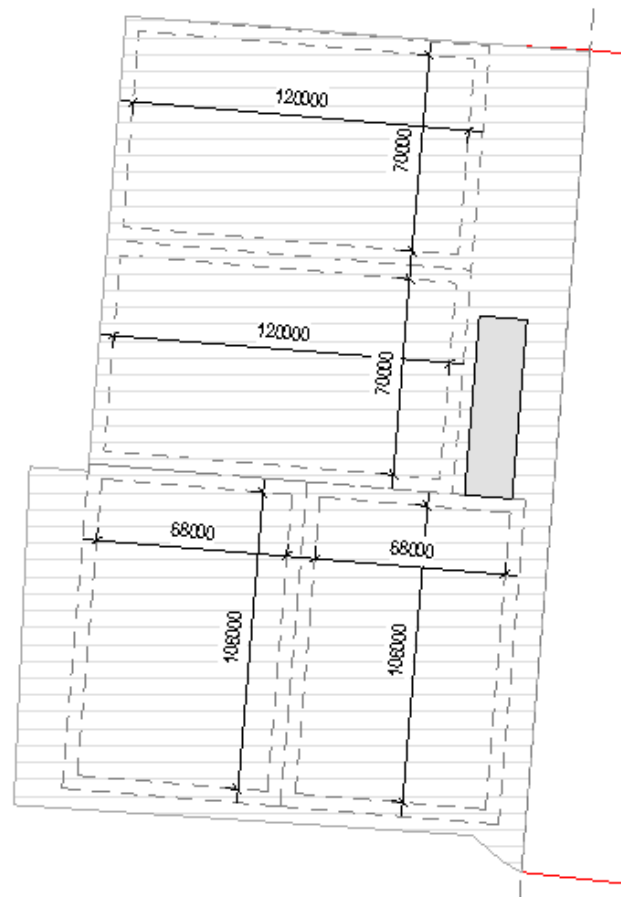


Figure 4.6





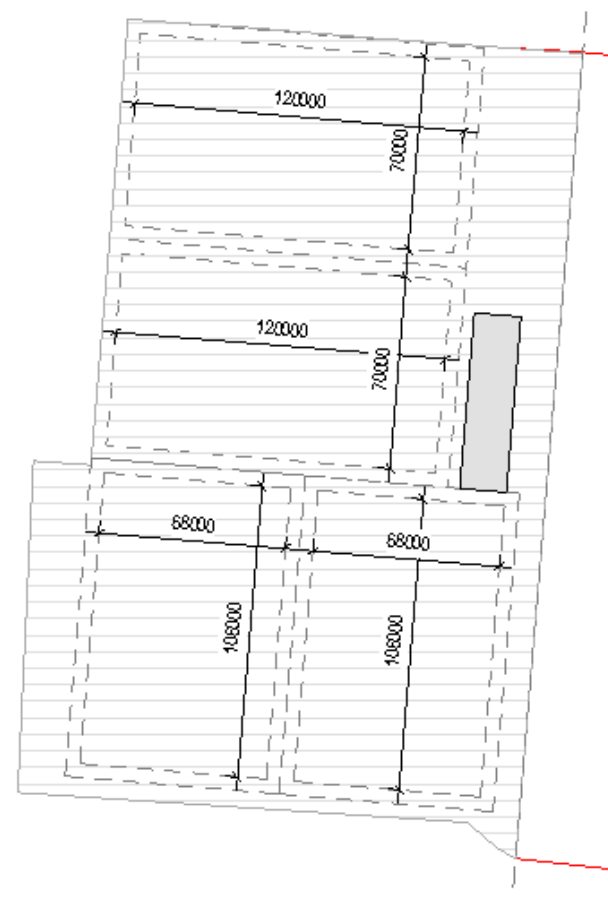
**49,128 SQ. M FOR  
RUGBY**



2 - Senior Rugby Pitch - 120 x 70m  
2 - Senior Rugby Pitch - 106x68m  
(in accordance with SportEngland 2015)

Figure 4.10

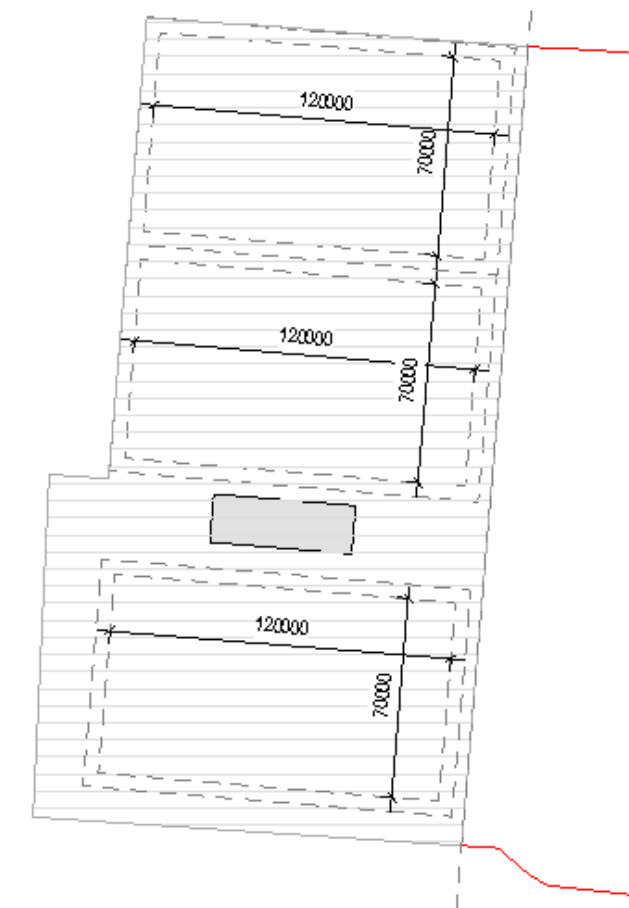
**49,128 SQ. M FOR  
RUGBY**



2 - Senior Rugby Pitch - 120 x 70m  
2 - Senior Rugby Pitch - 106x68m  
(in accordance with SportEngland 2015)

Figure 4.11

**40,166 SQ. M FOR  
RUGBY**



3 - Senior Rugby Pitch - 120 x 70m  
(in accordance with SportEngland 2015)

Figure 4.12





If on site, the Rugby Club's pitch requirements will determine the site area remaining for the Oxford United Development.

If the Gosford All Blacks provision is for 4no. full size pitches, they will require 38% of the site (excluding the triangular site).

If the Gosford All Blacks provision is for 3no. full size pitches, they will require 31% of the site (excluding the triangular site).

The location and size of the Gosford All Blacks facility will be a huge factor in determining the scale and arrangement of the Oxford United development at Stratfield Brake.

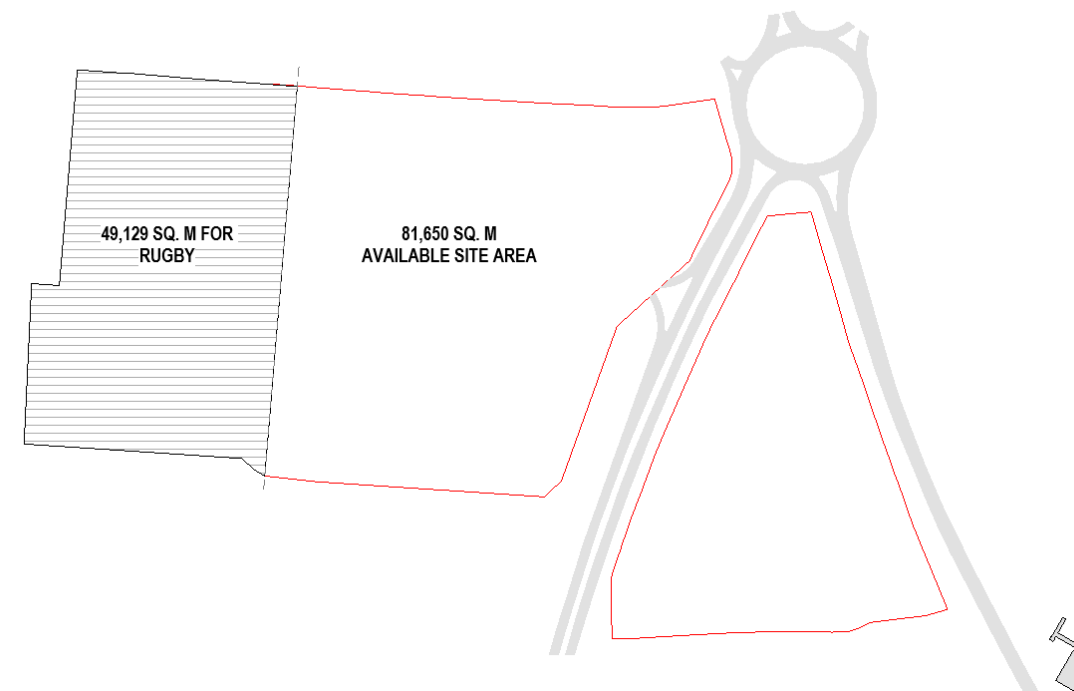


Figure 4.13

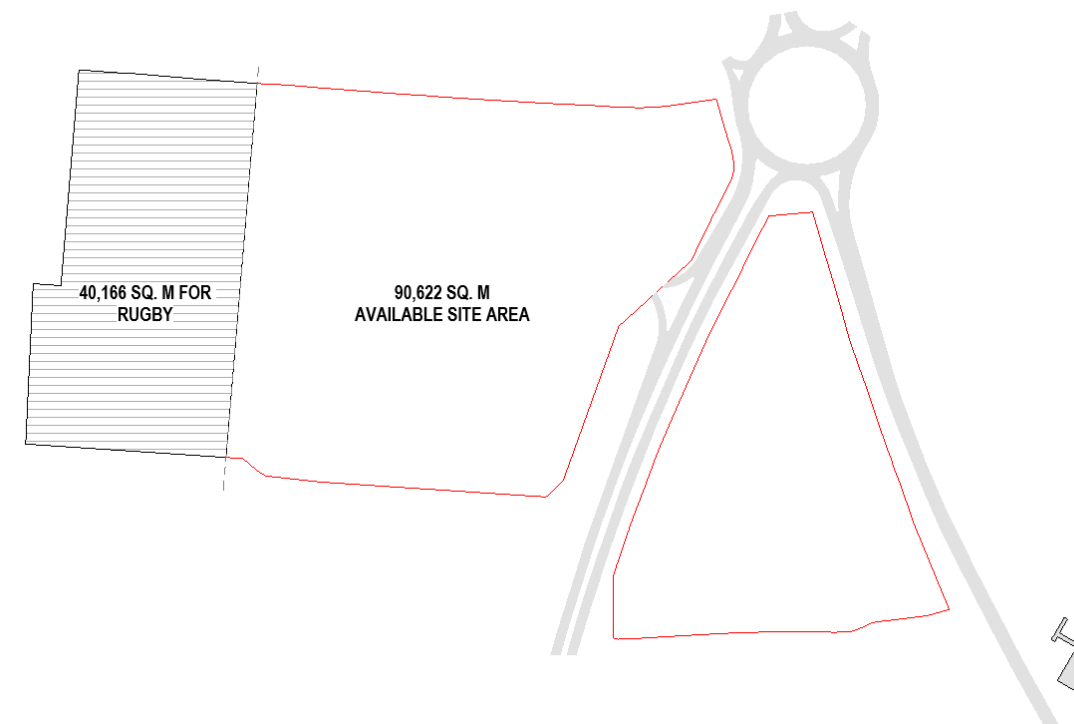


Figure 4.14





## 4.6 Clubhouse Design - Gosford All Blacks RUFC

The following notes are based on the Sport England 'Clubhouse Design Guidance Notes - 2016 update'.

### 4.6.1 Understanding the Needs & Defining the Brief

The clubhouse should be able to facilitate the following uses and provide facilities for the following pitches:

- 3 or 4no. Adult pitches (potential 3G provision)
- Matchday hospitality
- Hireable community space

### 4.6.2 Locating the New Clubhouse

For the purposes of this report, we are assuming Gosford All Blacks will remain and share the Stratfield Brake site with Oxford United.

### 4.6.3 Clubhouse Accommodation

- Changing rooms
- WC / Showers
- Multi-functional function room/community hub
- Defined internal and external storage spaces

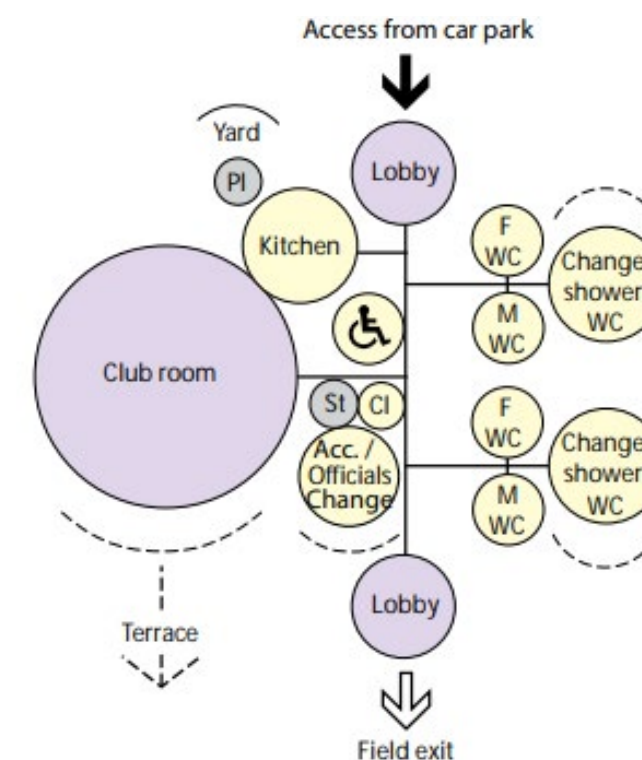
### 4.6.4 Layout of Spaces

The design of the clubhouse will obviously develop and adapt to the site & client's specific needs. For now, we have taken the Sport England adjacency diagram as a foundation to work from.

### 4.6.5 Outside the Building

Sport England advise recommends the following parking is provided:

- 1 space per 3 staff
- 1 space per 3 players
- 1 space per 3 spectators (with a minimum of 10 spaces)







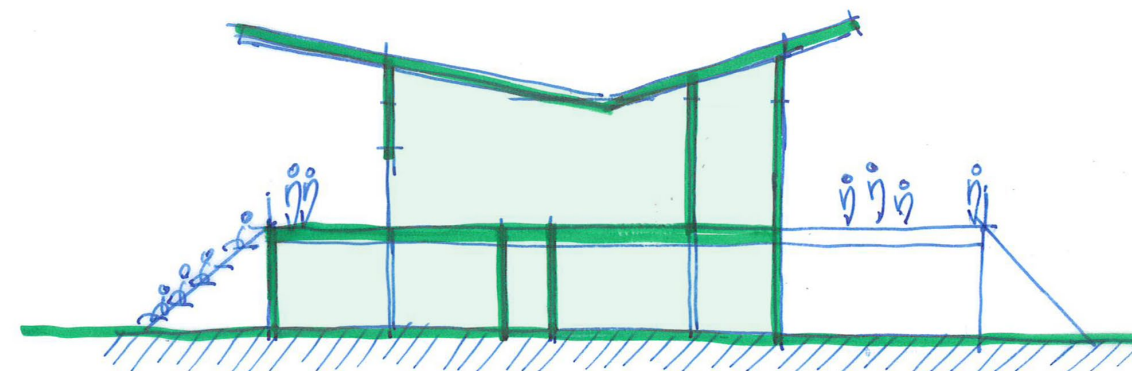
#### 4.6.6 Initial Design & Space Planning

The initial design thoughts for the 2no. pavilions are to separate the sports facilities from the community/social facilities on two levels.

As shown, changing facilities and sports storage will be on the Ground (Pitch) Level, with the community and hospitality areas on the Upper Level.

The sketch accounts for the following facilities:

- 8no. team changing rooms (with designated WC & Shower facilities)
- Officials change
- Store rooms
- Multi-functional community space
- Bar (with associated kitchen & cellar)
- Office (for either the club or the Woodland Trust)
- WCs
- Viewing terrace







#### 4.7 Sports Pavilion Precedents











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## 5. Design Development

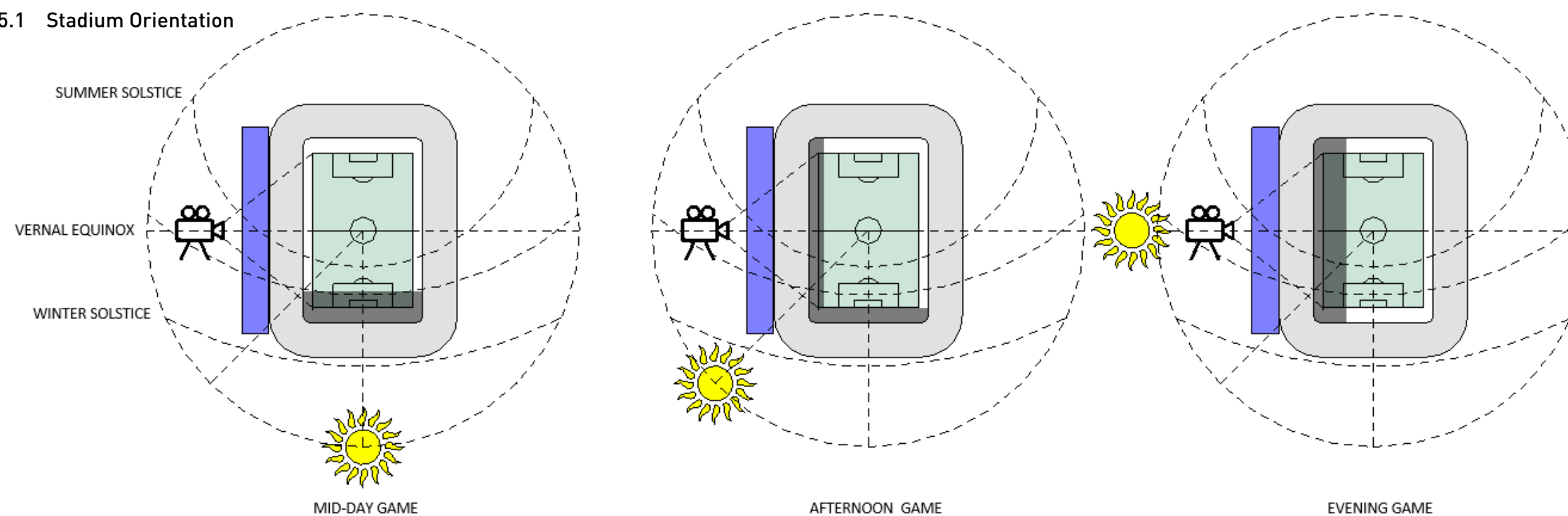




## 5 Design Development

The following section outlines the architect's design progression from stadium orientation and scope of the development to the current design proposal. Having analysed the client brief and site constraints we explored several options for the Stratfield Brake site, as well as briefly exploring the possibility of using the triangular site adjacent.

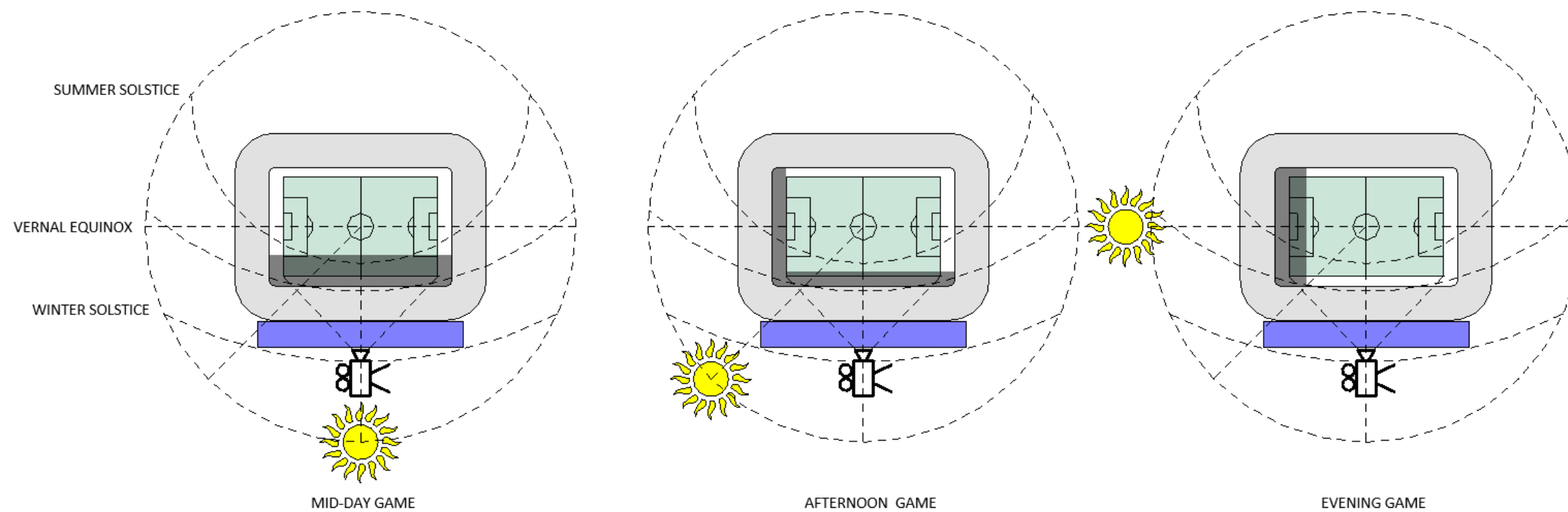
### 5.1 Stadium Orientation



#### Typical stadium Orientation

North – South Pitch with Media on the West

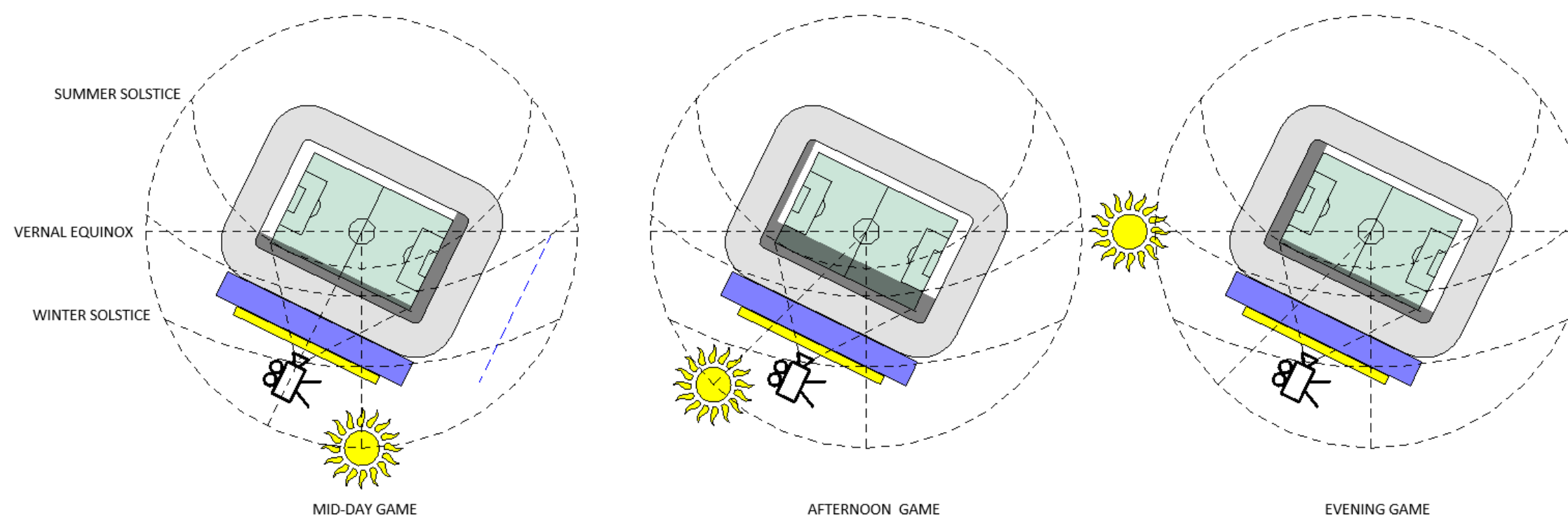




### Optional Orientation

West-East Pitch with Media and Main Stand on the South





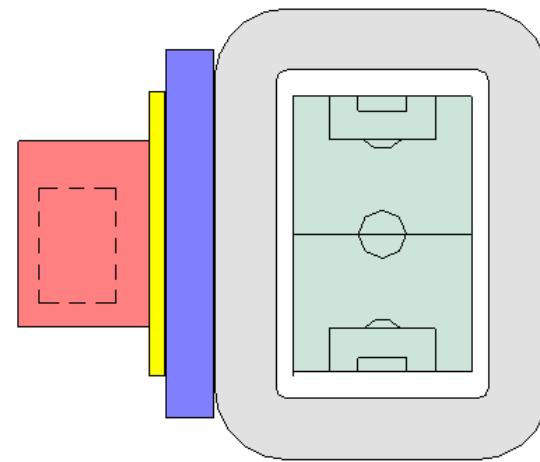
**Suggested Orientation – Rotated to Road (Optimised for Afternoon-Evening games)**

West-East Pitch with Media and Main Stand on the South



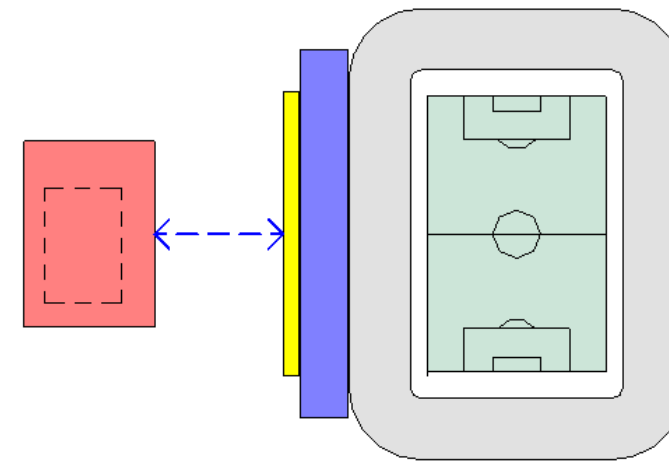


### 5.3 Arena Option



#### ***ARENA ATTACHED TO STADIUM***

- Ability to share concourses and facilities
- Reduced frontage and entrance points



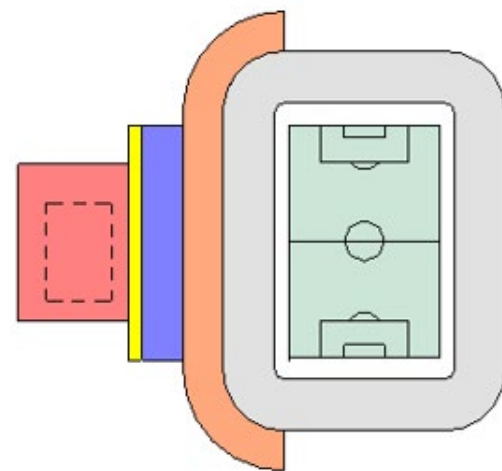
#### ***ARENA SEPERATE TO STADIUM***

- Good frontage to Arena and Stadium
- Can operate separately





## 5.4 Hotel & Arena Option



### Arena and Hotel Attached to Stadium

- Ability to share concourses and facilities
- Reduced frontage and entrance points





## 5.5 Stadium on Smaller Site

East-West with Hospitality on the South

### Conclusion:

Limited space but possible.

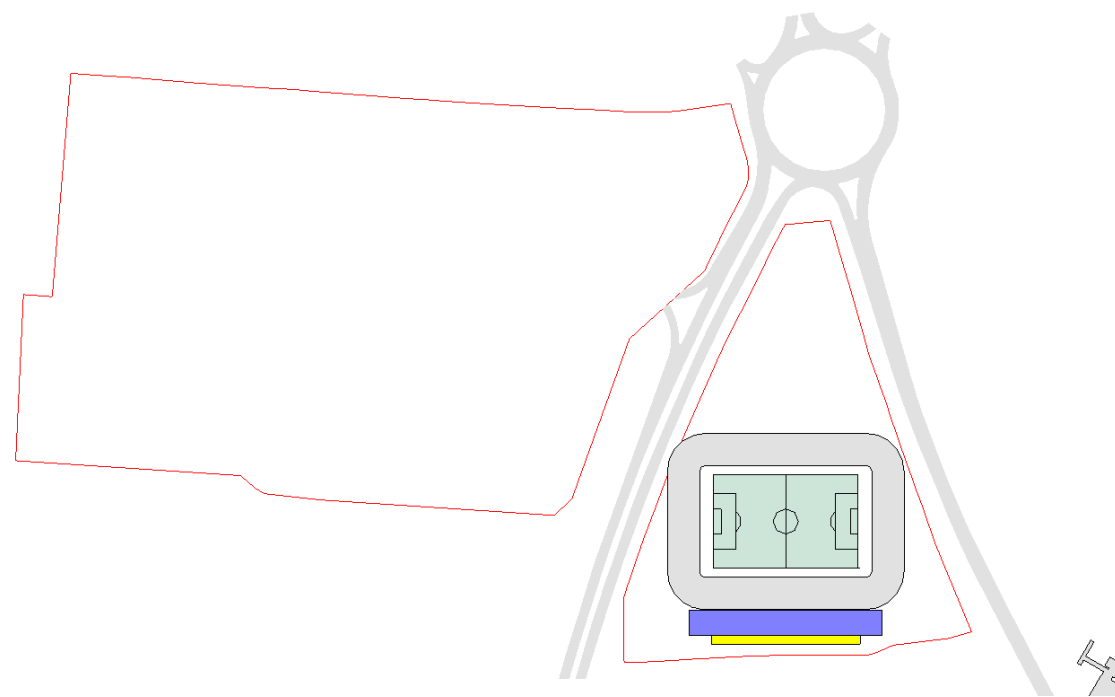


Figure 5.1

North-South with Hospitality on the West

### Conclusion :

Limited space but possible.

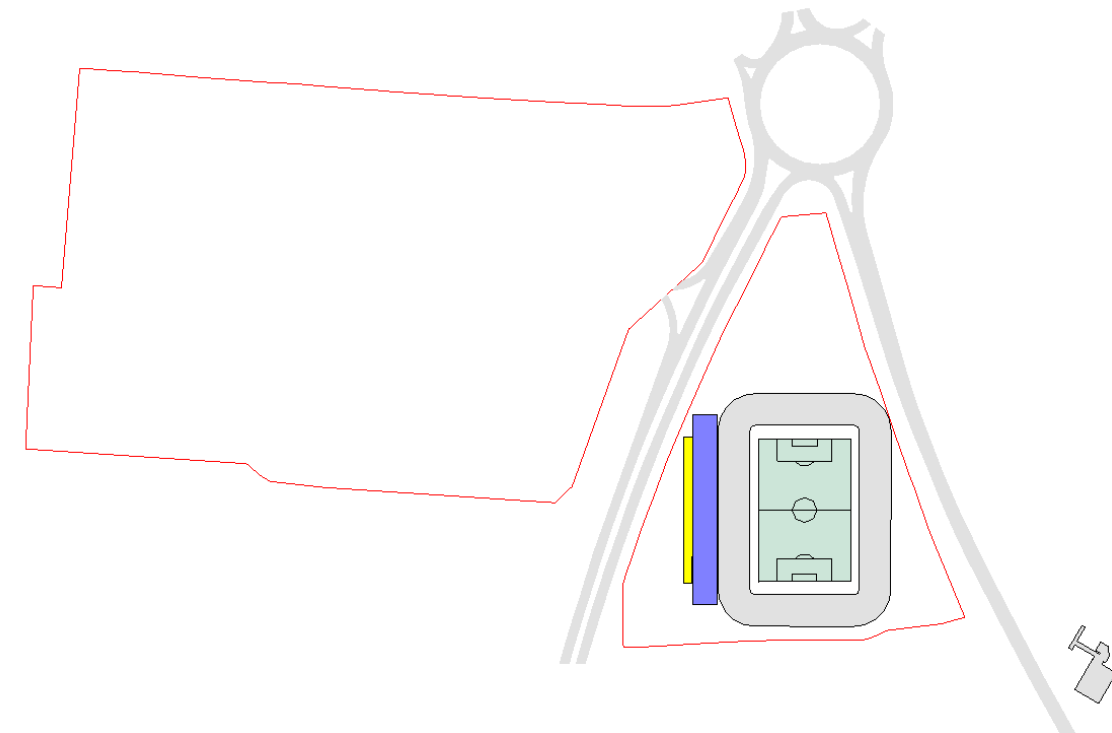


Figure 5.2





## 5.6 Initial Options

### 5.6.1 Option 1A - Stadium Only Option

North-South Orientation with Main Stand on the West

#### Pros

- Best Stadium Orientation
- Retains some existing pitches
- Public Fan Plaza in front of Building
- Potential use of main building for community pitches.

#### Cons

- Main Entrance at back of the building
- Frontage limited to main road
- Public Plaza detached from main entrance
- Increased Circulation for Hospitality

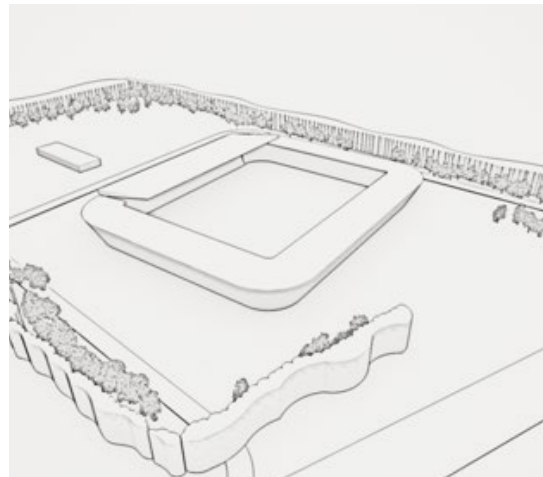


Figure 5.3

### OPTION 1A - STADIUM ONLY OPTION

North-South Orientation with Main Stand on the West

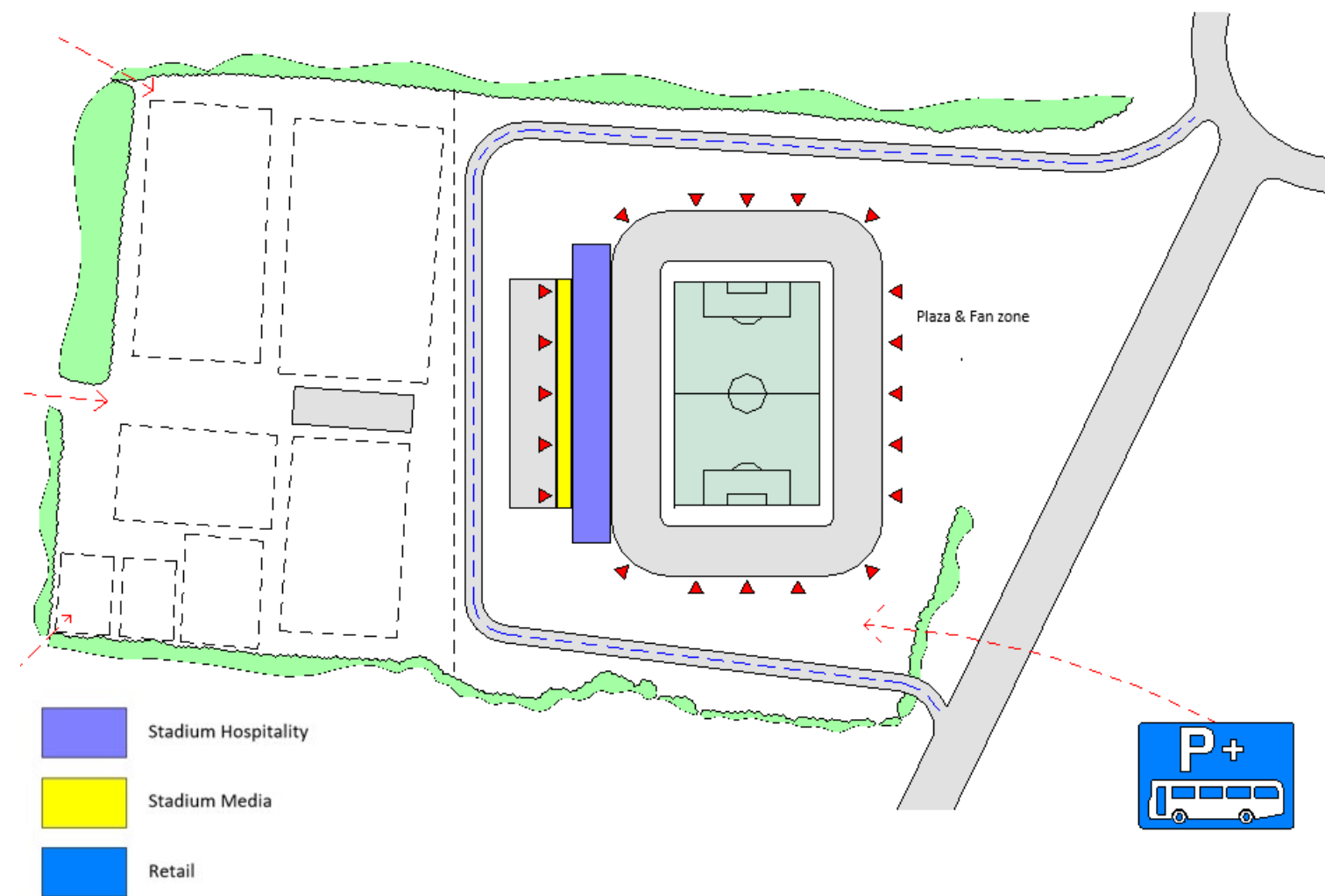


Figure 5.4





### 5.6.2 Option 1B - Stadium Only Option

North-South Orientation with Main Stand on the East

#### Pros

- Retains Media on West
- Hospitality facing road – good frontage
- Public Fan Plaza in front of Building
- Retains some existing pitches

#### Cons

- Media and Hospitality not in same building

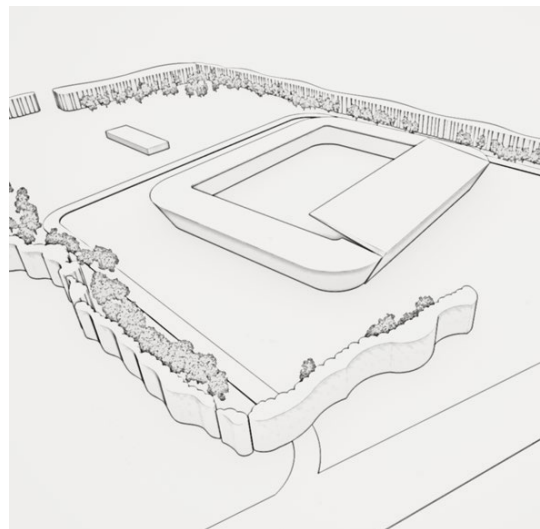


Figure 5.5

### OPTION 1B - STADIUM ONLY OPTION North-South Orientation with Main Stand on the East

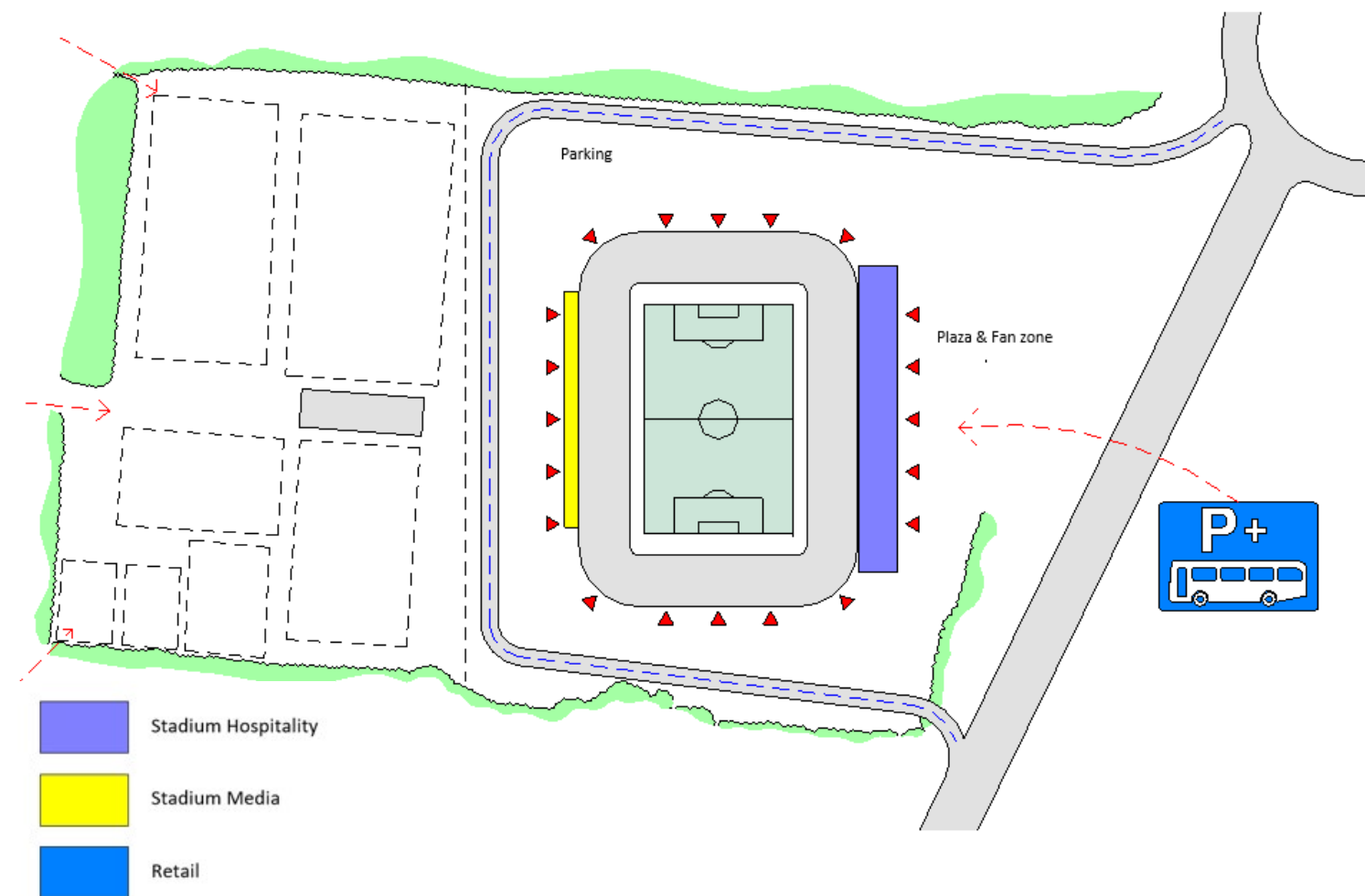


Figure 5.6





### 5.6.3 Option 1c - Stadium Only Option

East-West Orientation with Main Stand on the South-West

#### Pros

- Public Plaza in front of Building
- Retains some existing pitches
- Hospitality close to road, good access and visibility
- Media and Hospitality in same building

#### Cons

- Stadium Main Entrance slightly away from main road

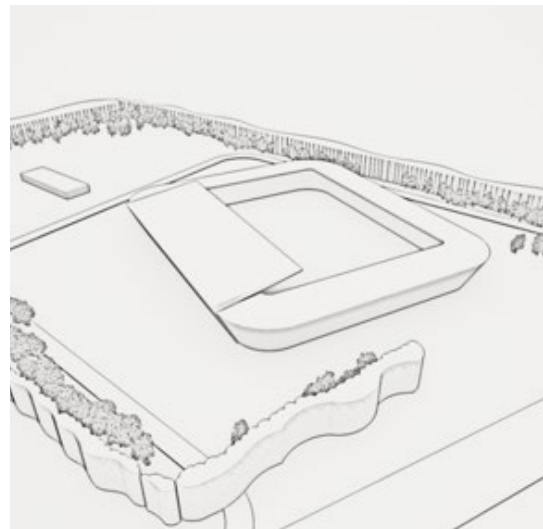


Figure 5.7

### OPTION 1C - STADIUM ONLY OPTION

East-West Orientation with Main Stand on the South-West

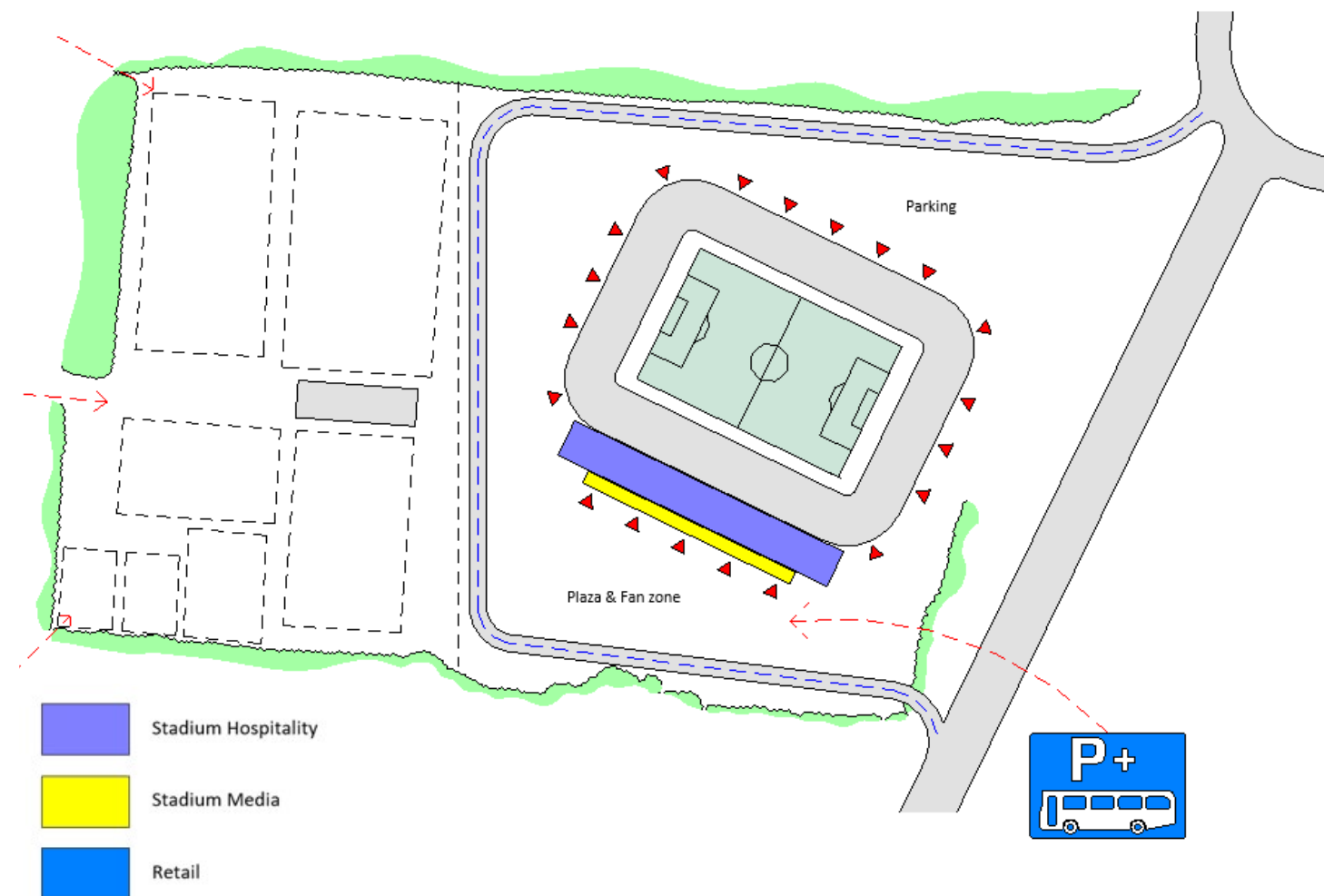


Figure 5.8





### 5.6.5 Option 2B - Stadium & Hotel

North-South Orientation with Main Stand on the West + Hotel linked to Hospitality

#### Pros

- Hotel orientated to countryside
- Potential for retail
- Hospitality could share with hotel
- Retains some existing pitches

#### Cons

- Hotel away from road – poor frontage
- Hospitality not facing road
- Shared operational issues

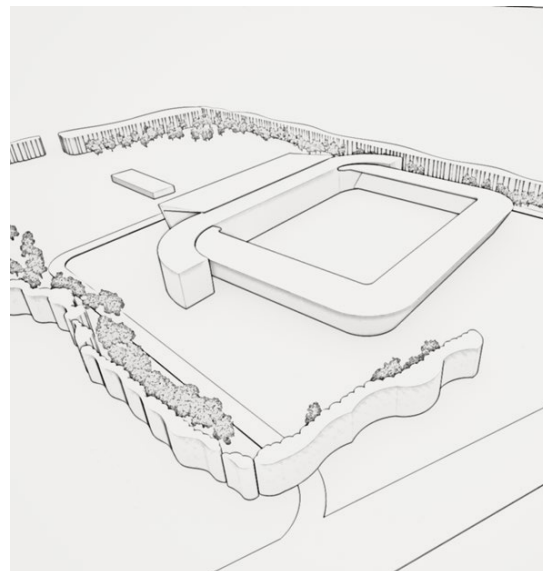


Figure 5.11

### OPTION 2B- STADIUM & HOTEL North-South Orientation with Main Stand on the West + Hotel linked to Hospitality

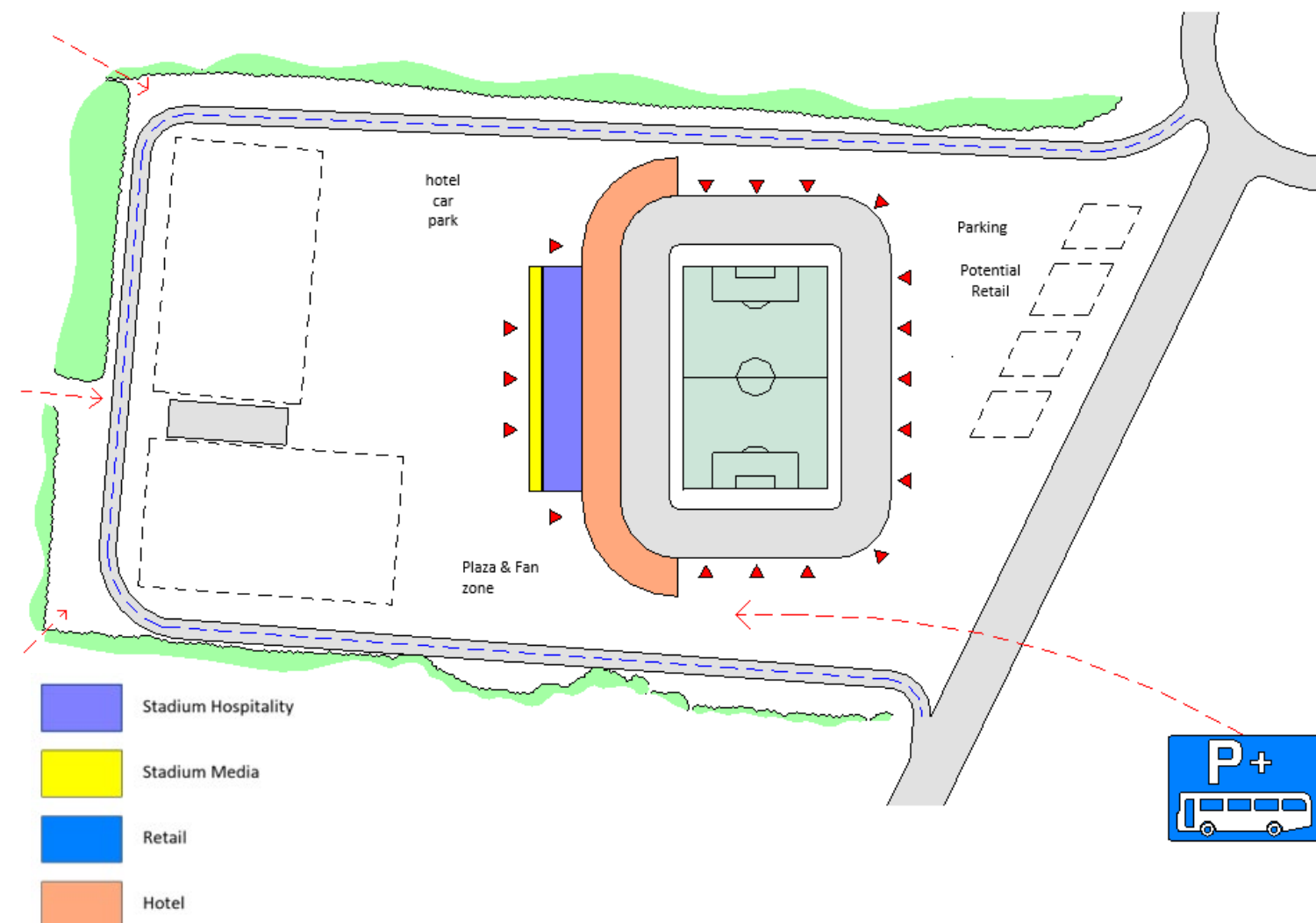


Figure 5.12





### 5.6.6 Option 2C - Stadium & Hotel

East-West Orientation with Main Stand on the South + Hotel

#### Pros

- Potential for retail
- Good frontage for Hotel
- Retains some existing pitches

#### Cons

- Stadium Main Entrance slightly away from main road
- Hotel facing road/noise
- Site feels tight

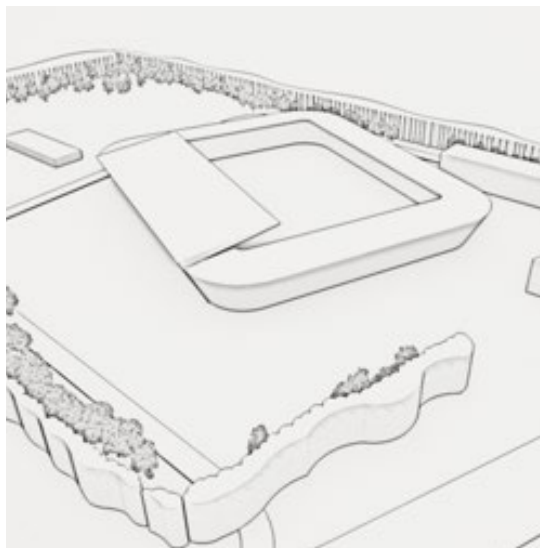


Figure 5.13

### OPTION 2C - STADIUM & HOTEL East-West Orientation with Main Stand on the South + Hotel

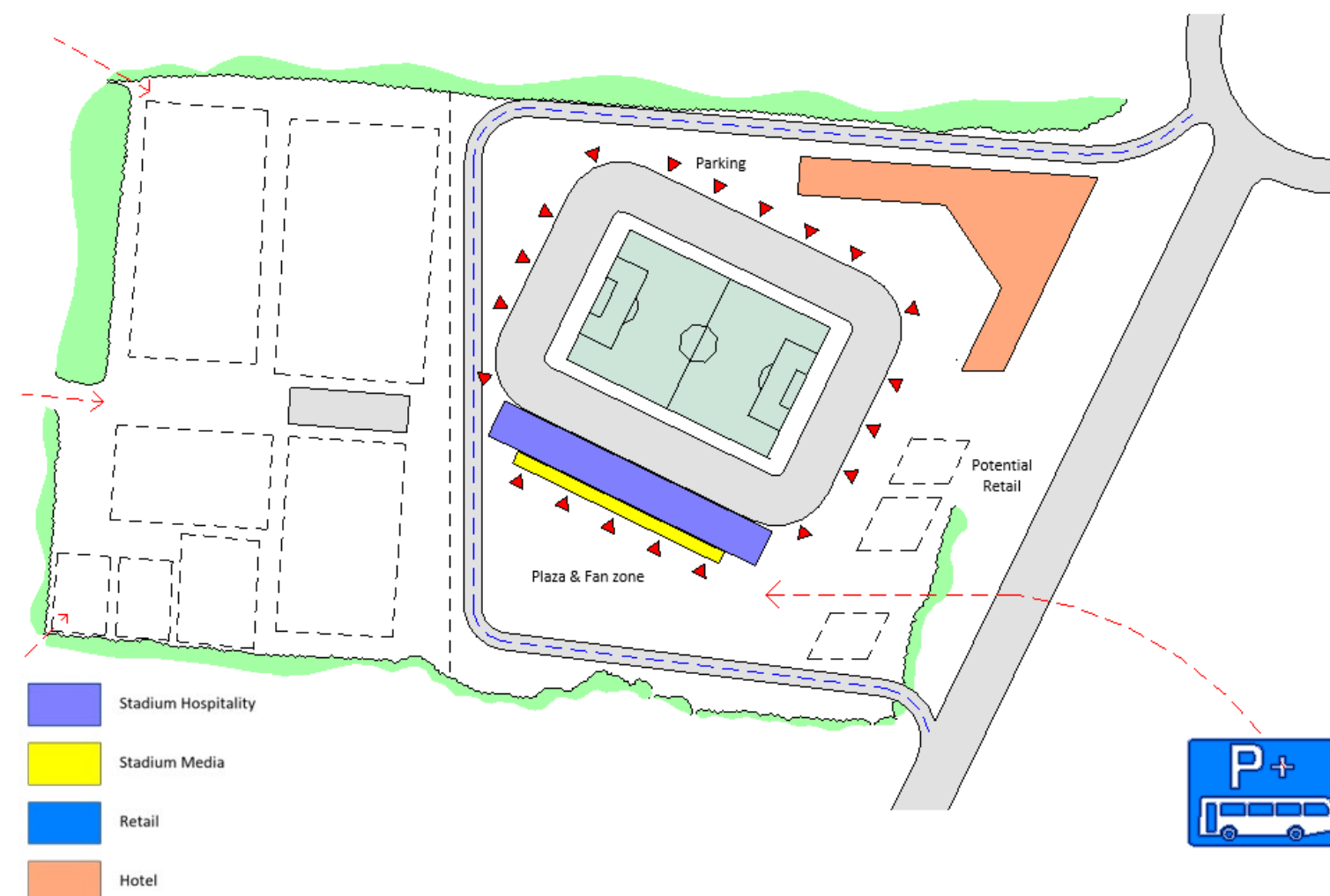


Figure 5.14



### 5.6.8 Option 3B - Stadium, Arena & Hotel

North-South Orientation with Main Stand on the East + Arena

### Pros

- Potential for retail
- Stadium Links to Arena
- Hotel also possible
- Good public realm at front of site
- Good Approach

### Cons

- Hotel and Arena disguised by stadium
- Set back from road – reduced presence
- Could lead to an overdeveloped site for the green belt location.

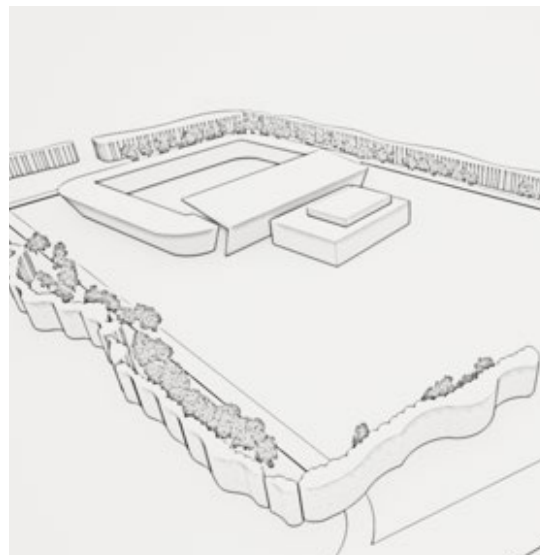


Figure 5.17

**OPTION 3B - STADIUM , ARENA & HOTEL**  
North-South Orientation with Main Stand on  
the East + Arena

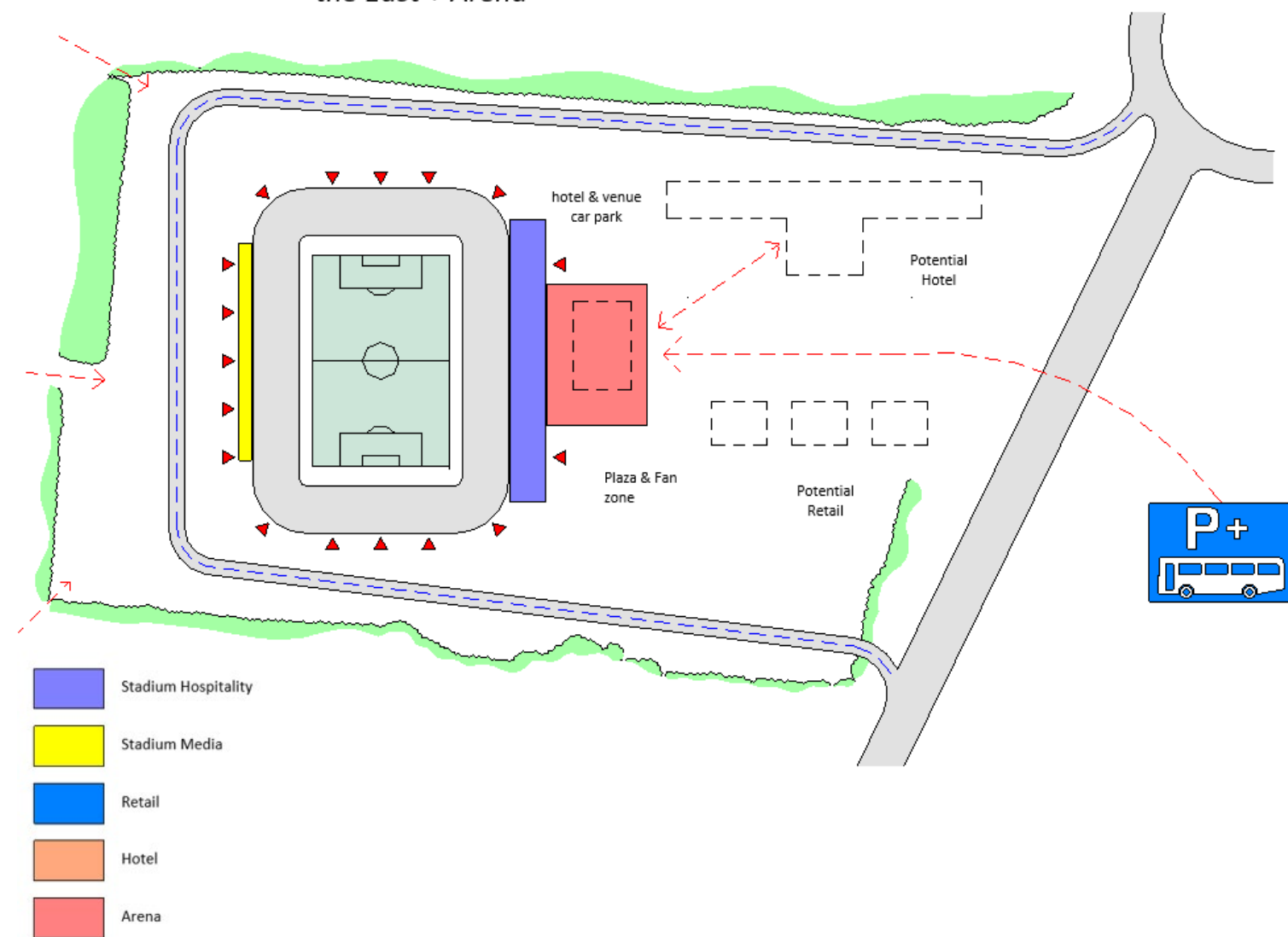


Figure 5.18





### 5.6.9 Option 3C - Stadium & Arena

East-West Orientation with Main Stand on the South + Arena

#### Pros

- Potential for retail
- Stadium Links to Arena
- Good public realm at front of site
- Retains Sports Pitches
- Potential for Hotel

#### Cons

- Stadium Main Entrance slightly away from main approach

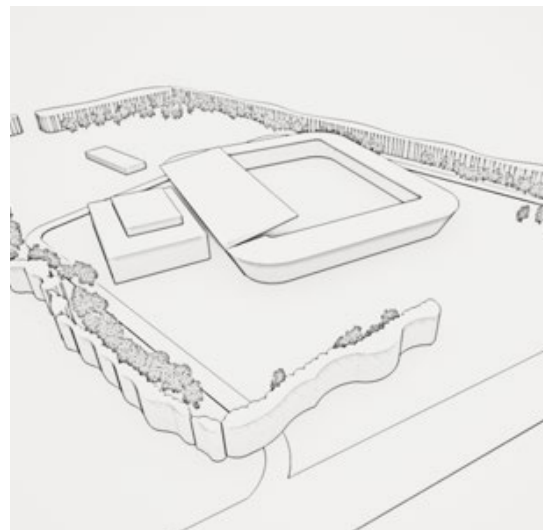


Figure 5.19

### OPTION 3C - STADIUM & ARENA East-West Orientation with Main Stand on the South + Arena



Figure 5.20





### 5.7.2 Development Option 2

- Retained Rugby with 3 Pitches
- North-South Stadium Orientation with Hospitality on the West
- Stadium, Arena & Hotel
- Combined Hotel Arena & Stadium

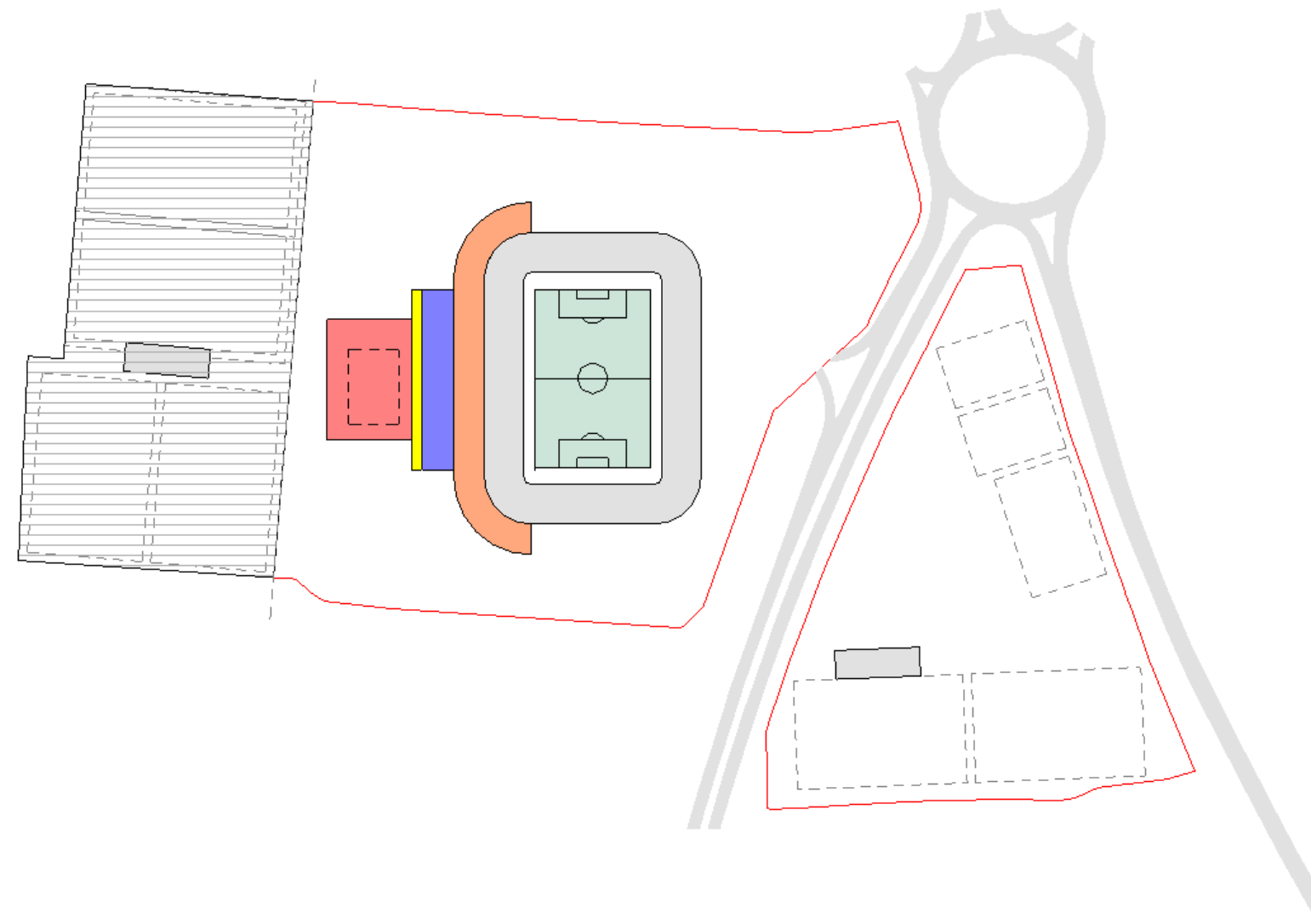


Figure 5.23





## 5.8 Design Progression

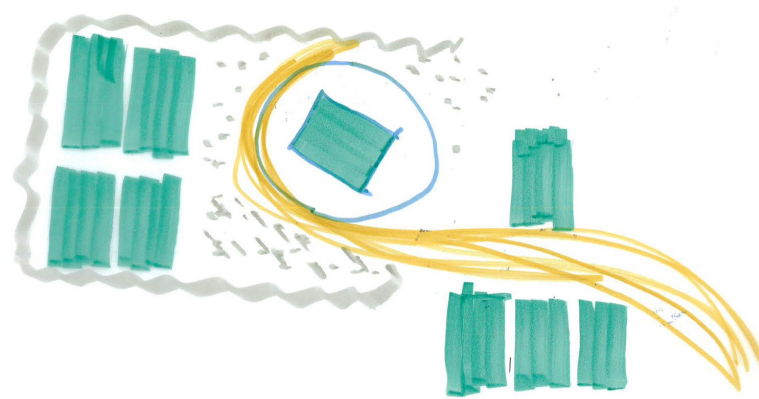


Figure 5.25

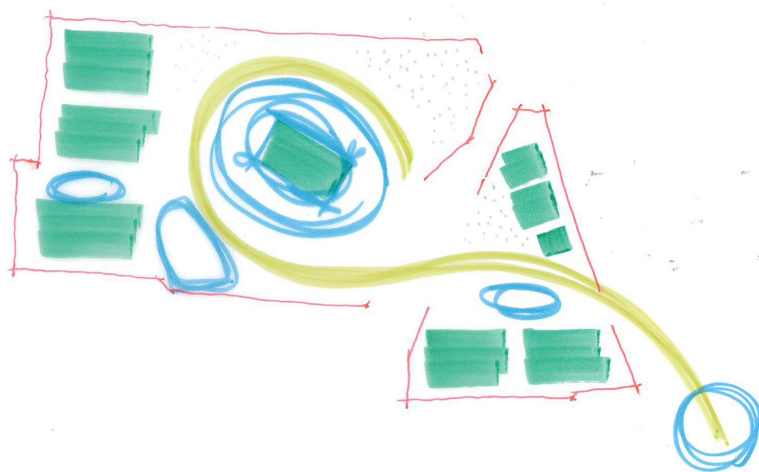


Figure 5.26

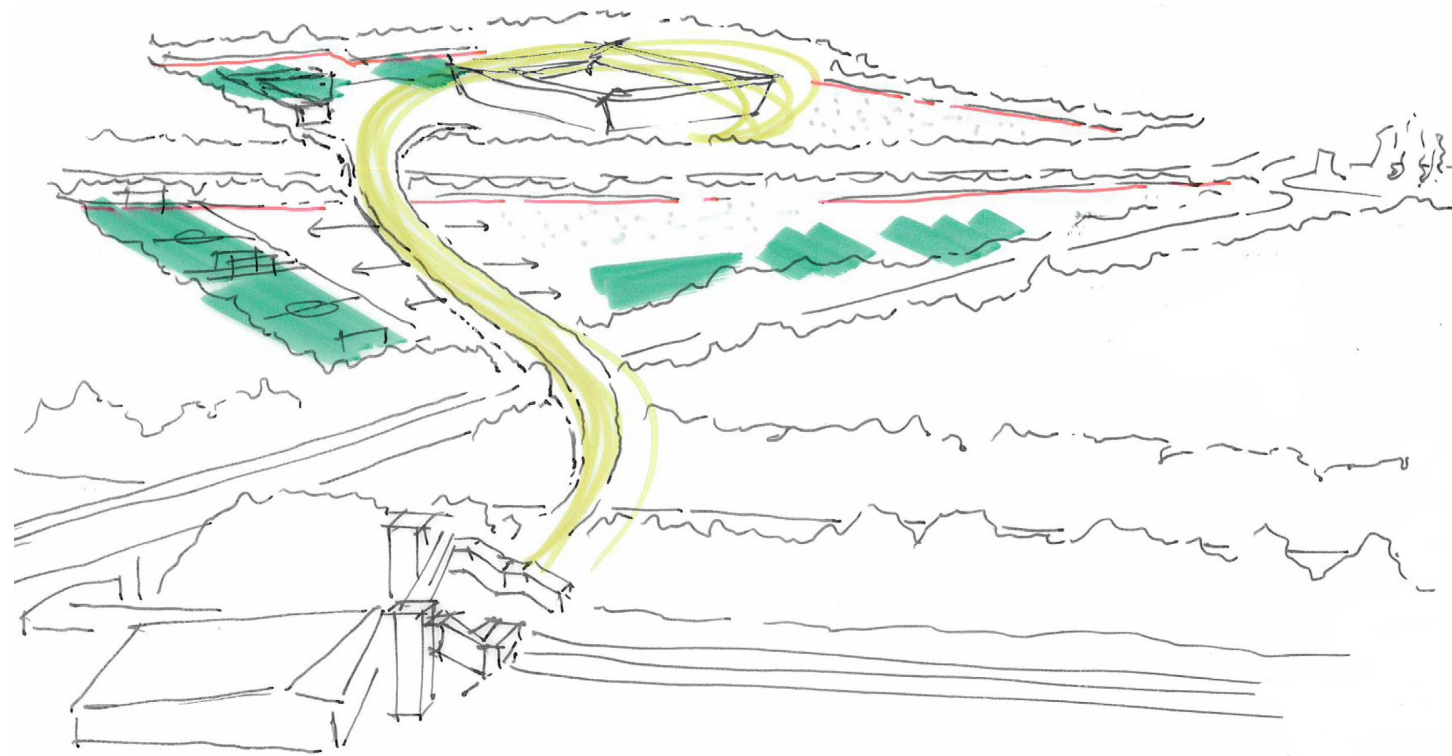


Figure 5.27





Design Development



Stratfield Brake Stadium  
Stage 0 Report - Strategic Definition

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## 6. Sustainability, Conservation & Reuse



## 6 Sustainability, Conservation & Reuse

### 6.1 Sustainable Options

A full report has been issued by Bioregional to read alongside our Stage 0 Report, titled "OUFC Stratfield Brake New Stadium Sustainability Guide" - October 2022.

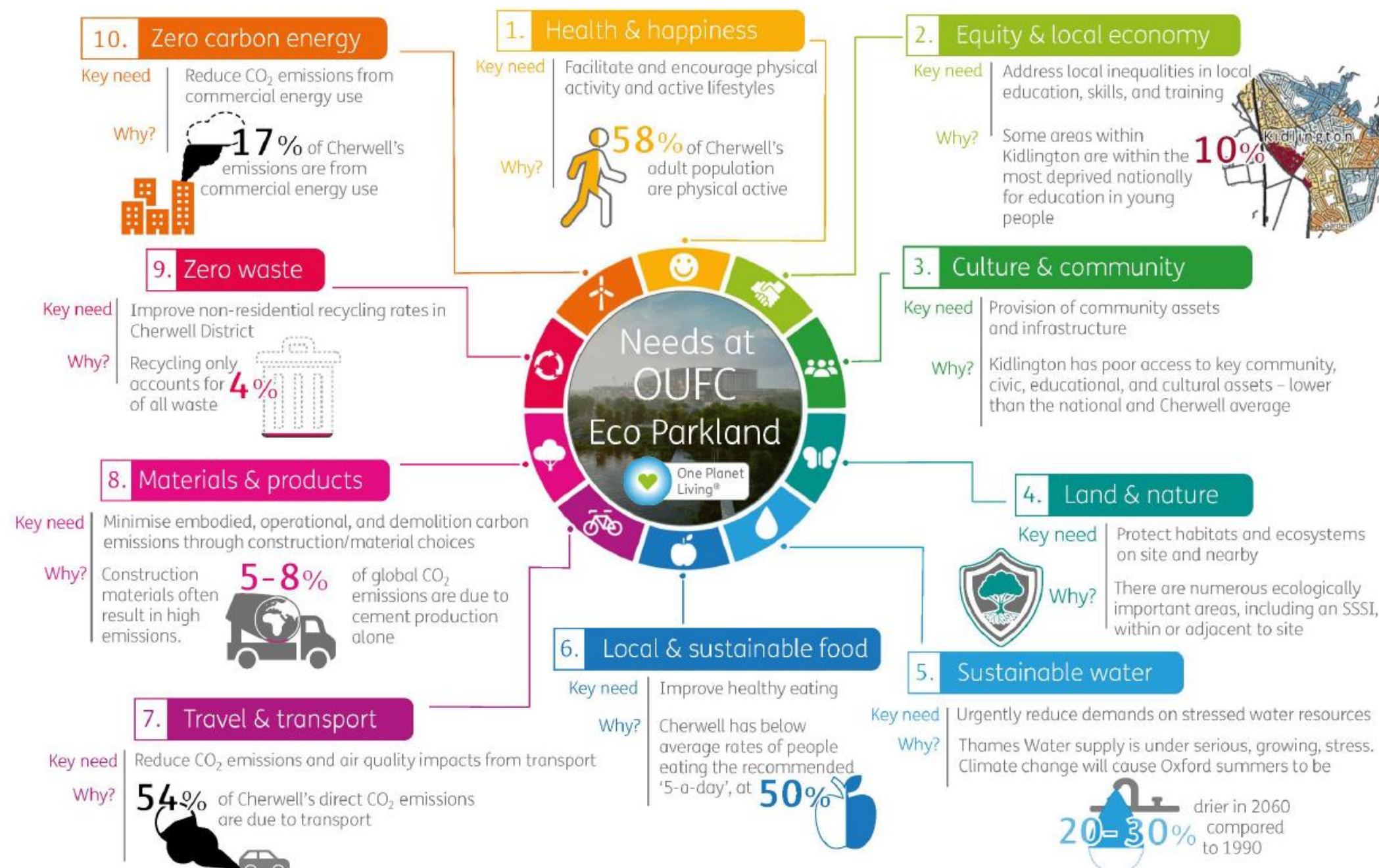
AFL have extensive experience designing sustainably focussed stadia. This diagram highlights the key sustainability strategies AFL will initially explore when developing the Oxford United scheme.

Our options include:

- MULTI-PURPOSE USE – Concerts, Community, Hospitality, Conference, Community, Retail, E Sports
- Digital Infrastructure – Future proofing
- Rainwater Harvesting – Toilets, Pitch
- Green/Blue Roof
- Operational
- Sustainable Materials – timber
- Recycled Materials – steel, plastic, rubber
- Renewables – PV, Ground source heating, air source heating, natural ventilation
- PTFE Roof – More natural light into terrace
- Waterless Urinals
- Increased Biodiversity
- LED lights
- Encouraged public transport and cycling
- Green Walls
- Super Insulated Fabric
- Waste – eco friendly cups, plates
- Locally Sourced Materials

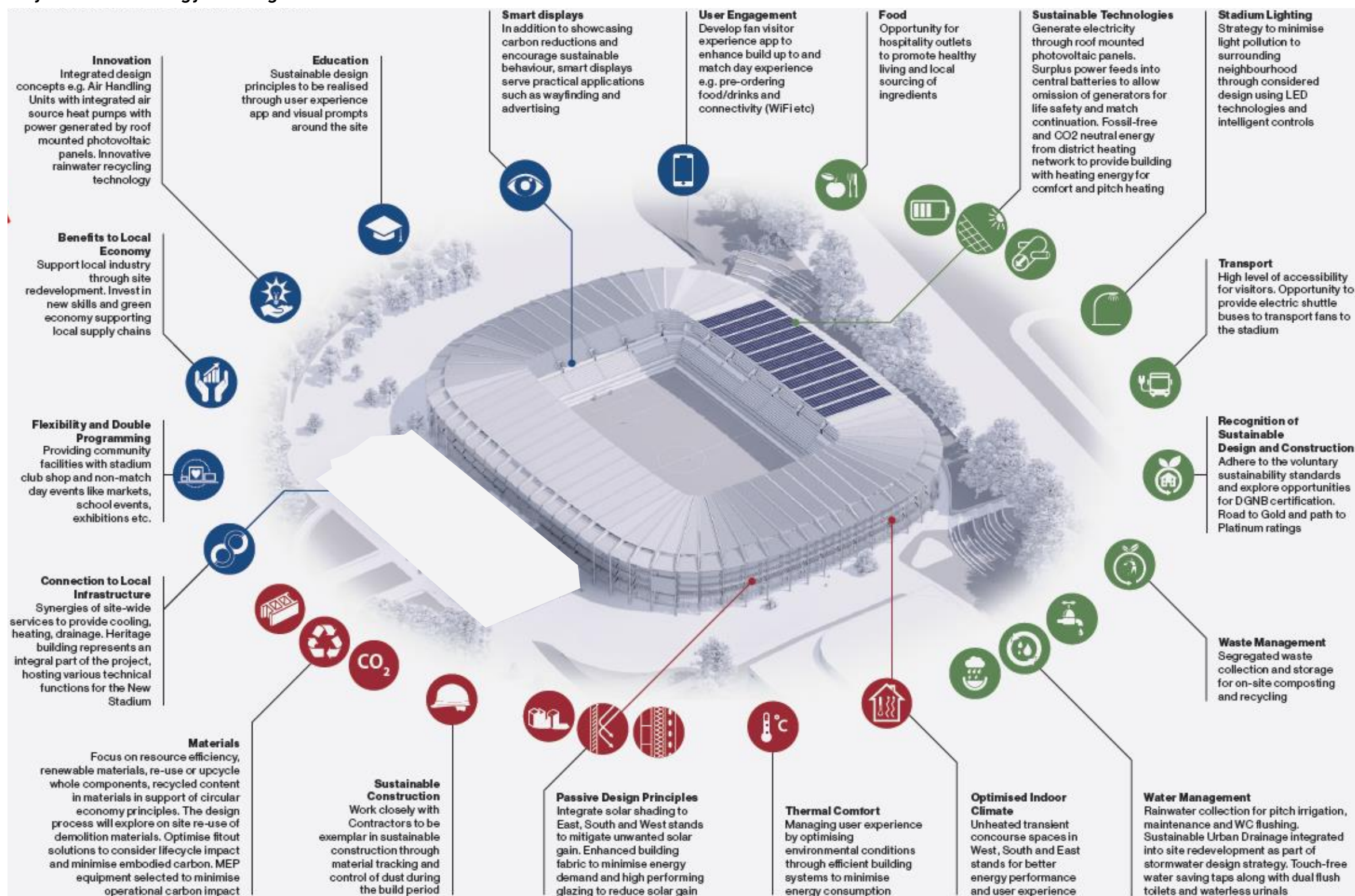
Figure 6.1 has been taken from BioRegional's report: 'Oxford United FC Sustainability Analysis 160322'.

Figure 6.1





## 6.2 Sustainability and Low Energy Strategies







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## 8. Next Steps





## 8 Next Steps

### 8.1 Stage 1 & 2 Design Development

#### 8.1.1 Stage 1- Preparation & Briefing

Period: 4-6 weeks

**Outcome: Project Brief approved by the client, and confirmed that it can be accommodated on the site.**

##### Core Tasks

- Prepare Project Brief including Project Outcomes and Sustainability Outcomes, Quality Aspirations and Spatial Requirements
- Undertake Feasibility Studies including the stadium site and the wider masterplan
- Agree Project Budget
- Source Site Information including Site Surveys
- Prepare Project Programme
- Prepare Project Execution Plan
- Source pre-application Planning Advice
- Initiate collation of health and safety Pre-construction Information

##### Information Exchanges

- Project Brief
- Feasibility Studies
- Site Information
- Project Budget
- Project Programme
- Procurement Strategy
- Responsibility Matrix
- Information Requirements

#### 8.1.2 Stage 2 - Concept Design

Period: 16 Weeks

**Outcome: Architectural Concept approved by the client and aligned to the Project Brief.**

##### Core Tasks

- Prepare Architectural Concept incorporating Strategic Engineering requirements and aligned to Cost Plan, Project Strategies and Outline Specification
- Develop wider masterplan
- Agree Project Brief Derogations
- Undertake Design Reviews with client and Project Stakeholders
- Prepare stage Design Programme

##### Core Statutory Processes

- Obtain pre-application Planning Advice
- Agree route to Building Regulations compliance

##### Information Exchanges

- Project Brief Derogations
- Concept Design Drawings
- Signed off Stage Report
- Project Strategies
- Outline Specification
- Cost Plan

#### 8.1.3 Stage 2+ Planning submission

Period: 4-6 Weeks

**Outcome: Submit Planning Application**

##### Core Tasks

- Prepare Planning documents
- Carry out all necessary environmental surveys (Note seasonally sensitive)

##### Core Statutory Processes

- Public Consultations
- Pre-application meeting(s)
- Submit outline Planning Application
- Computer Generated Images
- Planning Drawings
- Design and Access Statement
- Environmental Impact Assessment
- Other Planning documents
- Updated Cost Plan

## 8.2 OUFC Design Decisions

### Core Client Decisions Stage 1 - Preparation & Briefing

- Confirm if the main part of the Stratfield Brake site is to continue to be developed or instead move forward on an alternative nearby site that has been investigated separately at high level by some of this team.
- Agree mix of commercial facilities within overall masterplan
- Agree Extent of enabling infrastructure roads bridges etc.
- Agree potential phasing strategy/options for masterplan
- Agree project budget based on emerging business plan

### Main processes and actions for the client Stage 1

- Work through internal facilities mix for each venue based on operational function and commercial revenue.
- Input into the developing Business case
- Assist in the process of appointing a full design team ahead of Workstage 2

### Core Client Decisions Stage 2 - Concept Design

- If the outcome of Stage 1 included masterplan or briefing options, then at the very start of Stage 2 agree the choice of the option to progress.
- Following early presentations of Stage 2 design options presented for the built structures, agree the design option to progress in the finalisation of Stage 2.
- Sign off any variation in project budget based on developed business plan

### Main processes and actions for the Client at Stage 2

- Review costs against available project budget and agree any variations to the brief to achieve project budget.
- Fully engage in regular Design Team meetings and attend design workshops as required.





### 8.3 Stakeholder Engagement

There are several key stakeholders in the development of the wider masterplan.

- Oxford United FC's operational and sporting leads
- All potential development funding partners and landowners
- Chiltern Railways
- Network Rail
- Local Bus operators
- Police and Counter terrorism
- Cherwell District Council
- The Rugby, Football, Running and Cricket clubs located at Stratfield Brake - especially those that may be having facilities relocated or upgrades as part of the proposed development.
- Local Community Groups and residents
- Local Schools/Colleges and youth sports

### 8.4 Design Consultants Input

#### Stage 1 inputs

The existing consultants will continue in developing the Brief and outline approach to the Masterplan.

- Architect - AFL Architects
- Project Manager - Ridge
- Cost Planner - Ridge
- Planning - Ridge
- Transport - Ridge
- Sustainability - Bioregional
- Ecology - Ecology Solutions

#### Stage 2 inputs

For this workstage there will need to be a full Design Team in place. They will develop the overall masterplan concept along with the Stadium and associated development concept(s). In addition to the Stage 1 consultants above the following will be required:

- Structural & Civil Engineer
- MEP Engineer
- Fire Engineer
- Acoustic Consultant
- Specialist Architectural and Sports Lighting
- Facade engineer (optional depending on design approach)
- Catering Consultant
- Crowd Flow
- Accessibility and Inclusivity
- Waste Management
- Landscape Architect
- Network Rail advisor
- Sports Pitch advisor
- Community Engagement/Public Relations Specialist(s)

#### Stage 2+ inputs

As this is a continuation of the work carried out at Stage 2 the consultants will remain the same. However the Planning Consultant will take a lead on collating all the information required to submit a full planning application.





Architecture For Life





RIDGE

**RELOCATION OF OXFORD UNITED FOOTBALL CLUB, STRATFIELD BRAKE SPORTS GROUND**

October 2022

**Prepared for**

Oxford United Football Club  
Kassam Stadium  
Grenoble Road  
Littlemore, Oxford

**Prepared by**

Ridge and Partners LLP  
The Cowyards  
Blenheim Park  
Oxford Road  
Woodstock  
OX20 1QR

RIDGE

**RELOCATION OF  
OXFORD UNITED FOOTBALL CLUB,  
STRATFIELD BRAKE SPORTS GROUND**

**TRANSPORT OVERVIEW**  
October 2022



## VERSION CONTROL

[illegible]

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## EXECUTIVE SUMMARY

This report considers the baseline transport information available to Oxford United Football Club (OUFC) and Ridge and Partners LLP in preparation of proposals to relocate the OUFC Stadium to Stratfield Brake on the edge of Kidlington in Cherwell District.

There are a number of proposed infrastructure improvements planned in the vicinity of the site including works to Loop Farm Roundabout, Peartree Roundabout and Kidlington Roundabout. These works all include improvements for walking and cycling as well as highway capacity improvements and are expected to be in place prior to the Site at Stratfield Brake coming forward.

An OUFC stadium supporter survey undertaken in 2022 showed that currently a high proportion of supporters travel by car to matches, with 16.5% using buses and 6% using trains. When asked what their preferred method of travel to the proposed stadium would be, a much higher proportion stated train travel (31.8%) and Park and Ride with less stated they would travel by car. Postcode data from fan ticket sales shows the spread of where people are travelling in from, more analysis will determine what modes of travel would be available for fans from different locations and this will tailor the Match Day Travel Plan for the Site.

OUFC has the intention that 90% of fans will travel to the Site by sustainable modes, on this basis minimal car parking will be provided at the Site and a detailed transport strategy will be developed to get fans to the Stadium.

As part of this baseline study, discussions with both local bus and rail operators have been undertaken to discuss potential match day operations for the new stadium. These public transport operators are broadly supportive of proposals subject to further information as it comes forward. Further meetings will be required as proposals progress.

The Masterplan for the site is still being developed but is progressing on the basis of minimal car parking and an emphasis of walking, cycling and public transport use. This includes enhanced connections to Oxford Parkway and bus and coach stands on Site. EV charging is expected to comply to at least the Building Regulations Part S.

A sustainable Match Day Travel Plan will be developed as part of any planning application pack. This will reinforce the club's proposals to make up to 90% of the travel to the new club location by sustainable means. An initial draft is appended to this Report.

## 1. INTRODUCTION

- 1.1.1. Ridge & Partners LLP has been commissioned by Oxford United Football Club (OUFC) to provide transport planning consultancy services to support the submission of a Planning Application for the relocation of Oxford United Football Club to the land at Stratfield Brake on the edge of Kidlington in Cherwell District.
- 1.1.2. As a first stage Ridge have compiled a report covering what information is available now to inform the emerging design and pre-application process.
- 1.1.3. This Report is structured as follows;
  - Chapter 2 provides a summary of the relevant policies from the NPPF (2021) and Local Authority in relation to the proposed development Site;
  - Chapter 3 summarises the previous studies undertaken by OUFC;
  - Chapter 4 considers proposed infrastructure improvements in the study area;
  - Chapter 5 details what OUFC data is available to the study;
  - Chapter 6 sets out recent consultations and meetings with public transport operators and stakeholders;
  - Chapter 7 considers the emerging Masterplan;
  - Chapter 8 summarises relevant case studies and
  - Chapter 9 summarises the findings.



## 2. POLICY REVIEW

### 2.1. Oxfordshire Parking Policy

2.1.1. **Policy T7: Parking states:** Local Development Documents and Local Transport Plans should, in combination:

- adopt restraint-based maximum levels of parking provision for non-residential developments, linked to an integrated programme of public transport and accessibility improvements;
- Set maximum parking standards for B1 land uses within the range 1:30m<sup>2</sup> and 1:100m<sup>2</sup>;
- Set maximum parking standards for other non-residential land uses in line with PPG13, reducing provision below this in locations with good public transport.

2.1.2. This is the current policy position, but it is now several years out of date, and we expect it to be replaced in the coming months (see below).

### 2.2. Working Draft: Parking Standards for New Development (May 2022)

2.2.1. This parking standards draft document has been prepared to outline OCC's approach to parking at new developments. It is to be used to help determine the level of parking at new developments and provide the basis for the County Council's advice to the local planning authorities on development proposals and the soundness of policies related to parking for new developments.

2.2.2. This document replaces OCC's previous parking guidance "Transport for New Developments Parking Standards for New Residential Developments" dated December 2011.

2.2.3. Determining the parking demand for non-residential developments within Oxfordshire has been revised to accord with the council's objective to reduce 25% of car trips by 2030, and 33% by 2040. In essence, the approach being taken for such development proposals is that if on-site parking is restricted / reduced at a destination location this will influence people's travel behaviour and encourage alternative modes of travel to be used rather than that of the private car. The increase in commuters choosing to work from home more often throughout the working week has also influenced OCC in implementing this approach.

2.2.4. **Table 1** sets out OCC's standards on vehicular and cycle parking requirements by land-use class as set out in the Town and Country Planning (Use Classes) Order 1987 as amended up to 2021.

*Table 1: Non – Residential Parking Guidance for Oxfordshire*

Landuse	Vehicle standard	cycle parking standard
Hotels	1 space per bedroom	1 space per 5 car parking space provided
Commercial area	1 space per 20m <sup>2</sup>	1 space per 100m <sup>2</sup> for staff and 1 space per 100sqm for customers.
Outdoor sport/recreation area	1 space per 20sqm of public area	1 space per 100m <sup>2</sup> for staff and 1 space per 100sqm for customers.

2.2.5. For car parking, this table sets out the expected upper limit of provision that may be acceptable once the steps detailed in section 2.2.5 have been undertaken to establish the appropriate quantum as related to the development-specific criteria. However, should the assessment described in section 2.2.5 identify a smaller quantum of provision, this should take precedence over the numbers identified in **Table 1**.

2.2.6. The land use will mean that the amount of commercial / employment vehicle parking will vary per development site. The level of parking should be based on the following criteria:

- a) The development's land use,
- b) Trip rate associated with the development (including base and forecast mode share (also considered as part of OCC's Decide and Provide approach),
- c) Oxfordshire County Council car trip and local cycling targets; and
- d) The user group of employees / visitors of the site (including shift patterns).

2.2.7. At the time of writing this document is in draft but is expected to go to Oxfordshire's cabinet for approval Quarter 4 of 2022. It could be adopted policy by the time a planning application is prepared.

2.2.8. If the above standards are applied to the emerging Masterplan, then the proposed Hotel will need one space per bedroom and the Outdoor Sports and Recreation Area will require 1 space per 20m<sup>2</sup> of Public Area.

### 2.3. Oxford City - Car and Bicycle Parking Technical Advice Note

2.3.1. Although the proposed Site is within Cherwell District Council it is very close to the boundary with Oxford City Council, and we expect them to take an interest in the planning application. For reference we have included Oxford City's parking policy which is more putative towards car drivers and seeks to reduce car use within the City boundaries.

2.3.2. A Car and Bicycle Parking Technical Advice Note was published in March 2022 and provides further guidance for Policy M3: 'Motor Vehicle Parking' and M5: 'Bicycle Parking' of the Oxford Local Plan 2036.

2.3.3. The parking requirements for all non-residential development, whether expansions of floorspace on existing sites, the redevelopment of existing or cleared sites, or new non- residential development on new sites, will be determined in the light of the submitted Transport Assessment or Travel Plan, which must take into account the objectives of this Plan to promote and achieve a shift towards sustainable modes of travel. **The presumption will be that vehicle parking will be kept to the minimum necessary to ensure the successful functioning of the development.**

2.3.4. In the case of the redevelopment of an existing or previously cleared site, there should be no net increase in parking on the site from the previous level and the Council will seek a reduction where there is good accessibility to a range of facilities.

2.3.5. Where the proposal is for the expansion of an existing operation on an existing large site, a comprehensive travel plan should be submitted that looks at the development in the context of the whole site and demonstrates that opportunities will be sought to enhance and promote more



sustainable travel to and from the wider site. The Travel Plan will be kept under review to ensure that future opportunities to encourage a shift towards sustainable modes of travel are taken.

- 2.3.6. Access to a regular form of public transport is one of the determining factors in assessing whether a development will need to be car free. Good access to a regular form of public transport is considered to be a minimum of four buses per hour (per direction) during weekday daytimes (06.00-18.00). The development should be within 400m of the bus stops for these public transport services. This measurement should be taken from the centre of the development site and measured via publicly accessible footways to the stop. The development should also be within 800m of a local supermarket or equivalent facility.
- 2.3.7. Where the development is located within 400m of public transport offering a 15 minute or more frequent service, and within 800m walk of a local supermarket or equivalent facilities (as defined above), vehicular staff parking spaces should **aspire to be zero**. Any parking provided should be targeted to that required for operational staff; and visitor parking in city and district centre locations should aspire to be zero.
- 2.3.8. The Cycle Parking Standards are shown in **Table 2**.

Table 2: Cycle Parking Standards Oxford City Council

Landuse	Cycle parking standard
Hotels	1 space per 5 non-resident staff Plus 1 space per resident staff
Commercial area	1 space per 90m <sup>2</sup> or 1 space per 5 staff/public floor area.
Places of assembly including stadiums and concert halls	4 spaces per 10 seats up to 1000 seats and 1 space per 100 thereafter

- 2.3.9. These align with the current adopted standards. For new non-residential development, the City Council will seek the provision of showers and changing facilities in accordance with the minimum standards set out in the Local Plan 2036 and summarised in **Table 2**.

## 2.4. Oxford LCWIP (V1.1 February 2022)

- 2.4.1. The initial version of the LCWIP was published in March 2020 and approved by the Council cabinet. This has since been updated to Version 1.1 with improvements on layout and design and Annexes 1 (Cycle and walking network map) and 2 (List of Oxford LCWIP policies).
- 2.4.2. Oxford Local Cycling and Walking Infrastructure Plan (LCWIP) sets out a series of measures and programmes to achieve a transformational change in the levels of cycling and the attractiveness of walking in Oxford.
- 2.4.3. The cycling section identifies 2 targets to increase both commuter cycling and all cycling trips in Oxford by 50% by 2031. **Policy OC1:** OCC will plan for 38% of all Oxford to Oxford work journeys to be by bicycle by 2031. **Policy OC2:** OCC will plan for a 50% increase in all cycle journeys within Oxford for all purposes by 2031.

- 2.4.4. **Policy OC3:** OCC will plan Oxford's cycle and road network in line with OC1 & OC2 targets. This will mean for instance factoring in the increase of cycling in the allocation of road and junction space, when modelling traffic for road improvements, designing widths of cycle paths and calculations of cycle parking numbers at cycling destinations.
- 2.4.5. There are five broad factors which may be important in promoting cycling:
1. a town-wide cycle network,
  2. a cycle friendly public realm,
  3. traffic restraint,
  4. a cultural norm of cycling and
  5. Council commitment
- 2.4.6. The LCWIP sets out eight pillars fundamental to achieving a step change in cycling and walking in Oxford in terms of infrastructure. The five most relevant to cycling are pillars;
- A comprehensive cycle network),
  - Low traffic neighbourhoods
  - City centre control points
  - Workplace levy charge and
  - Traffic speed enforcement
- 2.4.7. **Policy OC6:** Whilst Oxford City Centre will remain the main focus for cycle routes, OCC will also prioritise cycle routes to workplaces and shopping centres outside the city centre. OCC will seek to ensure that adequate and convenient cycle parking is available at these locations.
- 2.4.8. **Policy OC23:** OCC will work with Oxford City Council and other districts to ensure that there are comprehensive cycle parking conditions and advice in planning guidance to ensure all new developments include sufficient, secure and convenient cycle parking.
- 2.4.9. Oxford is in the top 10 local authorities in terms of the percentage of people walking at least weekly. This is mainly because of its high levels of utility walking with 35% of adults making a walk trip at least 5 times a week.
- 2.4.10. Pedestrian audits identified a list of city centre public realm improvements. Improvement proposals were also identified for the four local shopping centres – Cowley Centre, Headington, Cowley Road and Summertown. It sets out walking design policies, including design policies for the extension of controlled parking zones to ensure that they enhance walking by removing obstructive parking from footways.
- 2.4.11. **Policy OW3:** OCC will review city centre streets in terms of Equality Analysis (EA) guidance, such as Inclusive Mobility guidance, particularly the need to provide smooth connected surfacing for wheelchair users and people with visual problems and seating for the elderly or disabled.
- 2.4.12. **Policy OW13:** Footway widths will not be narrowed below 2 metres.
- 2.4.13. **Policy OW15:** Crossings: OCC will consider the crossing needs of pedestrians on main roads to minimise delay or diversion and to satisfy existing or potential flows. The crossings will be designed as far as possible on desire lines to avoid diversion and delay.



## Emerging Policy

### 2.5. Central Oxfordshire Travel Plan

- 2.5.1. The Central Oxfordshire Travel Plan has been developed as part of the countywide Local Transport and Connectivity Plan (LTCP). The LTCP sets a clear vision to deliver a net-zero transport system that enables Oxfordshire to thrive, protects the environment and makes the county a better place to live for all residents.
- 2.5.2. In particular, it looks at options that re-allocate the limited road space we have to create a place where buses are fast, affordable, and reliable; where people can walk and cycle in pleasant and safe environments; and where high polluting, unnecessary, individual car journeys take a back seat.
- 2.5.3. The strategy is shaped by a number of defined outcomes. These outcomes represent a set of guiding transport and movement principles, which inform and run throughout the strategy. The outcomes are:
- A flagship comprehensive zero emission bus network
  - A comprehensive, safe, inclusive cycle network
  - Beautifully designed streets and public spaces, with clean air
  - A reduced impact of private vehicles, where roads are congestion-free for residents, visitors, and businesses to make essential journeys in zero emission vehicles
  - Carbon neutral transport for a carbon neutral city
  - A travel hierarchy prioritising sustainable travel and promoting 20-minute neighbourhoods
  - Improved safety realised through a Vision Zero approach to transport safety across the area and
  - An inclusive transport network that improves accessibility for all of our residents.
- 2.5.4. Various actions have been proposed including:
- **Action 8** – Deliver a central Oxfordshire cycle network, consistent with the Oxfordshire Strategic Active Travel Network and the latest LCWIP plans.
  - **Action 10** – To help meet Vision Zero, deliver junction improvements for active travel users
  - **Action 11** – Increased cycle parking at key destinations including for non-standard bikes. A public hire cycle scheme including e-bikes, and which could also include e-scooter provision.
  - **Action 12** – Deliver bus priority measures along key inter-urban bus routes and on key orbital routes in the Oxford area which includes A44 improvements near the Site.
- 2.5.5. At the time of writing the Central Oxfordshire Travel Plan is out to consultation but we expect that it will be adopted later this year. It is likely to be material for consideration by the time we submit a planning application.

## 3. PREVIOUS STUDIES, EXISTING CONDITIONS & CONSULTATIONS

### 3.1. Oxford United Football Club Relocation (ALP – 2021)

- 3.1.1. ALP on behalf of Oxford United FC in relation to the potential relocation of the football clubs' ground and associated facilities did a high high-level appraisal of the suitability of the Site along with land between Frieze Way and Oxford Road for ancillary use with regards to:
- Access;
  - Highway safety;
  - Access by sustainable modes; and
  - The impact on the local highway network.
- 3.1.2. The report proposes a four-arm signalised junction arrangement is most suitable to serve as site access to both parcels of developable land east and west of the A4260 given the traffic volume expected along with an emergency secondary access to the south of the site. A toucan crossing on the Frieze way along with a pedestrian bridge over A4260 Frieze Way to the north to access the Oxford Parkway Station is proposed.
- 3.1.3. Further work is proposed on Oxford Road between the site and Parkway Station.
- 3.1.4. In terms of safety no major accident issues were identified within the vicinity of the Site. Prevalence on the A4260 Oxford Road (northern arm) approach to the junction and slight cluster of accidents on Oxford Road, just south of the A34 / Railway Line overbridge may need to be investigated in more detail.
- 3.1.5. Oxford Parkway Station is located approximately 450m south east of the proposed Stadium site, which makes it a distance conducive for completing the journey on foot between the two facilities. The station lies on National Cycle Network Route 51 which links Oxford to Bicester and further East.
- 3.1.6. Existing bus stops are located on the Oxford Road corridor in the vicinity of the train station and within the Park and Ride side of the station itself. The Park and Ride currently provides a 30 minute frequency service (Saturdays) between Woodstock and Oxford City Centre in each direction calling at Oxford Parkway Station.
- 3.1.7. The bus stops on Oxford Road serve a number of routes, with those of particular prevalence including the 2/2b service between Oxford City Centre and Kidlington (operated by Stagecoach), and the S5 Gold service between Bicester and Oxford City Centre (also operated by Stagecoach). In total, the various bus services calling at these stops, provide a general frequency of a bus every 5 minutes in each direction along the Oxford Road corridor.
- 3.1.8. In other words the site is served with very good public transportation and cycle routes.
- 3.1.9. The existing traffic flows on Frieze Way (2017 peak hour two way 1,339) are not particularly high for a dual carriageway section of road. Typically no OUFC events take place during the traditional highway network peak periods of 07:00-10:00 and 16:00-19:00 weekdays (although noting that arrivals for midweek matches are likely to stray somewhat into the latter sections of that PM peak period).



- 3.1.10. Some of the work undertaken in this previous study is helpful from a background transport position and will help to inform work to be progressed at Stratfield Break.

### 3.2. Current Parking at Rugby Club

- 3.2.1. The Site is currently occupied by Stratfield Brake Sports Club which is a community sports facilities and has two cricket grounds, four rugby pitches, a mixture of different size football pitches, large area of open public space and a function room. The Site has approximately 116 parking spaces including 4 accessible spaces.
- 3.2.2. As a minimum we should be trying to re-provide the parking for the rugby club element with the re-provision of pitches at the Stratfield Break site.

## 4. PROPOSED INFRASTRUCTURE IMPROVEMENTS

### 4.1. A44 Corridor

- 4.1.1. There are plans to improve the network along with junction for the A44 corridor. This includes Loop Farm Roundabout, Peartree Roundabout and Kidlington Roundabout.
- 4.1.2. At the time of writing these works have started and are ongoing. They will be in place prior to the Site at Stratfield Break coming forward.
- 4.1.3. **Loop Farm roundabout to Cassington** improvement work was started August 2022. The scheme will introduce shared 4m wide footway/cycle way on one approach and 2m wide footway on the other approach between the two roundabouts. A bus lane is also proposed. These improvements will improve sustainable travel to the Site.
- 4.1.4. **Peartree Interchange to Loop Farm Roundabout** improvement work was started in June 2022. The scheme involves signalling all approaches and increasing circulatory lanes, installing pedestrian crossings on southbound off slip and A44 Woodstock Road. There will be shared pedestrian and cyclist facility to have better connectivity between the A44 approaches. This will improve the capacity of the junction along with improving pedestrian and cyclist access to the P&R.
- 4.1.5. Signal controlled crossing will be provided on Frieze Way and westbound A44 Woodstock approaches at Loop Farm Roundabout along with shared pedestrian and cyclist facility to have better connectivity between the A44 approaches.
- 4.1.6. **Kidlington Roundabout** improvement work started in June 2022. The scheme involves signalling all approaches of the roundabout to improve capacity, signal controlled crossings on Frieze Way, Oxford Road and Bicester Road approaches and extending the shared cycleways on Oxford Road and Bicester Road to improve sustainable travel. This will also improve the pedestrian and cycle link between the Site and Oxford Parkway Station and P&R.



## 5. OUFC DATA AVAILABLE TO THE PROJECT

### 5.1. OUFC Travel Survey – July 2022

- 5.1.1. OUFC stadium supporter survey of travel patterns and mode share was carried out on 20<sup>th</sup> July 2022. A total of 1766 persons responded. The results are summarised in this section of the Report.
- 5.1.2. The current travel patterns to Kassam Stadium on match days showed a high percentage of travel by car (58.8%) with low percentage of users using sustainable modes, for example; 16.5% of people used bus services and 6.0% use train services. The P&R use was very low at 1.6%. The full split of data is shown in **Table 3** below.

Table 3: Method of Current Travel Mode

Mode	Responses	Percentage %
On Foot	160	9.1
Car	1,038	58.8
Motorcycle	14	0.8
Bicycle	56	3.2
Bus	292	16.5
Train	106	6.0
Taxi	44	2.5
Park and Ride	29	1.6
Other	27	1.5
Total	1,766	

- 5.1.3. People were also asked ‘How do you think you would travel to Stratfield Brake on match days’. The response is detailed in **Table 4**.

Table 4: Method of preferred Travel Mode to proposed stadium

Mode	Responses	Percentage
On Foot	71	5.9
Car	391	32.3
Motorcycle	6	0.5
Bicycle	47	3.9
Bus	152	12.6
Train (Parkway)	384	31.8
Train (Other)	14	1.2
Taxi	8	0.7
Park and Ride	74	6.1
Other	62	5.1
Total	1,209	

- 5.1.4. There was a high increase in travelling by train to 31.8% (using Oxford Parkway due to its proximity) but a slight decrease in travelling by bus to 12.6%. Overall, there is a large decrease in car travel but 32.3% still responded that they would travel by car. Use of Park and Ride is also

higher at 6.1% compared to current use due to proximity of Park and Ride site, it is expected that these respondents would use Oxford Parkway P&R.

- 5.1.5. In response to encouraging sustainable travel **Table 5** showed that large proportion of the respondents favoured better foot and cycle access from Oxford Parkway, bus and rail passes, provision of direct coach and bus service and P&R scheme from Oxford City Centre.

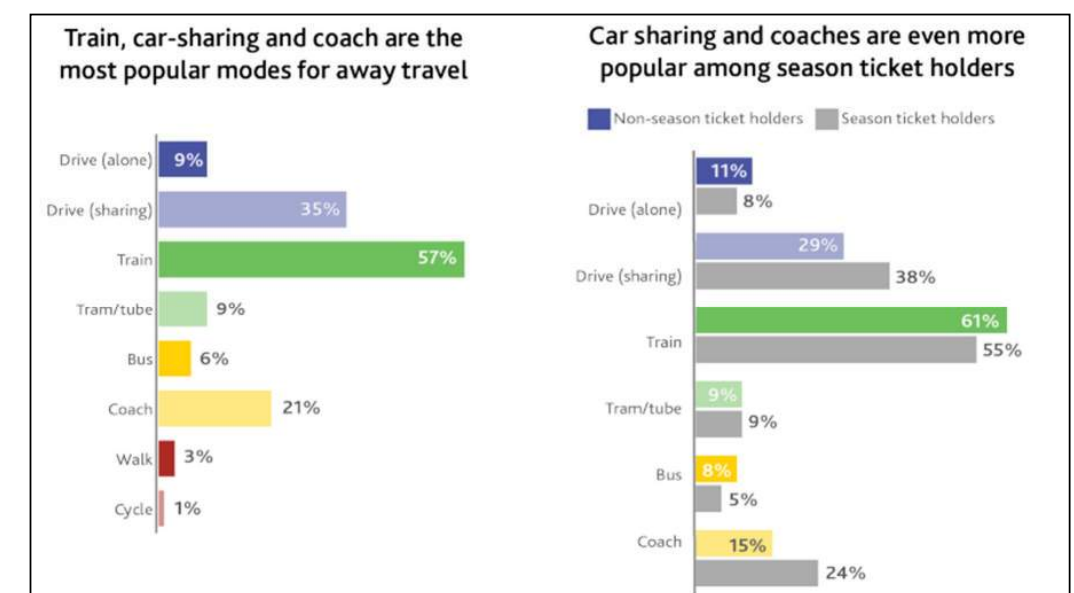
Table 5: Method to encourage Sustainable Mode Share

MODE	RESPONSE	PERCENTAGE
P&R scheme running from Oxford City Centre	622	51.7%
Direct foot & cycle routes from Oxford Parkway Rail Station	796	66.1%
Matchday rail and bus travel passes	736	62.0%
Dedicated secure cycle storage sheds outside the Stadium	432	35.9%
Provision of regular direct coach and bus services delivered with our transport partners	694	57.6%
Other (please specify)	180	15.0%

### 5.2. The Campaign for Better Transport – ‘Door to Turnstile’ Study

- 5.2.1. The Campaign for Better Transport have previously undertaken studies of ‘door to turnstile’ travel patterns of football fans across the leagues and importantly have surveyed modal choice among fans. These are shown in the **Figure 1** below.

Figure 1: Typical Travel Modal Choices of Football Fans



- 5.2.2. Car user proportion at the current stadium is lower than in this study for home fans. However, the proportion of away fans using cars is lower. There is also a high proportion of away fans using coaches compared to home fans.



- 5.2.3. The study showed that among season ticket holders, the proportion who take the coach when attending away games is almost one in four, while three-quarters of fans who say they go by coach to away matches hold a season ticket.

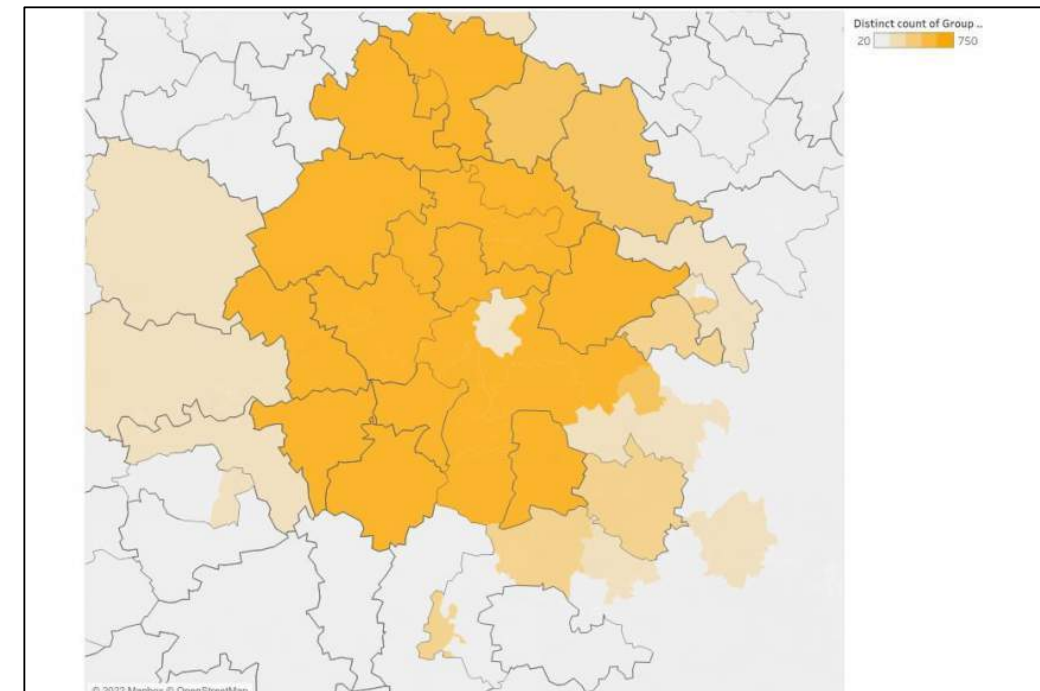
### 5.3. OUFC Bus Information – September 2022

- 5.3.1. As part of the data collection exercise, OUFC, has provided the following information of bus and coach use at the Kassam Stadium. This will form the basis of factoring up bus use for the proposed site.
- 5.3.2. Three special bus services operate during match days at different times depending on kick off times. OX2 service connects Didcot, Steventon, Drayton, Abingdon and the Kassam Stadium on all Oxford United home league match days. OX3 service connects Carterton, Brize Norton, Curbridge, Witney, Eynsham, Botley and Kassam Stadium. OX7 service connects Kassam Stadium, Cowley, Hollow Way, Headington Shops, Marston, Summertown and Kidlington.
- 5.3.3. Mick Brown at OUFC has advised the following. Over the last seven matches from last season and the away supporter coach numbers were as follows:
- |   |                     |                                 |
|---|---------------------|---------------------------------|
| ▪ | Doncaster Rovers    | 4                               |
| ▪ | MK Dons             | 4                               |
| ▪ | Sunderland          | 10 [had been told to expect 15] |
| ▪ | Cambridge United    | 1                               |
| ▪ | Bolton Wanderers    | 5                               |
| ▪ | Portsmouth          | 4                               |
| ▪ | Sheffield Wednesday | 8                               |
- 5.3.4. As a next step it has been suggested that we ask Reading FC about the numbers of coaches that they get as the closest Championship team to us [26 miles away] as that would also give an idea of requirements in the higher league.
- 5.3.5. In addition, there are three double decker buses every home match for Oxford Supporters from various parts of the county and occasionally a coach or two from community groups / boys & girls teams from Oxfordshire.
- 5.3.6. While OUFC support mini-buses, they do not accurately keep records of these for the various matches. It would be helpful if this data could be collected over the next few home games.
- 5.3.7. The away team always bring at least one team coach with bigger clubs two. During the height of Covid two team coaches was the norm. The away team also has a kit van as does the home team, so they need to be taken into account.

### 5.4. Postcode Data

- 5.4.1. OUFC provided postcode data from fan ticket sales, **Figure 2** shows the local spread within Oxfordshire.

Figure 2: Fan location by postcode within Oxfordshire



- 5.4.2. This data requires some further detailed analysis to consider what modes of travel would be available to the various fans from different locations across the city, county and further afield.



## 6. RECENT CONSULTATIONS WITH PUBLIC TRANSPORT OPERATORS

### 6.1. Oxford Bus Company

6.1.1. A meeting took place with the Oxford Bus Company on the 2<sup>nd</sup> of September 2022. At this meeting OUFC and Ridge set out the current proposals for the Site at Kidlington versus the current site at the Kassam. The Oxford Bus Company already provide some services to OUFC on match days. The following points were raised and discussed and noted for further action as the proposals proceed:

- We picked up on the Central Oxfordshire Transport Plan (see above) and the impact this would have on bus routes around Oxford and ring road linking Redbridge to Oxford Parkway.
- The Oxford Bus Company have agreed with Oxfordshire to reinvest any spare bus released by traffic / bus priority improvements around Oxford to the pump priming on new services. This includes a ring road service that will terminate at Oxford Parkway with the intention longer term of serving Kidlington. This bus route could longer term (subject to funding) operate every 10 minutes on a turn up and go basis.
- It was agreed that OUFC and Ridge would look at the provision of bus stops within the Masterplan for match days. (Numbers to be confirmed). This should be a mixture of stands and stops.
- We discussed the option to use Oxford Parkway for pick up after the match if that assisted design and capacity (and bus journey times).
- Joint ticketing was discussed with the Oxford Smart Ticket Zone, plus bus etc to work up a system similar to Magpie Movers operated by Newcastle United FC.
- It was agreed that the Oxford Bus Company would look at this within the Advanced partnership with other operators and OCC.
- It was agreed that OUFC and Ridge would look at fan postcode data in terms of heat map for services.

6.1.2. Generally the Oxford Bus Company are supportive of the proposals subject to further information when it becomes available. It was agreed that further meetings would be arranged once proposals progress.

### 6.2. Chiltern Railways

6.2.1. A meeting took place with Chiltern Railways on the 6<sup>th</sup> on September 2022. At this meeting OUFC and Ridge set out the current proposals for the Site in relation to Oxford Parkway railway station. The following points were raised and discussed and noted for further action as the proposals proceed:

- A pedestrian flow exercise will be required given the current layout of Oxford Parkway and any proposals for bridges or additional connections / entrances.
- An understanding of potential passenger numbers split north and south is needed but it was noted this depends to an extent on away fans / forecasting.
- Chiltern noted that their standard turbostar trains can accommodate around 200 passengers per train, so an idea of numbers allows them to consider train length and the requirement for charter trains.
- Passenger numbers will also allow Chiltern to forecast the required number of staff for ticket checks, gate lines and management within the station as they do at Wembley.

- It was noted that there is no British Transport Police presence at Oxford Parkway so we may need to consider this on match days as well as local police presence.
- We touched on the possibility of a bridge and making the station double fronted. Although a larger piece for Network Rail, Chiltern noted that a second entrance would need a second gate line which has an operating cost to them at the TOC.
- Chiltern raised queuing space and holding areas after a match given the current layout of Oxford Parkway. It was noted that OUFC could manage this on site and release fans as required or design in waiting areas.
- Chiltern raised station facilities and waiting areas / shelters as these have not been designed to cope with a higher level of demand. It was noted that a S106 contribution may be required.
- The number of away fans would need to be confirmed but is considered to be circa 2,500 at this stage. It is noted that is club dependent with London Clubs potentially being higher.
- Chiltern agreed to get their team that deal with Wembley events involved in further discussions. It was noted there may be some overlap of fixtures and events that would need careful planning.
- We briefly touched on ticketing and subsidising fans tickets as per Magpie Movers. Chiltern noted that we could look at this further and there are several options potentially available.

6.2.2. Generally Chiltern Railways were supportive of the proposals subject to further information when it becomes available. It was agreed that further meetings would be arranged once proposals progress and OUFC have a clearer understanding of the potential passenger numbers that Chiltern will need to consider.

### 6.3. The Traffic Management Company

6.3.1. A meeting took place with The Traffic Management Company on Friday the 30<sup>th</sup> of September 2022. The Traffic Management Company currently handle match day operations for OUFC and had the following points on the proposals for the new Site at Stratfield Break at Kidlington:

- They explained how TMC manage the current operations at the Kassam and what does and does not work.
- TMC would prefer any car park to have multiple entrances, so it is easier to manage flow. As a minimum they consider around 200 spaces are required for accessible use and VIP, although accept that parking needs to be kept to a minimum.
- We also need to consider home and away team players buses and how we deal with these at the correct changing room entrance.
- TMC consider that P&Rs are good and that we could utilise them better with the correct connecting bus services and pedestrian connections to Oxford Parkway.
- They picked up on the issue of offsite parking and we discussed the likely TROs required in Kidlington. It was agreed that this could be discussed further with OCC as part of the planning process.
- TMC are concerned about some of the local highway capacity but noted that they could manage this under traffic management powers during match days, with dedicated lanes etc. The same applied to management of the A4260.
- A pedestrian bridge would be welcomed to help with movement of fans and remove the need to manually override and operate pedestrian crossings (at grade).



- It was noted that fans had a poor compliance record re parking at the Kassam, so we need to get the travel plan right from day one.
- The segregation of home and away fans was discussed at length and the need for separate loading and unloading points for fans.
- The league above OUFC have at least 20 away match coaches a game so we need to plan for those levels as a minimum.
- We touched on the requirement for bus stops and stands as well as coach parking and the need for segregation between the two to make it clear what was local services and match day coaches.
- Finally, TMC requested an office for management staff is required, this needs external doors onto the fan area so that they do not have to go around via the Stadium.

6.3.2. It was agreed that The Traffic Management Company would be involved further in the design process as the Masterplan evolves to ensure the Site is manageable from their perspective on a match day.

6.4. Oxbotica

6.4.1. A meeting took place between Ridge and Partners, OUFC and Oxbotica on Thursday the 6<sup>th</sup> of October 2022. Oxbotica are developing and operating various autonomous vehicles around Oxfordshire including at Milton Park. OUFC are keen to explore the possibilities of using autonomous vehicles for various short connecting trips to the Site in the first instance for example connections to Oxford Parkway or Peartree Park and Ride. The following points were discussed:

- The team at Oxbotica explained their current operations and how their vehicles could work in the context of Stratfield Break and the surrounding area.
- OUFC set out what the initial thoughts were in terms of connecting services but was also keen to understand the bigger picture.
- We discussed the requirements in terms of what the vehicles needed to operate, design widths etc, an area for storage and charging and low carbon nature of the electric vehicle fleet.
- It was agreed that Oxbotica and OUFC would explore a strategic partnership on the basis that this site could offer a northern hub location for Oxford.

6.4.2. Oxbotica are supportive of the proposals and can see the benefits of working with OUFC. It was agreed that further meetings would be arranged once proposals progress.

7. EMERGING MASTERPLAN

7.1.1. At the time of writing a number of Masterplan options are being considered for the Site. In order to assist with the Master Planning exercise, we have considered the relevant parking standards and looked at providing minimal parking at the site in order to coerce sustainable modes of travel. **Table 6** below table is based on the parking standards set out above in Table 1.

Table 6: Proposed Parking Provision (Draft for Discussion)

LAND USE	CAR PARKING STANDARD	CYCLE PARKING STANDARD	CAR PARKING PROPOSED	CYCLE PARKING PROPOSED
Rugby Club *	-	-	46 + Spectators and Staff	10 (Reprovision of Existing)
Stadium	1,260	504	63 (5% of Standard)	720
TOTAL	1,260	504	109	730

Notes: Stadium 18,000 seats. Arena 3,500 Capacity. Therefore: Car parking disabled requirement is 5% of total spaces, assume standard then 5%. Cycling - Fans survey suggests 4% future mode share cycling.

7.1.2. EV charging is expected to comply to at least the Building Regulations Part S (1 in 10 spaces being active with a further 20% being passive ready for a later installation). Based on the above this would be a minimum of 66 spaces with active charging. It is noted that Oxford City Council have a 25% active standard, this site is within Cherwell District, but it may be prudent to adopt the slightly higher standard at this location.

7.1.3. The current parking provision at Park and Ride sites in Oxford is set out in **Table 7**.

Table 7: P&R Provision Around Oxford

P&R PROVISION	NUMBER OF CAR PARKING SPACES
Oxford Parkway - Water Eaton	758
Oxford Parkway - Railway Car Park	830
Pear Tree	1,035
Seacourt	1,389
Redbridge	1,412
Thornhill	1,335
Bicester	580
Total P&R Spaces *	6,509

\* Not including Oxford Parkway railway car park



- 7.1.4. This modal shift for the relocation of the club is to an extent already reflected in the responses to the fans travel survey set out in Section 5 above.
- 7.1.5. The fans Travel Survey suggests that 32.3% will be car users which for an 18,000 seat stadium would be a maximum of 5,814 spaces (assuming no car sharing / families / groups etc).
- 7.1.6. However, the target for the club is a maximum of 10% car users in future. For an 18,000 capacity stadium this is a maximum of 1,800 spaces assuming no car sharing. This suggests that the existing Park and Ride sites around Oxford have capacity to accommodate those wishing to drive to matches and then use sustainable modes for the final leg of their journey (walking, bus etc).
- 7.1.7. Some further research is required on car sharing and multiple occupancy at football games.
- 7.1.8. A sustainable Match Day Travel Plan will be developed as part of any planning application pack. This will reinforce the club's proposals to make up to 90% of the travel to the new club location by sustainable means. An early draft of this document is attached in **Appendix A**, this is expected to be developed as the proposals progress.

## 8. CASE STUDIES

- 8.1.1. The following case studies highlight other football clubs that have developed sustainable transport strategies at their grounds. These examples are considered success stories and offer examples what can be delivered by OUFC.

### 8.2. Brighton and Hove Albion FC

- 8.2.1. Since moving to their new stadium in 2011, a key goal of Brighton and Hove is to reduce carbon emissions by promoting sustainable transport links for match day travel. The club's Travel Management Plan aims to encourage fans, staff and visitors to use walking, cycling and public transport as an alternative to the private car, and introduce a series of physical and management measures that will facilitate staff and visitors to travel by sustainable modes.
- 8.2.2. Data collected over the last 5 seasons shows more than 50% of all home and away supported include an active component as part of their journey to the stadium on a matchday. Multi modal travel is high, i.e. combining walking or cycling with public transport and an excess of 200 cycling parking racks are used at every game. A travel guide has been produced by the club providing information on travelling to the stadium, and live social media updates on matchdays inform fans of travel options and any issues on the day.
- 8.2.3. More information can be found here: [Brighton & Hove Albion F.C. showcase active travel provision - Healthy Stadia](#)

### 8.3. Newcastle United: Magpie Movers

- 8.3.1. Newcastle United in partnership with local public transport operators Network One offer a special ticket for season ticket holders on matchdays allowing travel to and from first team league and cup home games up to three hours before the game and until the end of the service after the game from any departure point within Newcastle City Centre. At a discounted price, this offers a good incentive for supporters to travel by public transport to the ground.
- 8.3.2. More information can be found here: <https://networkonetickets.co.uk/tickets/magpie-mover/>  
<https://www.nufc.co.uk/news/latest-news/magpie-mover-on-sale-now/>



## 9. SUMMARY AND NEXT STEPS

### 9.1. Summary

- 9.1.1. The proposed Site is sustainably located and as a result the percentage of trips to and from the Site by sustainable modes can be maximised through design and parking restraint.
- 9.1.2. At the time of writing local parking standards are in flux with Oxford City adopting new standards earlier this year while Cherwell District still have older maximum standards. We understand at the time of writing that Oxfordshire County Council will shortly introduce new standards across the county that are restraint based. This will align with the emerging Masterplan thinking of minimal parking on Site.
- 9.1.3. The adopted Oxford LCWIP sets out a series of measures and programmes to achieve a transformational change in the levels of cycling and the attractiveness of walking in Oxford. It identifies the targets for 2031 and the policies to attain this target as well as improved routes to Kidlington from Oxford City Centre.
- 9.1.4. In terms of emerging policy, the Central Oxfordshire Travel Plan has been developed as part of the countywide [Local Transport and Connectivity Plan](#) (LTCP). The LTCP sets a clear vision to deliver a net-zero transport system that enables Oxfordshire to thrive, protects the environment and makes the county a better place to live for all residents. This emerging policy is currently out to consultation, but we expect it will be adopted in 2023.
- 9.1.5. The proposed improvements on A44 corridor includes four roundabouts and link between Loop Farm to Cassington. Work on all these schemes has started and expected to be completed by the end of 2023. The schemes would include new shared foot and cycleways and controlled crossing facilities which will enhance sustainable transport around the Site. Our emerging proposals will tie into these works to complete missing links.
- 9.1.6. The club has the intention that 90% of fans will travel to the Site by sustainable modes, on this basis minimal car parking will be provided at the Site and a detailed transport strategy will be developed to get fans to Stadium. Initial discussions with public transport operators show this is achievable with further collaboration. The emerging Masterplan will strengthen links with Oxford Parkway and Kidlington and will provide bus and coach facilities on Site.

### 9.2. Next Steps

- 9.2.1. The next step is to discuss these emerging proposals as part of a pre-application process with Cherwell District Council and Oxfordshire County Council.



- 1.1.3. This Technical Note sets out how OUFC propose to operate from a transport perspective on match days. This is a first draft and is expected to evolve during the design and application process.
- 1.1.4. Sustainable travel will be strongly promoted to reduce car travel by home fans, which will allow easier management of home and away fans.

## 2. ACCESS BY FOOT

- 2.1.1. The emerging Masterplan is being designed to promote walking and cycling through the creation of safe, direct and attractive routes for pedestrians and cyclists. On matchdays pedestrians will access the Stadium from a number of different access points, ensuring access is carefully managed and home and away supporters can remain separate if required
- 2.1.2. Safe and direct links for home and away fans to Oxford Parkway Station are proposed via a new bridge over the A4260, and a new pedestrian and cycling link through the re-provided football pitches (triangle site on east side of A4260). This will enable matchday crowds to be segregated from traffic as much as possible.
- 2.1.3. Access to existing bus stops within Kidlington will be improved via footway links north to Bicester Road, A4260 as well as bus stops outside Oxford Parkway Station. There will also be dedicated bus and coach stops within the Site (see Section 4).
- 2.1.4. More formal pedestrian and cycle links will also be designed to connect to existing residential areas such as Croxford Gardens and proposed residential developments around Kidlington to the north and east of the site as these sites come forward. This will provide enhanced connections to Kidlington to the north and alternative routes to Oxford Parkway to the east.
- 2.1.5. Separate from the proposals, there are a number of infrastructure works planned that are due to be in place prior to the site at Stratfield Brake coming forward further promoting pedestrian access. These include:
- Extending the shared footway/cycleways on Oxford Road and Bicester Road improving the pedestrian and cycle link between the Site and Oxford Parkway Station and P&R.
  - Improvement work to the Loop Farm roundabout to Cassington to introduce shared 4m wide footway/cycle way on one approach and 2m wide footway on the other approach between the two roundabouts.
  - Improvement work at the Peartree Interchange to Loop Farm Roundabout which includes installing pedestrian crossings on southbound off slip and A44 Woodstock Road and improving the pedestrian access to the Peartree Park and ride facility.
  - Provision of a signal controlled crossing on Frieze Way and westbound A44 Woodstock approaches at Loop Farm Roundabout along with shared pedestrian and cyclist route to enable better connectivity between the A44 approaches.
- 2.1.6. All these routes and connections make the site permeable to pedestrians and on match days means that access could be managed via a set of access points to keep home and away fans separate if required.
- 2.1.7. It is expected that the current traffic management company (The Traffic Management Company) who manage match days at the Kassam Stadium will manage the new facility on match days.

## 3. ACCESS BY BIKE

- 3.1.1. As set out in the previous section, access by foot and bike is being promoted by the emerging masterplan through the creation of safe, direct and accessible cycling links to the wider area. A new bridge over the A4260 and safe links through the eastern parcel of land will allow cyclists to access the site easily from Oxford Parkway Station and the existing cycle route on Oxford Road connecting south towards Oxford City Centre.
- 3.1.2. Connections will be enhanced to the National Cycle Route 51, which runs alongside the Oxford Road routing north through Kidlington and south to Oxford City Centre. Infrastructure proposals are currently in place (separate to these proposals) to extend the shared footway and cycleways on Oxford Road and Bicester Road improving connections from the site to Oxford Parkway Station and Peartree Park and Ride.
- 3.1.3. There is also the potential for a new cycle friendly bridge (to replace the existing pedestrian bridge) over the Oxford Canal running west of the site will provide connections to the west onto National Cycle Route 5, linking towards Woodstock.
- 3.1.4. On entering the Site, safe and secure cycle parking spaces will be provided close to the Stadium. As personal mobility moves forward to include personal electric vehicles including e-bikes and scooters, passive provision will be made for parking and storage of these vehicles on site.
- 3.1.5. The number of spaces will be based on the local cycle parking standards noting that Oxford City has a higher standard than Cherwell District. The exact number of spaces will be confirmed as part of the design process and pre-application discussions. The maximum provision is in the region of 900 spaces.

## 4. ACCESS BY BUS

- 4.1.1. Existing bus stops close to the Site are located on the Oxford Road corridor in the vicinity of Oxford Parkway Station and within the Park and Ride side of the station itself. There are also bus stops for local services on Bicester Road and Oxford Road to the east of the Site. These stops are served by a variety of local Oxford services which could call additionally at the Stratfield Brake Site or at new stops on the Oxford Road and Bicester Road closer to the Site.
- 4.1.2. The 700 and 7 Gold services also serve Oxford Parkway Park and Ride and currently provides a 30 minute frequency service (Saturdays) between Woodstock and Oxford City Centre in each direction calling at Oxford Parkway Station. These services pass close to the Site on Oxford Road as they enter Kidlington.
- 4.1.3. As part of the initial discussions Ridge and OUFC have consulted with the Oxford Bus Company with regards to current services, the services put on for the club now to the Kassam Stadium and future bus service plans in this area of Oxford.
- 4.1.4. The Oxford Bus Company has advised that a new ring road service from the Redbridge Park and Ride that will terminate at Oxford Parkway is being developed with the intention in the longer term of serving Kidlington. This bus route could longer term (subject to funding) operate every 10 minutes on a turn up and go basis. This service is expected to start in 2023 at a lower frequency and could be built upon by OUFC when they come forward. It would serve Littlemore and Cowley which are historically where OUFC supporters are based.



## RIDGE

- 4.1.5. On match days extra bus services will be put on and the existing park and ride buses to the Site will be extended to cater for supporters. The frequency of services to Kidlington would be increased. There is also an option for buses to pick up at Oxford Parkway after matches. Initial discussions have taken place with the Oxford Bus Company, who are broadly supportive of the proposals. Consultation will continue as the masterplan progresses.
- 4.1.6. As the masterplan develops, more work will be undertaken to understand where fans are travelling from and how they travel in order to plan future bus services around demand. New bus stops will be provided at the Site to cater for public services and coaches. Depending on the develop on Site it is expected that bus services will call throughout the week but will be more intense on match days.
- 4.1.7. As the masterplan develops the exact number and location of stands and stops will be developed. Based on discussions, to date it is expected that at least 20 stops or pick up points will be required.
- 4.1.8. Joint ticketing initiatives will be investigated to improve accessibility to the stadium and make journeys more convenient for fans. It is envisaged a similar system will be used as that currently in operation for Newcastle United FC - Magpie Movers. The options discussed to date include the 'City Zone' and 'Plus Bus' initiatives with the intention of selling sustainable travel to games as part of the ticket package.

## 5. ACCESS BY COACH

- 5.1.1. Dedicated coach parking and facilities will be provided for match day coaches. Access would be via the main entrance from the A4260 and via the internal spine road.
- 5.1.2. In terms of the need to separate home and away fans it is envisaged that the coach parking will be split and managed on site with two distinct areas so that any coaches bringing away fans to site will be unloaded and loaded closest to the away fans area of the Stadium while home fans are dealt with close to the main fans zone. Based on the predicted number of coaches there will be at least 20 spaces for away fan coaches.
- 5.1.3. Home fan coaches will either be accommodated on site or will lay-over at the Oxford Parkway Park and Ride site until needed on Site.
- 5.1.4. These areas will be planned further as the Masterplan develops and it is expected that away fans will use a separate exit onto the A4260 subject to agreement with OCC highways.

## 6. ACCESS BY RAIL

- 6.1.1. Oxford Parkway Station is located approximately 450m south east of Stratfield Break meaning the Site is highly accessible by train. The station is on the Oxford-Bicester Line and provides 2 services an hour to London Marylebone and Oxford.
- 6.1.2. The intention is to provide a dedicated pedestrian link between the station and the Site via bridges and embankments to create an accessible link that does not require fans to travel via the existing footways on Oxford Road.

## RIDGE

- 6.1.3. As part of the initial discussions Ridge and OUFC have consulted Chiltern Railways as the operator of Oxford Parkway station. Chiltern have raised a number of questions that will be developed with them during the design process for the Site. This includes a pedestrian flow exercise to evaluate the current layout of Oxford Parkway (south side entrance only) and any proposals for bridges or additional connections / entrances, an understanding of potential passenger numbers split north and south is needed but it was noted this depends to an extent on away fans / forecasting.
- 6.1.4. Chiltern Railways are broadly supportive as they currently deal with matches and events at Wembley Stadium but need more data to assist OUFC in the planning of events and station management. They have a team that can do this, and we will do further work on this aspect as the proposal develop.
- 6.1.5. As with the proposals for bus services the joint ticketing initiatives will be developed to improve accessibility to the stadium and make journeys more convenient for fans. It is envisaged a similar system will be used as that currently in operation for Newcastle United FC - Magpie Movers. The options discussed with Chiltern to date include 'Plus Bus' are rail tickets to fit with home and away matches with the intention of selling sustainable travel to games as part of the ticket package.

## 7. ACCESS FOR PRIVATE CARS

- 7.1.1. The main access for cars to the proposed Stadium will be from the A4260 via the existing access or an upgraded junction. It is expected that access into the Site will be limited and there will be limited car parking on site. The empathises will be on pedestrians, cyclists and public transport users.
- 7.1.2. General vehicle access will be restricted to the main spine road and car parking areas.
- 7.1.3. In the wider context of accessing the Site, the A4260 has good links to the wider strategic road network to the north of Oxford. The A4260 links to the A34 in both the south and north, via the A44 Peartree Roundabout and Bicester Road, respectively. At Bicester Road access can only be gained to the northbound carriageway. Access to and from the Oxford Ringroad (A40) is via the Cuttleslowe Roundabout (via Oxford Road) or the Wolvercote Roundabout (via A44 Woodstock Road)
- 7.1.4. At the time of writing this draft, there are a number of infrastructure works planned or underway which should be in place prior to the site coming forward. These include:
- Improvement work to the **Loop Farm roundabout to Cassington** including a bus lane and shared foot and cycleways.
  - Improvement work at the **Peartree Interchange to Loop Farm Roundabout** including lane widening, controlled pedestrian crossing facilities and shared pedestrian and cyclist facilities.
  - A signal controlled crossing will be provided on Frieze Way and westbound A44 Woodstock approaches at Loop Farm Roundabout along with shared pedestrian and cyclist facility to have better connectivity between the A44 approaches.
  - Improvement work at **Kidlington Roundabout** including signalisation of the junction with signalised crossing facilities shared cycleways on Oxford Road and Bicester Road to improve sustainable travel.



## RIDGE

- 7.1.5. It is expected that private car use to the Site can be reduced and restricted as part of the design and subject to the draft sustainable travel strategy set out above.
- 7.1.6. OUFC are also committed to reducing the impact of car parking on the residents of Kidlington and at this stage it is proposed that they will support and fund any required Traffic Regulation Orders to control unwanted parking as a result of matches and events. The process and requirements for these TROs will be discussed with Oxfordshire County Council as part of the design process.



RIDGE



[www.ridge.co.uk](http://www.ridge.co.uk)





# OUFC Stratfield Brake New Stadium Sustainability Guide

Bioregional – October 2022





# Executive Summary

This Sustainability Guide sets out how Oxford United Football Club’s proposed new stadium at Stratfield Brake could address sustainability issues, significantly decrease the operational carbon footprint of an OUFC match day and how a community-focused sustainable stadium design could look to existing best practice case studies for inspiration on how to deliver sustainability in practice.

This guide focuses on the areas where sustainable design could have the biggest impact, incorporating the overarching sustainability ambitions for the stadium, including:

- Addressing key questions set out in the Stadium Challenge Panel (including Cherwell District Council, Oxfordshire County Council, Kidlington Parish Council and Gosford and Water Eaton Parish Council)
- A coherent guide setting out the ambitions of the sustainability strategy for the scheme.

The guide is split into 4 chapters: Sustainable Building Materials; Renewable Energy; Net Zero Carbon and Sustainable Transport. Each chapter provides the key challenges to be addressed, best practice case studies, targets that will be met and potential targets to explore at later design stages. A summary of the guide is as follows:

## Sustainable Building Materials

Key challenge: the need to deliver a development with low embodied carbon, and sustainable materials choices (including circularity, responsible sourcing and health and ecology).

Case studies for inspiration include the London 2012 Olympics Aquatic Centre embodied carbon reduction using exemplary levels of lower carbon cement replacement.

Targets for sustainable materials will include BREEAM Excellent certification with an assessment score of >70% and a whole-life carbon analysis and could include using RIBA Climate Challenge or LETI guidance to set an embodied carbon target.

## Renewable Energy

Key challenges include the need to use reliable and cost effective energy solutions to ensure continuous energy supply and enabling energy sharing across the site and beyond.

Case studies to inspire include Arsenal FC Emirates Stadium battery storage set-up and Atlanta Mercedes Benz Stadium PV-covered walkway.

Potential targets include the ambition to be a fossil fuel-free development, using electricity-consuming technologies for space heating, cooling and domestic hot water such as heat pumps, utilising battery/energy storage on site, and the opportunity to work with Flit Solar Park to source 100% renewable electricity.

## Net-Zero Carbon

Key challenges include setting an appropriate net zero carbon target and not relying heavily on offsetting to achieve this, and the need for local renewable generation in order to reduce the developments reliance on grid power (and therefore the exposure of the operator to electricity price spikes or inflation).

Case studies on this topic include VfL Wolfsburg carbon reduction commitments and Forest Green Rovers offsetting cost within game ticket pricing.

Potential targets could include publicly announcing the carbon reduction strategy with a measurable target and annual reporting, 100% procurement of renewable energy and using UK-based offsetting solutions where this is required.

## Sustainable Transport

Key challenges for sustainable travel include encouraging visitors to the site to travel via public transport or to use active means of travel, reducing reliance on car travel and ensuring that these measures are suitably incentivised.

Case studies include Brighton & Hove Albion’s measures for encouraging public transport use and travel by foot and bike and Real Betis’ ‘Match for Sustainability’ alternative transport measures. Targets could include schemes subsidising public transport options, EV charging for 100% of car parking spaces and a target for <50% of fans to travel by car to a match.



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# Introduction to Bioregional

## Championing One Planet Living for more than 25 years

Bioregional is an award-winning, not-for-profit sustainability consultancy. We work with partners to support their transition to a net-zero carbon, circular, and sustainable future, and to create homes, businesses, and communities that enable sustainable living.

We were founded as a charity and social enterprise, with the goal of developing more sustainable ways of living. We initiated the award winning BedZED eco-village in south London at the turn of the millennium.

Since then, we have used our experience to advise others on how to reduce the huge impact that the built environment has on our planet.

Bioregional has a strong and continued presence in Oxfordshire, having supported the development of the UK's first eco-town (NW Bicester) for the past decade and worked alongside both Oxfordshire County Council and the districts on the creation of a county-wide sustainability vision. Bioregional also developed the growing business network, Oxfordshire Greentech.

Recent clients include:



Top: BedZED



Right: NW Bicester Eco-town



# Needs analysis and Kassam Stadium carbon footprint



# Sustainability Needs Analysis

Issued March 2022

This report contains analysis of local and regional sustainability needs using publicly available datasets and referring to applicable planning policies.

This work was structured using the ten principles of the One Planet Living Framework– see below. One Planet Living recognises that if everyone lived and consumed as we do in the UK, we would require nearly 3 planets to support us. We therefore need to reduce consumption to within the natural resources limits of the one planet we have, whilst increasing quality of life and leaving room for nature and wildlife.

## One Planet Living®

The 10 One Planet Living® principles:



## Key conclusions and key drivers

- 54% of all of Cherwell’s CO2 emissions come from transport sources
- 17% of Cherwell's emissions are from commercial energy use
- Areas within Kidlington are within the 10% most deprived areas nationally – particularly for education in young people
- Kidlington and the surrounding area has poor access to key community, civic and educational assets – this is lower than both national and Cherwell averages
- Thames Valley area will be 30% drier in the coming decades as it was in 1990
- There are a number of ecologically important areas close by, including UK-designated Sites of Special Scientific Interest (SSSIs) protected areas.
- Grid electrical capacity in local area is constrained – there is a need for flexibility and storage

Having analysed the data and background policy drivers, we have outlined the need to reduce carbon emissions from transport and have a sustainable transport strategy, the need for sustainable materials with low embodied carbon and the ambition to achieve net zero carbon as the areas for focus for the sustainability strategy for Stratfield Brake.



# Oxford United FC Match Day Carbon Footprint

Report to be issued October 2022

## Why

The carbon emissions associated with a football game are significant, but can be greatly reduced with appropriate design choices and management.

Kassam Stadium experiences a high reliance on private car use to travel to games, and an inefficient energy performance with no renewable energy generation.

A new stadium at Stratfield Brake would be well positioned to address these issues, and in turn greatly reduce the operational emissions associated with OUFC match days. However, the upfront embodied carbon of a new construction could be significant, and hence need to be carefully managed and minimised in order to ensure an overall net reduction in emissions is achieved within a reasonable time frame.

## What

Working with Oxford Brookes University, Bioregional has carried out a carbon footprint analysis of an average OUFC match day at the Kassam Stadium, and comparing this to modelled scenarios of a match day at the new Stratfield Brake stadium.

This includes analysis of the carbon emissions associated with energy use, transport, food and drink, and waste generated., alongside a consideration of the possible upfront carbon generated by a new stadium build.

The match day carbon footprint content featured in this guide is a snapshot of the full report.

The subsequent pages present a summary of the study, and key points relating to the energy and travel components of the footprint.

## How

### Energy / utility use

Modelled from OUFC utility bills (adjusted for the fact that not all energy use from the Kassam Stadium is used by OUFC). Electricity and gas charges were converted to kWh consumption using data from BEIS. kWh energy use was then converted into carbon emissions via DEFRA conversion factors (2021). A similar process was undertaken to calculate emissions from water, using Thames Water to convert charges into m<sup>3</sup> water use, and subsequently converted into carbon emissions for water supply and treatment again using DEFRA factors.

### Fan travel

Face to face surveys with fans were conducted over two match days to collect travel data (including postcode of origin, mode of transport used, and time taken to park if driven...). Based on postcode data, the Google Maps API was used to calculate the distance travelled to stadium for all responses. To ensure an average match attendance were represented accurately, statistical modelling techniques were used to scale the responses. Following this, the distances travelled for all fans were calculated, which were then converted to carbon emissions using DEFRA factors.

### Food and drink

Modelled from concessions sales data for each menu item. Each menu item has been broken into ingredients and weight, and converted to carbon emissions via bespoke conversion factors.

### Waste

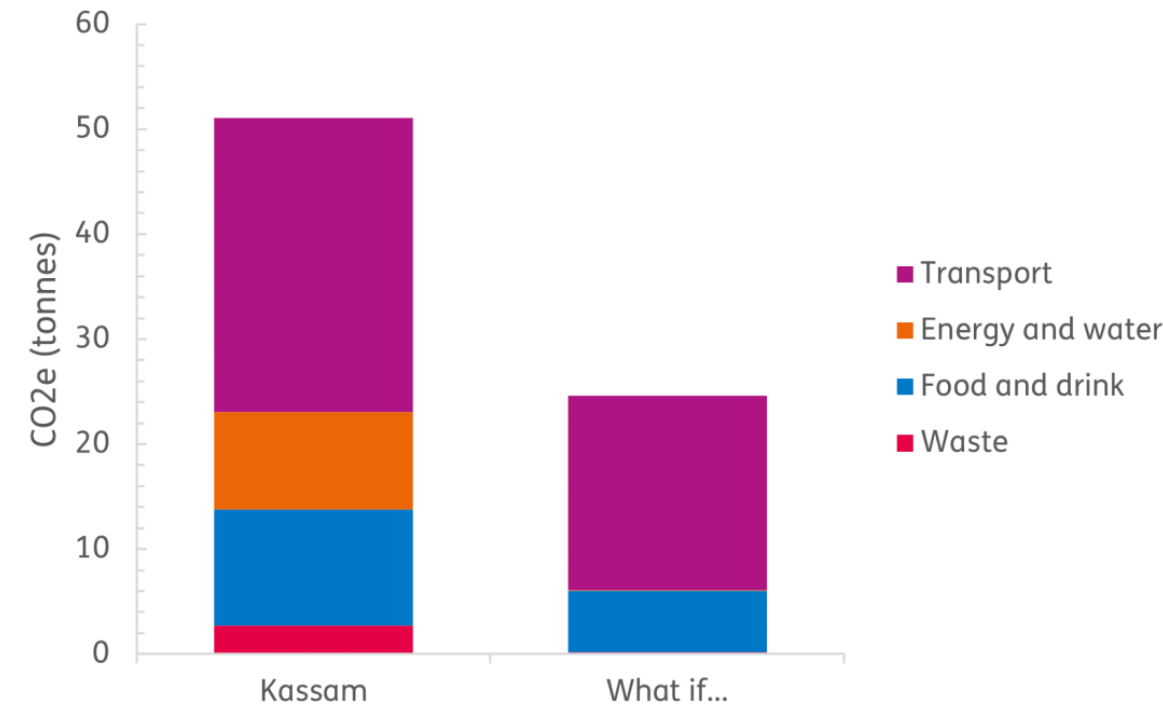
Modelled from packaging associated with food & drink consumption, and match-day waste composition survey. The extraction and production of packaging materials for each menu item were converted to emissions via DEFRA factors, and were combined with the emissions associated with waste disposal.



# Oxford United FC Match Day Carbon Footprint

## Results

### Carbon emissions from a typical match day



- At the Kassam Stadium, emissions per match are approximately 51 tonnes CO<sub>2</sub>e (carbon dioxide equivalent)
- The 'what if...' scenarios for a new stadium would result in an estimated footprint of 25 tonnes CO<sub>2</sub>e per match day
- A potential reduction of **26 tonnes CO<sub>2</sub>e per game**

### Note on upfront embodied carbon

The development of a new stadium will itself generate carbon emissions from the production of materials and construction processes. Hence it will be essential to address the choice of sustainable materials, design and embodied carbon, to reduce this upfront impact.

An high-level estimate for the embodied carbon of a new stadium was made using the London Olympic Stadium as a benchmark on a per seat basis. While the proposed new stadium is larger than at Kassam, to keep the footprint calculations comparable, our analysis has imagined a stadium of the same seating capacity as Kassam, built to best practice standards.

**At 0.6 tCO<sub>2</sub>e per seat, and 12,500 seats, this would give a total embodied carbon figure of 7,500 tCO<sub>2</sub>e.**

This upfront figure needs to be considered in relation to the savings presented per match.

**Over a 60 year lifespan, this would equate to 125 tCO<sub>2</sub>e per year, and based on an average of 28 home games per season, equates to ~4.5 tCO<sub>2</sub>e per match.**

These figures are highly sensitive to the assumed life-span of the new stadium.

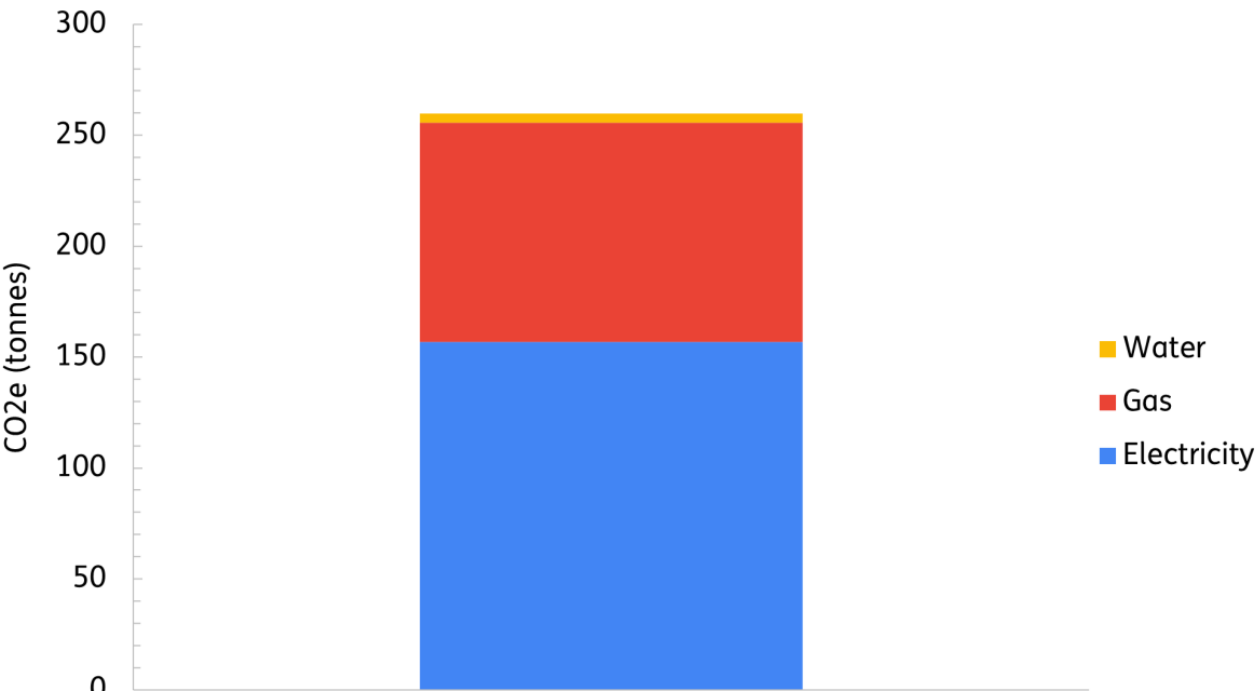
Put another way, **it could take 10 seasons worth of OUFC games for the operational savings to 'pay back' the upfront carbon emitted from building a new stadium** (or significantly less if savings from other uses of the stadium are also considered). Hence embodied carbon is an essential aspect to address.



# Oxford United FC Match Day Carbon Footprint

## Energy

### Emissions from energy and water use



Oxford United FC-responsible emissions at Kassam Stadium

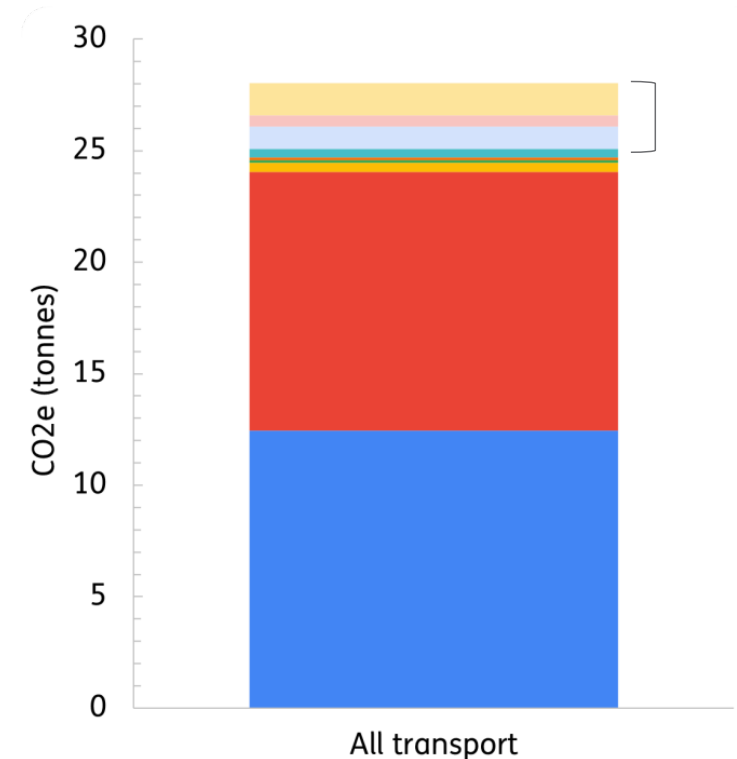
- At the Kassam Stadium, OUFC is responsible for 258 tonnes CO2e per season through operational energy consumption – c.9 tonnes CO2e per game (*assuming avg. season of 28 games incl. friendly/cup fixtures*)
- The total stadium emissions would be just over double this, as OUFC is only responsible for 50% of gas and electricity usage, and 60% water use
- Electricity is the largest contributor (157 tonnes CO2e), followed by gas (99 tonnes CO2e)
- The new stadium’s commitment to net-zero energy emissions would assume 0 CO2e from energy use, saving approx. 250 tonnes CO2e per season compared to the Kassam Stadium
- Water efficiency measures, such as low flow fixtures and fittings, and rainwater harvesting, would enable emissions from water to be reduced by an assumed 40%



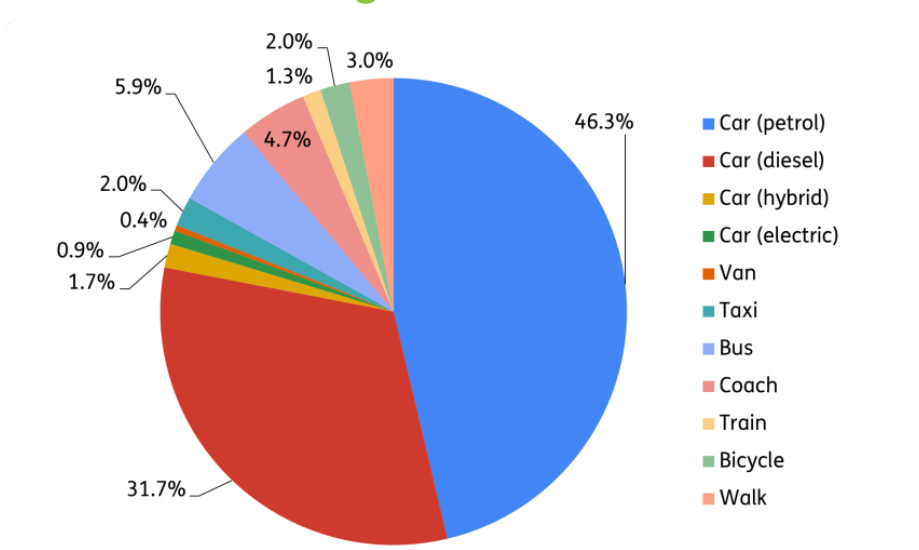
# Oxford United FC Match Day Carbon Footprint

## Fan travel

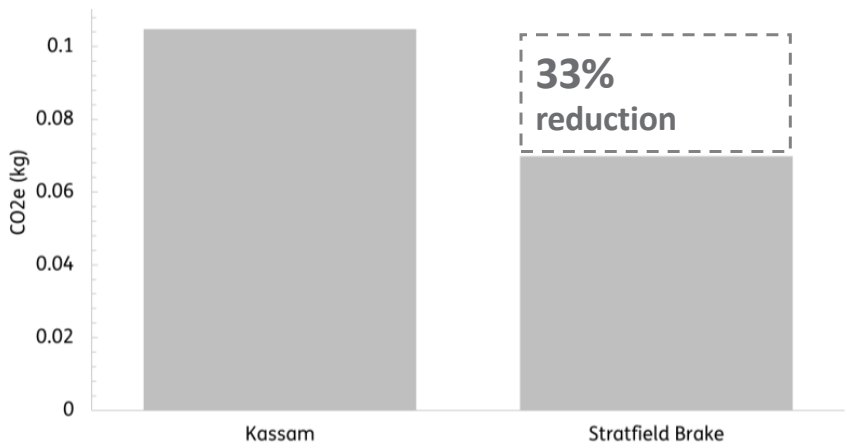
Total emissions from fan travel on average match day at the Kassam Stadium



How fans travel to games at the Kassam Stadium



Avg. emissions per km of fan travel



- Transport is the largest contributor to OUFC's match-day footprint- 55% of the whole footprint, 28 tonnes CO2e (carbon dioxide equivalent)
- 86% of fan travel emissions are through petrol/diesel car travel
- Majority of fans travel via car/van (81%), higher than estimated in the OUFC Traffic Management Plan (65%), though lower than the recent OUFC Mailing List Fan Survey (85%)
- The Kassam Stadium is not well connected by public transport, therefore most fans travel by car, causing traffic and air quality issues, exacerbated by idling cars
- A **33% reduction** in transport emissions per person per km could be achieved with a change in stadium location to Stratfield Brake, based on the OUFC Supporter Survey conducted by Devcomms which identified fans preferred travel options.



# Stratfield Brake Sustainability Guide



# Introduction to Stratfield Brake

## The Oxford United FC vision

With a deadline of 2026 to move out of Kassam Stadium, OUFC are looking to develop a new community stadium.

The vision is to *“Provide a world-class permanent home for OUFC to meet our on-pitch ambitions, provide an unrivalled matchday experience and ensure our off-pitch offer expands in line with our long-term vision”* (OUFC, 2022).

## Oxford United FC ambitions for the new stadium

- *“Long-term secure future for Oxford United;*
- *An environmentally and ecologically sensitive stadium;*
- *Sustainability at our core;*
- *Oxford United, a recognised community partner;*
- *Ensuring a legacy of sporting excellence throughout Oxfordshire;*
- *Fans and residents at the centre of the club”.*

## Proposed development

Mixed-use site with 18,000 seat stadium, arena, 250 bed hotel, 4 no. football pitches and clubhouse, sports facilities for use of the local community, pedestrian walkway connecting the site to Oxford Parkway station in addition to either 4 no. rugby pitches or 150 no. homes.

Two masterplan proposals are provided on the next pages.

## Location

North of Oxford City Centre, the Stratfield Brake site is near to Kidlington and Yarnton. The site is conveniently located near to Oxford Parkway train station and there are several Park and Ride facilities nearby too. The site is accessible by road along the A4260, the A34 and the A44. Transport options are provided in further detail in chapter 4 of this report.





# Planning Policies

## Cherwell District Council Local Plan 2011-2031

Policies within the current local plan relevant to energy and sustainability are provided below. Note that a local plan review is under way within Cherwell District Council. The current direction of travel is towards zero carbon buildings and developments. A regulation 18 version of this review is expected at the end of 2022 or early 2023.

**ESD1 Mitigating and Adapting to Climate Change:** Measures will be taken to mitigate the impact of development within the District on climate change. At a strategic level, this will include:

- .... Delivering development that seeks to reduce the need to travel and which encourages sustainable travel options including walking, cycling and public transport to reduce dependence on private cars;
- Designing developments to reduce carbon emissions and use resources more efficiently, including water;
- Promoting the use of decentralised and renewable or low carbon energy where appropriate.

**ESD2 Energy Hierarchy and Allowable Solutions:** In seeking to achieve carbon emissions reductions, we will promote an 'energy hierarchy' as follows:

- Reducing energy use, in particular by the use of sustainable design and construction measures;
- Supplying energy efficiently and giving priority to decentralised energy supply;
- Making use of renewable energy;
- Making use of allowable solutions.

**ESD3 Sustainable Construction:** All new residential development will be expected to incorporate sustainable design and construction technology to achieve zero carbon development through a combination of fabric energy efficiency, carbon compliance and allowable solutions in line with Government policy.

Cherwell District is in an area of water stress and as such the Council will seek a higher level of water efficiency than required in the Building Regulations, with developments achieving a limit of 110 litres/person/day.

All new non-residential development will be expected to meet at least BREEAM 'Very Good' with immediate effect, subject to review over the plan period to ensure the target remains relevant. The demonstration of the achievement of this standard should be set out in the Energy Statement.

All development proposals will be encouraged to reflect high quality design and high environmental standards, demonstrating sustainable construction methods including but not limited to:

- **Minimising both energy demands and energy loss**
- **Maximising passive solar lighting and natural ventilation**
- **Maximising resource efficiency**
- **Incorporating the use of recycled and energy efficient materials Incorporating the use of locally sourced building materials**
- **Reducing waste and pollution and making adequate provision for the recycling of waste**
- **Making use of sustainable drainage methods**
- **Reducing the impact on the external environment and maximising opportunities for cooling and shading (by the provision of open space and water, planting, and green roofs, for example);**
- **Making use of the embodied energy within buildings wherever possible and re-using materials where proposals involve demolition or redevelopment.**



# Planning Policies

## Cherwell District Council Local Plan 2011-2031 - continued

**ESD4 Decentralised Energy Systems:** The use of decentralised energy systems, providing either heating (District Heating (DH)) or heating and power (Combined Heat and Power (CHP)) will be encouraged in all new developments. A feasibility assessment for DH/CHP, including consideration of biomass fuelled CHP, will be required for:

- All residential developments for 100 dwellings or more;
- All residential developments in off-gas areas for 50 dwellings or more;
- All applications for non-domestic developments above 1000m2 floorspace.

Where feasibility assessments demonstrate that decentralised energy systems are deliverable and viable, such systems will be required as part of the development unless an alternative solution would deliver the same or increased benefit.

**ESD5 Renewable Energy:** Planning applications involving renewable energy development will be encouraged provided that there is no unacceptable adverse impact. A feasibility assessment of the potential for significant on site renewable energy provision (above any provision required to meet national building standards) will be required for:

- All residential developments for 100 dwellings or more
- All residential developments in off-gas areas for 50 dwellings or more
- All applications for non-domestic developments above 1000m2 floorspace.

Where feasibility assessments demonstrate that onsite renewable energy provision is deliverable and viable, this will be required as part of the development unless an alternative solution would deliver the same or increased benefit.

**ESD7 SUDS:** All development must use sustainable drainage systems for the management of surface water run-off.

**ESD10 Protection and Enhancement of Biodiversity and the Natural Environment:** Net gain in biodiversity, reuse of soils will be sought, and a Landscape Monitoring and Management Plan and an Air Quality Assessment will be required.

**ESD15 The Character of the Built and Historic Environment:** New proposals should...Consider sustainable design and layout at the masterplanning stage of design, where building orientation and the impact of microclimate can be considered within the layout. Incorporate energy efficient design and sustainable construction techniques, whilst ensuring that the aesthetic implications of green technology are appropriate to the context (also see Policies ESD 1 - 5 on climate change and renewable energy) Integrate and enhance green infrastructure and incorporate biodiversity enhancement features where possible (see Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment and Policy ESD 17 Green Infrastructure ). Well designed landscape schemes should be an integral part of development proposals to support improvements to biodiversity, the micro climate, and air pollution and provide attractive places that improve people's health and sense of vitality. Use locally sourced sustainable materials where possible.

**ESD17 Green Infrastructure:** Ensuring that green infrastructure network considerations are integral to the planning of new development. Proposals should maximise the opportunity to maintain and extend green infrastructure links to form a multi-functional network of open space, providing opportunities for walking and cycling, and connecting the towns to the urban fringe and the wider countryside beyond.

**BSC10 Open Space, Outdoor Sport and Recreation Provision:** Ensuring that proposals for new development contribute to open space, sport and recreation provision commensurate to the need generated by the proposals.



# Planning Policies

## Cherwell District Council Local Plan 2011-2031 - continued

### Gosford and Water Eaton Parish Council

The Parish Council website refers to Cherwell District Council and Oxfordshire County Council environmental and sustainability policies only.

### Kidlington Parish Council

Is committed to:

1. Declaring a Climate Emergency that requires urgent action.
2. Working to make the Council's activities net-zero carbon by 2030.
3. Achieving 100% clean energy across the Council's full range of functions by 2030.
4. Ensuring that all strategic decisions, budgets and approaches to planning decisions are in line with a shift to zero carbon by 2030.
5. Supporting and working with all other relevant agencies towards making the entire area zero carbon within the same timescale.
6. Working with, influencing and inspiring partners across the district, county and region to help deliver this goal through all relevant strategies, plans and shared resources.
7. Taking steps to proactively include young people in the process, ensuring that they have a voice in shaping the future.
8. Calling on the UK Government to provide the powers, resources and help with funding to make this possible, and ask local MPs to do likewise.
9. Considering other actions that could be implemented, including (but not limited to): renewable energy generation and storage, providing electric vehicle infrastructure and encouraging alternatives to private car use.

Kidlington Parish Council has been working alongside Cherwell District Council to develop the Local Cycling and Walking Infrastructure Plan (draft 2021) and support the UK-wide Climate and Ecology Bill.



# Sustainability Guide structure

The aim as a design team is to develop a proposal for a sustainable site and stadium, but the balance needs to be made between sustainable ambitions and cost and risk to OUFC.

With this in mind this guide focuses on the areas where sustainable design can have the biggest impact, incorporating the overarching ambition for the stadium, including:

- Key deliverables/questions set out in the Stadium Challenge Panel (OCC, CDC, 2 parish councils)
- A coherent guide providing the ambitions of the sustainability strategy for the scheme.

This Sustainability Guide demonstrates how key planning policy requirements will be exceeded and how Oxford United's Vision and Ambitions for their new stadium will be achieved. The priority from the Stadium Challenge Panel relating to energy and sustainability is to:

***Support the County Council's Net Zero Carbon Emissions Pledge through Highly Sustainable Development***

Please note ecological proposals and calculations to demonstrate biodiversity net gain target are being created by Ecology Solutions.

The guide also makes reference to the separate carbon footprint report that Bioregional have produced alongside Oxford Brookes University.

## Structure

The guide is structured into 4 chapters:

1. Sustainable design and materials
2. Implementation of renewable energy resources
3. Delivering Net Zero Carbon Standards
4. Promotion of means of sustainable transport

Each chapter content will cover:

- What are the challenges under each theme?
- What complications / barriers are there?
- Best practice and emerging trends
- Targets for each chapter theme



# Stratfield Brake Sustainability Guide

## 1. Sustainable design and materials



# 1. Using sustainable materials

## Key challenges

The IPPCC Special Report states all sectors must eliminate their reliance on fossil fuels to avoid exceeding the 1.5 °C global warming limit. The building and construction industry currently contributes 39% of global carbon emissions and the global building stock is set to double over the next 30 years. To meet the challenge of climate change, and act on the science set out within the IPCC reports, the UK Green Building Council has developed an industry wide pathway to deliver a net-zero Whole-life Carbon building sector by 2050. The whole-life carbon emissions of a building include all construction and material related emissions, the emissions from building operation, and those released when the building is demolition at the end of its life.

Materials emit carbon throughout their lifecycle, from extraction and manufacturing, during use and eventual disposal. This applies to both materials in the design and construction of the stadium, but also to those used across operations and maintenance. The carbon emissions which occur through this process are called “**embodied carbon**”.

However, when we refer to sustainable materials, we are referencing a wide range of important and inter-related issues, beyond solely the carbon emission impact:

- 1) **Circularity**, recycled content and Design for Deconstruction
- 2) Local sourcing, **Responsible Sourcing**, Social impact of material supply chains
- 3) The **health and ecological impact** of chemicals released from a product

This masterplan centred around OUFC’s new stadium development can have impact through sustainable procurement policies, designing to ambitious embodied carbon targets, preserving natural resources, and consideration of building re-use, refurbishment and deconstruction.

- **Embodied carbon** – Delivering a low-embodied carbon stadium immediately presents the design team with some complications. Firstly, minimal research has been published into stadium embodied carbon, and hence it is difficult to set targets based on prevailing industry practice. Secondly, sourcing low embodied carbon materials can in some cases be more costly than standard construction materials. Finally, some materials, such as timber construction, are limited in their use through current building insurance practices and regulations.
- **Circularity** – Alongside reducing embodied carbon, designers should explore the potential of their design to contribute to the establishment of a circular economy. Some elements of a building, such as the façade, has a shorter design life than the structural elements. Enabling the replacement of these elements through de-constructible flexible design extends the economic life the building, and ultimately allows those materials to be re-used within the wider economy.
- **Responsible sourcing** – Ensuring your material sourcing choices don’t unintentionally support deforestation or human rights abusing labour practices is vitally important, but often challenging due to the complexity of supply chains. Early in the design stage, the client should adopt a sustainable procurement guide which supports the design team in evaluating these risks.
- **Health and ecology** - Many modern construction products contain synthetic chemicals which release into the atmosphere or water-courses over their lifetime. The green building industry has recently been focussed on internal finishes which release volatile impacts into the internal environment, potentially leading to adverse health impacts. It is advised that before design work begins on the fitout, an internal air quality plan and limits are developed.

### Matchday Carbon Footprint

It is roughly estimated that, built to best practice standards, a new stadium could incur approx. 0.6 tonnes CO2e per seat relating to the embodied carbon



# 1. Using sustainable materials

## Key challenges...explored

### BREEAM

BREEAM is the UK’s most widely recognised environmental assessment methodology. It has been adopted by local councils as a benchmarking tool and developers can be required to achieve minimum ratings in order to meet planning policy. BREEAM and USA-based LEED are the only recognised environmental standards used to compare sporting stadiums and there is no accepted global standard for minimum requirements when it comes to lifespan, wider community benefits or sustainability.

Despite a BREEAM Very Good rating being required by CDC Policy, BREEAM Excellent is required in London Boroughs and across the UK where policies have been updated to require a higher standard from developers and increasingly recognised as the minimum requirement for demonstrating that sustainability has been integral to the design and construction of a building.

BREEAM rating		% score
Outstanding	★★★★★	≥85
Excellent	☆★★★★	≥70
Very good	☆☆★★★★	≥55
Good	☆☆☆★★★	≥45
Pass	☆☆☆☆★	≥30
Unclassified	☆☆☆☆☆	<30

### Artificial vs natural grass

The stadium should avoid using materials with adverse ecological or health impacts, whilst meeting budgetary requirements. 3G Football Turf Pitches meeting valid performance testing requirements can be used for league matches and FA competitions. 3G Football Turf Pitches are artificial but replicate the playing qualities of quality grass pitches. They are capable of sustaining increased levels of use compared to a traditional natural turf pitch (and can be designed to accommodate extended usage often up to 80 hours a week). An artificial grass pitch has a lifespan of at least 7-10 years before requiring surface replacement.

Artificial grass requires stabilising ‘infill’ to provide weight to the pitch, ensuring it doesn’t move, supports the fibres and provides adequate shock absorption for studded boots. Though typically made from silica sand, alternatively rubber granules processed from recycling end-of-life tyres are available in the UK marketplace. Organic infill including cork, bark and coconut husk can be 100% organic or a mix of granules (FA 3G Football Turf Pitch Guide, February 2020).

During use of the pitch, infill material can be lost, washed into drains or soils and loss of this material can increase chances of injury, reduce quality of play and has environmental consequences if artificial. Pitches can be topped up with 2-3 tonnes of material per year, which is expensive and a maintenance consideration upfront. Working with local businesses to source organic biodegradable infill is a clear way to manage environmental pollution.

It is recommended that a whole life comparative assessment for a defined artificial pitch procurement and material strategy is performed against a natural pitch to appraise the life-cycle carbon benefits.



# 1. Using sustainable materials

## Emerging trends / best practice

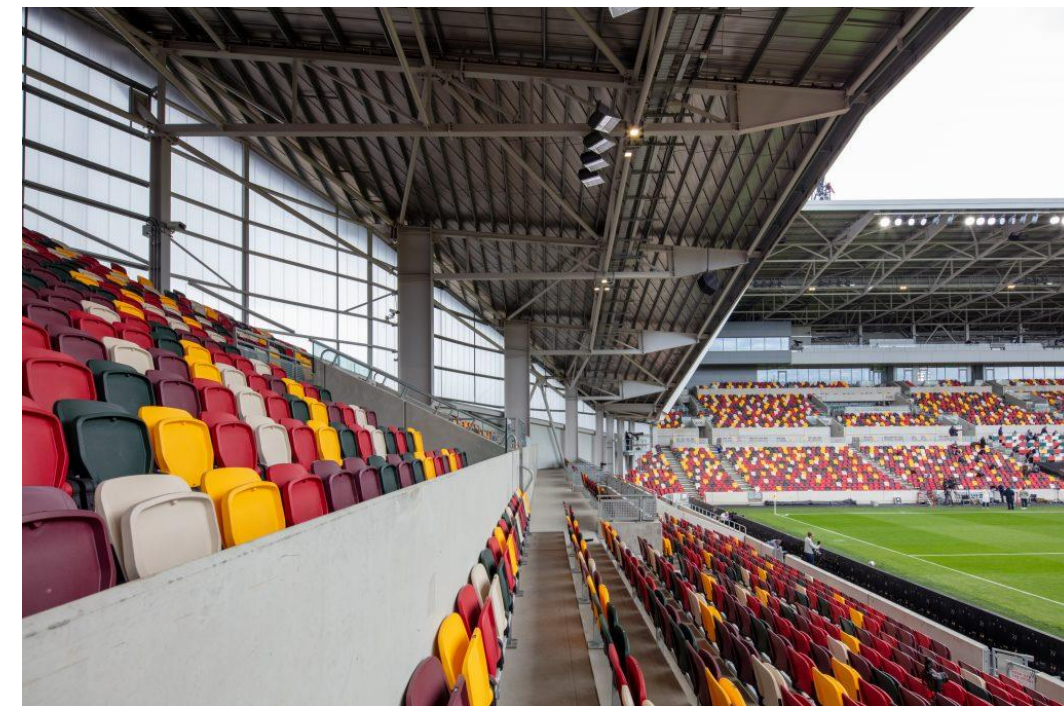
### London 2012 Olympic Park Aquatics Centre

No embodied carbon (EC) targets were set at the planning stage. The “Lessons learned from the London 2012 Games construction project” Report (Olympic Delivery Authority, 2011) sets out to define embodied carbon benchmarks for future Olympic venues. The Aquatics Centre is the only venue that is similar in capacity to OUFC Stratfield Brake, however, as an enclosed structure (with roof) it will have higher comparable embodied carbon.

- The Aquatics Centre had an embodied carbon of 37 tonnes CO<sub>2</sub> or 0.87 tonnes CO<sub>2</sub> per m<sup>2</sup>.
- The heavier weight of the iconic steel roof with heavy trusses drove up carbon emissions compared to other London stadia in the study. Due to the roof having a design element, the report states that, even with a high degree of optimisation, its roof structure still contained six times more steel than the similar sized roof over the Velodrome venue.
- The Aquatics Centre took the lead on testing concrete mixes with varying levels of aggregate and cement replacement, and then shared the results with the other projects to overcome reservations about performance and surface finish. In the final design, foundations were poured with 76 per cent recycled aggregate, and one-third of the superstructure (with its complex forms) used 55–70 per cent cement replacement.
- The report notes that a 10 per cent reduction in embodied carbon was achieved during the detailed design of the Aquatics Centre, between stages C and E, which apply to the Games. The savings after the Games were 27 per cent.

### Brentford FC community stadium

Arup claims to have achieved a 50% reduction in reinforced concrete used in construction versus the original scheme, in addition to reducing the amount of primary steel by a third (thereby cutting embodied carbon and costs). Solar path optimisation enhanced the efficiency of the 400m<sup>2</sup> rooftop photovoltaic installation, and energy, noise and emissions levels are all well within the London planning framework requirements. The stadium achieved a BREEAM Very Good sustainability rating (Arup, 2022).





# 1. Using sustainable materials

## Emerging trends / best practice - continued

### San Francisco 49ers Levi's Stadium

Achieved Gold LEED for design and also has a GOLD for operations and maintenance. "Due to a sustainable purchasing programme for cleaning materials and products, disposable janitorial paper products, and trash bags, almost 86 percent of such purchases won plaudits for meeting the strict sustainability criteria" (Climate Action, 2018). The stadium's construction used reclaimed materials where possible, including 100% of the wood used in the 'Citrix Owners Suites' being reclaimed from a local airplane hanger.

### SSE Hydro, Glasgow

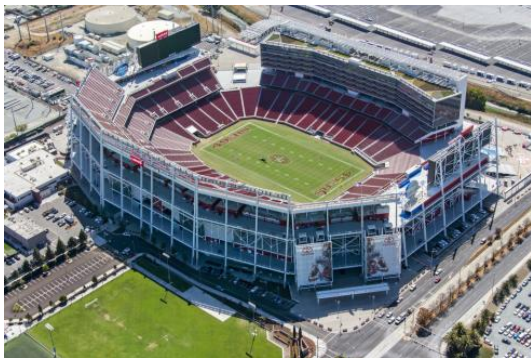
Achieved a "Very Good" BREEAM rating. LED lighting, natural ventilation from the building design and good building energy management systems. During the construction over 90% recycling was achieved.

### Dartford FC Princes Park Stadium

The stadium has been partially buried, helping to reduce noise and light pollution and requiring fewer materials to build. In addition, the roof is supported by timber frame and green roofs help to 'blend' the stadium into its surroundings.

### Forest Green Rovers stadium

'The New Lawn' Stadium, home to the Forest Green Rovers (until the new Eco Park stadium is completed) uses organic turf and nature-based methods to manage the pitch. The pitch management includes sand under the pitch to improve drainage, organic fertiliser with seaweed, magnesium and biochar soil improver, and a coconut wetting agent to prevent over/underwatering.



### Amazon's Second Headquarters, Metropolitan Park, Virginia

Thornton Tomasetti structural engineers were tasked with reducing the embodied carbon of the 1.2 m square feet multi-use site. They used the embodied carbon tool [Beacon](#), to optimise early, big-picture decisions.

The development is currently achieving a 15% reduction in embodied carbon. One area where embodied carbon has been reduced is a 700-person-capacity ground-level event centre that has a cross-laminated timber ceiling supported by ten, 80-ft-long glue-laminated beams.

To support the target of 10% less embodied carbon in the concrete, Thornton Tomasetti issued a performance-based specification which gave subcontractors the opportunity to be creative in developing lower-carbon mixes. The company believe that there is more risk in using prescriptive specifications as they may result in mixes that do not perform as intended.

To explore lower embodied carbon, the architects, ZGF, used its Concrete LCA Tool—a simple Excel calculator, offered free of charge to anyone, for rapid life-cycle assessments of concrete mix designs and comparisons to regional practices.



# 1. Using sustainable materials

## Emerging trends / best practice - continued

### Challenges in reducing embodied carbon

Forest Green Rovers’ new stadium by Zaha Hadid Architects was planned to have a timber frame structure to drive down embodied carbon. However, the timber frame may no longer be delivered following a value engineering process.

### Qatar World Cup Education City Stadium




This innovative environmental design using cyclopean concrete (CYC) methodology (site excavated boulders in the concrete mix to cast the under-raft foundation of the stadium). Most of the carbon footprint was associated with the reinforced concrete materials (94.57%). Using the CYC method reduces transportation of excavated material to landfill which accounts to 6% of transport carbon for the construction. Compared to conventional concrete 3,122 tonnes of CO2e were saved.

### RIBA 2030 Climate Challenge

RIBA 2030 Climate Challenge target non-domestic metrics and LETI (London Energy Transformation Initiative) guidance on how to set embodied carbon targets to set a suitable targets for some of the buildings proposed.



RIBA 2030 Climate Challenge target metrics for non-domestic (new build offices)

RIBA Sustainable Outcome Metrics	Business as usual (new build, compliance approach)	2025 Targets	2030 Targets	Notes
<b>Operational Energy</b> kWh/m <sup>2</sup> /y 	130 kWh/m <sup>2</sup> /y DEC D (90)	< 75 kWh/m <sup>2</sup> /y DEC B (50) and/or NABERS Base build 5	< 55 kWh/m <sup>2</sup> /y DEC B (40) and/or NABERS Base build 6	Targets based on GIA. Figures include regulated & unregulated energy consumption irrespective of source (grid/renewables) 1. Use a 'Fabric First' approach 2. Minimise energy demand. Use efficient services and low carbon heat 3. Maximise onsite renewables
<b>Embodied Carbon</b> kgCO <sub>2</sub> e/m <sup>2</sup> 	1400 kgCO <sub>2</sub> e/m <sup>2</sup>	< 970 kgCO <sub>2</sub> e/m <sup>2</sup>	< 750 kgCO <sub>2</sub> e/m <sup>2</sup>	Use RICS Whole Life Carbon (modules A1-A5, B1-B5, C1-C4 incl sequestration). Analysis should include minimum of 95% of cost, include substructure, superstructure, finishes, fixed FF&E, building services and associated refrigerant leakage. 1. Whole Life Carbon Analysis 2. Use circular economy strategies 3. Minimise offsetting, use UK schemes (CCC) BAU aligned with LETI band E; 2025 target aligned with LETI band C and 2030 target aligned with LETI band B.
<b>Portable Water Use</b> Litres/person/day 	16 l/p/day (CIRA W11 benchmark)	< 13 l/p/day	< 10 l/p/day	CIBSE Guide G.



# 1. Using sustainable materials

## Targets

This development will	
<ul style="list-style-type: none"><li>Score BREEAM Excellent certification with an assessment score of &gt;70%.</li><li>Carry out a whole life-carbon analysis to compare several options, which will be compatible with the requirements for BREEAM credit Mat 01.</li><li>Low carbon architectural and buildings services systems design to create a mixed-use development with efficient, comfortable buildings.</li><li>Ensure longevity of stadium and suitable design to extend lifespan of buildings on site, with measures allowing for future flexibility and adaptability of buildings where possible. This reduces the need to undertake extensive refurbishment or demolish and re-build to be able to meet future demands.</li><li>Develop a responsible sourcing strategy to minimise material ecological and carbon impacts, while delivering social value. All materials to be sourced according to this strategy.</li><li>Develop an internal air quality plan, and ensure internal finishes and materials meet the emission limits to deliver a healthy comfortable internal environment.</li><li>Identify chemicals of concern (COCs), and specify sourcing of safer alternative materials, including in relation to the pitch (artificial pitches containing toxic PFAS, natural grass pitches with harmful fungicides and pesticides), paints, coatings and waterproofing (VOCs), seats (polypropylene), and other COCs related to flame retardants, sealants, concrete adhesives and grouting.</li><li>Responsible construction practices including best practice pollution prevention policies applied on site.</li><li>Biodiversity Net Gain target to be achieved through a range of green infrastructure and landscaping features.</li></ul>	<p>CDC Planning Policies ES1, ESD3</p> <p>BREEAM Credits Mat 01 require a Life-Cycle Analysis to be carried out on substructure and superstructure BREEAM Credits Mat 03 and Mat 05</p>
Targets to be explored	
<ul style="list-style-type: none"><li>Using RIBA 2030 Climate Challenge target non-domestic metrics and LETI (London Energy Transformation Initiative) guidance on how to set embodied carbon targets to achieve the 2030 target for the stadium and hotel</li><li>Whole-life carbon assessment of stadium roof options: trade-off between structure suitable for solar PV but likely requiring higher embodied-carbon construction, versus lighter construction with potentially lower embodied carbon but no solar PV.</li><li>Cement replacement and use of all excavated material on-site.</li><li>Agree a contractual carbon budget with the contractors, e.g.. using a clause designed for this by the Chancery Lane Project, an initiative which aims to provide contractual solutions to climate change issues.</li><li>Rainwater and greywater harvesting to be explored within stadium design to reduce consumption of natural resources. This could be used for pitch irrigation or for internal reuse in toilets and office spaces.</li><li>Sustainable methods of keeping and maintaining the pitch (should grass be installed), for example through organic fertiliser.</li></ul>	<p>CDC Planning Policies ES1, ESD3</p>



# Stratfield Brake Sustainability Guide

## 2. Renewable energy



## 2. Implementation of renewable energy resources

### Key challenges

The climate and ecological emergency requires that we shift away from use of fossil fuel sources of energy in favour of renewables. Given the urgency, this needs to happen rapidly and at scale.

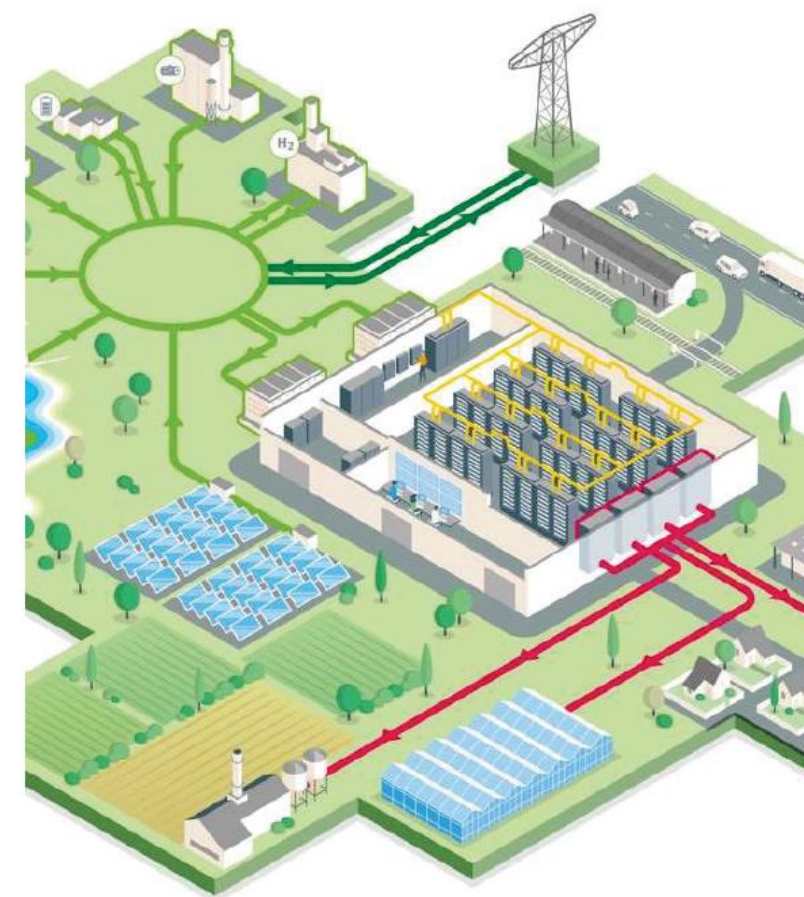
However, we also need to use proven and cost-effective technologies to minimise project delivery risks and to keep within viable build costs.

Careful design optimisation processes will need to be undertaken to balance the benefits of the renewable technologies against their capital cost and implications on operations.

This will most importantly consider the specification and sizing of technologies of such as PV panels, heat pumps and battery storage systems to create a solution that is free from fossil-fuel sources and is cost effective and reliable in operation.

It will be difficult to generate all electricity required on site at the time of use that it is required. Battery storage can help with this, and further augmented by energy sharing across different use types in the locality. Lastly, there will need to be a procurement solution to ensure that additional electricity purchased from off-site is from robust REGO certified renewable sources.

Furthermore, there will need to be exploration into how on-site generation, battery storage and demand flexibility can contribute to local grid capacity constraints and ideally generate an additional income stream for the club.



There is potential for Energy sharing on site – early design considerations have been outlined by RED Engineering Design Ltd. Please see Appendix B for their initial ideas.



## 2. Implementation of renewable energy resources

### Emerging trends / best practice

#### Arsenal FC - Emirates Stadium – Battery storage, renewable electricity use, anaerobic digestion

The Emirates has a 3MW battery storage system. The stadium also sends 100% of collected match day food waste to an anaerobic digestion plant run by Octopus Energy, saving 2.32 million kg/CO2e a year.

Arsenal was the UK's first football club to install large-scale battery energy storage, capable of powering the 60,000 seat Emirates stadium for an entire match. The system was installed to reduce electricity costs, as the power required for a game was calculated to be equivalent to powering 2,700 homes for 2 hours. The 2MW battery capacity is set to be increased in future years. According to Forbes (2018), the battery system can be charged when electricity prices are cheap and can provide a revenue stream if electricity is sold to the National Grid at peak times.

Arsenal also claim to be the first Premier League club to switch to 100% green electricity and state that since partnering with Octopus Energy in 2016, they have cut their carbon footprint by 10.7 million kilograms of CO2.



### Solar PV panel installations

#### Johan Cruyff Arena, Netherlands

Home to Ajax football club has 4,200 PV panels installed on the roof and a wind turbine and uses 280 no. second-life Nissan Leaf car batteries to provide back-up power (Nissan, 2020). Where electricity is not needed in the stadium, surplus is redistributed to surrounding neighbourhood.



#### Weser Stadium, Bremen, Germany

Was completely rebuilt in 2008 to feature a solar-powered exterior, solar towers and solar roofing with 6,000 square meters of solar cells generating over 1.2 megawatts of electricity (Climate Action, 2018).



#### Mercedes-Benz Stadium, Atlanta, USA

Home to the Atlanta Falcons American Football and Atlanta United FC soccer teams, a solar covered walkway greets fans and provides shelter for main entrance to stadium during times when queues build up for entry.





## 2. Implementation of renewable energy resources

### Emerging trends / best practice

#### Solar PV panel installations

##### Nef Stadium, Turkey

At the Ali Sami Yen Sports Complex in Istanbul, Nef Stadium – the ~52,000 seater home of Galatasaray – is the world’s largest stadium rooftop solar PV array. The ~4.3 MW array was installed by the power distributor Energisa Enerji, and is comprised of 10,404 solar PV panels. As well as supplying 63% of energy for the stadium, the array can provide electricity for around 2,000 homes. This provides additional revenue stream, projected to generate £59.9 million over 25 years.



##### Europa-Park Stadion - SC Freiburg, Germany

2.4 MW rooftop solar array has been installed on the rooftop of Freiburg’s ~35,000 capacity stadium, with 6,000 solar modules covering 15,000m<sup>2</sup> of roof area. The installation is the 3rd largest PV system on a stadium roof. The solar PV generation is close behind the world’s 2nd largest stadium PV array of 2.5 MW on Brazil’s ~70,000 capacity National Stadium Mane Garrincha in Brasilia.



#### Kinetic floor tiles

Football clubs such as Barcelona are considering the potential for kinetic flooring, inspired by projects with smaller-scale grassroots community football by the UK-based manufacturer Pavegen. The Pavegen tiles generate up to 7W of power per footstep, and currently cost ~£600 per m<sup>2</sup> of tile – enough to power floodlights. Demonstration projects include pitches in Morro da Mineira favela in Rio de Janeiro, and community stadiums in Johannesburg, and Lagos.



#### Thames Valley Athletics Stadium GSHP

8 old gas boilers were replaced with a ground source heat pump in 2021 at the community facility near Windsor and Maidenhead. This led to an estimated annual reduction in carbon emissions of 35 tonnes CO<sub>2</sub>e.



#### Opportunities for hydrogen-powered stadiums

There is potential for stadiums to meet energy demands using green hydrogen production via electrolyzers powered by renewable electricity, combined with hydrogen-CHP (combined heat and power) systems. Hydrogen-CHP for a stadium has been explored by Aberdeen City Council, which would be a “first of its kind”.





## 2. Implementation of renewable energy resources

### Targets

This development will	
<ul style="list-style-type: none"><li>• Be a fossil-fuel free development with no need for gas connection. Using only electricity will mean that the carbon emissions of the new stadium will reduce as the national electricity grid continues to decarbonise (National Grid, 2022).</li><li>• Use a decentralised energy system to build in energy supply resilience.</li><li>• Carry out a feasibility assessment of renewable energy technologies to determine the most appropriate system to meet the varying needs on site.</li><li>• Install heat pumps with minimum 300% efficiency used for space heating, cooling and domestic hot water.</li><li>• Install solar photovoltaic (PV) panels across the site (note, dependent on potential for connection between OUFC and Flit Solar Park – please see targets the ‘targets to be explored’), covering all suitable rooftops, including the arena, hotel, school and clubhouses.</li><li>• Create a feature of PV panels on covered pedestrian walkway from Oxford Parkway by installing PV panels on the roof for fans to view as they walk into site, providing people with shelter from rain, sun, wind on their way.</li><li>• Incorporate a range of battery storage measures to capture renewable electricity generated on site and reduce electricity exported back to the grid.</li><li>• Explore options for demand side flexibility and smart grid services as well as options for energy sharing with other local consumers and generators.</li></ul>	<p>CDC Planning Policy ESD5</p> <p>BREEAM Credits Ene 01, Ene 04</p>



## 2. Implementation of renewable energy resources

### Targets

Opportunities to be explored	
<ul style="list-style-type: none"><li>Consider ground source heat pumps in addition to/instead of air source. There is significant potential for generation from GSHPs given the site is ~44 acres and significant areas of landscaping provide opportunities for boreholes.</li><li>Explore partnership with existing 43-acre Flit Solar Park which is adjacent to the site and has a 10.5 MW capacity (with 41,040 PV panels and 6 inverters):<ul style="list-style-type: none"><li>Direct Power Purchase Agreement (PPA) would provide fixed income for operator by connecting a private wire to use this energy directly (rather than Flit Solar exporting it to the grid).</li><li>Explore potential for expansion of the solar park to ensure additionality of renewable electricity generation.</li><li>Offer Flit Solar Park demand-side response (DSR) services if feasible and sought by the generator, buying and storing electricity during peak solar PV generation (or converting to thermal energy in heat batteries) when lower demand, using on site and providing electricity battery storage infrastructure for the generator to use to supply other customers with renewable electricity.</li></ul></li><li>Further solar PV on-site generation: Feasibility of installing solar PV panels on the rooftop of the stadium, considered in whole-life carbon assessment of stadium roof options: Trade-off between structure suitable for solar PV but likely requiring higher embodied-carbon construction, vs lighter construction with potentially lower embodied carbon but no solar PV.</li><li>Bio-solar roofs where possible (combine PV roofs with green roofs, including for the pedestrian walkway).</li><li>Explore the potential of innovative and emerging technologies (such as kinetic tile flooring) for generation of renewable electricity and for engaging staff and site visitors in sustainability.</li><li>Electronic information boards show fans on match days the amount of renewable electricity being produced by the on-site technologies, and what this could power (using an appropriate metric, e.g.: electricity used in an average home/all of the flood-lighting for a match).</li></ul>	<p>CDC Planning Policy ESD5</p> <p>BREEAM Credits Ene 01, Ene 04</p>



# 2. Implementation of renewable energy resources

## Targets

Opportunities to be explored	
<ul style="list-style-type: none"><li>• Solar thermal collector panels on rooftops and hot-water storage systems for pre-heating domestic hot water used on site particularly the hotel and school.</li><li>• Wastewater heat recovery systems – especially given high domestic hot water demand in a hotel.</li><li>• Heat batteries that convert excess solar PV electricity to thermal energy in hot water tanks, which can be used to meet heating and hot water demand across the site including hotel.</li><li>• Anaerobic digestion of food waste from all uses on site – consider export to gas grid. Option could also be explored as a demonstration project with educational benefits (with local school).</li><li>• Hydrogen electrolyser running on renewable electricity supplied from solar PV to produce green hydrogen used for combined heat and power (CHP) unit. Potential partners include the Oxfordshire Hydrogen Hub.</li></ul> <p>In accordance with RED Engineering Ltd Sustainable engineering solutions presentation (See Appendix B), the proposals could include:</p> <ul style="list-style-type: none"><li>• Smart city technologies and systems that allow for future proofing</li><li>• Microgrid for grid stabilization capability</li><li>• Site-wide thermal networks for heating sharing, waste heat recovery and centralised energy balancing</li><li>• Thermal storage (bulk water, phase change, geothermal)</li><li>• Urban utilities integration including EV charging and street lighting</li><li>• Macro-control of network supply and demand and monitoring</li></ul>	<p>CDC Planning Policy ESD5</p> <p>BREEAM Credits Ene 01, Ene 04</p>



# Stratfield Brake Sustainability Guide

## 3. Net-zero carbon



# 3. Delivering net-zero carbon

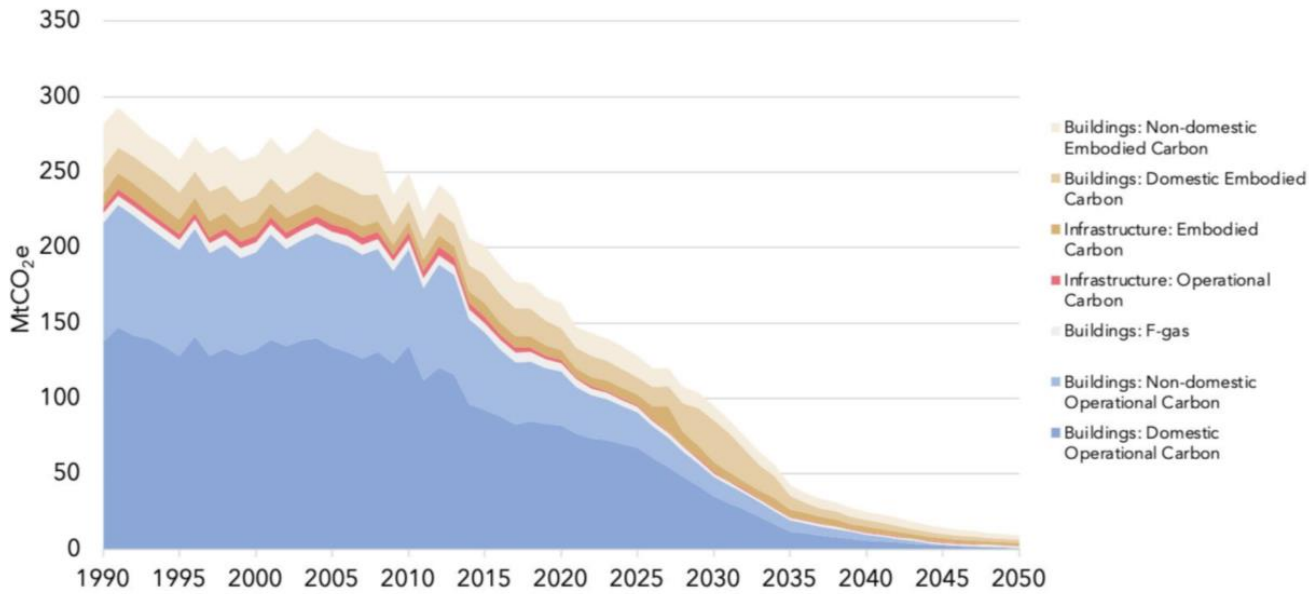
## Key challenge

The UKGBC has produced a Framework definition of Net Zero Carbon for Buildings. This covers both 'Building Construction' and 'Building Operation' which are brought together in the 'Whole life' carbon emissions. In order to achieve Whole Life Net Zero carbon, a scheme needs to minimise upfront and embodied carbon in the materials and construction whilst also reducing emissions from the heating, lighting and wider energy demand of the operations of building.

This section brings together the first two sections of this report into a single overarching objective.

For housing and some commercial buildings, it is possible for a building to produce as much energy as it consumes across a given year. However, this may be more challenging for a stadium to achieve on-site on its own. Hence an energy masterplan should consider the range of mixed uses across an area, and how they might work-together to create the optimum energy solution for the area.

Cherwell District Council's emerging local plan sets the promotion of net zero carbon as a key objective. It is expected that a regulation 18 version of this Local Plan review is expected later in 2022 or early 2023.



**Figure 31:** Overall carbon trajectory for the built environment (1990 – 2050)



# 3. Delivering net-zero carbon

## Key challenges

Reducing annual operational carbon emissions to zero is a powerful commitment to make. This is achieved by designing an efficient fabric and form, specifying energy efficient building services, and generating as much energy on-site through renewable installations as is consumed by the buildings operation. Where this isn't technically possible, the offsetting of remaining emissions can be considered.

This approach has the further benefit of minimising the developments demands on the electricity grid. This not only minimises upfront District Network Operator (DNO) reinforcement costs (which the developer has to cover), but also reduces the on-going energy purchase liability. Significant local renewable generation reduces the developments reliance on grid power, and hence reduces the exposure of the operator to electricity price spikes or inflation.

PV panels generate electricity during daylight hours. However, the site has significant night-time electrical energy demands, including floodlights, retail, restaurant spaces and the hotel. In order to ensure reliance of supply, smooth out renewable energy intermittency and enable maximum on-site consumption of generated power, battery storage should be incorporated to allow the electrical energy to be stored and used at later hours. With the current elevated electricity prices (which are likely to remain high for many years), the payback periods for investing in generation equipment such as Photovoltaics and lithium-ion battery storage are very attractive.

Ensuring energy is not wasted. A Building Energy Management Systems can help regulate the energy use within the building. Including: purchasing REGO (Renewable Energy Guarantees of Origin) energy when costs are lowest at night, making sure energy is not wasted and heating the building in the most efficient and cost effective way.

Please also see Bioregional's Needs Analysis (March 2022).

It is a key requirement for clubs within the FA National League System and is also essential on artificial grass pitches to ensure extended community use, which allows for increased hours of play and football outcomes. FA Guidance on Artificial Lighting and Floodlighting should be followed if an artificial pitch is chosen.

### Matchday Carbon Footprint

At Kassam, Oxford United FC is responsible for 50% electricity and gas use, and 60% of water use. This equates to approx. 258 tonnes CO2e per season



# 3. Delivering net-zero carbon

## Emerging trends / best practice

### St Sidwell's Point Leisure Centre, Exeter

First UK Passivhaus swimming pool. Robust business plan with a predicted utility cost of £20/m2 compared to the conventional cost of c. £60/m2. Expected to save £200,000 a year compared to a conventionally constructed design.

### Tottenham Hotspur new stadium

Highly efficient insulation and building fabric to reduce heating and cooling demands. 100% certified renewable energy and zero scope 2 emissions, with Renewable Energy Guarantees of Origin (REGO)-backed electricity and carbon neutral gas provided to the stadium by Brook Green Supply Ltd energy supplier.

### Aberdeen Football Club

Their current Pittodrie Stadium has a capacity of 22,199 seats. As of April 2022, they had announced that they are going to be building Europe's first net zero stadium, with the club signed up to the UN Sports for Climate Action Framework. The AFC website suggests that the stadium could be powered by hydrogen. Key facts about the new 20,000 seat Kingsford Stadium (Kingsford, 2022) are noted on their website, however no sustainability targets or renewable energy have been mentioned.

### United Nations Sports for Climate Action Framework

*"By joining the Sports for Climate Action Framework, organisations commit to supporting its overarching mission to help drive the sports sector to net-zero emissions by mid-century, in line with a 1.5°C pathway. Organisations also commit to the Framework's various principles and values related to collaboration, education and advocacy for climate action".*

### Project LEO (Localised Energy Oxfordshire)

Local Energy Oxfordshire innovative energy trials to accelerate UK transition to a zero-carbon energy system. Smart and Fair Neighbourhood trials will demonstrate how flexibility services can explore smarter, low carbon, locally balanced systems.

### Kick-off time amendments

Schedule earlier kick-off times to help reduce energy bills amid the current cost-of-living crisis, as Scottish Football Association have recommended recently. The German Football League have recommended that clubs set an individual energy saving target of 15 to 20% during the 2022-23 season.



# 3. Delivering net-zero carbon

## Emerging trends / best practice

### Forest Green Rovers ticket offset for carbon neutrality

By building a mandatory offset cost into every ticket for home and away visitors, Forest Green Rovers are achieving carbon neutrality for fan travel as an interim measure (they can't control how fans travel and travel to away games cannot always be done by electric coach). It is not clear how much this cost is to fans, or how the money is spent (The Sustainability Report 2019).

### Tottenham Hotspur

Sky and Tottenham Hotspur partnered to host "the world's first net zero carbon elite football match", when Spurs played Chelsea on 19 September 2020.

They first created a baseline by measuring the carbon emissions from a standard match to determine reduction opportunities. They minimised emissions from matchday activity by powering the stadium using 100% renewable electricity, replacing high energy floodlights with efficient LED bulbs, and using green gas to power all heating and cooking in the stadium. Players travelled to and from the stadium in coaches powered by green biodiesel. Fans were encouraged to travel to the match using sustainable transport, but fan travel still represented the largest proportion of emissions (as shown in the table to the right) due to 65% fans travelling to the match in petrol or diesel cars. All food served inside the stadium was locally and sustainably sourced, with 94% more vegetarian and plant-based options on the menu compared to a standard match. Water consumption was also minimised, with waterless urinals and low flow fittings and fixtures having been installed in the stadium.

The Sky Sports production crew achieved a 70% baseline reduction through having more staff working remotely, using green biodiesel in production vehicles and the on-location generator, and making sure any on-site crew and pundits travelled to the match sustainably. Any emissions that couldn't be eliminated were offset by Natural Capital Partners through nature-based carbon sink restoration. The overall carbon footprint for Game Zero totalled 861.9t CO2e, which is broken down in the table below:

	tCO2e	Proportion
Energy	1.4	<1 %
Water, wastewater and waste	4.8	<1 %
Employee commuting, both squads travel and Chelsea hotel stays	1.5	<1 %
Fan travel and hotel stays*	805.7	93 %
Materials / consumables**	44.4	5 %
Misc	4.1	<1 %
<b>Total</b>	<b>861.9</b>	

### Polestar electric car case study

It is considered that the manufacture of an electric vehicle means that it will need to drive 50,000 miles before an equivalent fossil fuel car becomes less green, due to the carbon associated with the manufacture of the electric battery (Forbes, 2020). In 'Decarbonising Road Transport: There Is No Silver Bullet 2020' report the EV carbon footprint of a Polestar 2 EV and a fossil-fuel Volvo XC40, where the Polestar produces 24 tons of CO2 during manufacture and the Volvo uses 14 tons CO2 are compared. However, it is argued that although the operational carbon is significantly lower in EV cars, that the 50,000 miles is exaggerated (due to using a worst case scenario national grid electricity carbon factor, when electric car charging points often use renewable energy). This example shows how the concept of 50,000 (or perhaps less) miles to be offset between the two options is a figure people can understand, and could be used to compare the number of years for offsetting the build of the new stadium at Stratfield Brake against the Kassam Stadium (when designs allow for detailed embodied carbon analysis to take place).



# 3. Delivering net-zero carbon

## Emerging trends / best practice

### VfL Wolfsburg Net Zero Emissions by 2050

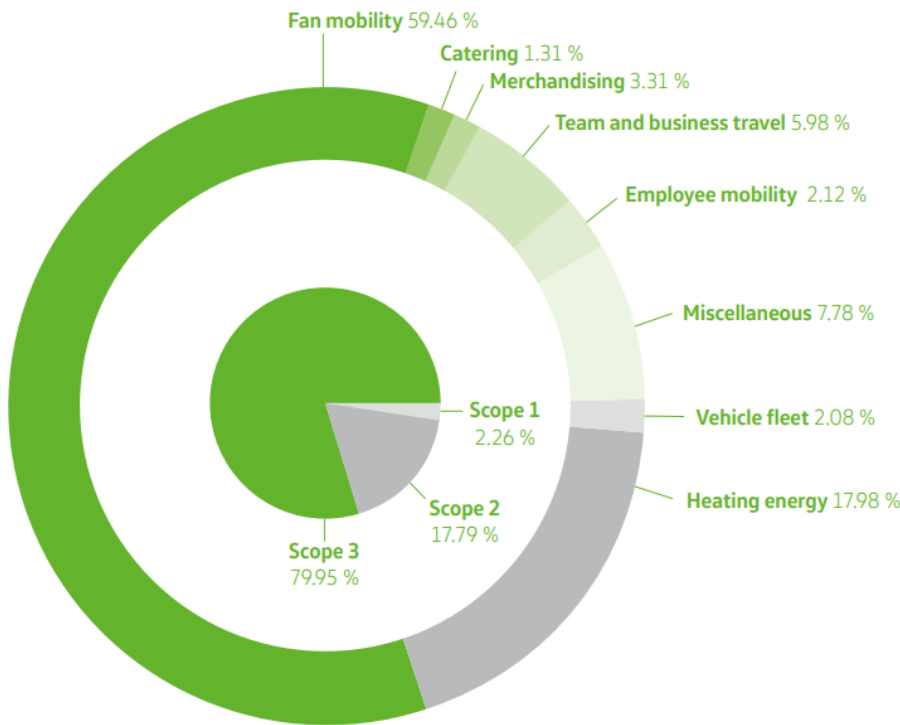
VfL Wolfsburg became the first European football club in the top leagues to publicly commit to the systematic reduction of its carbon emissions, by signing the ‘Sports for Climate Action’ climate protection agreement and becoming a ‘Race to Zero’ partner of the UN. In 2020, they revised their climate targets to develop a reduction roadmap for their CO2 emissions based on Science Based Targets Initiative methods. VfL’s aim is to reduce its emissions to net zero by 2025. To achieve this it plans to reduce its total emissions (Scopes 1 to 3) by 6.45% per year, to reach a reduction of 55% by 2030 compared to a 2017/18 baseline.

In 2019/20, VfL reduced its Scope 1 and 2 emissions by 24.5% compared to the 2017/18 season, which it attributes largely to the reduction in consumption of district heating due to milder weather. However, 80% of VfL’s emissions are in the Scope 3 category of which the largest proportion is caused by fan travel to and from home matches.

VfL’s stadium is 100% powered by renewable electricity, whether this is procured or generated by the PV and solar thermal system that is installed on the roof and that is due to be expanded. They are also planning to expand the e-charging infrastructure, and increase the number of professional players and employees that use the company EV cars.

The club acknowledges that team and fan travel is the biggest and most difficult area of emissions to reduce, but they provide incentives for sustainable travel practices, for example by offering fans the option to buy a climate-neutral ticket and merchandise which includes the cost of offsetting the associated CO2 emissions.

### CO<sub>2</sub> FOOTPRINT





# 3. Delivering net-zero carbon

## Targets

This development will	
<ul style="list-style-type: none"><li>• Set appropriate embodied carbon target and achieve net zero operational carbon through use of energy efficient systems, renewable energy and carbon offsetting. Set a clear target and publicly commit to achieving this. Publish performance against the target on an annual basis.</li><li>• Achieve minimum of 4 no. BREEAM Ene 01 credits , which is the minimum required for an Excellent rating. The final number of credits that can be achieved for reduced emissions and reduced demand will be calculated at a later design stage.</li><li>• Procurement of electricity on site from suppliers using 100% renewable energy and ensure these contracts are for the lifetime of the stadium, retail spaces, school and hotel. Renewably sourced electricity could be procured from Octopus or Ecotricity, for example.</li><li>• Green leases for commercial spaces to ensure occupiers/tenants adhere to sustainable ambitions during operation.</li></ul>	<div>CDC Planning Policies ESD1, ESD2, ESD5</div> <div>BREEAM Credits Ene 01, Ene 04</div>
Targets to be explored	
<ul style="list-style-type: none"><li>• Use UK offsetting providers to have visibility over how the money is spent and explore offsetting locally. Where international offsetting is used, need to consider additionality (carbon reductions achieved by offsetting need to be additional to what would have occurred without the project), traceability (ensuring the offset is not also sold to a different buyer), and verification (auditing/third party oversight).</li><li>• Use LETI guidance to set an Energy Use Intensity (EUI) target. They suggest &lt;65 for schools and &lt;55 kWh/m2/year (GIA) for offices, but have no specific target for sports stadiums.</li><li>• Apply LETI guidance target of space heating demand &lt;15 kWh/m2/year.</li><li>• Offset some emissions by offering a voluntary carbon offset price when purchasing tickets – link this to ticket purchasing for season tickets holders OR include mandatory carbon offset cost in ticket price for all fans.</li></ul>	<div>CDC Planning Policies ESD1, ESD2, ESD5</div> <div>BREEAM Credits Ene 01, Ene 04</div>



# Stratfield Brake Sustainability Guide

## 4. Sustainable transport



## 4. Sustainable transport

### i) Reducing emissions from transport

#### Key challenges

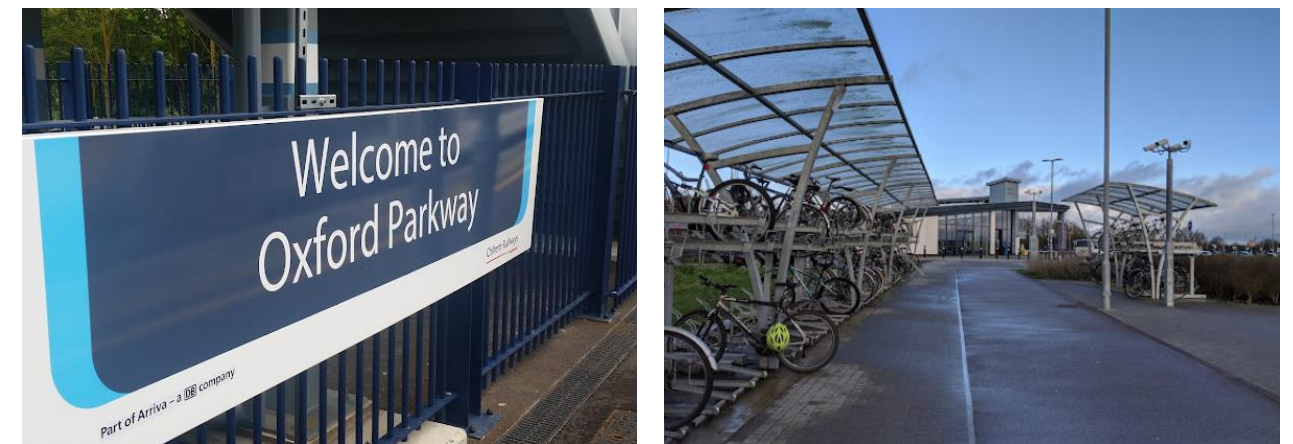
Proposals will need to ensure public transport journeys are quick and easy and at a price that encourages people to leave their car behind. Active travel such as cycling and walking must be as attractive as possible, with the right infrastructure provided, and ensuring people feel safe by foot or bike. Local stakeholders will need to be part of the process to ensure that this behaviour change can be sustained.

Oxford United FC will need to set the right incentives and disincentives to achieve sustainable behaviour change, such as by providing gold standard cycle parking while minimising car parking spaces to a few specific needs. Local stakeholders will need to be part of the process to ensure that this behaviour change can be sustained.

Where minimal car parking is required (i.e.: for disabled site users and hotel users), providing passive EV charging to all car parking spaces with connection to on-site battery storage requires early design consideration for electrical infrastructure to ensure grid can handle the operation of these. Active rapid EV charging should be installed and a minimum of 1 active electric vehicle space for every 10 spaces will be required in order to meet Building Regulations Part S (2021).

Oxford United FC's own transport choice must be sustainable in order to set the right example and help to challenge the behaviour change needed to reduce emissions from transport. Efforts made by the staff, club sponsors and the team to reduce emissions from transport, commuting and deliveries should be publicised on a regular basis to gain traction.

Ensuring that local air quality is protected is essential and protecting local residential streets from being used by fans to park cars will require careful managing and supported by widely advertising sustainable transport options. Also see Bioregional's Needs Analysis (March 2022).



Oxford Parkway train station is a 12-minute walk away along existing roads, with 150 covered cycle parking spaces with CCTV.

#### Matchday Carbon Footprint

Fan travel to games is the largest contributor to OUFC's carbon footprint at Kassam at 28 tonnes CO<sub>2</sub>e per game. 86% of these emissions are through petrol/diesel car travel.



## 4. Sustainable transport

### i) Reducing emissions from transport

#### Emerging trends/best practice

##### London Olympics 2012

Sustainability was embedded in the London 2012 Olympics under the concept 'Towards a One Planet Olympics', established in partnership with Bioregional and the World Wide Fund for Nature (WWF). Key objectives for sustainable low carbon transport were to provide safe, secure, inclusive, environmentally-friendly, fast and reliable transport for staff, athletes and spectators.

Established in 2006, the Active Travel Advisory Group comprised representatives from lobby groups, local authorities and delivery partners who came together to offer advice and maximise the opportunity provided by the Games.

With a decision not to provide any spectator car parking spaces, The Active Travel Programme was developed to encourage more walking and cycling before, during and after the Games.

This strategy proved highly effective. A key element was using existing public transport and supplementing these with special Games services in London and at other venues, such as providing extra trains to Weymouth for sailing events.

Over 75km of walking and cycling routes in East London have been enhanced by Transport for London (TfL) and delivery partners, following £10m investment from the Olympic Delivery Authority.

Improvements included resurfacing, widening cycle lanes, re-aligning cycle ways and improving road crossings. Many of the routes are along towpaths and away from vehicular traffic. A comprehensive programme of 'way-finding' has been delivered by TfL to aid navigation with around 280 signs being installed along the eight routes.

Completed in October 2011, the routes were collectively known as the 2012 Games Walking and Cycling Routes and formed the main spectator routes used by people walking and cycling to the Olympic Park and River Zone venues during the Games.





# 4. Sustainable transport

## i) Reducing emissions from transport

### Emerging trends/best practice

#### Newcastle United

The club have shown it is possible for a football club to work effectively with local authorities and transport providers to encourage sustainable transport. Through schemes such as ‘Alternative Travel’ and the ‘Magpie Mover’ matchday travel ticket, Newcastle fans are among the least car dependent in the Premier League. (Door to Turnstyle report, 2013).



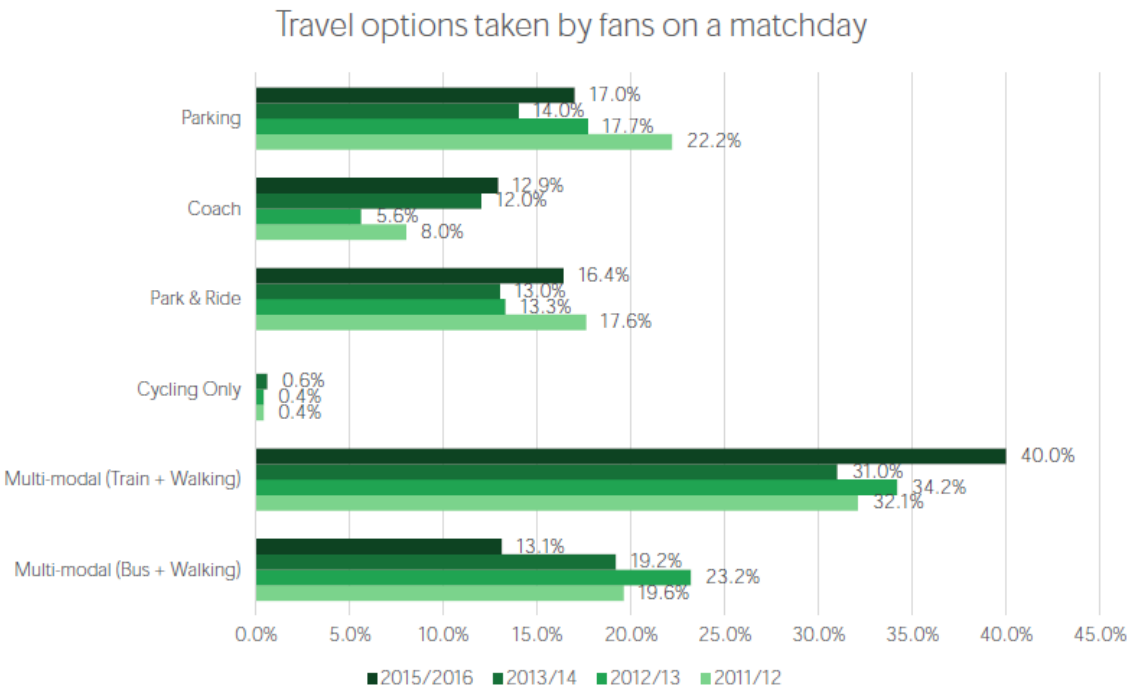
Matchday Free Travel Scheme

#### Brighton and Hove Albion

The purpose-built out-of-town stadium has mitigated and overcome the disadvantages with its new location: “The club is doing a good job of promoting public transport and cycling and there is a very good scheme with local transport operators where match tickets can be used for free travel within a wide zone” (Door to Turnstyle report, 2013).

The Healthy Stadia Case Study (2017) report states that during the 2015/2016 season, 50% of the total attendance per match used multi-modal travel, by walking, or cycling in combination with public transport). The report states that on a matchday, the number of fans travelling on matchdays using park and ride facilities was 16%, coach 12% and car parking 17% - please see graph on the right.

It should be noted that Brighton and Hove Albion provide an ideal case study due to the similar spatial locations to Stratfield Brake i.e... Set outside of a city centre location, close to major A-road and rail links with minimal car parking provision. This should provide reassurance and confidence on what is possible.





## 4. Sustainable transport

### i) Reducing emissions from transport

#### Emerging trends/best practice

##### Forest Green Rovers

Based in Gloucestershire, Forest Green Rovers was described by FIFA in 2017 as ‘the greenest football club in the world’. Key actions they take for reducing transport emissions include:

- At home games, promoting the nearby park & ride, cycle parking and EV charging points
- Offsetting the carbon emissions of group coach travel to away games
- Reducing team travel emissions: the First Team use an electric coach whilst the Academy players travel to their training ground in an electric minibuss.
- The club has partnered with mobility app Bolt. Bolt seeks to accelerate the transition from private cars to shared mobility, including micro-mobility, shared cars, and ride-hailing.

##### Transport plans for their new Eco-Park stadium include:

- New traffic lights to the site, a pedestrian crossing, cycle crossing and combined footway/cycle way which will link to a National Cycle Route.
- Plans to subsidise match day buses from nearby towns, and trial a bus service from local train stations.
- An initial aim that the number of supporters’ cars parked will not exceed 34% of total match attendance.





# 4. Sustainable Transport

## i) Reducing emissions from transport

### Targets

This development will	
<ul style="list-style-type: none"><li>• Demonstrate sustainable travel planning by provision of a BREEAM compliant travel plan for the development, including ‘normal’ and ‘match day’ plans</li><li>• Appoint a Sustainable Travel Co-Ordinator for the site and create a detailed Travel Information System to promote sustainable travel (BREEAM credit Tra 02)</li><li>• Demonstrate an increase over the existing <u>Accessibility Index</u> through negotiation with local bus and train companies to increase the frequency of the local service provision for the development, particularly on match days. (BREEAM credit)</li><li>• Promote the use of sustainable public transport</li><li>• Work with bus and train companies to develop a subsidized match day ticket offer</li><li>• Work with existing park and ride facilities to ensure fans can use these facilities on match days and information is provided about these on the FC website</li><li>• Ensure that driving a car to the venue is not the most cost-effective option otherwise it may be difficult to incentivize people to travel by public transport long term, and on days where there is bad weather.</li><li>• Explore providing an electric shuttle bus service to transport people from Oxford Parkway and other local transport nodes for people with mobility issues.</li><li>• Require all businesses on site to have a Sustainable Travel Plan</li><li>• Minimise car parking spaces to only for VIPs, disabled visitors, hotel guests and some re-provision for rugby/cricket</li><li>• Working with local councils to establish parking permit zones to nearby residential streets to restrict fans/site visitors from parking nearby.</li><li>• All parking spaces have passive EV charging; charging points for personal EVs (electric cycles and scooters)</li><li>• Building Regulations Part S June 2022: all new non-residential building with more than 10 parking spaces must have a minimum of one charge point and cable routes for one in five (20%) of the total number of spaces (This exceeds BREEAM EV charging target).</li></ul>	<p>CDC Planning Policy ESD1</p> <p>BREEAM Credit Tra 01, Tra 02</p>



# 4. Sustainable Transport

## i) Reducing emissions from transport

### Targets

Targets to be explored	
<ul style="list-style-type: none"><li>To ensure sustainable travel planning during operation, appoint a Travel Plan Co-ordinator within six months of grant of outline planning consent (as FGR)</li><li>All transport used by the football team uses renewable energy. Example: Forest Green Rovers</li><li>Baseline and annual travel surveys once in the new stadium, remediation action as necessary</li><li>Following precedents such as Brighton &amp; Hove Albion, number of fans travelling by car will not exceed 50% of the total of supporters at the match</li><li>If car parking to be allowed, set up, and promote, a car sharing group with dedicated parking spaces to encourage sharing. Provide priority spaces for car sharers for at least 5% of the total car parking capacity for the development (would secure points for BREEAM credit Tra 02)</li><li>Ensure Sports England Car Parking and Landscape Design Guidance is followed</li><li>Work with existing park and ride operators (Oxford Parkway Water Eaton, Oxford Parkway Railway Car Park, Pear Tree, Seacourt, Redbridge, Thornhill and Bicester) to ensure minimum of 5,000 park and ride spaces are available (calculated by Ridge and Partners LLP (transport planners).</li><li>Current targeted numbers for car parking and cycle parking calculated by Ridge and Partners LLP (transport planners) to be:<ul style="list-style-type: none"><li>936 no. cycle parking spaces (made up of: 40 no. for the hotel, reprovision of 10 no. for the rugby club, 166 no. for the arena and 720 no. for the stadium).</li><li>246 no. car parking spaces (made up of: 200 no. for the hotel, 46 no. for the rugby club)</li><li>84 no. disabled car parking spaces (made up of: 63 no. spaces for the stadium and 21 no. spaces for the arena).</li></ul></li></ul>	<div>CDC Planning Policy ESD1</div> <div>BREEAM Credit Tra 01, Tra 02</div>



## 4. Sustainable transport

### ii) Improving health through increasing physical activity and active travel

#### Key challenges

OUFC needs to ensure travel infrastructure and travel options encourage active travel; walking and cycling routes should be coherent, direct, safe, continuous and attractive and secure cycle parking should be provided.

There are also behaviour barriers to overcome including a prevailing car culture, an individual's lack of an active travel habit and lack of confidence around physical activity.

There could also be some cost barriers for some to use facilities/travel to facilities, or to buy equipment such as a bicycle.

There can be a reluctance to use E-Bikes and E-scooters due to perceived high risk of theft so proposals should ensure that secure storage is available, or rental schemes can be welcomed to operate from the site.

Inclement weather could also deter people from active travel, e.g.. heavy rain, too hot to travel comfortably, and having several options for sustainable travel can help overcome this.

Please also see Bioregional's Needs Analysis (March 2022).





## 4. Sustainable transport

### ii) Improving health through increasing physical activity and active travel

#### Emerging trends / best practice

##### KAA Gent and Ghelamco Arena, Ghent Belgium

KAA Gent team are based at 20,000 capacity Ghelamco Arena, which boasts:

- 2838 permanent cycle locking stalls
- 600 mobile stalls
- An average during the season of 2000 KAA Gent supporters using bicycles each match +15% of KAA Gent supporters travel to Ghelamco arena on their bicycle, significantly reducing congestion

##### Primary impetus: move to out of town new-build area in 2013

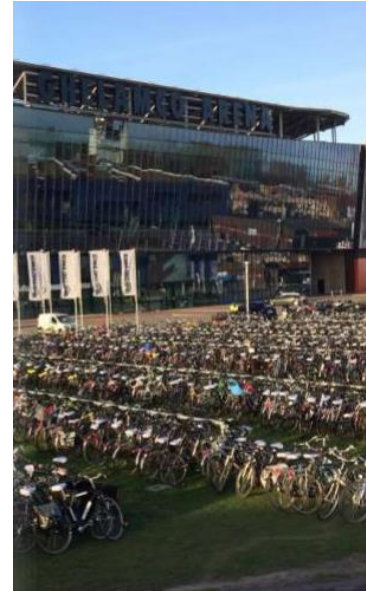
Major opportunity to restrict all non-essential car transport & change mobility culture amongst fans.

Investment: cycle lane routing to stadium & initial 1,500 spaces.

Communications push: 'Cycling Buffalos' campaign launched with huge social media push promoting cycling ahead of opening new stadium – Mayor & players on YouTube channels.

Whole club approach: Operations & Safety Manager / Mobility Manager / Community Manager.

Whole city approach: Ghent Bikers Foundation / KAA Supporters Federation / Local public transport providers / City Council.



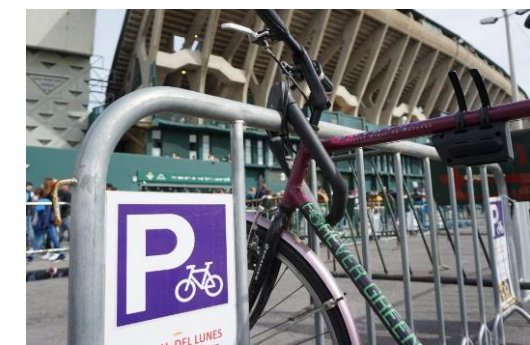
##### Real Betis' 'Match for Sustainability' May 2022

Together with other sustainability actions, the club encouraged fans to travel to the stadium via public or active transport.

Using the Ciclogreen app, which promotes sustainable mobility, fans logged more than 1,000 km of journeys made to the Estadio Benito Villamarín via means other than car. Those walking made up 43% of those journeys, while bus, bicycle and e-scooters accounted for 20%, 13% and 4.35% respectively.

To support fans with sustainable transport choices, they were offered codes for Acciona electric motorcycles (more than 2,000 were downloaded), Lime electric bikes (more than 100) and Voi scooters (more than 120). Scooter and bicycle parking was also made available outside of the stadium.

Ecoterrae, the firm measuring the footprint, estimates that the public transport campaign saved 911 tonnes of CO2e, which also equates to the energy use of 70 homes over a year.





## 4. Sustainable transport

### ii) Improving health through increasing physical activity and active travel

#### Emerging trends / best practice

##### Parc Olympique Lyonnais – underground cycle parking

The out of-town Parc Olympique Lyonnais stadium built in 2016, has state-of-the-art sports facilities, two hotels, a leisure centre and commercial and business offices.

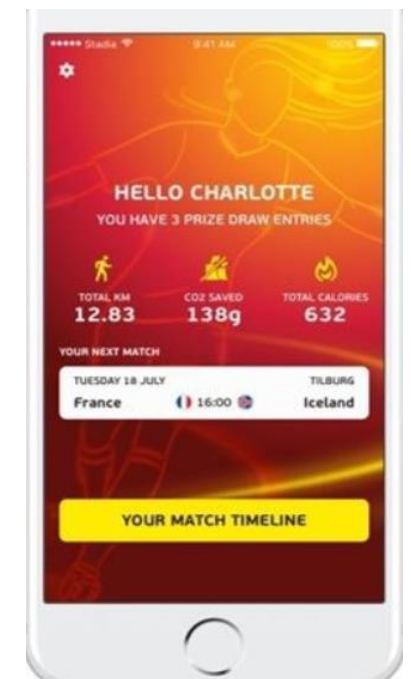
The new stadium also included an innovative underground solution to cycle locking facilities which helped to solve security issues during sports fixtures; keeping bicycles protected from the weather; and wayfinding information on site and dedicated cycling lanes making cycling accessible and easy.



##### Promoting active mobility through an app for fans

An app was created by Healthy Stadia for the UEFA Women's EURO 2017 that provided fans with route finding and directional assistance as well as information on where cycle parking was located at each stadium.

The app also tracked fans' calorie expenditure, distance travelled, and kilograms of CO2 saved through walking or cycling. Fans who completed a minimum distance were entered into a competition to win tournament tickets and match balls, incentivising fans to walk or cycle to matches.





# 4. Sustainable transport

## ii) Improving health through increasing physical activity and active travel

### Targets

This development will	
<p><b>Walking</b></p> <ul style="list-style-type: none"><li>• provide signed, well lit walking routes to stadium</li><li>• create a footbridge over the A4260 connecting pedestrians to Oxford Parkway train station</li><li>• put in place traffic calming measures to reduce speed of car traffic coming in off A34, A44 and A4260.</li><li>• cover areas of walkways and use planting to protect from rain, sun</li><li>• use planting to delineate paths and make route attractive to use while boosting biodiversity</li></ul> <p><b>Cycling</b></p> <ul style="list-style-type: none"><li>• Infrastructure will be suitable for cyclists of varying levels of ability and speeds of cycling</li><li>• allow separation from vehicle traffic</li><li>• minimise interactions with pedestrians</li><li>• provide continuity at road crossings, junctions and bus stops</li><li>• provide cycle facilities for staff, visitors and players: BREEAM: provide changing facilities, and drying facility; Lockers – 1 per cycle space; Showers – 1 per 10 cycle spaces up to 8 showers per building</li><li>• Cycle parking adequate for now and flexible for increased demand in future</li></ul>	<p>CDC Planning Policy ESD1</p> <p>BREEAM Credit Tra 01, Tra 02</p>



# 4. Sustainable transport

## ii) Improving health through increasing physical activity and active travel

### Targets

Targets to be explored	
<ul style="list-style-type: none"><li>Follow guidance on active mobility: Sports England Active Design Guidance and Active Design Checklist and Sustrans Cycle Parking and Security Standards</li><li>Running campaigns to promote active travel and offering incentives – partner with local companies to deliver these</li><li>Requiring all businesses on site to offer staff a Cycle To Work scheme</li><li>Providing signed, well lit walking routes covering routes within 2km of stadium</li><li>Establishing an area of the site’s website promoting active travel and go live before first match</li><li>Promoting circular economy approaches such as cycle hire, E-scooter hire, E-bike scheme</li></ul> <p><b>Cycle parking targets</b></p> <ul style="list-style-type: none"><li>Department for Transport Local Transport Note 1/20 (July 2020) – provides guidance for local authorities on designing high-quality, safe cycle infrastructure. The most applicable guidance (for leisure centres) suggests:<ul style="list-style-type: none"><li>Short stay: Greatest of: 1 per 50m<sup>2</sup> or 1 per 30 seats/capacity (i.e.. 600 temporary cycle parking on match days for the proposed 18,000 seat stadium; Long stay: 1 per 5 employees</li></ul></li><li>European Healthy Stadia Network – Active Mobility Guidance recommends the following cycle parking spaces for stadia with between 10,000 – 39,999 seats:<ul style="list-style-type: none"><li>Bronze - 1 per 500 seats; Silver - 1 per 350 seats; Gold - 1 per 200 seats (i.e. 90 for the proposed 18,000 seat stadium).</li></ul></li></ul>	<p>CDC Planning Policy ESD1</p> <p>BREEAM Credit Tra 01, Tra 02</p>



## 4. Sustainable transport

### iii) Ensuring the stadium and wider development is accessible for all

#### Key challenges

Disabled people make up nearly one in five (19%) of the population. The Equality Act 2010 requires providers of services to the public, such as a sports stadium, to make a 'reasonable adjustment' so that disabled people are not placed at a 'substantial disadvantage' compared to non-disabled people. Therefore, all plans for sustainable transport need to ensure they are suitable for people with ranging abilities, ages, finances and physical needs to travel to and around the entire site.

Walking paths need to be designed for those with mobility issues such as ramps, non-slip surfaces, wider paths for wheelchairs, way finding features for the blind.

Car parking and cycle parking need to make allowances for disabled visitors.

Traffic calming measures will be required around the new stadium to ensure the safety of site visitors.

Disabled people report a lack of information about the facilities available and having to contact grounds in advance to check make planning their visit more difficult.

Travel costs for lower income visitors or those with special needs need to be considered e.g.. discounted match day travel tickets, free shuttle bus from the station.

Promotional actions will be needed to persuade a diverse range of people that their needs will be met on site to encourage attendance.

Please also see Bioregional's Needs Analysis (March 2022).



Difficulty travelling to and from using public transport."

Not enough disabled coaches supplying transport."

Lack of parking for blue badge holders."

*The Inclusive and Accessible Stadia Report | Attending Spectator Sports: Disabled Spectators' Experiences and Club Perspectives 2015*



# 4. Sustainable transport

## Ensuring the stadium and wider development is accessible for all

### Emerging trends / best practice

#### Brighton and Hove Albion

In 2021, Age UK Mobility assessed all Premier League Clubs for their accessibility for disabled supporters. Brighton and Hove Albion, Southampton and Watford ranked highly for all of the disability factors taken into account and scored 4.5/5 on Trip Advisor.

Brighton and Hove Albion have a dedicated Disability Liaison Officer and friendly, helpful stewards are given Disability Awareness Training. The club provides a high ratio of wheelchair spaces to total capacity with a variety of viewpoints. Disabled fans are able to buy their tickets on-line and use an Inclusion Room for a quieter match experience.

Measures taken to ensure accessible transport to the stadium include:

- Accessible parking – 50% discount when pre-booked
- Accessible shuttle bus from the accessible parking area which is near bus stops
- The coach park has a lift to take supporters to concourse level



Equity	· Same experience or level of service, regardless of functional capacity
Dignity	· Individual's status and respect maintained
Functionality	· Service/facility meets the needs of all constituent groups

Accessibility Guide An Inclusive Approach to the Olympic & Paralympic Games 2013



# 4. Sustainable transport

## iii) Ensuring the stadium and wider development is accessible for all

### Targets

This development will	
<ul style="list-style-type: none"><li>• adopt an ‘Inclusive Planning ‘ approach, involving disability experts and stakeholder groups in the design and travel planning.</li><li>• match day and clubs stewards will receive disability-awareness / confidence training. The training will be provided by disabled people who have the lived experience of having an impairment.</li><li>• provide up to date, appropriate and relevant transport information for disabled visitors about accessible travel to and from the venue.</li><li>• work in partnership with local transport providers to ensure that disabled supporters are not put off by transport and parking barriers.</li><li>• allocate dedicated parking bays that will comply with best practice standards for disabled people (location, width, signage etc).</li><li>• provide a drop-off bay adjacent to the main entrance that is long enough to allow ‘tail loading’.</li><li>• ensure surfaces for pedestrian use are smooth, even, hard surfaces with dropped curbs that are suitable for buggies and wheelchairs.</li><li>• ensure there is appropriate signage regarding accessibility.</li><li>• provide accessible transport for away matches.</li><li>• meet Approved Building Regulations 2000 document Part M: - "Access to and use of buildings" (2015/2020 edition).</li></ul>	<div>CDC Planning Policy ESD1</div> <div>BREEAM Credit Tra 01, Tra 02</div>
Targets to be explored	
<ul style="list-style-type: none"><li>• provide a free electric shuttle bus from the station for those with reduced mobility.</li><li>• extending disability training to every member of staff that comes in contact with the public at a sports venue.</li><li>• take account of impairment needs in the travel information it provides e.g.. adapting the colour of venue maps to take account of colour blindness. Information could be provided in more than one format, for example, easy read, large print, maps in two contrasting colours, audio, British Sign Language etc.</li><li>• provide a minimum of 1 accessible space at every cycle parking location, with 5% where over 20 cycle parking spaces are provided.</li><li>• planning lighting design so that illumination avoids the creation of contrasting pools of light and darkness to assist the visually impaired.</li><li>• using specific planting and different surface materials for pedestrian routes to provide olfactory and tactile information to assist visually impaired people.</li><li>• use range of sources of guidance: Sport England guidance on accessible facilities ; BS 8300: 2009 Design of buildings and their approaches to meet the needs of disabled people Code of practice.</li><li>• Incorporate design measures that prioritise accessibility for all potential site users, including interventions to prepare for the area’s ageing population. Consult UEFA’s ‘Access for All’ resource for stadium-specific guidance and set targets for the Access Audit, following the guidance.</li></ul>	<div>CDC Planning Policy ESD1</div> <div>BREEAM Credit Tra 01, Tra 02</div>



# Appendices



# Appendix A

## References

Aberdeen FC (2022) <https://www.building.co.uk/news/aberdeen-fc-commits-to-building-europes-first-net-zero-stadium/5116925.article>

AIA, 2022. <https://www.aia.org/articles/70446-ten-steps-to-reducing-embodied-carbon>

Approved Building Regulations 2000 document Part M: - "Access to and use of buildings" (2015/2020 edition). [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/990362/Approved\\_Document\\_M\\_vol\\_2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/990362/Approved_Document_M_vol_2.pdf)

Arsenal.com, 2022. Renewable energy - partnership with Octopus Energy. <https://www.arsenal.com/news/renewable-energy-partnership-octopus-energy>

Arup, 2014. Build Stadiums to last: <https://www.csemag.com/articles/arup-thoughts-build-stadiums-to-last/>

Arup (2022) 'Brentford Community Stadium: How do you design a cutting edge home for an ambitious team?' : <https://www.arup.com/projects/brentford-community-stadium>

BREEAM New Construction 2018 Manual [https://files.bregroup.com/breeam/technicalmanuals/NC2018/#03\\_scoringrating\\_newcon/scoring.htm%3FTocPath%3D%2520and%2520rating%2520BREEAM-assessed%2520buildings%7C%200](https://files.bregroup.com/breeam/technicalmanuals/NC2018/#03_scoringrating_newcon/scoring.htm%3FTocPath%3D%2520and%2520rating%2520BREEAM-assessed%2520buildings%7C%200)

BREEAM Transport Measures [https://www.designingbuildings.co.uk/wiki/BREEAM\\_Sustainable\\_Transport\\_Measures](https://www.designingbuildings.co.uk/wiki/BREEAM_Sustainable_Transport_Measures)

Centre for Ageing Better 2021: Active Travel and Mid-Life: Evidence on Attitudes and the Role of the Built Environment. <https://ageing-better.org.uk/sites/default/files/2021-08/active-travel-mid-life-full-report.pdf>

Climate Action, 2018. The 5 most sustainable sports venues in the world. <https://www.climateaction.org/news/the-5-most-sustainable-sports-venues-in-the-world>

Climate Protection CO" Neutral Football Made in Wolfsburg: <https://www.vfl-wolfsburg.de/en/vfl/corporate-responsibility/environment/climate-protection>

Connect4, 2022. The Evolution of Eco-friendly Football Stadiums. <https://www.connect4climate.org/infographics/evolution-eco-friendly-football-stadiums>

CREDS. 2022. Place-based carbon calculator. <https://www.carbon.place/>

Current News 2022 <https://www.current-news.co.uk/news/energy-price-volatility-to-last-till-2030-at-least-warns-cornwall-insight>

Department for Transport (July 2020) Cycle Infrastructure Design: Local Transport Note 1/20: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf)

Designing Wiki 2020: Allowable solutions for zero carbon buildings: [https://www.designingbuildings.co.uk/wiki/Allowable\\_solutions\\_for\\_zero\\_carbon\\_buildings](https://www.designingbuildings.co.uk/wiki/Allowable_solutions_for_zero_carbon_buildings)

Ecotricity (Next Generation Ltd) 2017: Eco Park revised scheme: FGRFC stadium application s.16/0043/out Outline Travel Plan <https://www.stroud.gov.uk/media/558493/rs-appendix-123-outline-travel-plan.pdf>

ENR Mid Atlantic: Amazon HQ2 Puts Concrete on an Embodied Carbon Diet: <https://www.enr.com/articles/53329-amazon-hq2-puts-concrete-on-an-embodied-carbon-diet>

Essex County Football Association : Floodlights <https://www.essexfa.com/leagues-and-clubs/finance/facilities-and-funding/floodlights>

FA Guide to Floodlighting <https://www.thefa.com/-/media/cfa/essexfa/files/facilities/fa-guide-to-floodlighting.ashx>

FA Guide to 3G Football Turf Pitch Design Principles and Layouts, FA, February 2020 <https://www.thefa.com/-/media/cfa/sheffieldfa/files/fa-3g-guide.ashx?la=en>

Gosford and Water Eaton Parish Council <http://www.gosfordandwatereaton-pc.gov.uk/>

Gov.uk, 2019. Future Homes Standard: <https://www.gov.uk/government/news/rigorous-new-targets-for-green-building-revolution>

Guardian article, 2018. Arsenal leads charge into battery power at Emirates Stadium <https://www.theguardian.com/business/2018/nov/26/arsenal-battery-power-emirates-stadium>

Healthy Stadia, Active Mobility Guidance; How to promote walking and cycling to sports venues <https://healthystadia.eu/wp-content/uploads/2021/06/Active-Mobility-Guidance-How-to-promote-walking-and-cycling-to-sports-venues.pdf>

Active Travel Case Study: American Express Community Stadium Brighton & Hove Albion FC, Healthy Stadia Network (2017) [https://healthystadia.eu/wp-content/uploads/dlm\\_uploads/2017/03/Active\\_Travel\\_Case\\_Study\\_-\\_BH\\_Albian.pdf](https://healthystadia.eu/wp-content/uploads/dlm_uploads/2017/03/Active_Travel_Case_Study_-_BH_Albian.pdf)

International Paralympic Committee Accessibility Guide: An Inclusive Approach to the Olympic and Paralympic Games, June 2013: [https://www.paralympic.org/sites/default/files/document/130902143349868\\_IPC+Accessibility+Guide\\_2nd+EDITION\\_FINAL.pdf](https://www.paralympic.org/sites/default/files/document/130902143349868_IPC+Accessibility+Guide_2nd+EDITION_FINAL.pdf)



# Appendix A

## References...continued

Katsaprakakis, D.A., Dakanali, I., Zidianakis, G., Yiannakoudakis, Y., Psarras, N. and Kanouras, S., 2019. Potential on energy performance upgrade of national stadiums: a case study for the Pancretan stadium, Crete, Greece. *Applied Sciences*, 9(8), p.1544.

Kidlington Parish Council [http://www.kidlington-pc.gov.uk/Environment\\_40499.aspx](http://www.kidlington-pc.gov.uk/Environment_40499.aspx)

Kingsford Stadium 2022 <https://www.kingsfordstadium.co.uk/about/>

Moving Together. Sustainability Report of VfL Wolfsburg 2020: [https://static-typo3.vfl-wolfsburg.de/user\\_upload/Medien/Dokumente/210425-VfL-Wolfsburg-Sustainability-Report.pdf](https://static-typo3.vfl-wolfsburg.de/user_upload/Medien/Dokumente/210425-VfL-Wolfsburg-Sustainability-Report.pdf)

National Grid 2022 <https://www.nationalgrid.com/stories/journey-to-net-zero>

National Tradesmen, 2022, British Steel Raises Prices Again by £100 Per Tonne: <https://nationaltradesmen.co.uk/2022/09/11/british-steel-raises-prices-again-by-100-per-tonne/#:~:text=New%20price%20hikes%20for%20structural%20steel%20to%20C2%A3800%20per%20tonne&text=The%20increase%20of%20C2%A350,last%20summer%20as%20reported%20by%E2%80%A6>

Nissan, 2020. Second life LEAF batteries to power Amsterdam Arena. <http://nissaninsider.co.uk/second-life-leaf-batteries-to-power-amsterdam-arena/>

Proceedings of the IASS-SLTE 2014 Symposium “Shells, Membranes and Spatial Structures: Footprints” 15 to 19 September 2014, Brasilia, Brazil. Comparing material quantities and embodied carbon in stadia Catherine DE WOLF\*, Julia HOGROIANA, John OCHSENDORFb Massachusetts Institute of Technology

Project LEO <https://project-leo.co.uk/our-trials/place-based-trials/>

Sky, 2022: Game Zero: Changing the game. <https://www.skygroup.sky/game.zero>

Sports England checklist <https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/active-design-checklist-oct-2015.pdf?VersionId=az73PYXRmKYaXMfLu8BCxgXSByeiAQ1d>

Sports England Guidance [https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/spe003-active-design-published-october-2015-high-quality-for-web-2.pdf?VersionId=uCz\\_r6UyApzAZlaiEVaNt69DAaOCmkIQ](https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/spe003-active-design-published-october-2015-high-quality-for-web-2.pdf?VersionId=uCz_r6UyApzAZlaiEVaNt69DAaOCmkIQ)

Sustrans Standards for Public Cycle Parking and Security Standard June 2021: <https://www.bicycleassociation.org.uk/wp-content/uploads/2021/06/05132-Cycle-Parking-and-Security-Standards-June-2021-REV-5.pdf>

The Sustainability Report article ‘Forest Green Rovers to compensate carbon emissions related to fan travel: <https://www.sustainabilityreport.com/2019/07/31/forest-green-rovers-to-compensate-carbon-emissions-related-to-fan-travel/#:~:text=League%20Two%20football%20club%2C%20Forest,an%20offset%20into%20every%20ticket.>

The Sustainability Report article ‘Match for Sustainability’ public transport push slashes fan travel carbon footprint, 26 May 2022: <https://www.sustainabilityreport.com/2022/05/26/match-for-sustainability-public-transport-push-slashes-fan-travel-carbon-footprint/>

Thornton Tomasetti news: <https://www.thorntontomasetti.com/news/2020-embodied-carbon-showcase-delivering-resilience-metropolitan-park>

UK Parliament Building to net zero: costing carbon in construction: Government Response to the Committee’s First Report, Third Special Report of Session 2022-2023: <https://publications.parliament.uk/pa/cm5803/cmselect/cmenvaud/643/report.html#:~:text=The%20Net%20Zero%20Strategy%20sets,new%20buildings%20in%20the%20future>

United Nations Climate Change Sports for Climate Action <https://unfccc.int/climate-action/sectoral-engagement/sports-for-climate-action>

University of Portsmouth, 2020: <https://www.port.ac.uk/news-events-and-blogs/news/university-of-portsmouth-wins-design-award-for-new-sports-centre>

VfL Wolfsburg Net Zero Emissions by 2050 <https://www.vfl-wolfsburg.de/en/vfl/corporate-responsibility/environment/climate-protection>

World Green Building Council, 2022: Bringing Embodied Carbon Upfront. <https://www.worldgbc.org/embodied-carbon>







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10736: RELOCATION OF OXFORD UNITED FC, STRATFIELD BRAKE

BRIEFING NOTE: BIODIVERSITY NET GAIN ASSESSMENT

INTRODUCTION

- 1. Ecology Solutions was commissioned by Ridge and Partners LLP in August 2022 to undertake a biodiversity net gain assessment in support of development proposals for the Relocation of Oxford United FC at Stratfield Brake, Kidlington (hereafter referred to as 'the site').
- 2. This document details the Biodiversity Net Gain Assessment undertaken for the above site, using the DEFRA Biodiversity Metric 3.1.

BIODIVERSITY NET GAIN ASSESSMENT

- 3. This Biodiversity Net Gain Assessment has been based upon the indicative landscape proposals for the above site, which is included at Appendix 1.
- 4. The landscape proposals include the loss of amenity grassland, amenity planting, willow plantation, rough grassland, hedgerows, mixed scrub, buildings, as well as areas of hardstanding. Plan ECO2 shows the existing habitats within the site.
- 5. Proposed habitats include amenity grassland, amenity planting, species-rich wildflower grassland, species-rich hedgerows and buildings/hardstanding, while areas of mixed scrub and the majority of hedgerows are to be retained. Plan ECO3 shows the proposed habitats within the site.
- 6. Following calculations undertaken using the DEFRA Biodiversity Metric 3.1 Calculation Tool, it can be seen that a net gain in biodiversity will not be delivered for habitats as a result of the proposed development however, a gain in hedgerows will be achieved. Specifically, the development will essentially 'break even' in habitat units (from 36.76 units to 36.75 units, equating to a 0.01% decrease) and an increase in hedgerow units from approximately 27.27 units to 38.29 units (which equates to a 40.41% increase). The DEFRA Biodiversity Metric 3.1 Calculation Tool is shown at Appendix 2.
- 7. It should be noted that the DEFRA Biodiversity Metric calculation does not take into consideration measures relating to protected or notable species. The provision of new wildflower grassland will provide enhanced foraging opportunities

for bats, birds and Badgers, terrestrial habitat for amphibians, reptiles and invertebrates. Hedgerow enhancements, creation and new landscape planting will provide enhanced foraging and navigational opportunities for bats, foraging opportunities for Badgers, foraging and nesting opportunities for birds and hibernation opportunities for amphibians and reptiles, as well as enhanced habitat for invertebrates.

- 8. A number of additional enhancements will also be provided as part of the proposed development, that are not accounted for within the net gain calculation. This includes bat boxes providing enhanced roosting opportunities for bats and bird boxes providing enhanced nesting opportunities for birds, as well as the provision of log piles that will provide enhanced hibernation opportunities for amphibians and invertebrates post-development.

CONCLUSION

- 9. The calculation indicates that a net gain in biodiversity cannot be achieved under the current development proposals. It is recommended that proposals target a net gain in excess of 10%, which is expected to become the minimum net gain requirement following the adoption of a regulation within the Environment Act. In order to achieve a net gain of 10%, an additional 3.68 units would need to be provided either through onsite or offsite provision, or through contributions to an offsetting scheme.
- 10. It is considered that the development proposals will deliver a net gain in biodiversity through the additional enhancement measures detailed above that are not accounted for within the calculation.



**PLANS**

**PLAN ECO2**  
Existing Habitat Measurements



QGIS.org (2020). QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.org> -Based upon the Ordnance Survey map with permission of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Ecology Solutions Ltd, Farncombe House, Farncombe Estate, Broadway, W12 7LJ. AL 10004628



**KEY:**

- SITE BOUNDARY 18 ha
- HEDGEROW 0.103 km
- SPECIES-RICH HEDGEROW 0.273 km
- SPECIES-RICH HEDGEROW WITH TREES 1.62 km
- HEDGEROW WITH TREES 0.31 km
- MODIFIED GRASSLAND (POOR CONDITION) 12.191 ha
- ARABLE (WILLOW PLANTATION) 3.355 ha
- HEDGEROW (AREA) 1.06 ha
- SCRUB 0.872 ha
- DEVELOPED SEALED SURFACE 0.49 ha
- INTRODUCED SHRUB 0.029 ha



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10736: RELOCATION OF OXFORD FC,  
STRATFIELD BRAKE

PLAN ECO2: EXISTING HABITATS

Rev: A  
Oct 2022



## **APPENDICES**

### **APPENDIX 1** DEFRA Biodiversity Metric Calculation



Headline Results

Return to results menu

On-site baseline	Habitat units	36.76
	Hedgerow units	27.27
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	36.75
	Hedgerow units	38.29
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	-0.01%
	Hedgerow units	40.41%
	River units	0.00%
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	0.00
	Hedgerow units	11.02
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-0.01%
	Hedgerow units	40.41%
	River units	0.00%
Trading rules Satisfied?	No - Check Trading Summary ▲	



A-1 Site Habitat Baseline												
Condense / Show Columns					Condense / Show Rows							
Main Menu					Instructions							
	Habitats and areas			Distinctiveness		Condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline
Ref	Broad Habitat	Habitat Type	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic Significance multiplier		Total habitat units
1	Sparsely vegetated land	Ruderal/Ephemeral	1.06	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	2.12
2	Cropland	Non-cereal crops	3.355	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	6.71
3	Heathland and shrub	Mixed scrub	0.872	Medium	4	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (≥)	3.49
4	Grassland	Modified grassland	12.191	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	24.38
5	Urban	Introduced shrub	0.029	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	0.06
6	Urban	Developed land; sealed surface	0.49	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00
7												
8												
9												
10												
11												
	Total habitat area		18.00									36.76

Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comments	
Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area habitat lost	Units lost		Assessor comments	Reviewer comments
0.881	0	1.76	0.00	0.18	0.36		Area beneath hedgerows	
0	0	0.00	0.00	3.36	6.71			
0.164	0	0.66	0.00	0.71	2.83			
4.94	0	9.88	0.00	7.25	14.50			
0	0	0.00	0.00	0.03	0.06			
0	0	0.00	0.00	0.49	0.00			
5.99	0.00	12.30	0.00	12.01	24.46			

Total area lost (excluding area of Urban trees and Green walls)	12.01
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## A-2 Site Habitat Creation

Condense / Show Columns

Condense / Show Rows

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### Instructions

Post development/ post intervention habitats																							
Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness		Condition		Strategic significance				Temporal multiplier						Difficulty multipliers				Habitat units delivered	Comments	
			Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard time to target condition/years	Habitat created in advance/years	Delay in starting habitat creation/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	Assessor comments		Reviewer comments	
Urban	Developed land: sealed surface	4.517	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	0	0	Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	developed		
Urban	Developed land: sealed surface	1.63	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	0	0	Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00			
Urban	Introduced shrub	0.698	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0	0	Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	1.35	10/30 mix built/introduced shrub		
Grassland	Other neutral grassland	2.756	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5	0	0	Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	18.45	10/30 mix built/introduced shrub		
Grassland	Modified grassland	2.302	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0	0	Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	4.44	Comments		
Sparsely vegetated land	Ruderal/Ephemeral	0.112	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0	0	Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	0.22	Sports pitches		
																					Area underneath hedgerows		
Total habitat area		12.02																					
Site Area (Excluding area of Urban trees and Green walls)		12.02																					
																				Total Units	24.46		



B-1 Site Hedge Baseline												
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Baseline ref	UK Habitats - existing habitats			Habitat distinctiveness		Habitat condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline
	Hedge number	Hedgerow type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier		
1	1	Native Species Rich Hedgerow with trees	0.132	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	1.58
2	2	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.483	V High	8	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like	7.73
3	3	Native Species Rich Hedgerow with trees	0.151	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	1.81
4	4	Native Species Rich Hedgerow - Associated with bank or ditch	0.273	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	3.28
5	5	Native Hedgerow	0.079	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.16
6	6	Native Hedgerow with trees	0.101	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	0.81
7	7	Native Species Rich Hedgerow with trees	0.399	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	4.79
8	8	Native Species Rich Hedgerow with trees	0.107	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	1.28
9	9	Native Species Rich Hedgerow with trees	0.343	High	6	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	4.12
10	10	Native Hedgerow with trees	0.208	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Like for like or better	1.66
11	11	Native Hedgerow	0.024	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.05
12												
13												
14												
15												
16												
			2.30									27.27
			Retention category biodiversity value									
			Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost				
			0	0.132	0.00	1.58	0.00	0.00				
			0	0.483	0.00	7.73	0.00	0.00				
			0	0.151	0.00	1.81	0.00	0.00				
			0	0	0.00	0.00	0.27	3.28				
			0	0	0.00	0.00	0.08	0.16				
			0	0.082	0.00	0.66	0.02	0.15				
			0	0.399	0.00	4.79	0.00	0.00				
			0	0.107	0.00	1.28	0.00	0.00				
			0	0.182	0.00	2.18	0.16	1.93				
			0	0.165	0.00	1.48	0.02	0.18				
			0	0.024	0.00	0.05	0.00	0.00				
			0.00	1.76	0.00	21.56	0.66	5.70				





B-2 Site Hedge Creation																								
Condense / Show Columns											Condense / Show Rows													
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			Proposed habitats		Habitat distinctiveness		Habitat condition		Strategic significance			Temporal multiplier						Difficulty risk multipliers				Hedge units delivered	Comments	
Baseline ref	New hedge number	Habitat type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard Time to target condition/years	Habitat created in advance/years	Delay in starting habitat creation/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied		Assessor comments	Reviewer comments	
1	12	Native Species Rich Hedgerow with trees	0.1	High	8	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0	0	Standard time to target condition applied	20	0.490	Low	Standard difficulty applied	Low	1	0.88			
2	13	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.144	V High	8	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0	0	Standard time to target condition applied	20	0.490	Low	Standard difficulty applied	Low	1	1.69			
3	14	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.202	V High	8	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0	0	Standard time to target condition applied	20	0.490	Low	Standard difficulty applied	Low	1	2.38			
4	15	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.113	V High	8	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0	0	Standard time to target condition applied	20	0.490	Low	Standard difficulty applied	Low	1	1.33			
5																								
6																								
7																								
8																								
9																								
			0.56																			6.88		









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