



Greater Cambridge Partnership

---

# **CAMBOURNE TO CAMBRIDGE**

Appendix TR5.11: Statement to Inform Habitats  
Regulations Assessment





Greater Cambridge Partnership

---

## **CAMBOURNE TO CAMBRIDGE**

Appendix TR5.11: Statement to Inform Habitats Regulations  
Assessment

**Type of document (version) Public**

**Project no. 70086660-451**

**Date: August 2023**

WSP

62-64 Hills Road

Cambridge

CB2 1LA

Phone: +44 1223 558 050

Fax: +44 1223 558 051

WSP.com



# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Project Background	1
1.2	Report Purpose	1
<b>2</b>	<b>Scheme Description</b>	<b>3</b>
2.1	Overview	3
2.2	The Route	3
2.3	General Design Features	5
2.4	Specific Design Features	6
2.5	Landscape Strategy	7
2.6	Drainage	7
2.7	Roads and Junctions	9
2.8	Construction	9
<b>3</b>	<b>HRA PROCESS</b>	<b>14</b>
3.1	Habitats Regulations Assessment	14
3.2	Stages of Habitats Regulations Assessment	15
3.3	Screening (Stage 1)	16
3.4	Appropriate Assessment (Stage 2)	17
3.5	Further HRA Stages (Stage 3 and 4)	19
<b>4</b>	<b>Identification of Relevant Sites</b>	<b>20</b>
4.1	Study Area	20
4.2	Consultation	20
4.3	NSN and Ramsar Sites and their Qualifying Features, Threats and Conservation Objectives	25
<b>5</b>	<b>Stage 1: Screening</b>	<b>31</b>
5.1	Consideration of Effects	31

<b>5.2 National Site Network and Ramsar Site Management Statement</b>	<b>31</b>
<b>5.3 Identification of Impacts</b>	<b>32</b>
<b>5.4 Identification of Other Plans and Projects</b>	<b>32</b>
<b>5.5 Potential In-Combination Effects</b>	<b>44</b>
<b>5.6 Summary of Screening Outcomes</b>	<b>45</b>
<b>6 Environmental Baseline</b>	<b>46</b>
<hr/>	
<b>6.1 Baseline for Barbastelle Bat</b>	<b>46</b>
<b>7 Stage 2: Appropriate Assessment</b>	<b>51</b>
<hr/>	
<b>7.1 Introduction</b>	<b>51</b>
<b>7.2 Assessment of Scheme in Isolation</b>	<b>51</b>
<b>7.3 In-combination Effects</b>	<b>61</b>

## ***Tables***

<b>Table TR5 2-1 - C2C Scheme detention basin/ ponds</b>	<b>8</b>
<b>Table TR5 4-2 - Sites Identified</b>	<b>23</b>
<b>Table TR5 4-3 - Eversden and Wimpole SAC Qualifying Features</b>	<b>25</b>
<b>Table TR5 4-4 - Ouse Washes SAC Qualifying Features</b>	<b>27</b>
<b>Table TR5 4-5 - Ouse Washes Ramsar Site's Qualifying Features, Threats and Pressures and Conservation Objectives</b>	<b>28</b>
<b>Table TR5 4-6 - Fenland SAC Qualifying Features, Threats and Pressures and Conservation Objectives</b>	<b>29</b>
<b>Table TR5 5-1 - Screening of Impact Pathways and Likely Significant Effects</b>	<b>34</b>

## ***Figures***

<b>Plate TR5 2-1 - The route comes alongside the A428 north of Bourn Airfield</b>	<b>4</b>
<b>PlateTR5 2-2 - Typical cross sections for the C2C Scheme route</b>	<b>5</b>



**Plate TR5 2-3 - Proposed Construction Phasing**

11

**Plate TR5 6-1 - Landscape Mitigation Feature**

58

---

## ***Annexes***

Annex A

Internationally Designated Sites



# Executive Summary

This report has been prepared to inform a Habitats Regulations Assessment (HRA) assessment under the Conservation of Habitats and Species Regulations 2017 (as amended) (the ‘Habitats Regulations’) of the proposals by Greater Cambridge Partnership (GCP) to obtain consent for the proposed Cambourne to Cambridge (C2C) Scheme located in Cambridgeshire (hereafter referred to as ‘the C2C Scheme’).

The C2C Scheme lies between Cambourne and Cambridge, to the west of Cambridge city centre. Consent for the Scheme would be achieved via Transport Works and Act Order (TWAO) and deemed planning permission via an application to the Secretary of State for Transport. The Secretary of State and their government department would therefore act as the competent authority for the HRA which is required as part of their decision-making process.

The Habitats Regulations require that a competent authority, before giving any consent or permission for a plan or project which is likely to have a significant effect on a site within the National Site Network (NSN) either alone or in combination with other plans or projects must make an ‘Appropriate Assessment’, NSN sites encompass the UK Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Further, it is a matter of UK national policy that Ramsar Sites are considered in the same manner.

This report presents information to inform Stages 1 and 2 of the HRA process, to establish whether or not the C2C Scheme would have a Likely Significant Effect (LSE) (Screening, Stage 1) and, if so, would risk an adverse effect on integrity (Appropriate Assessment, Stage 2) of any NSN or Ramsar Site. Stages 3 and 4 of the HRA are outside of the purpose of this report.

Several NSN and Ramsar Sites have been identified within the vicinity of the C2C Scheme which require consideration under the Habitats Regulations, these are:

- Eversden and Wimpole SAC – 6km north of the C2C Scheme;
- Ouse Washes SAC and Ramsar – 15.49km north of the C2C Scheme; and
- Fenland SAC – 15.38km northeast of the C2C Scheme and 18.77km downstream.

At the screening stage the qualifying interest features of each site, its conservation objectives, possible threats to site integrity, and impact pathways from the C2C Scheme were assessed. No LSE were identified for the Ouse Washes SAC and Ramsar nor the Fenland SAC. However, the following impacts were considered to have the potential to affect the Eversden and Wimpole Woods SAC, designated for its maternity colony of Barbastelle Bats, during the construction and operational phases of the C2C Scheme.

- Fragmentation impacts to qualifying features (Barbastelle Bat) within functionally linked habitat as a result of construction and / or operation;
- Road traffic mortality during operation; and



- Impacts to functionally linked habitat because of hydrological impacts during construction and operation.

No measures to mitigate these affects were included at this stage. As such, likely significant effects are assessed as a result of the C2C Scheme, alone and in combination with other plans and projects.

Following detailed assessment, it is concluded that following mitigation there will be no adverse effects on site integrity of Eversden and Wimpole Woods SAC either alone or in combination with other plans or projects.

# 1 Introduction

---

## 1.1 Project Background

- 1.1.1. The Cambourne to Cambridge (C2C) Scheme will include a 13.6km long mainly dedicated busway connecting Cambourne in the west with Cambridge in the east. A service road and maintenance track, to be used as an active travel path, will run alongside the segregated sections of busway.
- 1.1.2. To deliver C2C, the Greater Cambridge Partnership (GCP), through Cambridgeshire County Council (CCC) as lead local authority (the Applicant), is applying to the Secretary of State for an order under the Transport and Works Act 1992 (TWA) and a Planning Direction under Section 90(2A) of the Town and Country Planning Act 1990 (TCPA). If authorised, the Transport Works and Act Order (TWAO) and deemed planning permission would together provide the powers required for the construction, maintenance and operation of the C2C Scheme. The competent authority would therefore be the Secretary of State for Transport.
- 1.1.3. The C2C Scheme will use hybrid vehicles (and in due course, electric vehicles), providing a service of around 10 buses per hour each way. The Scotland Farm travel hub (a park and ride facility) will be situated along the route, just north of the A428, approximately 5km west of Cambridge.
- 1.1.4. Further details about the C2C Scheme proposal are set out in Chapter 3 of the ES<sup>1</sup> and information relevant to this HRA are included in Section 2.

## 1.2 Report Purpose

- 1.2.1. The Scheme lies to the west of the city of Cambridge and a number of sites within the National Site Network (NSN) are present in the wider area. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. These statutory designated sites of international importance are hereafter collectively known as 'NSN or Ramsar sites. There are no candidate SACs (those proposed for designation as SACs and submitted to the European Commission before the end of the Transition Period following the UK's exit from the EU, but not yet formally designated), proposed SACs, proposed SPAs or proposed Ramsar sites in the Study Area (see Section 4.1).
- 1.2.2. NSN sites are statutory designated sites of importance to nature conservation that are protected by the Conservation of Habitats and Species Regulations 2017 (as amended). Until further amendment, the legislation refers to NSN sites as 'European sites', although the former term has been adopted by UK nature conservation policy. Under this legislation 'Competent Authorities' must assess Plans and Projects for their potential to cause 'Likely Significant Effects' (LSEs) on NSN sites in accordance

---

<sup>1</sup> Environmental Statement (Document reference: C2C-10-00-Environmental Statement (Volume 1))





with the National Planning Policy Framework (NPPF, 2021). The assessment process is commonly referred to as Habitats Regulations Assessment (HRA).

- 1.2.3. This report comprises a Screening Assessment (HRA Stage 1) and an Appropriate Assessment (HRA Stage 2) which are described in Section 3.2. It provides the Competent Authority with the information it needs to inform an assessment of LSEs associated with the Scheme on NSN sites, to make an appropriate assessment of the implications of the Scheme on NSN sites in view of the sites' conservation objectives, and whether mitigation can offset these effects. This report will also determine whether further HRA stages (Stage 3 and 4) need to be applied to achieve compliance with legislation.
- 1.2.4. This report accompanies a planning application to gain consent under the Transport and Works Act 1992) from the Secretary of State for Transport (in its role as Competent Authority) for construction and operation of the Scheme.

## 2 Scheme Description

---

### 2.1 Overview

- 2.1.1. The Cambourne to Cambridge (C2C) Scheme will include a 13.6km long mainly dedicated busway connecting Cambourne in the west with Cambridge in the east. A service road and maintenance track, to be used as an active travel path, will run alongside the segregated sections of busway. The C2C Scheme will use hybrid vehicles (and in due course, electric vehicles), providing a service of around 10 buses per hour each way. The Scotland Farm travel hub (a park and ride facility) will be situated along the route, just north of the A428, approximately 5km west of Cambridge. Further details about the C2C Scheme proposal are set out in Chapter 3 of the ES<sup>2</sup>.
- 2.1.2. Construction is anticipated to commence in 2025 and continue over approximately 24 months, for a scheme opening in 2027.
- 2.1.3. The new bus service is expected to operate approximately between 6.00am and midnight, in line with existing Cambridge guided bus services. There will be several bus services that use the route along all or part of the length of the C2C Scheme, which are set out in the Transport Assessment<sup>3</sup>. These total up to approximately 10 services an hour in each direction, although service frequency will vary at different times of the day. The travel hub will be accessible 24 hours per day, but will be used most intensively between 6.00am and 7.00pm.

### 2.2 The Route

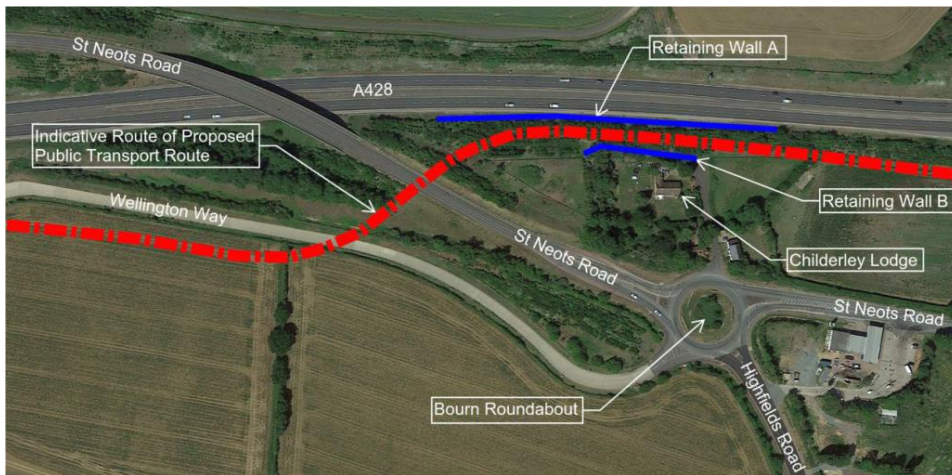
- 2.2.1. Working from west to east, the C2C Scheme begins in Cambourne at Sterling Way passing east along a section of segregated route created on an existing footway/cycleway, which will be recreated alongside the busway.
- 2.2.2. The route crosses Broadway, using a signalised junction, and enters the now former Bourn Airfield. It passes around the western and northern perimeter of this future new community, where it will largely be accommodated on its own dedicated route.
- 2.2.3. The route bears north-east out of Bourn Airfield and crosses St Neots Road about 150m northwest of the Bourn roundabout at Childerley Gate. A new signalised crossing will be installed on St Neots Road.
- 2.2.4. North of St Neots Road, the route bears east, supported by retaining walls, to take it between the A428 and the nearest of three residential properties at Childerley Lodge.

---

<sup>2</sup> Environmental Statement (Document reference: C2C-10-00-Environmental Statement (Volume 1)).

<sup>3</sup> Transport Assessment (Document reference: C2C-25-00-Transport Assessment).

**Plate TR5 2-1 - The route comes alongside the A428 north of Bourn Airfield**



- 2.2.5. The route continues off road on the south side of the A428 for approximately 1.2km before bearing south to join St Neots Road, 170m west of Scotland Road. C2C buses will be able to use Scotland Road to access the travel hub located east of Scotland Farm. A new signalised junction will allow the buses to pass to and from the travel hub.
- 2.2.6. An existing 107m long culvert taking a minor watercourse beneath the A428 will need to be extended by 9m to allow the C2C Scheme to pass over it.
- 2.2.7. The C2C Scheme will continue along St Neots Road for about 2km, passing the northern edge of the village of Hardwick.
- 2.2.8. West of Long Road the route bears south from St Neots Road, passing west and south of the Comberton plantation (also referred to as the Waterworks site). The route will use a signalised junction across Long Road.
- 2.2.9. The route continues east across farmland that takes it north of the main built settlement of Coton. This section of the C2C Scheme will use a combination of landform and planting to help fit the alignment into the landscape. The footpath between Coton and Madingley will be retained across the route.
- 2.2.10. The route crosses Cambridge Road at a new signalised junction before continuing across Coton Orchard to a new bridge that will carry it over the M11. Various measures have been included to maintain safe wildlife movement across the busway, including underpasses for animals like badgers, foxes and rabbits, and retention of the poplar trees on the eastern boundary to maintain a route for bats. The route will be suitably fenced for security here, as well as to guide mammals towards underpasses and prevent them crossing the busway, with its associated collision risk.
- 2.2.11. East of the M11 crossing, the C2C Scheme will enter West Cambridge University Campus, passing along Charles Babbage Road. It will then bear south through a gap between existing campus buildings and enter the West Fields, bearing east and south around the edge of Cambridge University athletics sportsground.

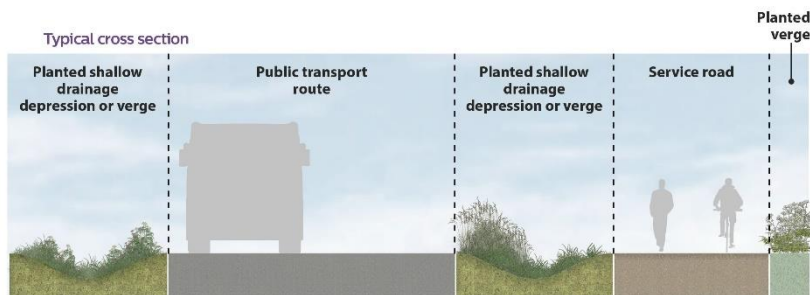
2.2.12. The route continues eastward along the Rifle Range track, crossing Bin Brook over a new bridge. A special design is included here to ensure that ground disturbance is minimised and that, as a result, the protected trees along Rifle Range are retained. The route passes north of the Cambridge University Rugby Union Football Club ground and south of properties on Herschel Road, before connecting to Grange Road, where the C2C Scheme ends, but from where buses will continue along existing routes into Cambridge and onto other destinations such as the Biomedical Campus.

## 2.3 General Design Features

### The Scheme Profile

- 2.3.1. The profile of the C2C Scheme encompasses both the new busway and the service road for the majority of the alignment. As **PlateTR5 2-2** illustrates, the busway will be separated from the service road by a planted shallow drainage depression or verge. The separation between the two is generally about 3m, though narrowing to 0.5m approximately 75m west of the M11 overbridge, the latter being the desirable minimum separation for a 30mph speed limit.
- 2.3.2. The busway will predominantly comprise dedicated sections where the busway traffic is segregated from the existing road network but there are also sections where the busway would use existing roads with bus priority provided at junctions.

#### PlateTR5 2-2 - Typical cross sections for the C2C Scheme route



- 2.3.3. The C2C Scheme will use single decker buses. The buses will be 12m long, containing as a minimum, a Euro VI compliant engine, with an aspiration for electric vehicles to be introduced at the earliest opportunity.
- 2.3.4. The service road will run parallel to off-road sections of the busway within the TWAO limits and would include facilities for pedestrians, cyclists and horse riders. For on-road sections the existing facilities used by cyclists and pedestrians will be improved. For the majority of the service road, the route will segregate cyclists and pedestrians.
- 2.3.5. The type of guidance system adopted for the C2C Scheme (optical or kerb) will determine the width of the service road (see Section 4.6).
- 2.3.6. Facilities to maintain access across the busway by footpaths and bridleways (Public Right of Way (PROW)) and access tracks will be included.

## Lighting

- 2.3.7. All lighting introduced along the C2C Scheme will use LED technology designed to minimise both vertical and horizontal light spillage. Lighting will only be installed in areas of high use, including junctions with highways, at busway stops, and at the travel hub.
- 2.3.8. It is assumed that the service road will have solar studs or similar lighting to provide wayfinding along sections through the countryside in order to maintain low lighting levels along the route, and so limit visual impact.
- 2.3.9. The design will seek to ensure minimum levels of light needed to enable safe use and will be designed in accordance with current standards and national guidance, in addition to ensuring compliance with relevant local planning authority standards and policy. Equally, details on lighting design and location will be mindful of its potential for impact on bats. A sensitive lighting strategy for areas used by commuting bats will be developed as part of the detailed design.
- 2.3.10. Hours of operation for lighting along the route will be agreed between the local authority and future operator. It is likely that lighting will be dimmed during periods of low bus use. The travel hub lighting levels would be set at a minimum level during off-peak usage (22:00 - 05:30), according to standard requirements. Lighting at busway stops will only be active during operational hours.

## 2.4 Specific Design Features

### The Travel Hub

- 2.4.1. Scotland Farm travel hub will provide space for around 2,000 cars and 300 bicycles, as well as coach parking. It will include recharging points for electric vehicles. It will have a central single storey building offering amenities such as toilets and waiting rooms.
- 2.4.2. Landscaping at the travel hub will help to mediate good access and movement, as well as supporting biodiversity and offering aesthetic benefits.
- 2.4.3. The hard standing parking space will be interweaved with planted 'fingers'. Trees and shrubs within these will soften the grid layout, while more peripheral planting will soften the geometry and help to screen views. Habitat creation and new amenity space will link with Callow Brook at the eastern edge of site.

### M11 overbridge

- 2.4.4. The C2C Scheme will cross the M11 approximately 200m south of Junction 13 A new bridge, approximately 57m long (clear span) and 15m wide, will carry the scheme over the motorway, with sufficient clearance to allow National Highways to widen the northbound slip lane if required.
- 2.4.5. The existing north-south bridleway running along the top of the east M11 cutting will be diverted behind the stanchion structures to enable connectivity with the east-west route.

## Bin Brook bridge

- 2.4.6. The C2C Scheme will cross Bin Brook on a 10m long clear span and 14m wide bridge, which would be about 2m above the existing water level to take account of future flood risk, including climate change impacts.

## 2.5 Landscape Strategy

- 2.5.1. A Design and Access Statement has been prepared separately in support of the TWA Order consent application. This emphasises a vision that seeks to use the environment as an opportunity in promoting a scheme that “maximises access and movement, biodiversity, a sense of place, local character, sustainable water resources and enhanced health and well-being”. The DAS highlights opportunities for:
- enhancing local character and assets;
  - designing with future trends in mind;
  - increasing biodiversity and ecological features; and
  - improving health and wellbeing.
- 2.5.2. The DAS sets out a series of generic design principles and follows these with 11 area-specific concepts to achieve them, as well as to mitigate potentially adverse effects.

## 2.6 Drainage

- 2.6.1. The C2C will introduce new areas of hard standing, totalling approximately 18.5ha, including 7.5ha for the travel hub. Drainage of these surfaces will be managed carefully to ensure that water passing from them to ground or watercourses is clean and controlled. All will be subject to discharge consents.
- 2.6.2. The exact measures used will be influenced by the underlying geology. Much of the route west of Coton lies over glacial till, which has high clay content and therefore does not drain well, requiring run off to be directed to local ditches and watercourses. The aquifer beneath Coton will also restrict the use of soakaways. East of Coton and between the M11 and Grange Road, underlying chalk has created more permeable soils, within which soakaways offer a more feasible solution.
- 2.6.3. The project’s drainage strategy follows guidance that emphasises the use of sustainable techniques and the SuDs Manual<sup>4</sup> and Cambridge County Council<sup>5</sup>. In particular a drainage network using sustainable systems (SuDS) is proposed to:
- ensure that surface water drainage will be managed as close to its source as possible, and will maintain natural ground conditions;
  - provide at source pollution control;

---

<sup>4</sup> Ballard S et al (2015) The SuDS Manual (CIRIA C753)

<sup>5</sup> Cambridgeshire County Council Surface Water Drainage for Developers (June 2021)

- limit discharge rates to open, ‘greenfield’ land to natural run-off rates; and
- attenuate run-off up to the ‘critical’ rainfall event (when rainfall would cause the highest peak flows or levels at a particular location, taking account of climate change projections) and minimise flooding for events that exceed this.

2.6.4. The busway will be kerb edged, but with drop kerbs provided at regular intervals to allow for discharge into a filter strip and then to a swale network. Swales are shallow vegetated channels that store and carry runoff and remove pollutants. Swales will direct surface water runoff to existing ditches or local watercourses, or to detention ponds introduced as part of the scheme (see **Table TR5 2-1**). The detention ponds will discharge to local watercourses at restricted rates to help mitigate flooding. Each detention pond will include an edge buffer for landscaping and access. The swales and detention ponds will provide sufficient pollution mitigation to allow outfall of clean water to the local watercourse.

2.6.5. At the travel hub, surface water runoff will be directed eastwards to a detention pond before being discharged to Callow Brook. The chosen SuDS options for this area will be defined as the design progresses. The detention basin will be developed as part of a wider habitat creation initiative, within the land between the hub boundary and Callow Brook.

**Table TR5 2-1 - C2C Scheme detention basin/ ponds**

Detention pond/ basin	Volume	Discharge point
Pond 01: Between Bourn Airfield and Childerley lodge	3,642m <sup>3</sup>	Existing ditch south of the A428
Pond 02: Between the A428 and St Neots Road	1,707m <sup>3</sup>	Existing watercourse south of the A428
Pond 02A: Between the A428 and St Neots Road	442m <sup>3</sup>	Existing watercourse south of the A428
Basin 09: South of Neots Road	830m <sup>3</sup>	To existing watercourse south of St Neots Road
Basin 10: West of Long Road	466m <sup>3</sup>	Existing ditch adjacent to the west side of Long Road
Basin 11: South of Madingley Mulch	1,388m <sup>3</sup>	Existing ditch south of the basin
Basin 05: West of the M11	4,425m <sup>3</sup>	Existing course west of the M11
Pond 06: South of the University of Cambridge	672m <sup>3</sup>	Existing watercourse south of Clerk Maxwell Road

Detention pond/ basin	Volume	Discharge point
Basin 07: West of Bin Brook	602m <sup>3</sup>	Bin brook
Pond 08: East of the Travel Hub	9,235m <sup>3</sup>	Callow brook
Note: Attenuation ponds 03 and 04 were discontinued due to design changes.		

## 2.7 Roads and Junctions

- 2.7.1. The C2C Scheme will largely follow a segregated path, except where it aligns along St Neots Road past Hardwick and links with the Scotland Farm travel hub, and on Charles Babbage Road through the West Cambridge campus.
- 2.7.2. It forms junctions with existing highways at Broadway east of Cambourne, St Neots Road twice (at Childerley Gate and southwest of Scotland Road), Long Road east of Hardwick, Cambridge Road in Coton, and Grange Road. The junctions will be signalised, with priority for buses.
- 2.7.3. The service road will run primarily south of the proposed public transport route, with crossing points located at the highway junctions, as well as on the eastern side of Scotland Road, where there are existing uncontrolled crossing points on the eastern arm of both roundabouts.
- 2.7.4. There will be crossing points also 75m east of the southern arm of the Scotland Road/St Neots Road roundabout, and between Millers Way and the blue bridge footbridge over the A428.

## 2.8 Construction

### Construction Strategy

- 2.8.1. The information presented here outlines the approach to construction and is sufficient to allow the EIA to determine any significant temporary effects that are likely to result from landtake, introduction of plant and temporary features, construction activity and emissions. It has also supported the development of a base cost estimate and helped identify any risks to cost and programme.
- 2.8.2. Should the TWA Order be granted, the GCP will appoint a principal contractor who will then work up a detailed design and construction strategy and programme. This may vary some of the information set out here, but not so that it introduces the requirement for any additional landtake outside the agreed Order limits, or that may result in additional likely significant effects, or worsening of likely significant effects described in this ES.
- 2.8.3. The construction strategy addresses general working practices including use of construction worksites and access to and from the works, access requirements for





bringing people and materials to and from worksites, working hours. It also hinges on the application of best practice measures to ensure that environmental effects are kept as low as practicable. These measures are set out in a Code of Construction Practice<sup>6</sup> (CoCP), which forms part of the TWA Order application.

### **Code of Construction Practice**

2.8.4. Construction work can be one of the chief causes of environmental impact. To minimise this risk, a CoCP has been developed for the project which sets out a range of measures and principles which contractors are required to abide with in undertaking their work. These build on more general measures that are used under the Considerate Constructors Scheme Code of Practice to ensure that:

- work sites are well managed and looking professional;
- local communities and those affected by the work are respected;
- the environment is protected;
- everyone is kept safe; and
- the work force is mutually respectful.

2.8.5. The principal contractor will be required to prepare a more detailed construction management plan (CMP). Building on the CoCP, the CMP will reflect the contractor's more detailed design, workplan and assumptions, and will provide the basis for detailed engagement with the relevant local authority.

### **Programme and Timing**

2.8.6. Construction is anticipated to commence in 2025 and continue over approximately 24 months, for a scheme opening in early 2027. The proposed construction phasing is shown in **Plate TR5 2-3**, overleaf.

---

<sup>6</sup> Code of Construction Practice (Document reference: C2C-26-00-Code of Construction Practice)



Plate TR5 2-3 - Proposed Construction Phasing<sup>7</sup>

SECTION	2025												2026											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
SECTION 1 - CH0-320 STERLING WAY – BROADWAY*																								
SECTION 2 - CH320-530 BROADWAY JUNCTION*																								
SECTION 3 - CH530-2280 BROADWAY TO ST NEOTS ROAD																								
SECTION 4 - CH2280-2750 ST NEOTS ROAD JUNCTION																								
SECTION 5 - CH2750-3750 ST NEOTS ROAD																								
SECTION 6 - CH3750-4030 ST NEOTS ROAD/SCOTLAND ROAD JUNCTION																								
SECTION 7 - CH4030-5670 ST NEOTS ROAD																								
SECTION 8 - CH5650-6200 ST NEOTS ROAD TO LONG ROAD																								
SECTION 9 - CH6200 -6350 LONG ROAD JUNCTION																								
SECTION 10 - CH6350-8450 LONG ROAD TO CAMBRIDGE ROAD																								
SECTION 11 - CH8450-8650 CAMBRIDGE ROAD JUNCTION																								
SECTION 12 - CH85650-9150 CAMBRIDGE ROAD TO M11 OVERBRIDGE WEST																								
SECTION 13 - CH9150-9600 M11 BRIDGE																								
SECTION 14 - CH9600-9659 ADA LOVELACE ROAD JUNCTION																								
SECTION 15 - CH9659-10180 CHARLES BABBAGE ROAD																								
SECTION 16 - CH10170-11750 CHARLES BABBAGE ROAD TO GRANGE ROAD																								
SECTION 17 - CH11750-11780 CHARLES BABBAGE ROAD JUNCTION																								
PARK & RIDE																								

<sup>7</sup> \*Dates to be provided by the principal contractor in due course.

## **Worksites**

- 2.8.7. Construction will require the use of 16 worksites, including one main compound at Scotland Farm Travel Hub, five secondary compounds and ten local works compounds to support construction of particular elements.
- 2.8.8. The main compound will provide strategic support to secondary and local worksites. It will have space for storage and lay down of materials along with parking and maintenance facilities for plant and machinery. This will reduce storage requirements at satellite compounds.
- 2.8.9. The main compound will also include the main welfare facilities for staff, which will provide training and induction facilities, a canteen, and washing, toilet, clothes storage and drying room facilities together with temporary worker's accommodation.
- 2.8.10. The smaller secondary compounds will provide office accommodation for limited numbers of engineering and delivery staff, and local storage for plant and materials, as well as limited welfare facilities and car parking.
- 2.8.11. General material and bulk material deliveries will be required daily, delivered to the main compound by HGV and distributed from there.

## **Working Hours**

- 2.8.12. The construction activities are planned to take place between 0800 and 1800 Monday to Friday, and 0800 and 1300 on Saturday, with no working on Sundays or bank holidays, and with some start-up and shut-down activities either side of these ranges. Occasional out of hours working, where required, will be agreed in advance with the local authority, and with any people affected by it to be notified in advance.
- 2.8.13. Typically, site deliveries via HGV will be limited to normal working hours. Large and exceptional concreting operations may require concrete to be delivered outside of normal hours; these will tend to occur over specific short durations within the construction programme.

## **Plant and Equipment**

- 2.8.14. Construction plant required for the development of the C2C Scheme will typically include excavators, dumpers, mobile cranes, bulldozers, compactors, bowsers and graders. The types and numbers of plant will vary between each phase of works.

## **Construction Traffic and Access**

- 2.8.15. The delivery of plant to each phase of the construction strategy will be managed by the principal contractor. Construction traffic will access the works from two principal points: the A428/ Scotland Road junction and the Madingley Mulch roundabout. From the west, construction traffic will travel on the A428 and access the works via either the A428/ Scotland Road junction or the Madingley Mulch roundabout. From the east, construction

traffic will travel via the M11 and Madingley Road to the Madingley Mulch roundabout, and from there access the works via St Neots Road.

- 2.8.16. Some construction traffic will use Madingley Road and the University of Cambridge's West Cambridge campus' on-site roads to provide access for the M11 bridge and the section of busway between the M11 and Grange Road. Limited amounts of construction traffic will be permitted to travel on Madingley Road and Grange Road in order to construct the tie-in between the Busway and Grange Road.
- 2.8.17. The volumes of construction traffic along each of these routes will vary throughout the total construction period. The construction of each element of the scheme will involve different activities as it is built, and a consequent variation in the number of vehicles needed to service it. The timing and duration of peak construction activity and peak construction traffic will vary for each scheme element.
- 2.8.18. The key routes and numbers are summarised below. Details on timing and duration of peak activity to be confirmed with Milestone.
- 2.8.19. No construction traffic pass through the core parts of the villages of Hardwick or Coton.

## 3 HRA PROCESS

---

### 3.1 Habitats Regulations Assessment

- 3.1.1. The Conservation of Habitats and Species Regulations 2017 (as amended, hereafter referred to as the Habitats Regulations) protects a NSN of sites within the UK consisting of SACs, SPAs, and by extension through planning policy, Ramsar convention wetlands. It is focussed on intrinsically important habitats, and biological species populations and the habitats that support them. The NSN supports and forms part of a wider network of sites within Europe.
- 3.1.2. Following the UK's departure from the European Union, references to Natura 2000 in the 2017 Regulations and in guidance are referred to as the NSN.
- 3.1.3. Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to:
- Fulfil the commitment made by government to maintain environmental protections; and
  - Continue to meet the UK's international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.
- 3.1.4. Regulation 63 (1) of the Habitats Regulations states that '*A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which:*
- a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and*
  - b) is not directly connected with or necessary to the management of that site,*
    - *must make an Appropriate Assessment of the implications for that site in view of that site's conservation objectives.'*
- 3.1.5. Where effects on a NSN site are likely to be significant, they must be subject to the second stage of the HRA process, Appropriate Assessment. The Habitat Regulations also make allowance for projects or plans to be completed if they satisfy '*imperative reasons of overriding public interest (IROPI)*':
- a) Reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or .*
  - b) Any other reasons which the competent authority, having due regard to the opinion of the appropriate authority [DEFRA, following the UK's departure from the European Union], consider to be imperative reasons of overriding public interest.*
- 3.1.6. Regulations 64 and 68 of the Habitats Regulations regulates in such situations.
- 3.1.7. Although the UK has now left the European Union, Court of Justice of the European Union (CJEU) decisions issued prior to 1st January 2021 in respect of the Habitats Regulations

remain relevant until subsequent UK court decisions overrule them (noting that there is currently Parliamentary debate as to whether this will change).

## **National Planning Policy Framework 2021 (NPPF)**

- 3.1.8. The NPPF sets out the Government’s planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development (for the purposes of this assessment the Scheme is considered to be a development) can be produced. It must be taken into account in preparing the development plan and is a material consideration in planning decisions.
- 3.1.9. The NPPF (at para 179) states that when considering the conservation and enhancement of the natural environment, with regard to habitats and biodiversity, the Local Planning Authority should:

*‘...protect and enhance biodiversity and geodiversity, plans should:*

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- b) Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*

- 3.1.10. Para 181 to 182 of the NPPF states:

*‘The following should be given the same protection as habitats sites:*

- a) Potential Special Protection Areas and possible Special Areas of Conservation;*
- b) Listed or proposed Ramsar sites; and*
- c) Sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

*The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.’*

## **3.2 Stages of Habitats Regulations Assessment**

- 3.2.1. Following its departure from the European Union, the UK Government (through Defra) has clarified that existing guidance applies to the HRA process following the UK’s withdrawal from the European Union (EU) . The EU (Withdrawal) Act 2018 likely supports the use of such guidance documents through Section 6 (2) which states:

*‘[domestic courts and tribunals] may have regard to anything done by the CJEU or another EU entity [i.e. the European Commission] ... so far as it is relevant to any matter before the court or tribunal’*

- 3.2.2. Thus, existing guidance on the assessment of effects of plans or projects on Natura 2000 sites issued by the European Commission (2018) has been used by this Appropriate Assessment. This sets out the stepwise approach which should be followed to enable Competent Authorities to discharge their duties under the Habitats Regulations. The process used is usually summarised in four distinct stages of assessment:
- Screening (Stage 1): the process to identify the likely effects of a plan or project upon the qualifying features and conservation objectives of NSN sites, either alone or in combination with other plans or projects and consider whether there will be a LSE;
  - Appropriate Assessment (Stage 2): detailed consideration of LSEs and whether they would lead to significant adverse effects on the integrity of the NSN site, either alone or in combination with other plans and projects. Where there are adverse effects, mitigation is considered to offset them. Consent may only be granted at this stage if the Appropriate Assessment can conclude beyond reasonable scientific doubt that the plan or project will not have adverse effects (alone or in-combination with other plans or projects). If the mitigation options cannot avoid adverse effects, then development consent can only be given if Stages 3 and 4 are followed;
  - Assessment of Alternative Solutions (Stage 3): the process which examines alternative ways of achieving the objectives of the plan or project that avoid or have lesser adverse effects on the integrity of the NSN sites; and
  - Imperative Reasons of Overriding Public Interest (IROPI) (Stage 4): the assessment where no alternative solutions exist and where adverse effects remain: an assessment of whether the development is necessary for IROPI and, if so, of the compensatory measures needed to maintain the overall coherence of the site or integrity of the NSN sites.
- 3.2.3. There is no specific definition of what constitutes a LSE, however case law (European Court of Justice C-127/02) clarified that in the context of an HRA, a LSE is one whose occurrence cannot be excluded based on objective information.

### 3.3 Screening (Stage 1)

- 3.3.1. An initial broad screening of National Network sites to investigate the potential for effects pathways linking them to the Scheme has been undertaken and is referred to as ‘screening’. The screening process was wide-ranging and took into consideration the sensitivity and mobility of National Network site Qualifying Features (as listed in **Table TR5 4-1**), e.g. birds and bat species, as well as the nature of the proposed works and working methods.

- 3.3.2. Its purpose is to identify the likely impacts upon a National Network site of a project or a plan, either alone or in combination with other plans or projects and considers whether these impacts are likely to be significant. It includes:
- Determining whether the plan is directly connected with or necessary for the management of applicable sites (SAC, SPA, Ramsar);
  - Describing the project/plan that may have the potential for significant effects upon applicable sites;
  - Undertaking an initial scoping for potential direct and indirect impacts upon applicable sites;
  - Assessing the likely significance of any potential effects identified as resulting from these impacts, both alone and in-combination with other plans and projects; and
  - Excluding sites where it can be objectively concluded that there will be no significant effects.
- 3.3.3. The likely significant effects screening test is taken as a ‘trigger’<sup>13</sup> and identifies whether the greater scrutiny of an ‘appropriate assessment’ is necessary. Case law informs how likely significant effects should be interpreted, as follows:
- *“Where such a plan or project is likely to undermine the conservation objectives of the site concerned, it must necessarily be considered likely to have a significant effect on the site (underlining added)”<sup>14</sup>;*
  - *“Notwithstanding the word “likely” in Article 6(3) [Habitats Directive] the precondition, before there can be a requirement to carry out an appropriate assessment, is not that significant effects are probable, a risk is sufficient”<sup>15</sup>;*
  - *A “risk” of significant effects on the site concerned “exists if it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the site concerned” and “in case of doubt as to the absence of significant effects such an assessment must be carried out”<sup>14</sup>; and*
  - *There must be “credible evidence that there was a real, rather than a hypothetical, risk”<sup>15</sup>.*
- 3.3.4. Following the judgement handed down by the Courts of Justice for the European Union (CJEU) in Case C-323/17 (referred to as People Over Wind), it is no longer appropriate to consider measures taken specifically to reduce a projects potential impact on European designated sites into account at the screening stage. Accordingly, no reference to mitigation is made or relied upon in screening for this assessment.
- 3.3.5. Results of the screening assessment are presented in Section 5.

## 3.4 Appropriate Assessment (Stage 2)

- 3.4.1. The precautionary principle is applied at all stages of the HRA process. In relation to screening this means that projects or plans where effects are considered likely and those



where uncertainty exists as to whether effects are likely to be significant must adhere to further stages in the HRA process. Appropriate Assessment (Stage 2) follows screening and is the subject of this report. LSEs identified within Stage 1 are subject to detailed examination to determine whether they would have adverse effects on the integrity of NSN sites, via inhibiting the success of their conservation objectives, either alone or in combination with other plans or projects.

- 3.4.2. LSEs have been assessed with respect to the following sources of information to determine whether adverse effects on integrity would occur:
- Natural England Supplementary Advice on Conservation Objectives ('SACO'), where this is available;
  - Baseline data from environmental surveys and desk-based studies such as modelling work; and
  - Reasoned argument, professional judgement and experience from similar coastal defence projects.

3.4.3. Results of the Appropriate Assessment are set out in Section 7.

### **Appropriate Assessment - Integrity**

- 3.4.4. The currently applied definition of integrity in relation to NSN sites comes from the Office of the Deputy Prime Minister (ODPM) Circular 06/2005 which states: 'The integrity of a site is the coherence of the site's ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated' (ODPM, 2005). In addition, European Commission guidance (2018) on managing NSN sites emphasises that site integrity involves its ecological structure, function and ecological processes and that the assessment of adverse effects should focus on, and be limited to, the site's conservation objectives.

### **Appropriate Assessment - Adverse Effects**

- 3.4.5. An adverse effect on site integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. In addition, an adverse effect would be one which caused a detectable reduction of the features for which a site was designated, at the scale of the site rather than at the scale of the location of the impact.
- 3.4.6. The Habitats Directive (92/43/EEC) defines the conservation status of species as 'favourable' when:
- Population dynamics of the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
  - The natural range of the species is predicted to maintained for the foreseeable future; and

- There is, and will probably continue to be, a sufficient habitat to maintain its populations on a long-term basis.
- 3.4.7. 'Favourable' conservation status of habitats is defined by the Habitats Directive as occurring when:
- Its natural range and areas it covers within that range are stable or increasing; and
  - The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- 3.4.8. The European Commission guidance (European Commission, 2018) also recommends that, when considering the 'integrity of the site', it is important to take account of the possibility that effects can manifest over the short, medium or long-term.
- 3.4.9. Where examination reveals adverse effects would arise as a result of the Scheme, mitigation options are considered that would avoid or offset effects and maintain the integrity of the NSN site and its Qualifying Features.

### **3.5 Further HRA Stages (Stage 3 and 4)**

- 3.5.1. Stages 3 and 4 are outside of the purpose of this report as the Appropriate Assessment concludes that once appropriate mitigation measures have been considered the Scheme will not have adverse effects (alone or in-combination with other plans or projects) on the NSN sites.

## 4 Identification of Relevant Sites

---

### 4.1 Study Area

- 4.1.1. This section defines the geographic limits from the scheme used to identify NSN and Ramsar sites to be considered within the HRA process and to be screened for LSEs. The Study Area reflects the high sensitivity of qualifying features of NSN and Ramsar sites and the fact they often support species that are mobile and wide ranging, such as bats and birds.
- 4.1.2. The principal criterion defining the Study Area is a zone of 2km surrounding the Scheme, as measured from the boundary of the C2C Scheme, a distance appropriate to encompass possible effect pathways from the Scheme to NSN and Ramsar sites. This 2km ZoI was extended in the following circumstances:
- Where the scheme crosses, or lies adjacent to, upstream, or downstream of, a watercourse which is designated in part or wholly as an NSN site or Ramsar site further consideration was given to hydrological impacts at NSN or Ramsar sites within 10km;
  - Where bats were identified as a qualifying feature of a SAC within 30km of the scheme;
  - Where the scheme has a potential hydrological or hydrogeological linkage to an NSN or Ramsar site containing a groundwater dependent terrestrial ecosystem (GWDTE);
  - Where NSN or Ramsar sites were located within 200m of the boundary of the new busway or where, in accordance with Natural England guidance<sup>8</sup>, there was a credible risk that impacts might extend beyond 200m; and
  - Where the scheme was located within or adjacent to habitat that may be functionally linked to a NSN or Ramsar site.

### 4.2 Consultation

- 4.2.1. Consultation forms an essential part of HRA. Natural England have been formally consulted on the C2C Scheme through the EIA Scoping exercise and through the Discretionary Advice Service.

#### **EIA Scoping Consultation**

- 4.2.2. The EIA Scoping Report or the Scheme identified potential for LSE upon Eversden and Wimpole Woods SSAC and the requirement for an HRA.
- 4.2.3. Barbastelle bats are known to forage up to 20km from their main roosting sites and habitat within this range may be important to the maintenance of the local Barbastelle Bat

---

<sup>8</sup> Natural England's Approach to Advising Competent Authorities on the Assessment of Road Traffic Emissions under the Habitats Regulations (June 2018), paragraph 4.10.

population. The EIA Scoping Report acknowledges that the Proposed Scheme is located within the potential foraging range of the SAC barbastelle population.

- 4.2.4. Natural England were consulted through the EIA Scoping exercise and provided the following comment (11 March 2022 ref. 383612):

*'Natural England welcomes confirmation that the potential effects of the Scheme on SAC barbastelle foraging and commuting habitat, which may be functionally linked to the SAC, will be addressed through the ES and HRA. In addition to the Bourn Airfield development, this will need to consider the findings of bat survey work undertaken for other relevant projects such as the A428 Black Cat Roundabout to Caxton Gibbet Improvement Scheme and the East West Rail project. Reference should be made to the Greater Cambridge Biodiversity Supplementary Planning Document (SPD) which provides guidance on protecting bats, including Eversden and Wimpole Woods SAC barbastelles, through development.'*

### **EIA Public Consultation**

- 4.2.5. Natural England were also contacted for views on the EIA through the public consultation and provided the following response relating to bats (05 July 2022 ref. 393770):

*..'The site and surrounding landscape are particularly important for bats, providing important roosting, foraging and commuting habitat. Eversden and Wimpole Woods Site of Special Scientific Interest (SSSI) is also designated as a Special Area of Conservation (SAC) on account of its maternity colony of barbastelle bats. Madingley Wood SSSI, a few hundred metres to the north of the Proposed Scheme, also supports Barbastelles and other bat species. We are aware that GCP is undertaking extensive survey work to ensure that the effects of the Proposed Scheme on bats and their inter-connected supporting habitat is minimised. This is welcomed by Natural England'...*

### **Discretionary Advice Service**

- 4.2.6. Natural England were commissioned through the Discretionary Advice Service to provide advice on the scope of bat surveys (traditional non-invasive surveys versus advanced bat survey techniques) required to support EIA and HRA for the C2C Scheme. A technical note was prepared by WSP and provided to clarify this approach. The technical note also discussed how the survey scope interacts with the approaches taken by other infrastructure schemes in the wider area and relates specifically to Barbastelle Bats, which could potentially be impacted by the C2C Scheme.
- 4.2.7. Given the sensitivity of the Barbastelle bat SAC population within proximity to the C2C scheme, WSP sought Natural England's advice on the proposed 2022 survey effort and mitigation measures for this species. In particular, WSP was seeking:
- To understand if the survey effort proposed (i.e. not to undertake advanced techniques for C2C and to instead enter into a data sharing agreement with East West Rail) is

considered proportionate to the relative impact of the scheme outlined above and is acceptable to meet the requirements of data collection; and

- To determine whether there are any specific data requirements to inform the HRA for the C2C scheme. To determine Natural England's views on what constitutes supporting habitat within the C2C scheme, potential impacts resulting from the C2C scheme and, in turn, any views on the mitigation measures available.

4.2.8. Natural England provided the following response (11 July 2022 ref. DAS/389080):

... 'Data Requirements

*Natural England requires survey data to indicate whether the Barbastelle bat population roosting in Madingley Woods SSSI is connected to (within the same meta population as) the Eversden and Wimpole Woods SAC population; if so, Madingley Wood SSSI should be considered functionally linked to the SAC for HRA purposes.*

*For the purpose of HRA, data should be sufficiently detailed to enable an assessment of the 'likely significant effect' of the Proposed C2C Scheme on the SAC barbastelle population, including functionally linked habitat, alone or in combination with other plans and projects. Consideration of 'likely significant effects' should be progressed through an Appropriate Assessment.*

*Natural England's view is that all suitable bat habitat in C2C is potentially supporting habitat for the SAC due to the connectivity within the wider local landscape, including several known Barbastelle maternity woodlands. The scheme is within the known flight distance of female Barbastelles and records indicate a bat from Bucket Hill Wood being tracked directly back to SAC. Therefore, unless further survey effort indicates otherwise, we welcome the precautionary approach set out in the Technical Note whereby it will be assumed that other woodlands within 500m of the proposed development, and connecting linear features, are a likely roosting / foraging resource for SAC barbastelles, and mitigating impacts accordingly.*

*We would expect surveys to determine where Barbastelles are foraging and commuting both within the red line boundary and within any adjacent areas which will be subject to light spill.*

*Impacts and Mitigation*

*The above data is required to assess the effects of the Proposed C2C Scheme on the SAC barbastelle bat qualifying feature and to identify mitigation measures to address any adverse effects. Without the survey results Natural England will be unable to comment on the potential impacts and/or proposed mitigation- whether in support of a HRA or a licence application. Please note that, as above, if there are any limitations to obtaining survey data to inform the HRA (for example, due to access constraints) a significant effect should be assumed in line with a precautionary principle.*

*We support proposals for habitat creation to achieve Biodiversity Net Gain. Our advice is that this should include habitat enhancement for all bats species. Reference should be made to the enhancement opportunity areas identified for the Nature Recovery Network, available to view at [magic.defra.gov.uk](http://magic.defra.gov.uk). Further information is available through the Cambridge Nature Network. Natural England has no objection to the proposed approach to barbastelle bat survey and data gathering set out in Technical Note (WSP, 7 April 2022) subject to this being progressed in accordance with our advice above.*

*The advice on this proposal, and the guidance contained within Natural England’s standing advice relates to this case only and does not represent confirmation that a species licence (should one be sought) will be issued. Please see Annex 1 for information regarding licensing for European Protected Species.*

**Next steps**

*Natural England has no objection to the proposed approach to barbastelle bat survey and data gathering set out in Technical Note (WSP, 7 April 2022) subject to this being progressed in accordance with our advice above.’...*

**Table TR5 4-1 - Sites Identified**

<b>Zone of Influence</b>	<b>Relevant NSN or Ramsar Site</b>	<b>Details</b>
The scheme is located within 2km of an NSN or Ramsar site.	There are no NSN or Ramsar sites within 2km of the scheme.	Not applicable
The scheme is located within 2km of a potential or candidate NSN site; or proposed Ramsar site.	There are no potential or candidate NSN sites.	Not applicable
The scheme crosses, or lies adjacent to, upstream, or downstream of, a watercourse which is designated in part or wholly as an NSN site or Ramsar site.	There are no NSN or Ramsar sites within 10km of the scheme.	Not applicable
The scheme is located within 30km of a SAC where bats are identified as a qualifying feature (and therefore potentially functionally linked).	Eversden and Wimpole Woods SAC.	This NSN site is located approximately 6km south of the scheme.

Zone of Influence	Relevant NSN or Ramsar Site	Details
The scheme has a potential hydrological or hydrogeological linkage to an NSN or Ramsar site containing a GWDTE.	There are no NSN or Ramsar sites containing a GWDTE with hydrological or hydrogeological linkage to the scheme.	Not applicable
The scheme is within or adjacent to habitat which is potentially functionally linked to an NSN or Ramsar site (other than for bats).	Ouse Washes SAC; and Fenland SAC	The Fenland SAC is designated for the mobile species, Spined Loach <i>Cottus taenia</i> . The SAC is located 15.38km northeast of the centre of the scheme, with potential hydrological linkage present. Ouse Washes SAC and Ramsar site are 15.49km directly north of the centre of the scheme. These sites are designated for mobile species, Spined Loach, while the Ramsar site also includes birds and invertebrates which have no potential to be functionally linked to the scheme.
The scheme has an Affected Road Network (ARN) within 200m of an NSN or Ramsar site (or at a greater distance where a 'credible risk' is identified).	There are no NSN or Ramsar sites within 200m of an ARN associated with the scheme and no credible risk for an extended Zol.	Not applicable

- 4.2.9. Four NSN and Ramsar sites were screened in within the Study Area criteria as described above. The Wimpole and Eversden Bat SAC, 6km south of the scheme; Ouse Washes SAC and Ramsar 15.49 km north of the scheme; and Fenland SAC located 15.38km northeast of the scheme.
- 4.2.10. Chippenham Fen Ramsar 26.68km northeast, Devils Dyke SAC 21.98km east, Portholme SAC 13.1km north, Wicken Fen Ramsar 16.3km northeast, and Devils Dyke SAC 18.5km east of the scheme are not located within the Zols identified above and have therefore been screened out of further assessment.
- 4.2.11. The Ouse Washes is also designated as a SPA due to it supporting internationally important populations of breeding and wintering birds. There is no functionally linked habitat to the SPA within or adjacent to the scheme however.
- 4.2.12. All of the above NSN and Ramsar sites are shown on Figure 1 in **Annex A**.

### 4.3 NSN and Ramsar Sites and their Qualifying Features, Threats and Conservation Objectives

- 4.3.1. The reasons for designation, and the vulnerabilities, threats and pressures, to these sites are summarised for each NSN and Ramsar site in **Table TR5 4-2** to **Table TR5 4-5** below<sup>9</sup>. This information is collated from the Natura 2000 standard data forms (JNCC, 2016)<sup>10</sup>, Supplementary Advice on Conservation Objectives (SACOs), Site Improvement Plans (SIPs) (Natural England (NE) (NE, 2014)<sup>11</sup> and Information Sheets on Ramsar Wetlands (RIS) where relevant for the NSN and Ramsar site. Relevant supplementary advice is also included, which provides advice on conserving and restoring site features.
- 4.3.2. The threats and pressures identified within the SIPs are included within the summary tables. These threats and pressures are the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. These measures are included for reference only and some (or all) of the issues identified for the site(s) may not apply to the impacts and effects from the C2C Scheme.

**Table TR5 4-2 - Eversden and Wimpole SAC Qualifying Features**

Detail	Supporting Information
Reasons for designation	<p>The site of approximately 66.48ha was designated as a SAC under the Habitats Regulations in April 2005. The primary reason for selection of the site as an SAC is that it hosts the following Annex 2 species: Barbastelle Bat <i>Barbastella barbastellus</i>.</p> <p>The site comprises a mixture of ancient coppice woodland (Eversden Wood) and high forest woods likely to be of more recent origin (Wimpole Woods). A colony of barbastelle <i>Barbastella barbastellus</i> is associated with the trees in Wimpole Woods. These trees are used as a summer maternity roost where the female bats gather to give birth and rear their young. Most of the roost sites are within tree crevices. The bats also use the site as a foraging area. Some of the woodland is also used as a flight path when bats forage outside the site.</p> <p>There are no Annex 1 habitats or other Annex 2 species present at the site</p>
Threats and pressures with measures to address	<p>Based on detail within the SIP the following threats and pressures have been identified:</p> <ul style="list-style-type: none"> <li>■ Feature location/ extent/condition unknown – Survey additional areas for Barbastelle Bats;</li> </ul>

<sup>9</sup> For full citations refer to JNCC website: <http://jncc.defra.gov.uk/>

<sup>10</sup> <https://jncc.gov.uk/our-work/special-protection-areas-overview/> and <https://jncc.gov.uk/our-work/special-areas-of-conservation-overview/>

<sup>11</sup> <http://publications.naturalengland.org.uk/category/5458594975711232>



Detail	Supporting Information
	<ul style="list-style-type: none"> <li>■ Offsite habitat availability/ management – Research and identify areas and habitats used by the bats off the SAC, and secure suitable management in order to maintain, enhance and increase the supporting habitat;</li> <li>■ Forestry and woodland management – Manage the woodland appropriately and</li> <li>■ Air pollution: impact of atmospheric nitrogen deposition – Investigate areas of atmospheric nitrogen on site.</li> </ul>
<p>Conservation objectives</p>	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>■ The extent and distribution of the habitats of qualifying species;</li> <li>■ The structure and function of the habitats of qualifying species;</li> <li>■ The supporting processes on which the habitats of qualifying species rely;</li> <li>■ The populations of qualifying species; and</li> <li>■ The distribution of qualifying species within the site.</li> </ul> <p>The following additional objectives are included in the supplementary advice document<sup>12</sup>. These objectives have been included so that the supporting habitats and process that Barbastelle Bats may rely upon are appropriately assessed.</p> <ul style="list-style-type: none"> <li>■ Maintain water quality and quantity of supporting habitats to a standard which provides the necessary conditions to support Barbastelle</li> </ul> <p>Barbastelle Bats are often associated with water and there are lakes and ponds in the parkland close to the roost (but off the SAC) at which they could forage.</p> <ul style="list-style-type: none"> <li>■ Restore the concentrations and deposition of air pollutants to within the site relevant Critical Load or Level values given for the SAC’s supporting habitats on the Air Pollution Information System.</li> </ul> <p>The supporting habitat of this feature is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature.</p> <ul style="list-style-type: none"> <li>■ Maintain the presence, structure and quality of any linear landscape features which function as flight-lines between the SAC and surrounding foraging areas used by Barbastelles.</li> <li>■ Maintain core areas of feeding habitat outside of the SAC boundary that are critical to Barbastelle bats during their breeding period.</li> </ul>

<sup>12</sup> Eversden and Wimpole Woods SAC Conservation Objectives supplementary advice (2018). Available online at: <https://publications.naturalengland.org.uk/publication/6736081810620416>

Detail	Supporting Information
	<p>Barbastelles may commute to foraging or sustenance areas along linear landscape features, such as woodland edges and, hedgerows, to cross extensive open areas (i.e. arable fields) to reach foraging grounds and may feed to a certain extent within these more open areas. Typical flight-lines used by this species include linear hedgerows, waterways, blocks of scrub, wooded rides and tracks. Such flight-lines should remain dark, unlit and well-connected to roosting and feeding areas.</p> <p>Flight-lines will extend beyond the designated site boundary into the wider local landscape. Four references (5, 6, 7 &amp; 12) mention that the narrow strip of woodland and hedge that link Wimpole and Eversden Woods together is a very important flight-line for barbastelle and other bats. It is important to manage this feature very carefully including thickening the hedge with additional planting.</p>

**Table TR5 4-3 - Ouse Washes SAC Qualifying Features**

Detail	Supporting Information
Reasons for designation	<p>The site is designated under Habitats Regulations as it hosts the following Annex II species:</p> <ul style="list-style-type: none"> <li>▪ S1149 Spined Loach <i>Cobitis taenia</i></li> </ul> <p>The Ouse Washes SAC supports populations of Annex II species spined loach <i>Cobitis taenia</i>. The species occurs in the Counter Drain, Old Bedford/RiverDelph areas of the Ouse Washes, which contains clear water and abundant macrophytes which are of particular importance to maintain healthy populations of this species.</p>
Threats and pressures with measures to address	<p>Based on detail within the SIPs the following threats and pressures have been identified:</p> <ul style="list-style-type: none"> <li>▪ Inappropriate water levels (<i>Habitat creation to offset historical decline of wintering and breeding birds and other strategies to alleviate flooding</i>)</li> <li>▪ Water pollution (<i>Implementation of Diffuse Water pollution plan to tackle inappropriate levels of nutrients from flooding</i>).</li> </ul>
Conservation objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of the habitats of qualifying species;</li> <li>▪ The structure and function of the habitats of qualifying species;</li> <li>▪ The supporting processes on which the habitats of qualifying species rely;</li> <li>▪ The populations of qualifying species; and,</li> <li>▪ The distribution of qualifying species within the site.</li> </ul>

Detail	Supporting Information
	Detailed Conservation Objectives Supplementary Advice is available for Ouse Washes SAC and has informed the HRA process carried out for the C2C Scheme <sup>13</sup> , alongside the Site's Improvement Plan <sup>13</sup> .

**Table TR5 4-4 - Ouse Washes Ramsar Site's Qualifying Features, Threats and Pressures and Conservation Objectives**

Detail	Supporting Information
Reasons for designation	<p>The site is designated under the Convention on Wetlands; Ramsar Convention (1971), as it meets Ramsar Criteria 1a, 2a, 5 and 6:</p> <p>1a. The site is a good representative example of a natural or near-natural wetland characteristic of its biogeographic region. It is one of the most extensive areas of seasonally flooding washland of its type in Britain, and the wetland has high conservation value for many plants and animals.</p> <p>2a. The site supports appreciable numbers of nationally rare plants and animals. This includes several nationally scarce plants, including, Small Water Pepper <i>Polygonum minus</i>, Whorled Water-milfoil <i>Myriophyllum verticillatum</i>, Greater Water Parsnip <i>Sium latifolium</i>, River Water-dropwort <i>Oenanthe fluviatilis</i>, Fringed Water-lily <i>Nymphoides 28eltate</i>, Long-stalked Pondweed <i>Potamogeton praelongus</i>, Hair-like Pondweed <i>Potamogeton trichoides</i>, Grass-wrack Pondweed <i>Potamogeton compressus</i>, Tasteless Water-pepper <i>Polygonum mite</i> and Marsh Dock <i>Rumex palustris</i>. Invertebrate records indicate that the site holds good relict fenland fauna, including the National Red Data Book dragonfly species, 'large darter' now known as Scarce Chaser <i>Libellula fulva</i> and the Rifle Beetle <i>Oulimnius major</i>.</p> <p>The site also supports a diverse assemblage of nationally rare breeding waterfowl associated with seasonally flooding wet grassland.</p> <p>5. Internationally important waterfowl assemblage (greater than 20,000 birds).</p> <p>6. Over winter the site regularly supports internationally important populations of: Bewick's Swan, Gadwall, Pintail, Shoveler, Teal, Whooper swan, and Wigeon.</p> <p>Species occurring at levels of international importance.</p> <p>Fish. <i>Cobitis taenia</i>.</p> <p>Invertebrates. <i>Libellula fulva</i>, <i>Oulimnius major</i></p>
Threats and pressures with measures to address	<p>Based on detail within the RIS, the following threats and pressures have been identified:</p> <ul style="list-style-type: none"> <li>■ Vegetation succession;</li> </ul>

<sup>13</sup> Ouse Washes SAC Conservation Objectives Supplementary Advice and Site Improvement Plan Available at: <https://publications.naturalengland.org.uk/publication/5354106084392960>

Detail	Supporting Information
	<ul style="list-style-type: none"> <li>■ Drainage/reclamation for agriculture;</li> <li>■ Water diversion for irrigation/domestic/industrial use;</li> <li>■ Eutrophication;</li> <li>■ Reservoir/barrage/dam impact: flooding; and</li> <li>■ Other (not linked to specific factors).</li> </ul> <p>Detailed information on the conservation of the Ramsar site is available for Ouse Washes and has informed the HRA process (JNCC, 2008).</p> <p>Measures within the RIS state:</p> <p>‘Much of the conservation importance of the Ouse Washes is due to its continued use as functional washland, with extensive winter flooding and traditional forms of agricultural management, including grazing and mowing of permanent grassland and rotational ditch clearance. In recent years, summer flooding (April- May) has adversely affected both the breeding birds and the traditional washland management regime. It also results in <i>Glyceria</i> competing with the other grasses and herbs which may affect food availability for wintering waterfowl. This problem is now being addressed by the Environment Agency and by other bodies with a major interest in managing the washes, through the Ouse Washes Management Strategy. Severe siltation in the Great Ouse River is a factor affecting the drainage of the Ouse Washes. Nutrient enrichment continues to be a problem, possibly resulting in some plant species as well as some fish and invertebrate species declining. These issues are currently being investigated by the Environment Agency.</p> <p>Wildfowling takes place on the site; but it is not considered to cause significant disturbance at current levels. Any proposals for increased wildfowling will be regulated through the Habitat Regulations.’</p>
Conservation objectives	Specific conservation objectives for Ramsar sites are not available.

**Table TR5 4-5 - Fenland SAC Qualifying Features, Threats and Pressures and Conservation Objectives**

Detail	Supporting Information
Reasons for designation	<p>The site is designated under the Habitats Regulations as it hosts the following Annex I habitats:</p> <ul style="list-style-type: none"> <li>■ 6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) Fenland contains, particularly at Chippenham Fen, one of the most extensive examples of the tall herb-rich East Anglian type of M24 <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> fen-meadow. It is important for the conservation of the geographical and ecological range of the habitat type, as this type of fen-meadow is rare and ecologically distinctive in East Anglia.</li> </ul>

Detail	Supporting Information
	<ul style="list-style-type: none"> <li>■ 7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> * Priority feature</li> </ul> <p>The individual sites within Fenland SAC each hold large areas of calcareous fens, with a long and well-documented history of regular management. There is a full range from species-poor <i>Cladium</i>-dominated fen to species-rich fen with a lower proportion of <i>Cladium</i> and containing such species as black bog-rush <i>Schoenus nigricans</i>, tormentil <i>Potentilla erecta</i> and meadow thistle <i>Cirsium dissectum</i>. There are good transitions to purple moor-grass <i>Molinia caerulea</i> and rush pastures, all set within a mosaic of reedbeds and wet pastures.</p> <p>The site is also designated under the Article (4)4 of the Directive (92/43/EEC) as it hosts the following Annex II species:</p> <ul style="list-style-type: none"> <li>■ 1149 Spined Loach <i>Cobitis taenia</i></li> <li>■ 1166 Great Crested Newt <i>Triturus cristatus</i></li> </ul>
Threats and pressures with measures to address	<p>Based on detail within the SIPs the following threats and pressures have been identified:</p> <ul style="list-style-type: none"> <li>■ Water Pollution (<i>Undertake water quality assessment. Multiple collection points over prolonged period</i>).</li> <li>■ Hydrological changes (<i>Review the Water Level Management Plan (WLMP). Investigate other flood storage options on Great Fenland. Pilot augmentation scheme. Monitor effects and produce an implementation plan</i>).</li> <li>■ Air Pollution: impact of atmospheric nitrogen deposition (<i>Further investigate potential atmospheric nitrogen impact on the site</i>).</li> </ul>
Conservation objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>■ The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>■ The structure and function (including typical species) of qualifying natural habitats</li> <li>■ The structure and function of the habitats of qualifying species</li> <li>■ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>■ The populations of qualifying species, and</li> <li>■ The distribution of qualifying species within the site.</li> </ul> <p>Detailed Conservation Objectives Supplementary Advice is available for Ouse Washes SAC and has informed the HRA process carried out for the C2C Scheme<sup>14</sup>, alongside the Site's Improvement Plan<sup>13</sup>.</p>

<sup>14</sup> Fenland SAC Conservation Objectives Supplementary Advice and Site Improvement Plan Available at: <https://publications.naturalengland.org.uk/publication/6712672527581184>

## 5 Stage 1: Screening

---

### 5.1 Consideration of Effects

- 5.1.1. Utilising the information set out above, the C2C Scheme has been screened to identify whether potential impact pathways to the NSN and Ramsar sites within the ZOI are present during construction or operation and whether there will be likely significant effects upon these sites. The initial screening is presented in **Table TR5 5-1**. Where a pathway is considered to be present, the potential for any likely significant effect has been considered.
- 5.1.2. A number of woodland Sites of Special Scientific Interest (SSSIs) are discussed within **Table TR5 5-1**, with reference to the Eversden and Wimpole SAC. These SSSIs are not designated for Barbastelle Bats, however bat radio tracking surveys have identified roosts for this species within these woodlands and may be functionally linked to the SAC.
- 5.1.3. A Water Framework Directive (WFD) Screening and Scoping Assessment was undertaken for the C2C Scheme in February 2023. The results of this assessment are presented in The ES Chapter 13: Water, Technical Report 13.2.
- 5.1.4. The primary aim of the WFD is to protect the water environment and ensure all water bodies meet their objective of Good Ecological Status (or Good Ecological Potential for heavily modified water bodies) and to prevent any deterioration in water body status. A suite of ecological and chemical quality elements is used to determine the overall status/potential of each surface water body. This assessment consists of a screening exercise of all WFD water bodies, protected areas, and construction and operational activities related to the C2C Scheme.
- 5.1.5. The WFD Screening and Scoping Assessment has been used to inform this HRA Screening.
- 5.1.6. The C2C Scheme is expected to operate for at least 60 years. Once built, it will be regularly repaired and maintained to ensure its operation is safe, reliable and efficient. The ES provides further information on the maintenance requirements of the C2C Scheme. In view of the relatively long lifespan of the C2C Scheme, and the absence of a decommission plan, there is insufficient information now to allow for a meaningful assessments of likely significant effects arising from a decommissioning phase. As such, the HRA will not discuss the decommissioning of the C2C Scheme.

### 5.2 National Site Network and Ramsar Site Management Statement

- 5.2.1. The scheme is not directly connected with or necessary for the management of any of the NSN or Ramsar sites identified in Section 4. The scheme has not been conceived solely to further the conservation of these sites and nor is it essential to the management of these sites.

## 5.3 Identification of Impacts

- 5.3.1. C2C has various characteristics and features associated with its design, construction and operation that could cause environmental impacts. These include:
- displacement of or alteration to land use and property, or habitat loss;
  - new features or structures introduced into the environment;
  - new or altered activities generated by or resulting from the scheme; and
  - release of materials to land, air or water, or of sounds or vibration.
- 5.3.2. These characteristics and features may result in a host of different impacts and environmental effects, either temporarily or permanently. The temporary effects are frequently related to construction, though impacts arising during construction can have effects that persist into the long term.
- 5.3.3. A further consideration for the EIA is that of major accidents and disasters. The EIA requirements now mandate consideration of these abnormal and unplanned events that can cause their own specific impacts and effects on the environment.

## 5.4 Identification of Other Plans and Projects

- 5.4.1. When determining the potential implications of a plan or project in light of the conservation objectives for NSN sites (i.e. assessing the potential for LSE and ascertaining the potential for effect on site integrity), it is necessary to consider the potential for in-combination effects with other plans and projects on the designated interest features/conservation on the site. This should include:
- Approved but as yet uncompleted plans or projects;
  - Permitted on-going activities such as discharge consents of abstraction licences; and
  - Plans and projects for which an application has been made and which are currently under consideration but not yet approved by competent authorities.
- 5.4.2. An in-combination assessment considers the potential for each plan or project to influence the site. In order for an in-combination effect to arise, the nature of two effects does not necessarily have to be the same. The in-combination assessment, therefore, focuses on the overall implications for the site conservation objectives regardless of the type of effect.

### **Commercial and Residential Development**

- 5.4.3. There are 11 residential and commercial developments listed below which have either been granted planning permission, are under construction or are awaiting decision. These developments have been considered as potentially having a cumulative effect with the Scheme and other projects.
- Cambourne West (under construction);
  - Bourn Airfield New Village (outline consent granted);

- Land at Highfields (under construction);
- Inspired Villages at Comberton: Integrated retirement community (pre-application);
- West Cambridge Development Site (under construction);
- Clerk Maxwell Road Scheme (under construction);
- North West Cambridge Development (under construction);
- Land Between 21 And 29 Barton Road (under construction);
- Darwin Green. (outline consent granted);
- New Development at St Chad's (consented); and
- Grange Lane College Accommodation (under construction).

#### **A428 Black Cat to Caxton Gibbet Road Improvement Scheme**

- 5.4.4. Planning permission (via a Development Consent Order (DCO)) was granted for the A428 Black Cat to Caxton Gibbet Road Improvement Scheme by the Secretary of State in August 2022.





**Table TR5 5-1 - Screening of Impact Pathways and Likely Significant Effects**

N= No impact pathway, Y= Likely Significant Effects

EW SAC = Eversden and Wimpole SAC, OW SAC = Ouse Wash, OW SPA = Ouse Wash SPA and OW Ramsar = Ouse Wash Ramsar.

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
Habitat loss within an NSN or Ramsar Site as a result of construction or operation	N	N	N	N	<p>The scheme is not located within any NSN or Ramsar sites and would not directly impact NSN or Ramsar sites. A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site is therefore unlikely to occur as a result of the C2C Scheme.</p> <p><b>Conclusion:</b> <i>No impact pathway from the scheme to any NSN or Ramsar sites during construction or operation.</i></p> <p><b>LSE can be ruled out.</b></p>
Fragmentation impacts to qualifying features (e.g. disrupting dispersal or creating barriers within functionally linked habitat) as a result of	Y	N	N	N	<p><u>Eversden and Wimpole SAC</u></p> <p>The Greater Cambridge Supplementary Planning Document<sup>15</sup> highlights ancient woodland and hedgerows surrounding the Eversden and Wimpole SAC as functionally linked habitat within 5 and 10km of the SAC. It notes that smaller woodlands may not be shown and that the mapped habitats are illustrative only. Radio tracking has also shown that Barbastelle Bats also use the streams and ditches to commute and forage<sup>16</sup>. It is considered reasonable given radiotracking<sup>8</sup> has recently identified Hardwick Wood SSSI to support a breeding population, which was previously unknown and that the SPD is indicative only, to apply the precautionary principle<sup>17</sup> that all woodlands and linking</p>

<sup>15</sup> Greater Cambridge Shared Planning (Adopted February 2022) Biodiversity Supplementary Planning Document

<sup>16</sup> EWR 2022 Barbastelle Bat Radiotracking Report

<sup>17</sup> [The precautionary principle: Definitions, applications and governance | Think Tank | European Parliament \(europa.eu\)](#)

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
construction and / or operation					<p>hedgerows/streams within the 5km Key Conservation Area and wider 10km Conservation Area are potentially functionally linked habitat. It can therefore be concluded that although there will be no direct impacts through habitat loss to woodlands within the scheme or wider area, it is considered the scheme could fragment flight paths (hedgerows and streams) used by Barbastelle Bats as they move around the local landscape between roosting and foraging areas. Fragmentation of flight paths may be through lighting during construction and operation or habitat severance during construction, or a combination of the two. Although mitigation is provided within the scheme, it cannot be considered at this stage of HRA<sup>18</sup>.</p> <p><b>Conclusion:</b> <i>Impact pathway present from the scheme during construction and operation.</i></p> <p><b>LSE cannot be ruled out.</b></p> <p><u>Ouse Washes SAC/Ramsar</u></p> <p>There is no fish data for the Bin Brook and a search of available EA fish data on the River Cam (both upstream and downstream of Fen Causeway Bridge) shows no record of Spined Loach. There are multiple barriers to fish passage present in the section of the River Cam that connects to the watercourses in the scheme boundary. Consequently, it is unlikely Spined Loach is present within the scheme boundary.</p> <p>In addition, the assessment of aquatic ecological features (as summarised in Chapter 8 and Technical Report TR05 of the ES) identifies the macroinvertebrate taxa present in Bin Brook as an assemblage associated with slow flowing water and highly sedimented conditions, with a low conservation value. The WFD considers the Bin Brook a heavily modified waterbody. This provides further confidence that the Bin Brook is considered suboptimal for</p>

<sup>18</sup> A ruling by the Court of Justice of the European Union (CJEU) (Sweetman v. An Bord Pleanála, Case C-258/11, CJEU judgment 11 April 2013)

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<p>spined loach, and that it is highly unlikely for spined loach to be present within the scheme Boundary.</p> <p>The WFD assessment also confirms there are no impacts to the downstream River Cam from construction or operation of the scheme at the Bin Brook, which can be inferred to also apply to the distant SAC and Ramsar, as such the spined loach population should remain unaffected by the scheme. As such, it is not considered likely that functionally linked habitat is present and impacted by the scheme.</p> <p><i>Libellula fulva, Oulimnius major</i> are invertebrate qualifying features of the Ouse Washes Ramsar; however, the aquatic assessment of the water courses within the scheme area show that the watercourses do not support protected species and are of a low conservation value. As such, it is not considered likely that functionally linked habitat for the Ouse Washes invertebrate qualifying features is present and impacted by the scheme.</p> <p><b>Conclusion:</b> <i>No pathway to fragmentation impacts from the scheme during construction or operation.</i></p> <p><b>LSE can be ruled out.</b></p> <p><u>Fenland SAC</u></p> <p>Great crested newts (GCN) and spined loach are supported by the Fenland SAC located 18.77km downstream of the scheme.</p> <p>It is not considered feasible that there would be functionally linked habitat present and impacted by the scheme given the 18.77km distance. Furthermore, an assessment of ponds using the GCN Habitat Suitability Index HSI and eDNA within the scheme area has determined GCN are considered to be likely absent (refer to section 5.6 of the ES).</p> <p>The Bin Brook within the scheme boundary drains into the River Cam and is hydrologically connected to the Fenland SAC. The Fenland SAC supports</p>

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<p>spined loach and is located 18.77km downstream of the Bin Brook via the River Cam. There is no fish data for the Bin Brook and a search of available EA fish data on the River Cam (both upstream and downstream of Fen Causeway Bridge) shows no record of Spined Loach. There are also multiple barriers to fish passage present in the section of the River Cam that connects the Fenland SAC to the watercourses in the scheme Boundary. Consequently, it is unlikely Spined Loach is present within the scheme boundary.</p> <p>In addition, the assessment of aquatic ecological features (as summarised in Chapter 8 of the ES) identifies the macroinvertebrate taxa present in Bin Brook as an assemblage associated with slow flowing water and highly sedimented conditions, with a low conservation value. The WFD considers the Bin Brook a heavily modified waterbody. Further providing confidence that the Bin Brook is considered suboptimal for spined loach, and that it is highly unlikely for spined loach to be present within the scheme.</p> <p>The WFD assessment also confirms there are no impacts to the downstream River Cam from construction or operation of the scheme at the Bin Brook, which can be inferred to also apply to the further downstream Fenland SAC, as such the spined loach population should remain unaffected by the scheme. As such, it is not considered likely that functionally linked habitat is present and impacted by the scheme.</p> <p><b>Conclusion:</b> <i>No impact pathway from the scheme during construction or operation.</i></p> <p><b>LSE can be ruled out.</b></p>

<p>Killing and injury of interest features/species during operation</p>	<p>Y</p>	<p>N</p>	<p>N</p>	<p>N</p>	<p><u>Eversden and Wimpole SAC</u></p> <p>It is considered Barbastelle Bats fly between 2 and 10m<sup>19</sup>. The scheme has embedded landscape mitigation to reduce severance of the flight paths along linear features (e.g. hedgerows, streams) used by Barbastelle Bats to minimise road traffic collisions within this flight zone. Juvenile bats learning to fly in August to September are considered most at risk. The public transport route will operate 3m high buses travelling 30 times an hour covering both directions, buses are likely to stop operating beyond 11pm and to start again at 6am. Mitigation that has been embedded in the scheme to avoid harm to a European site or to avoid LSEs cannot be considered at this Screening stage in accordance with the People over Wind judgement. It is considered that Barbastelle Bats may be at a low level of collision risk and Likely Significant Effects cannot be ruled out.</p> <p><b>Conclusion:</b> <i>Impact pathway present.</i></p> <p><b>LSE cannot be ruled out as a result of mortality from road traffic collisions during operation.</b></p> <p><u>Ouse Washes SAC and Ramsar Site</u></p> <p>Spined Loach is a feature of the Ouse Washes SAC and Ramsar. The SAC is located 15.49km north of the Scheme. The Callow Brook is approximately 19.6km upstream of the Fourth Sock Drain The point at which the network of waterbodies leading from Callow Brook meet is approximately 11.km downstream of the SAC. The Callow Brook (within the scheme) flows into the Old West River catchment which joins the Great River Ouse and the Ouse washes SAC and Ramsar, which supports spined loach. The assessment of aquatic ecological features (as summarised in Chapter 8 of the ES) describes the Callow Brook within the scheme as straightened, modified, and incised with steep banks, with a variety of flow types and habitats and macrophytes present. The Callow Brook then appears to become culverted at Dry Drayton providing sub-optimal conditions for connectivity to the Ouse washes. Other adjacent field ditches intersected by the scheme identified by the Aquatic ecology assessment are also considered unsuitable to support most aquatic species due to their dry or modified/urban nature. It is therefore considered highly unlikely for Spined Loach to be present in the study area and impacted by the scheme.</p>
---	----------	----------	----------	----------	--

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<p><b>Conclusion:</b> No impact pathway from the scheme during construction or operation.</p> <p><b>LSE can be ruled out.</b></p> <p><u>Ouse Washes SPA/Ramsar</u></p> <p>As described above there is no functionally linked habitat for the OW SAC, SPA and Ramsar present within or impacted by the scheme.</p> <p><b>Conclusion:</b> No impact pathway from the scheme during construction or operation.</p> <p><b>LSE can be ruled out.</b></p>
Resource requirements during construction and operation	N	N	N	N	<p>The scheme will not require resources from the NSN or Ramsar sites; therefore, no potential impacts or effects will occur.</p> <p><b>Conclusion:</b> No impact pathway for any NSN or Ramsar site during construction or operation.</p> <p><b>LSE can be ruled out.</b></p>
Impacts to functionally linked habitat because of indirect (1. Hydrological, 2.	N	N	N	N	<p>As described above there is no functionally linked habitat for the OW SAC and Ramsar present within or impacted by the scheme.</p> <p><b>Conclusion:</b> No impact pathway for OW SAC and Ramsar during construction or operation.</p>

<sup>19</sup> CEDR Transnational Road Research Programme Call 2013 Roads and Wildlife. Fumbling in the dark- effectiveness of bat mitigation measures. Bat Mitigation Measures on Roads – A Guideline.

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
air quality or 3. disturbance) impacts during construction and operation					<p><b><i>LSE can be ruled out.</i></b></p> <p><u>Eversden and Wimpole SAC</u></p> <p>1. Hydrological Impacts</p> <p>Effects on water quality/water levels during construction and operation may impact invertebrates and thus bat foraging areas for the bat SAC. The Bourn Brook has been shown through radiotracking<sup>20</sup> to form an important bat foraging area for the Eversden and Wimpole SAC. However, the Water Framework Directive (WFD) Assessment confirms the Bourn Brook and a ditch crossing at its upper boundary is sufficiently hydrologically disconnected from the Bourn Brook water body and is screened out of impacts from the scheme and further assessment.</p> <p>Fen Drayton is another important bat foraging area used by the Madingley Wood SSSI Barbastelle Bat breeding population (assumed to be functionally linked supporting habitat to the Eversden and Wimpole SAC). However, it is considered by the WFD assessment to have minimal overlap with the scheme and has been screened out of impacts from the scheme and further assessment.</p> <p><b><i>Conclusion:</i></b> No <i>impact pathway is present for Eversden and Wimpole SAC.</i></p> <p><b><i>LSE can be ruled out.</i></b></p> <p>2. Air Quality Impacts The assessment of construction phase impacts associated with fugitive dust and fine particulate matter emissions has been undertaken in line with the relevant Institute of Air Quality Management (IAQM) guidance and concluded the effect of dust and particulate matter releases during</p>

<sup>20</sup> EWR (2022) Bat Radiotracking Report

Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<p>the construction phase would not impact the nearest woodland habitat which supports a breeding population of Barbastelle bats, and which is assumed to be functionally linked habitat. This is because although Madingley is 350m from the construction Site, dust and fine particulate matter emissions are limited to 50m, in addition when considering the track out of plant using existing roads Madingley is at least 1km from the construction Site, meaning, even in the absence of mitigation dust will be significantly reduced over 500m of tracking, such that any residual effects will be negligible at the point of Madingley Wood (refer to <b>Technical Report 2: Air quality</b> for screening of effects).</p> <p>The assessment of the potential air quality impacts associated with road traffic generated by the construction and operational phase of the scheme has been completed in line with published methodologies and technical guidance. Applying the Natural England guidance<sup>21</sup> the SAC lies beyond the 200m affected road network criterion. This also applies functionally linked habitat to the SAC i.e. Madingley Wood SSSI.</p> <p><b>Conclusion:</b> No impact pathway due to air quality and dust during construction or operation on the E&amp;W SAC. No LSE will arise.</p> <p><b>LSE can be ruled out.</b></p> <p>2. Disturbance</p> <p>Madingley Wood SSSI supports a breeding population of Barbastelle bats and assumed to be functionally linked supporting habitat is adjacent to a busy road (A428) and therefore additional construction traffic using this road is not considered to be significantly different to the existing situation.</p>

<sup>21</sup> Natural England, 2018, Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations



Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<b>Conclusion:</b> No impact pathway due to disturbance on the E&W SAC during construction or operation. No LSE will arise.
Waste during construction and operation	N	N	N	N	Effects as a consequence of waste are not considered likely as waste disposal will not occur within the NSN/Ramsar sites during construction or operation.  <b>Conclusion:</b> No impact pathway due to waste for any NSN/Ramsar Sites during construction or operation. No LSE will arise.  <b>LSE can be ruled out.</b>
Introduction or spread of invasive species because of construction activities or operation	N	N	N	N	Whilst invasive species are present within Bin Brook and within the boundary of the C2C Scheme, relevant locations are >150m distant from the closest NSN/Ramsar sites. The construction and operation of the scheme would therefore not be likely to cause the spread of this or other invasive species.  <b>Conclusion:</b> No impact pathway due to INNS for any NSN/Ramsar site during construction or operation. <b>LSE can be ruled out.</b>
Improved access to recreation at NSN or Ramsar Sites during public transport operation.	N	N	N	N	The Public transport route is 6km from the nearest NSN or Ramsar site and does not improve access to the Site. Madingley Wood SSSI assumed to be functionally linked supporting habitat to the E&W SAC is a privately owned wood and not open to the public so although near to the route, will not have any increased recreational pressure.  Hardwick Wood SSSI assumed to be functionally linked supporting habitat to the E&W SAC has public access and is already within a sub urban setting with recreational pressure. It is 1.5km from the route and access will not be improved to this Site.



Potential Impact	EW SAC	OW SAC	OW Ramsar	Fenland SAC	Consideration of Likely Significant Effects
					<p>In addition, there will be improved accessible green space within the scheme Red Line Boundary improving countryside access opportunities.</p> <p><b>Conclusion:</b> <i>No impact pathway due to improved access for any NSN or Ramsar sites during construction or operation. <b>LSE can be ruled out</b></i></p>

## 5.5 Potential In-Combination Effects

- 5.5.1. A total of 12 developments were identified in Section 5.4 and have been screened below for potential in-combination effects with the Scheme. These developments include:
- 11 commercial and residential development that have either been granted planning permission, are under construction or are awaiting decision; and
  - A428 Black Cat to Caxton Gibbet Road Improvement Scheme which is consented via DCO.

### Commercial and Residential Developments

- 5.5.2. The majority of these development schemes are small to medium sized developments that are generally isolated from the C2C Scheme. It is considered that for the majority of the developments, there are no plausible impact pathways that could combine to result in significant effects.
- 5.5.3. Cambourne West is a large-scale mixed development of up to 2350 residential units, commercial, community and leisure facilities. The development is to the west of Cambourne, approximately 1.6km from the C2C Scheme. The development will impact almost exclusively upon arable land, with a number of field boundaries also affected. Due to the distance to the C2C Scheme and that it largely impacts upon habitats of low importance, there are no anticipated in combination effects.
- 5.5.4. The C2C Scheme will extend through the Bourn Airfield development, with part of the busway being developed as part of these proposals, where the C2C Scheme extends from Bourn Airfield, across Broadway and into Cambourne. The Bourn Airfield development is a mixed-use village providing approximately 3500 residential units, commercial, leisure and community facilities. A Report to Inform HRA<sup>22</sup> has been produced for this scheme and includes measures to mitigate impacts upon the Eversden and Wimpole SAC. No other NSN sites were screened for this project.
- 5.5.5. There is potential for in-combination effects to occur between these two projects, given the scale of the Bourn Airfield development and the spatial overlaps between the two projects.

### A428 Black Cat to Caxton Gibbet Road Improvement Scheme

- 5.5.6. The scheme was subject to an HRA Screening. The HRA concluded that there is no potential for impacts to occur as a result of construction, operation or maintenance of the scheme (either alone or in combination with other identified plans or projects) on:
- The Ouse Washes SAC, SPA and Ramsar sites, designated for their international significance for wintering and breeding wildfowl and waders (SPA and Ramsar site) and

---

<sup>22</sup> Thomson Environmental Consultants (2019). Report to Inform Habitats Regulations Assessment: Bourne Airfield. [https://applications.greatercambridgeplanning.org/online-applications/files/6F1E2F93E75F75B9B8182038D6CE2FED/pdf/S\\_3440\\_18\\_OL-AMENDED\\_ES\\_Appendix\\_11\\_Report\\_to\\_inform\\_HRA\\_Appropriate\\_Assessment-5110976.pdf](https://applications.greatercambridgeplanning.org/online-applications/files/6F1E2F93E75F75B9B8182038D6CE2FED/pdf/S_3440_18_OL-AMENDED_ES_Appendix_11_Report_to_inform_HRA_Appropriate_Assessment-5110976.pdf)

Spined Loach (SAC) and located 16.01 kilometres as the bird flies (9.45 miles) and 43.2 kilometres (26.8 miles) as the river flows from the Scheme;

- Portholme SAC, designated for the lowland hay meadow grassland communities of the alluvial flood meadow type and located 8.9 kilometres (5.5 miles) from the Scheme; and
- Eversden and Wimpole Woods SAC, a European Site designated for its bat interest and located 8.10 kilometres (5.03 miles) from the Scheme.

5.5.7. No potential impacts were identified and as such there are no effects that could act in combination.

## **5.6 Summary of Screening Outcomes**

5.6.1. LSE cannot be ruled out for the Eversden and Wimpole SAC for the scheme alone as a result of:

- Fragmentation impacts to qualifying features within functionally linked habitat as a result of construction and / or operation; and
- Road traffic mortality during operation.

5.6.2. In accordance with the HRA process, it will therefore be necessary to proceed to Stage 2: Appropriate Assessment, to determine whether there will be adverse effects on the integrity of the SAC, with respect to the site's conservation objectives and its structure and function, alone or in-combination with other projects or plans. A separate in-combination assessment is not required at the screening stage for these sites.

5.6.3. No other LSE were identified for the Ouse Washes SAC and Ramsar nor the Fenland SAC. For all of these sites no impact pathways were identified and as such, there are no non-significant effects that could act in-combination with the other projects or plans listed above and no further assessment is necessary.

## 6 Environmental Baseline

---

### 6.1 Baseline for Barbastelle Bat

6.1.1. This section provides a summary of the baseline data for Barbastelle Bats that has informed this assessment. Full information on the methodology and survey locations is detailed within ES Technical Report 5 and Technical Report 5.2 and there referenced third party reports.

#### **Summary of Survey Methods**

6.1.2. A range of bat surveys have been undertaken throughout the Scheme at various stages of the project lifecycle. These have included a range of bat roost surveys, summer and winter static bat detector monitoring, bat activity transects and crossing point surveys. The results of these surveys have been used to inform this assessment. In addition, surveys undertaken for the Bourn Airfield housing development, East West Rail, the A428 Black Cat to Caxton Gibbett Road Improvement Scheme and by Cambridgeshire Bat Group are also summarised.

6.1.3. A total of 23 crossing point locations were surveyed. These locations are referenced numerically as CP1 to CP23, with CP referring to 'crossing point'.

6.1.4. A suite of bat roost suitability surveys and presence/likely absence surveys have been carried out between 2017 and 2022 for structures and trees. The most recent surveys were completed in winter 2021-2022 and summer 2022.

6.1.5. Six walked transect sites were mapped across the scheme to survey and record further bat activity throughout the Scheme that could be affected by the Scheme. All six of the transect routes were surveyed five times between May and October 2021.

#### **Bourn Airfield Data**

6.1.6. The Bourn Airfield housing development is located within Bourn Airfield in the western extent of the Scheme. The development is immediately south of the Scheme to the east of Cambourne. Trapping and radio-tracking surveys were completed by Thompson Ecology and IDW Ecology at Bucket Hill Plantation (within the southeast of the airfield boundary) in May, August and September 2016<sup>23</sup>. Bat trapping surveys were undertaken in July, August and September 2015, however no radio tracking was undertaken alongside this trapping effort.

---

<sup>23</sup> Thomson Ecology (20218). Bourn Airfield. ES Volume 3: Ecology Survey Technical Reports BCOU110/001 10.1.

### East West Rail Data

- 6.1.7. The radio tracking surveys were undertaken for the East West Rail scheme in 2020<sup>24</sup> and 2022<sup>25</sup>. The primary focus of these surveys was to establish potential links between the Barbastelle Bat colonies at Eversden and Wimpole SAC and woodlands within the wider landscape. Bat trapping and radio tracking was undertaken in 2022 at Waresley and Gransden Wood, Elsworth Wood SSSI, Kingston Wood SSSI, Knapwell Wood, Hardwick Wood SSSI, Madingley Hall, Madingley Wood SSSI and Hauxton Wood. Radio tracking of bats from Eversden and Wimpole SAC was also undertaken in 2020.
- 6.1.8. Woodland transect surveys were also completed by EWR over 2020 and 2021 to identify potential Barbastelle Bat colonies, potentially warranting further trapping and tracking. Nine woodlands were surveyed, and the highest levels of Barbastelle Bat activity were recorded at Madingley Wood SSSI, Hayley Wood SSSI and Hardwick Wood SSSI. Static bat detector monitoring surveys were deployed by EWR around the SAC and associated woodland complex in 2020 to identify important flight lines.

### A428 Black Cat to Caxton Gibbett Road Improvement Scheme Data

- 6.1.9. The A428 Black Cat to Caxton Gibbett Road Improvement Scheme runs to the west of the Scheme between St Neots and Cambourne. The radio-tracking surveys undertaken for the Black Cat scheme did not identify any interaction with Barbastelle Bat populations in proximity to the Black Cat scheme and those within Eversden and Wimpole SAC.

### Cambridgeshire Bat Group Data

- 6.1.10. Cambridgeshire Bat Group undertook trapping, tagging and radio-tracking in 2010 at Madingley Wood SSSI<sup>26</sup>.

## **Baseline Summary**

### **Bat Trapping Radio Tracking Surveys**

#### Overview

- 6.1.11. Extensive radiotracking surveys of Barbastelle Bats throughout the wider landscape have identified the use of multiple woodland sites for foraging and roosting, including for maternity roosts. The data has shown that Barbastelle Bat appear to use landscape features such as woodland, tree lines and hedgerows when travelling to reach woodland blocks and foraging areas, but they are also able to cross open areas, including the A428. Breeding colonies have been identified at Madingley Wood (approximately 250m north of the Scheme) and Hardwick Wood (approximately 1.7km south of the Scheme), peak counts of 28 and 27 bats respectively. Eversden and Wimpole SAC is also designated for its Barbastelle breeding

---

<sup>24</sup> East West Rail. (2023). 2022 Bat Radio-Tracking survey report. Unpublished manuscript.

<sup>25</sup> BSG & Corylus (2020). Wimpole Radiotracking Report For and on behalf of East West Company (Version 2 revised 5th March 2021)

<sup>26</sup> Vice, C. (2010). Cambridgeshire Bat Group: Barbastelles at Madingley Cambridgeshire Bat Group.

colony. No link between these breeding colonies has been identified through the surveys, however they do share the same foraging resources.

- 6.1.12. The home range and core foraging areas for Barbastelle Bat within Madingley Wood are primarily north of the woodland, within the Madingley Hall estate, south of Madingley village and the woodland itself. They also extend south of the woodland and extend within the Scheme boundary. The home range and core foraging areas for Barbastelle Bat from the Hardwick Wood colony primarily extend north of the woodland east of Highfield Caldecote and Bourn Airfield, and extended beyond St Neots Road and the A428, and within the Scheme boundary. This also corresponds with static detector data collected in 2022, where the highest levels of Barbastelle Bat activity (relative to the areas surveyed) were at the detector locations east of Hardwick (adjacent to Cambridge Road and the tree line east of the proposed new St Neots Road junction).

#### **Bourn Airfield Data**

- 6.1.13. Barbastelle Bat were tracked back to maternity roosts at Kingston Wood SSSI, located approximately 4.2km southeast of Bucket Hill Plantation and Hayley Wood SSSI which is located approximately 7.2km southwest of Bucket Hill Plantation.
- 6.1.14. A pregnant female Barbastelle Bat was caught in Bucket Hill plantation in May 2016 and was subsequently recorded roosting within Hayley Wood where a peak count of 21 bats was recorded. This bat also roosted in Honey Hill Wood, which is located approximately 1.7km north of Bucket Hill Plantation, where a peak count of two bats was recorded. This bat was not recorded interacting with the Eversden and Wimpole SAC. A post-lactating, breeding female Barbastelle Bat was caught at Bucket Hill Plantation in September 2016 and was subsequently recorded roosting within Kingston Wood. The bat was also recorded flying between Bourn Airfield, Kingston Wood and over the Eversden and Wimpole SAC.
- 6.1.15. Key bat flight lines were identified through the radio tracking surveys. These included the southern and eastern boundaries of Bourn Airfield. The flight lines along the eastern boundary extended north from Bucket Hill Plantation, over Childerley Gate (St Neots Road) and over the A428.

#### **East West Rail Data**

- 6.1.16. The radio tracking surveys confirmed the presence of other Barbastelle Bat colonies in Hayley Wood SSSI and Waresley and Gransden Woods SSSI, to the west of the SAC. Bats tracked from Hayley Wood SSSI were recorded using the local landscape to the north as far as Cambourne. Bats from the SAC were also identified northeast of the SAC towards Grantchester and Haslingfield. Only a single bat was trapped and tracked from Waresley Wood and the results from this single animal are inconclusive as to the nature of the roost or how a colony within this woodland might interact with the SAC.
- 6.1.17. A total of 42 roosts were identified within their survey area (23 confirmed roost locations and 19 approximate locations) which included seven maternity roosts. The maximum count from any one roost was 28 bats, in a roost within Madingley Wood is approximately 8km from

Eversden and Wimpole SAC (and approximately 250m north of the Scheme boundary). A total of Five Barbastelle Bat tree roosts were identified in Madingley Wood. Five roosts were also identified within Hardwick Wood with a maximum count of 27 bats recorded. Seven roosts were recorded within Waresley and Gransden Wood, one in Kingston Wood, one at Rectory Farm near Hauxton and one at Hauxton Gravel Pit Wood.

- 6.1.18. The core foraging areas for bats from the Madingley Wood colony were within the deciduous woodland within Madingley Wood, wood pasture and parkland at Madingley Hall and the ditch and hedgerow lined agricultural fields to the northeast of Madingley village.
- 6.1.19. The radio-tracking surveys undertaken for the East West Rail project have not established that the breeding colonies at Madingley Wood SSSI, Hardwick Wood SSSI and Waresley and Gransden Wood SSSI directly interact with the Eversden and Wimpole Woods SAC maternity colony with respect to roost switching. The surveys indicate that these are four distinct breeding colonies. The surveys did however indicate that foraging resources are shared by the breeding colonies at Hardwick Wood, Madingley Wood and the Eversden and Wimpole Woods SAC population.
- 6.1.20. The potential breeding colony within Kingston Wood identified during the Bourn Airfield radio tracking surveys in 2016 was not found during the East West Rail radio tracking surveys. No breeding females were caught in Kingston Wood during the radio-tracking surveys in 2022 and none of the breeding females caught in other woodlands were recorded roosting in Kingston Wood.

#### **A428 Black Cat to Caxton Gibbett Road Improvement Scheme Data**

- 6.1.21. Bat trapping and radio tracking was undertaken within Boys Wood, south of St Neots and approximately 14.5km west of the SAC. One Barbastelle Bat was caught but not radio-tagged in Boys Wood in October 2018, three Barbastelle Bats were caught and radio-tagged in Boys Wood in October 2019. Two of the radio-tagged bats in Boys Wood in 2019 were radio-tracked back to roosts (one in a tree on edge of Boys Wood and the second in a derelict building).
- 6.1.22. A further four females and three male Barbastelle Bats were caught, radio-tagged and radio-tracked at Eversden and Wimpole SAC in September 2021. It was concluded that Barbastelle Bat from the SAC were not commuting or roosting close to the Black Cat scheme and were flying north of the SAC towards Toft (golf course and woods), which is approximately 1.5km southeast of Hardwick Wood SSSI.

#### **Scheme Surveys**

- 6.1.23. No Barbastelle Bat roosts were recorded throughout the surveys for the Scheme. Foraging and commuting Barbastelle Bats were identified during crossing point and activity transect surveys, and throughout the Scheme using static detector surveys. The following areas within the Scheme were considered to be potentially important foraging and or commuting features for the species.
- Crossing point 10 - The entrance to Bourn Airfield;



- Crossing point 9 - Area of woodland plantation northeast of Bourn Airfield;
- Crossing point 19 and static location 13 - The proposed St Neots Rd bus gate junction;
- Crossing point 18 - The proposed new junction with Long Road, east of Hardwick;
- Crossing point 6 - The ditch line southwest of Madingley Wood;
- Crossing point 16 and static point 10 - Hedgerow south of the American Cemetery and Madingley Wood;
- Crossing point 5 and activity transect 2, leg 3 - Hedgerow south of Madingley Windmill, north of Coton Primary School;
- Crossing point 2 and activity transect 3, leg 4 - The eastern boundary of Coton Orchard; and
- Crossing point 1 - located in the east of the Scheme at the intersection between the Scheme and existing hedgerows south of the University Sports Ground.

6.1.24. The site is regularly used by Barbastelle Bats that potentially use of the Scheme as commuting and core foraging habitat for bats associated with maternity roosts at Madingley Wood SSSI and Hardwick Wood SSSI and potentially overlap with Barbastelle Bat colonies at Eversden and Wimpole Woods SAC.

## 7 Stage 2: Appropriate Assessment

---

### 7.1 Introduction

- 7.1.1. This information, to inform an Appropriate Assessment, determines whether adverse effects on the integrity of the Eversden and Wimpole SAC can be ruled out, considering mitigation measures, and the potential for further in-combination effects that may arise from the scheme with other plans or projects.
- 7.1.2. Site integrity is defined by Natural England 2018<sup>27</sup> as meaning the coherence of the site's ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was, or will be, designated or classified. The European Commission<sup>28</sup>, describes a high degree of integrity as being 'the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained and a minimum of external management is required'.

### 7.2 Assessment of Scheme in Isolation

#### Potential Effects of Fragmentation

- 7.2.1. Barbastelle Bats commute along linear landscape features, such as woodland edges and hedgerows, and use them to cross extensive open areas. Barbastelle Bats use linear features to support navigation, protection from wind and predation when moving within a landscape. Such flightlines provide access between roosts and feeding areas and should remain dark, unlit and well-connected to maintain and support the Barbastelle Bat lifecycle throughout the year. The scheme is 6km away from the SAC and will sever linear features such as ditches and hedgerows. Lighting for the scheme may also exacerbate habitat severance. Given that breeding Barbastelle Bats forage up to 7km from their maternity roosts, with some individuals foraging further, it is considered feasible that fragmentation effects due to the scheme may occur impacting the population. It should be noted that the existing baseline is already fragmented owing to severance and lighting from the presence of several major linear infrastructures (M11, A603, A1198, A486, A31301) within the Bat SACs existing landscape. In addition, a study of radio tracked Barbastelle Bats found that they are capable of crossing motorways over roads (motorways) and via underpasses during foraging and roost switching<sup>29</sup>.
- 7.2.2. The area of accessible foraging may be reduced if linear features were to become severed. Continued access to roosts for mating, breeding and hibernating which are spread across

---

<sup>27</sup> Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations Version: June 2018

<sup>28</sup> European Commission (2000). Managing Natura 2000 Sites (section 4.6.3).

<sup>29</sup> Kerth G, Melber M (2009) Species-specific barrier effects of a motorway on the habitat use of two threatened forest-living bat species. Biol Cons 142:270–279

the wider landscape may be disturbed. This could impact how the bats meet their energetic requirements for breeding and rearing young and thus impacting breeding success. If barrier impacts persist, in an unmitigated worst case scenario fragmentation may affect the population, resulting in a reduction in genetic exchange and eventually population collapse.

- 7.2.3. The scheme severs linear landscape features approximately 6km outside of the SAC site boundary. Linear features are required to maintain the structures, functions and supporting processes associated with the Barbastelle Bat and its supporting habitats. Severance may also reduce the bats' accessibility to supporting habitat.
- 7.2.4. Habitat features such as hedgerows, lines of trees and woodland will be interrupted by the Scheme where it intersects these habitats within the landscape. These habitats are typically used by bats to navigate the landscape and construction of the Scheme will permanently sever these habitats. Bat surveys across the Scheme have identified potentially important commuting routes and they have also identified that all of the habitat features that will be intersected are used by a variety of species. In order to maintain connectivity for bats throughout the Scheme, the landscaping proposals include planting of woodland, trees and hedgerows at all habitat features in order to minimise disruption of flight paths for bats through the landscape. Within the landscaping proposals, larger, more mature standard trees have been specified to minimise adverse impacts through habitat severance. Planting of mature standards will ensure that these reinstated habitat features are able to establish faster and reach similar maturity to habitats that are lost to the Scheme through construction. This has included planting of trees along the banks of the busway and as close to the service road as reasonably practicable in order to reduce the gap and interruption caused by the Scheme.
- 7.2.5. The existing habitats within the scheme boundary provide a small proportion of the potential foraging habitat within their core foraging areas and the loss of these foraging areas are highly unlikely to have a significant effect on Barbastelle Bats given the availability of habitat in the wider landscape. However, the landscaping strategy has been designed to replace existing bat foraging and commuting habitat to be lost to the C2C Scheme (i.e., hedgerows, tree lines and grassland), and to provide habitat enhancement.
- 7.2.6. The newly created habitat will provide potentially greater access and foraging habitats around and within the Scheme for bats, particularly when compared to the existing arable land. The landscape strategy will also provide some mitigation / buffering for increased levels of lighting. The landscaping proposals will be reassessed by an ecologist at detailed design to ensure no adverse effects on the FCS of the local bat population.

### **Consideration of Mitigation**

- 7.2.7. Based on currently available evidence certain factors contribute to the success of mitigation implemented to address severance of bat flight paths These include mitigation that:
  - is installed early;
  - is installed along the existing flight path of the bats;

- is designed to reflect the bats flight strategy i.e. not to alter height or direction of flight; and
- should be unlit, with access and connectivity maintained<sup>30, 31</sup>.

7.2.8. Barbastelle Bats' have a flight pattern with medium manoeuvrability<sup>32</sup> and will hunt and commute both in and away from vegetation and structures, and at a variety of flight heights. It is also considered that they will commute over open stretches and fly at medium heights between 2m and 10m, with no clear tendency to lower flight.

7.2.9. All linear features creating severance or giving rise to potential mortality through collision with buses were identified, with landscape mitigation features proposed at each habitat severance point where the bat crossing point surveys<sup>33</sup> threshold for mitigation installation was reached. The lowest threshold of one commuting Barbastelle Bat (from the available one to five commuting bats) was used to determine whether landscape mitigation features would be required. This is designed to ensure the bats can continue their flightpath preventing fragmentation effects for the supporting processes for the SAC in the wider area to be maintained. Following mitigation, the scheme has sought to maintain a permeable landscape overall and throughout the development maintaining the SAC's conservation objectives. In theory, although residual effects may be present irrespective of being individually not significant, they can act in combination with similar impacts elsewhere to result in significant effects. However, on balance given that regularly used features will be maintained through the provision of landscape mitigation features there are unlikely to be residual effects alone or in combination.

7.2.10. A lighting strategy will also be implemented and secured through a planning condition to mitigate impacts of lighting of the scheme to an acceptable level in accordance with the Bat Conservation Trust and Institute of Lighting Professionals Guidance Note 08/18 such that No Likely Significant Effects will arise. Again, the Lighting Strategy will be comprehensive for example by extensive tree planting and buffering, to ensure that there are unlikely to be residual effects alone or in combination.

### **Conclusion**

7.2.11. In conclusion, following mitigation, no adverse effects are anticipated on the integrity of the SAC as a result of fragmentation.

---

<sup>30</sup> O'Connor G et al (2011) A review of Bat Mitigation in Relation to Highway Severance

<sup>31</sup> Natural Resources Wales. Bats and Linear Infrastructure. A Summary of DEFRA research project by Dr Anna Bertinussen and Professor John Altringham. Version 1 August 2017.

<sup>32</sup> CEDR (2016) – Transnational Road Research Programme Call 2013: Roads and Wildlife. Fumbling in the Dark -effectiveness of bat mitigation measures on roads. Bat Mitigation measures on roads – a guideline.

<sup>33</sup> Designed to inform where there is severance and mitigation is necessary for bats

## Potential Effects of Road Traffic Mortality During Operation

- 7.2.12. Bats and road traffic mortality are well documented<sup>34</sup>. Based on several factors reported in studies known to impact the number of bat road traffic mortalities<sup>20</sup> and the nature of this Scheme it is considered bat mortality arising from the scheme is of low likelihood.
- 7.2.13. For example, collisions with bats are four times more likely on a four lane road rather than a two lane road<sup>35</sup>. The new bus service is a single lane in either direction; in addition, its operations is limited to between approximately 6.00am and midnight, ceasing operations overnight. As such there is a limited overlapping period where bats are flying and the buses are operational. The bus service will also run at a low frequency relative to a trunk or motorway for which mortalities are well documented, with approximately ten services an hour in each direction, totalling 20 movements although service frequency will vary at different times of the day.
- 7.2.14. The speed of buses will be limited to 50mph, and slowed to 30mph at junctions, which minimises the risk of mortality following a collision according to studies on vertebrates. Forman et al<sup>36</sup> (2003, pp 120-122) showed that wildlife collisions increase with increases in vehicle speed and traffic volume and with the proximity of wildlife habitat and wildlife movement corridors. Bats are not considered distinct from these findings in literature, with a study of bats on road mortality concluding road width, speed and volume were contributing factors to increased bat road mortality<sup>37</sup>.
- 7.2.15. The most credible risk of road traffic mortality remains when the juvenile bats learn to fly in August and September, as one road traffic mortality studies<sup>19</sup> reported the highest mortality is during the dispersal of young bats.
- 7.2.16. The risk to juvenile bats can be defined as when Barbastelle Bats emerge from a roost up to the ceasing of bus operations at midnight. Barbastelle bats emerge between 12 and 36 minutes after sunset, with a mean average of 24 minutes after sunset<sup>38</sup>. Sunset in August and September, when young bats are flying, is between 20:50 at the beginning of the August and around 18:40 at the end of September. It is impossible to predict when and where the bats will be emerging and foraging in relation to the bus route. However, it is considered the overlapping period of bus operational time between emergence and midnight varies and is approximately five hours maximum during the juvenile risk period and will be limited to the 20 bus movements per hour, which is a much-reduced traffic volume when compared to a fully operational road.

---

<sup>34</sup> Lesinski 2007 Bat Road Casualties and Factors determining their number. *Mammalia* 2007 138-142.

<sup>35</sup> Novaes, R. L. M et al 2018. On a collision course: the vulnerability of bats to roadkills in Brazil. *Mastozoología Neotropical*, 25: 115–128.

<sup>36</sup> Forman TT et al. 2003. *Road ecology: science and solutions*. Island Press, Washington. 481 pp.

<sup>37</sup> Ramalho, D, F et al (2021) Factors influencing bat road casualties in a Neotropical savanna. *Perspectives in Ecology & Conservation*. Volume 19. Issue 2, April – June 2021. Pages 189-194.

<sup>38</sup> Zeale M, Davidson-Watts I & Jones G 2012. Home range use and habitat selection by barbastelle bats (*Barbastella barbastellus*): implications for conservation. *Journal of Mammalogy* 93(4): 1110-1118

- 7.2.17. Barbastelles were recorded returning to roosts up to around four and a quarter hours before sunset, and on average about 3 hours 40 minutes before. Buses are operational from 06:00am, meaning there is a very low likelihood of overlap with the buses operation when the bats return to the roost at dawn from foraging, due to sunrise being between approximately 05:00am at the beginning of August and 07:00am by the end of September.
- 7.2.18. Given that the available evidence and literature shows the risk of bat mortality due to roads is proportionate to the width of the road (and gap that bats have to cross), and the speed and volume of traffic. It is considered that with the single decker buses' low height, low frequency, volume and speed, the risk of road traffic mortality from collisions is very low when compared to the existing operational road network.
- 7.2.19. The SACO states that the population and abundance of the breeding Barbastelle population should be maintained at a level of between 11 to 54 bats or more, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.
- 7.2.20. This SACO population estimate does not take into consideration breeding populations recently identified in the wider landscape through recent radiotracking<sup>39</sup> at Hardwick Woods SSSI (1.5km from the scheme) and Madingley Woodlands (within 250m of the scheme). There are peak counts for bats emerging from a single tree at these breeding populations of 27 and 28 Barbastelle Bats respectively which has doubled the current population estimate, as such there could be further unknown populations in the wider area.
- 7.2.21. Although there was no direct roost swapping recorded between the SAC and these woodland breeding populations during radiotracking, they may operate as a metapopulation and are considered Functionally Linked Supporting Habitat. This is in alignment with the Greater Cambridge SPD whereby smaller woods in the wider landscape of the SAC and the connecting linear features are considered Functionally Linked Supporting Habitat, until data suggests otherwise.
- 7.2.22. It is noted by Altringham<sup>40</sup> that due to the low reproductive rates and high intrinsic mobility of bats they are more susceptible to decline by the additional mortality caused by roads. In respect of the C2C Scheme only low numbers (a maximum of one barbastelle bat observed commuting in any one crossing point survey) have been recorded using linear features along the scheme (Technical Report 5: Ecology, Appendix TR5.5: Bat Activity Report). As well as recorded flying between 2 and 4m height, this is a snapshot of time. It is therefore considered appropriate to add confidence to the risk level to juveniles to include mitigation for this very low-risk scenario.

### **Consideration of Mitigation**

- 7.2.23. Landscape mitigation features have been embedded in the Scheme design to ensure that connectivity for bats and safe flight heights are maintained. An illustrative example of a

---

<sup>39</sup> EWR (2023) Radiotracking Report

<sup>40</sup> Altringham Bat Ecology and Mitigation. Proof of evidence. Public Inquiry into The A350 Westbury Bypass 2008

typical design of the landscape mitigation features is presented in **Plate TR5 7-1 - Landscape Mitigation Feature.**

- 7.2.24. Extensive replacement woodland planting at Highfields roundabout (crossing point 9) and an increase in embankment height will ensure planting reduces light spill from the lit junction and to encourage bats to fly through this area at height. This was an area that was determined to be a potentially important flight path for bats from the radio tracking from Bucket Hill Plantation. This area was also determined be potentially important for Barbastelle Bats from static detector surveys.
- 7.2.25. Barbastelle Bats were detected in the northeast of the Bourn Airfield, at the entrance from Broadway during crossing point surveys (crossing point 10), although all were heard and not seen by surveyors. Barbastelle Bats were also detected on static detectors placed along a hedgerow north of the existing access which will form the access for the new Bourn Airfield development. The new entrance to the Bourn Airfield development will share the same existing access, with the Scheme also running parallel through this area, however this is outside of the Scheme design, as this area is designed and developed as part of the Bourn Airfield development. Operational impacts from lighting and bus movements will occur at this junction. A dark corridor will be maintained to the west (along the eastern side of Cambourne) and the C2C Scheme will incorporate a new drainage pond and habitat planting with woodland and trees to the north of the new junction layout to ensure dark corridor can be maintained through the C2C and Bourn Airfield development.
- 7.2.26. Barbastelle Bats were recorded at crossing point 19 (static location 13) during 2022 surveys. This is located within the arable field to the west of Long Road. The Scheme will also sever the hedgerow running south. Barbastelle Bats were recorded commuting along the east-west hedgerow and were not recorded commuting south towards the new bus gate junction. As such, mitigation within this area has focussed on enhancing the habitat connectivity in an east-west direction through the planting of new woodland around the north and east of the junction. This habitat planting will also provide a buffer to any lighting proposed at the new bus gate junction. Mature tree planting along the line of the existing hedgerow has been incorporated in the landscaping design to maintain connectivity in a north-south direction.
- 7.2.27. Barbastelle Bats were recorded along Long Road through static detector surveys between 2019 and 2020. They were subsequently recorded commuting north during crossing point surveys in 2022 (crossing point 18). A new traffic light junction is proposed at this location and as such, landscaping has been design to maintain connectivity along Long Road and maintain flight height by creating bunds along the eastern side of the hedgerow along Long Road. Further mature tree planting has been incorporated in landscape proposals to encourage an increased flight height over the new busway and act as buffer planting to any new lighting at the traffic light junction. These features will be developed further at detailed design stage, however the focus of this mitigation will be to create a bund with mature tree planting on top that will be 4m above the made ground level. This is to encourage

commuting bats to pass over of the height of buses running along the Scheme. The sensitive lighting strategy detailed below will also focus on this junction.

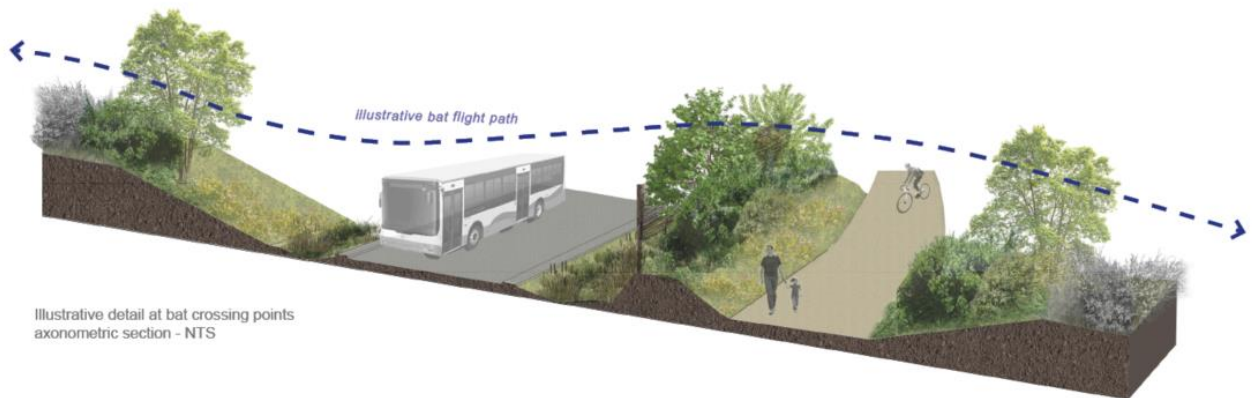
- 7.2.28. The following crossing point locations along the route were also considered to require additional landscape mitigation features as they were deemed to be potentially important landscape habitat features routes for bats during crossing point surveys, static detector surveys and activity transect surveys. These locations are identified as potentially important habitat features because Barbastelle Bats have been recorded commuting along them during crossing point surveys or because more than ten commuting bats have been observed during a single crossing point survey. These habitat features are described below.
- Crossing point 6 – The ditch line southwest of Madingley Wood;
  - Crossing point 16 and static point 10 - Hedgerow south of the American Cemetery and Madingley Wood;
  - Crossing point 5 and activity transect 2, leg 3 – Hedgerow south of Madingley Windmill, north of Coton Primary School; and
  - Crossing point 2 and activity transect 3, leg 4 – The eastern boundary of Coton Orchard.
- 7.2.29. At each of these locations, landscape mitigation features will be incorporated to encourage flight heights to be maintained at a height above 4m. This will include bunds where necessary with mature tree planting over them that will be a minimum height of 4m above the made level of the new road. Willow fencing or similar will be used as a temporary measure if tree planting cannot establish this height initially. It is anticipated that these will be a temporary measure until tree planting has become established and mature. Where the scheme is in cutting, the same principle of a 4m level above the new road height will be designed. It is anticipated that crossing point 5 will be in cutting and no bund creation is necessary, however this will be determined at detailed design stage. As a general rule, the gap between the canopy heights either side of the new road should be less than 20m to encourage bats to maintain their flight height over the road.
- 7.2.30. Barbastelle Bats and a range of other bat species were recorded at crossing point 1, located in the east of the Scheme at the intersection between the Scheme and existing hedgerows south of the University Sports Ground. Bats were generally recorded flying east to west, evidencing foraging and commuting behaviour. This area of the Scheme had particularly high levels of activity, with a large number of heard and not seen bats. It is considered likely that this area is of particular interest as foraging habitat due to the presence of plantation woodland in a north-south aspect and a large, mature hedgerow in an east-west aspect that likely creates a large wind break and in turn used by a high abundance of invertebrate prey. As the majority of commuting activity was considered to be in an east-west direction, additional planting has been incorporated in the landscape proposals that will maintain connectivity to the east and west, as well as north and south.
- 7.2.31. The design of the landscape mitigation features are based on the bats' flight strategy and risk described above, as a proportionate approach to severance. A study of bats has shown



that bat flights across a 20m road gap were at a greater height where the height of vegetation was taller either side of the road<sup>41</sup>. Further to this, Berthinussen found that road-crossing heights for bats increased with the height of the roadside embankment<sup>42</sup>. It is therefore considered that for Barbastelle bats which have the ability to cross gaps, that by minimising the gap to approximately 20m and installing landscape mitigation features using mature vegetation planted on earth banks with a combined height of 4m (at least) either side of the gap, which will grow higher over time, that the Barbastelle Bat flight path at height will be maintained. This vegetation allows at least 1m headroom flight above the low height buses at 3m, allowing for the most vulnerable juveniles before they have perfected flying skills reducing the risk of mortality (given Barbastelle Bats fly between 2 and 10m, the bats have the ability to achieve an additional 9m of height over time). See below.

- 7.2.32. Disturbance of the landscape mitigation features once installed should be minimised e.g. minimising vegetation clearance of the trees during the bat active season, no lighting to be introduced, which could impact on the effective use of the Structure.
- 7.2.33. Secured through relevant legal undertaking, there should be annual monitoring of the condition of the planting for 5 years until establishment and then every 3 years thereafter. This is to ensure any unestablished trees are replaced such that the height of vegetation is maintained at no less than 4m and that the tree line is maintained at no less than 10m either side at the point of severance.

**Plate TR5 7-1 - Landscape Mitigation Feature**



- 7.2.34. The gap between the landscape treatments will affect bat species differently due to their varying flight and echolocation strategies.. Whereas Pinaud *et al.* (2018) demonstrated that other bat movements were significantly affected by gap width, with the probability of

<sup>41</sup> Russel A.L et al (July 2009) Road-killed bats, Highway design and the Commuting Ecology of Bats. *Endangered Species Research*.Vol.8:49-60, 2009.

<sup>42</sup> Berthinussen A, Altringham J (2012) Do bat gantries and underpasses help bats cross roads safely? *PLoS ONE* 8:e38775

crossing a gap dropped below 0.5 for gaps larger than 38 m<sup>43</sup>. As previously mentioned, a 20m gap is considered manageable for the open flying Barbastelle Bat.

- 7.2.35. Landscape mitigation features have been incorporated in the scheme design where potentially important commuting features have been identified.
- 7.2.36. It is considered that following mitigation, should there be mortality arising, given the scheme parameters of low bus speeds, low height of buses and low operational bus frequency, the rates would be very low based on the evidence base of conditions for road mortality.

### **Conclusion**

- 7.2.37. In conclusion, following mitigation, there are considered to be no adverse effects on the integrity of the SAC, with no residual adverse effects anticipated as a result of mortality. Maintenance of the breeding population of the Barbastelle bats will not be Adversely affected by the C2C Scheme.

### **Monitoring**

- 7.2.38. To add further confidence to the conclusion of no residual effects, monitoring will be carried out in accordance with good practice recommendations. Bertinussen et al (2015), and Claireau<sup>44</sup>.
- 7.2.39. Bertinussen et al (2015) set out a strategy to monitor the effectiveness of bat mitigation whereby pre-construction crossing point surveys (completed for C2C and reported in Technical Report 5, Appendix TR5.5) are compared with the results of post-construction crossing point surveys.
- 7.2.40. To ensure the monitoring is robust, the surveys should be carried out using the same equipment and at standardised, comparable times of year to the pre-construction surveys. For example, a bat survey in August will not be comparable to September/October as the bat activity levels are different. Further, the use of thermal/IR imaging equipment for one survey and not another will not be comparable as a survey without equipment may miss bat observations. If surveys pre-construction and post-construction are not standardised in timings and equipment it may result in a negative/or positive perception on the population, which may not be accurate.
- 7.2.41. It is proposed to apply this methodology with adaptations to the C2C Scheme's particular parameters. For mitigation to be considered effective '*a similar number of bats must be using the commuting route before and after construction, and at least 90% of bats must be using the (landscape mitigation feature or mitigation) structure to cross the road safely.*'
- 7.2.42. *To answer these questions, the data are analysed as follows.*

---

<sup>44</sup> Claireau F et al. Major roads have important negative effects on insectivorous bat activity. Biological Conservation 235 (2019) 53–62

*“Q1) Are similar numbers of bats using the commuting route both before and after construction and installation of the crossing structure?”*

- i. To assess effectiveness, the number of crossing bats must be compared pre- and post-construction.*

*For this stage of the analysis, the total number of bats crossing per survey during each stage of construction must be extracted from the data. Comparisons can then be made between any two stages of construction (e.g. before, during or after) using a simple statistical test, the Wilcoxon signed rank test.*

*The null hypothesis is that there is no significant difference between the two datasets. Therefore, a P value of less than 0.05 indicates a significant difference in the number of bats using the commuting route between the two stages of construction that were compared. Looking at the boxplot of the data will tell you whether numbers have increased or decreased.*

*Q2) Are at least 90% of bats using the crossing structure to safely cross the road?*

*We use set definitions to determine whether bats are ‘using’ a mitigation structure to cross the road or railway or are crossing the road/railway at ‘safe’ or ‘unsafe’ heights.*

- Use of the mitigation structure*

*Over the road structures: bats crossing the road/railway within 5 m of the crossing structure and at a safe height (over 3m above the bus height).*

- Safe / unsafe crossing heights*

*‘Safe’ and ‘unsafe’ crossing heights are defined as being greater and less than 3m above the bus route surface respectively. Bats crossing the road below a height of 3 m are considered to be at risk of being killed by passing traffic.*

*Using the set definitions provided, calculate the total number of bats crossing the road/railway for each of the following across all surveys of your post-construction data:*

- a) The total number of crossing bats;*
- b) The total number of bats crossing ‘using’ the mitigation structure.*

*The number of bats crossing at a horizontal distance of less than 5m from the structure and at a height between 5m above the road and 5m above the structure.*

- c) The total number of bats crossing the road unsafely*

*The total number of bats crossing the road/railway at a height of 3 m or less.*

*The R code provided will extract the totals (for all bats and individual species) from the spreadsheet and save them in a CSV file, as well as create a boxplot for visual presentation of the data. The percentages for each crossing behaviour, and for each species, can then be calculated from the totals (instructions provided after the R code on page 22).”*

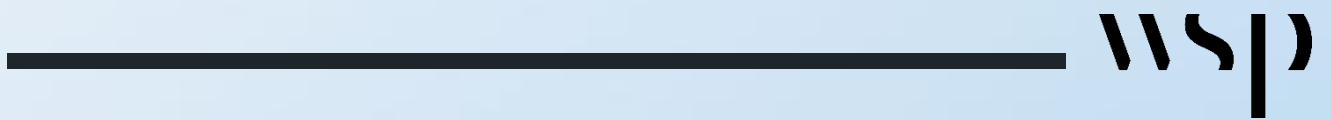
- 7.2.43. Guidance recommends monitoring for a minimum of three-years post-construction.
- 7.2.44. In the unlikely event monitoring shows bats at risk, remedial measures can then be incorporated into the mitigation to ensure its effectiveness before any harm to the Barbastelle Bat population. This may include the maintenance or replacement of landscaping trees, additional width or height to the landscape mitigation feature through additional planting. This overall approach is considered to add confidence to the conclusion of no adverse effects or residual effects to the Barbastelle Bat population through road collision mortality.

### **7.3 In-combination Effects**

- 7.3.1. Consideration of other plans or projects that may give rise to in-combination effects was undertaken at Stage 1. The Bourn Airfield scheme was the only development that was identified as representing a source of potential in-combination effects.
- 7.3.2. In relation to impacts from fragmentation and road mortality, following the implementation of the mitigation measures described above, there would be no residual effects that could act in-combination and as such, no further assessment is required.

# Annex A

**Internationally Designated Sites**



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED.

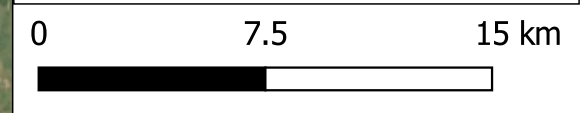
**Legend:**

- Scheme Boundary
- 10km Buffer
- 15km Buffer
- 20km Buffer
- 30km Buffer
- Special Areas of Conservation
- Special Protection Areas
- Ramsar Sites



STATUS: **FINAL**

Copyright  
Map data: Google ©2023

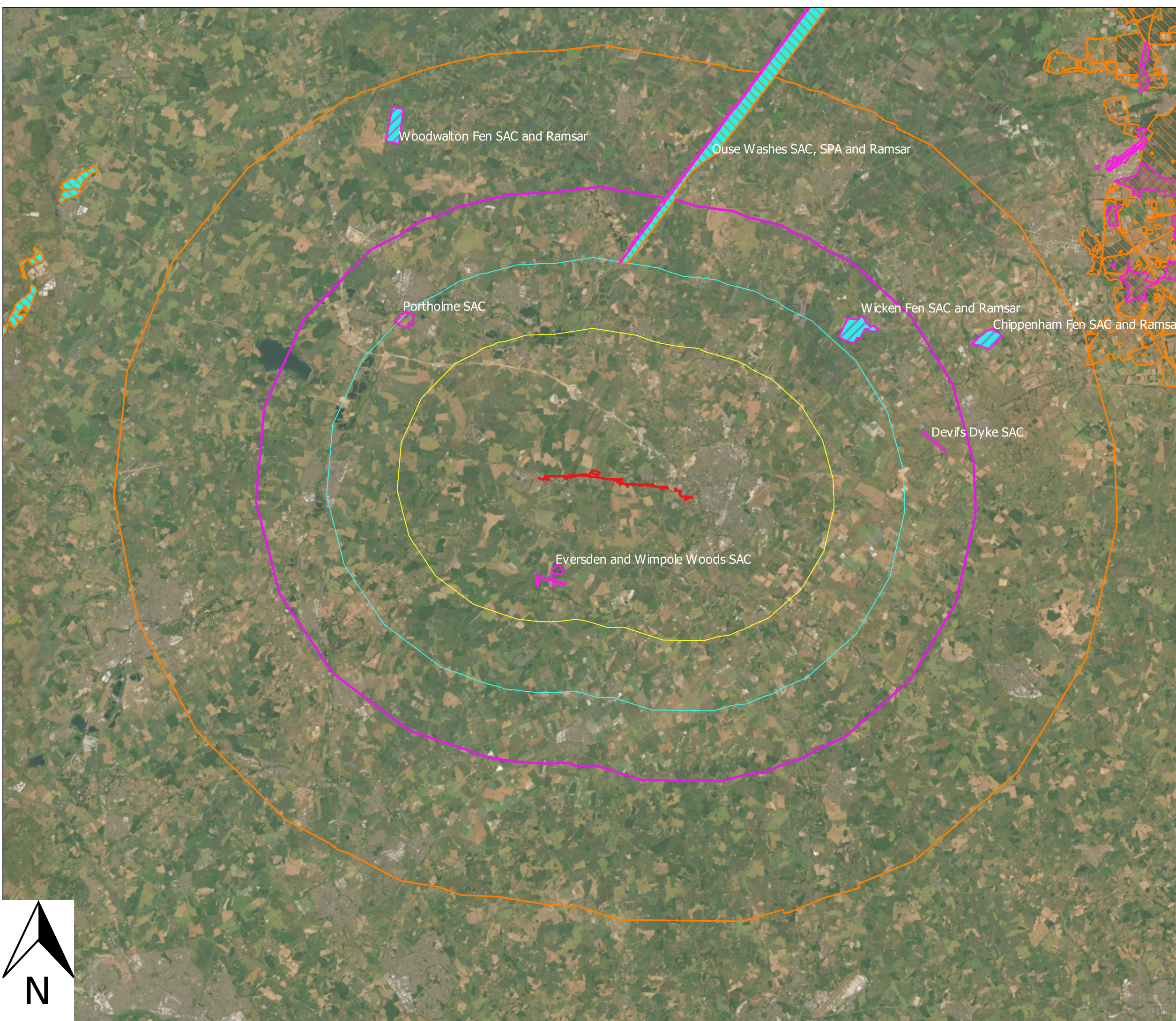


CLIENT: **Greater Cambridge Partnership**

PROJECT: **Cambourne to Cambridge**

TITLE: **Figure 1: Map of Internationally Designated Sites**

SCALE @A3:	CHECKED: <b>MP</b>	APPROVED: <b>GC</b>
QGIS FILE:	DRAWN: <b>08/02/2023</b>	DATE: <b>08/02/23</b>
PROJECT No: <b>70086660</b>	DRAWING No: <b>70086660_HRA_1</b>	REV: <b>0.1</b>





62-64 Hills Road  
Cambridge  
CB2 1LA

**wsp.com**

WSP UK Limited makes no warranties or guarantees, actual or implied, in relation to this report, or the ultimate commercial, technical, economic, or financial effect on the project to which it relates, and bears no responsibility or liability related to its use other than as set out in the contract under which it was supplied.