Land North West of Bicester

Third Environmental Statement Addendum

Prepared on behalf of Firethorn Developments Ltd

March 2022

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BARTON WILLMORE
PLANNING / DESIGN / DELIVERY

Land North West of Bicester

Third Environmental Statement Addendum

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TABLE OF CONTENTS

FIGURE

APPENDICES

A. PREAMBLE AND NON-TECHNICAL SUMMARY

A.1 In May 2021 Firethorn Developments Ltd (the Applicant) submitted an outline planning application (Ref: UT21/01630/OUT) to Cherwell District Council (CDC) for the following proposal on 23.97 hectares of land located to the north west of Bicester in Oxfordshire (the "Site"):

> *"residential development (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination."* (the "Development")

A.2 An Environmental Statement (referred to hereafter as the May 2021 ES) was prepared to accompany the planning application in accordance with the *Town and Country Planning (Environmental Impact Assessment) Regulations 2017* as amended[1] (the "EIA Regulations").

Subsequent Amendments to the May 2021 ES

July 2021

A.3 In July 2021 further information in support of the May 2021 ES was submitted to CDC comprising the findings of bat and bird surveys completed following submission of the planning application. The Biodiversity ES chapter submitted with the planning application was based on the results of the surveys completed prior to submission of the application and the survey information collated post submission aligned with that collected beforehand, accordingly the further information did not change the May 2021 ES conclusions or assessment. The submitted information, referred to hereafter as the first ES Addendum, comprised a covering letter and the bat and bird survey results.

November 2021

A.4 In November 2021 a second addendum was submitted to CDC (referred to hereafter as the second ES Addendum) to address responses to consultee comments on the Transport Assessment and the Development Heights Parameter plan.

A.5 The consultee responses to the Transport Assessment (TA) submitted with the planning application identified a requirement for further assessment of construction traffic, and

[1] *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017* SI 571, as amended by 2018/659

revisions to the proposed construction access arrangements. The Transport and Access ES chapter was subsequently revised to include a new assessment of construction traffic and to take account of the new construction access arrangement. The updated works resulted in a betterment of the residual effects identified and a change from a significant moderate adverse residual effect on Driver Delay to no significant effects identified for any of the assessed receptors.

A.6 With regard to the Development Heights Parameter Plan, CDC questioned the appropriateness of built development up to 16m in height. Accordingly, the height parameter plan was revised and the maximum height of the Development reduced to 14m. All of the Development parameter plans submitted with the planning application were updated to reflect the amendment to the construction access and the revised building heights. The change to the heights parameter plan did not result in any changes to any of the assessments within the ES.

A.7 The second ES Addendum included:

- a Preamble document setting out the changes to the ES;
- an updated ES Chapter 3A Site and Development – amended to reflect the changes to the Development Parameter Plans;
- an updated ES Chapter 5A Construction Methodology and Phasing – amended to reflect the revised construction access arrangements;
- an updated ES Chapter 6A Transport – amended to take consultation comments on board and the revised construction access arrangements;
- an updated ES Chapter 15A Summary – amended to reflect the revised residual effects; and
- an updated Non-Technical Summary; and the following supporting Figures:
  - Figure 1.1A: Site Location Plan;
  - Figure 3.1A: Maximum Building Heights and Footprint;
  - Figure 3.2A: Multi-functional Green Space; and
  - Figure 3.3A: Access and Movement.

Need for this ES Addendum

A.8 Following the second ES Addendum, consultation and discussion on the submitted planning application has continued to take place and these discussions have resulted in several further amendments to the submission. The amendments are discussed in detail below but in summary comprise:

- an amendment to the wording of the formal description of the Development;
- a change to the construction start date;
- provision of additional hydrological modelling data to the Environment Agency;
- an amendment to the Access and Movement Parameter Plan (Figure 3.1 of the May 2021 ES); and
- revisions to the ES Transport chapter updated in the November 2021 ES Addendum.

Amendments to the Description of the Development

A.9 The Development as assessed in the May 2021 ES is set out in paragraph A.1 above, however following further discussions with CDC it is proposed to amend the wording of the formal description to read:

> *"up to 530 residential dwellings ~~residential development~~ (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination"*

A.10 The Development assessed in the May 2021 ES remains unchanged and therefore the amendment to the wording of the description of the Development does not result in any changes to the technical assessments in the ES and no further information is provided on this point in this third ES Addendum.

Amendments to the Construction Start Date

A.11 Chapter 5 (Construction Methodology & Phasing) of the May 2021 ES identified that the construction of the Development would be expected to start in "*early 2022 subject to gaining planning permission, and span approximately five years*" (paragraph 5.3). Given the delay to the grant of planning permission this start date has now slipped to "winter 2022". The overall length of construction programme and anticipated activities would not change. The change in the start date will not result in new, amended, or other significant effects that would change the findings and conclusions of the assessments within the ES so no further updates have been provided as part of this third ES Addendum.

Submission of Technical Data to the Environment Agency

A.12 Following submission of the planning application in May 2021 and the statutory consultation process, the Environment Agency issued an objection based their review of the submitted hydraulic model and associated hydrology as it was felt there were issues with the modelling that needed to be addressed. Vectos, drainage consultants for the Development, responded

to the objection, provided further hydraulic data and confirmed the further information does not change the findings or conclusions of any of the submitted assessments or reports. The response to the Environment Agency is attached at Appendix A1 to this Preamble. As the response to this consultation has not changed any submitted assessment work, no further information is provided with this ES Addendum.

Amended Access and Movement Parameter Plan

A.13 Consultation comments received from Oxfordshire County Council Highways identified that the Access and Movement Parameter Plan (Figure 3.3 in the May 2021 ES and Figure 3.3A in the second ES Addendum in November 2021) should be amended to include not just the confirmed pedestrian and cycle access points but all possible pedestrian and cycle access points. The parameter plan has therefore been amended and is provided in this third ES Addendum as Figure 3.3B Access and Movement Parameter Plan. The ES has been reviewed to identify any significant effects that would result from this change, and it has been concluded that subject to ensuring the mitigation measures as set out in the May 2021 ES (such as ensuring that where possible access points should utilise existing gaps in the hedgerows to minimise landscape or biodiversity effects) are complied with, no new or amended significant effects would result and therefore no further amendments are required.

Amended Traffic Flow Data

A.14 The traffic data assessed in the Transport, Noise & Vibration, and Air Quality chapters of the May 2021 ES comprised the year 2016 Baseline situation compared to the year 2031 with and without Development scenarios. Since submission of the planning application uncertainty over the timing and delivery of a new proposed strategic link road on the A4095 has resulted in a requirement for further modelling work to be undertaken for a specific junction which would now be affected by traffic from the Development by the year 2026. No reassessment of the 2031 with Development traffic flows needs to be undertaken as the strategic link road is expected to be in place by 2031. The revised modelling work is presented as a sensitivity test in a Technical Note to support the Transport Assessment and is attached to this ES Addendum as Appendix 6.3. The Transport ES chapter has also been updated to reflect changes to the assessment which include the incorporation of a mini-roundabout. The amended assessment is presented in this third ES Addendum. For clarity the amendments made as bold / underline in the second ES addendum were accepted so that the new changes in this amendment were clear for the reader.

Summary of the Changes to the May 2021 ES

Table A1: Review of the Submitted ES and Addenda

ES Chapter	Conclusion
1. Introduction	These chapters were not amended in either the first or second addenda and the current proposed changes also do not result in a need for revision of these chapters. **The latest versions of these chapters comprise the May 2021 ES versions.**
2. EIA Methodology	
3. Site and Development	This chapter was revised in the second ES addendum to take account of changes to the Development Parameter Plans. The chapter has been updated again to take account of the new Access and Movement Parameter Plan. **The latest version of this chapter therefore comprises the March 2022 version included in this third ES Addendum**.
4. Alternatives	This chapter was not amended in either the first or second addenda and the current proposed changes do not result in a need for revision of this chapter of the ES. **The latest version of this chapter therefore comprises the May 2021 ES version.**
5. Construction Methodology and Phasing	This chapter was updated in the second ES Addendum to reflect revised access arrangements. The delayed start of the construction work as identified in this third ES Addendum does not result in a requirement to amend the ES chapter further. **The latest version of this chapter comprises the second ES Addendum version from November 2021**
6. Transport and Access	Amended chapter discussed above and provided with this ES Preamble. **The latest version of this chapter comprises the March 2022 version included in this third ES Addendum**.
7. Air Quality	A review of air quality assessment with regard to the amended traffic data for 2026 and the temporary mitigation scheme confirmed that there would be no changes to the assessment findings or conclusions and therefore this chapter has not been updated. **The chapter as submitted in May 2021 comprises the latest version of this assessment**.
8. Noise and Vibration	As with the air quality assessment a review of the amended traffic data for 2026 and the temporary mitigation scheme confirmed that there would be no changes to the noise and vibration assessment findings or conclusions and therefore this chapter has not been updated. **The chapter as submitted in May 2021 comprises the latest version of this assessment.**
9. Landscape and Visual Effects	These chapters were not amended in either the first or second addenda and the current proposed changes also do not result in a need for revision of these chapters of the ES. **The latest versions of these chapters comprise the May 2021 ES versions.**
10. Biodiversity	
11. Built Heritage	
12. Population and Human Health	
13. Water Resources and Flood Risk	
14. Climate Change	
15. Summary and Residual Effects	This chapter was not amended in the first ES addendum but was amended the second ES addendum The current proposed changes do not result in a need for revision of this chapter of the ES and **therefore the latest version of this chapter comprises the second ES Addendum version from November 2021**.

Summary of the Changes reported in this ES Addendum

Chapter 6: Transport and Access

A.15 The Transport and Access chapter has been revised to account for a new assessment in 2026 where the strategic link road for the A4095 does not come forward and mitigation in the form

of a temporary mini-roundabout is required. The assessment identified that there would be no changes to the findings or conclusions of the ES chapter as submitted in November 2021 in the second ES addendum.

Conclusion

A.16 This ES Addendum addresses comments raised by statutory consultees. No significant effects have been identified and all other conclusions of the May 2021 ES, and second ES addendum of November 2021, including the additional bat and bird survey information provided in the July ES Addendum, remain valid.

Structure of the ES Addendum

A.17 The ES Addendum is designed to be read alongside the ES. Chapter numbers correspond to those used in the ES.

Table A2: ES Addendum Structure

May 2021 ES Chapter	Author	Third ES Addendum Chapter
N/A	Barton Willmore LLP	Preamble
1 Introduction	Barton Willmore LLP	None. Chapter not updated
2 EIA Methodology	Barton Willmore LLP	Chapter not updated
3 Site & Development	Barton Willmore LLP	Chapter updated and provided as revised Chapter 003B in this third ES addendum.
4 Alternatives and Design Evolution	Barton Willmore LLP	None. Chapter not updated
5 Construction Programme	Barton Willmore LLP	None. Chapter not updated
6. Transport and Access	Velocity	Chapter updated and provided as revised Chapter 006B in this third ES addendum.
7 Air Quality	Tetra Tech	None. Chapter not updated
8 Noise and Vibration	Tetra Tech	None. Chapter not updated
9 Landscape and Visual Effects	LDA Design	None. Chapter not updated
10 Biodiversity	Aspect Ecology	None. Chapter not updated
11 Built Heritage	Cotswold Archaeology	None. Chapter not updated
12 Population and Human Health	Barton Willmore LLP	None. Chapter not updated
13 Water Resources and Flood Risk	Vectos and Stantec	None. Chapter not updated
14 Climate Change	Stantec	None. Chapter not updated
15 Summary and Residual Effects	Barton Willmore LLP	None. Chapter not updated
Non-Technical Summary	Barton Willmore LLP	NTS of new information provided with this Preamble

Methodology

A.18 The following terminology is used throughout this addendum:

- The ES submitted alongside the planning application in May 2021: the "the May 2021 ES";

- The bat and bird survey information submitted to CDC in July 2021: the first ES addendum";
- The revisions to the Development Parameter Plans and updates to the ES Transport Chapter submitted to CDC in November 2021: the second ES addendum"; and
- This document produced in March 2022, which updates the above documents: the "third ES addendum".

A.19 New text inserted into a chapter is indicated with underlining. Deleted text is identified by a strikethrough as follows: ~~deleted~~. Replacement Figures and Appendices are indicated by using the chapter number as a prefix followed by '**B**'.

Availability of the ES Addendum

A.20 The ES is available to view online at https://planningregister.cherwell.gov.uk/

A.21 Comments on the planning application can either be made via the Council's website or can be forwarded to the Planning Department during normal office hours at the following address:

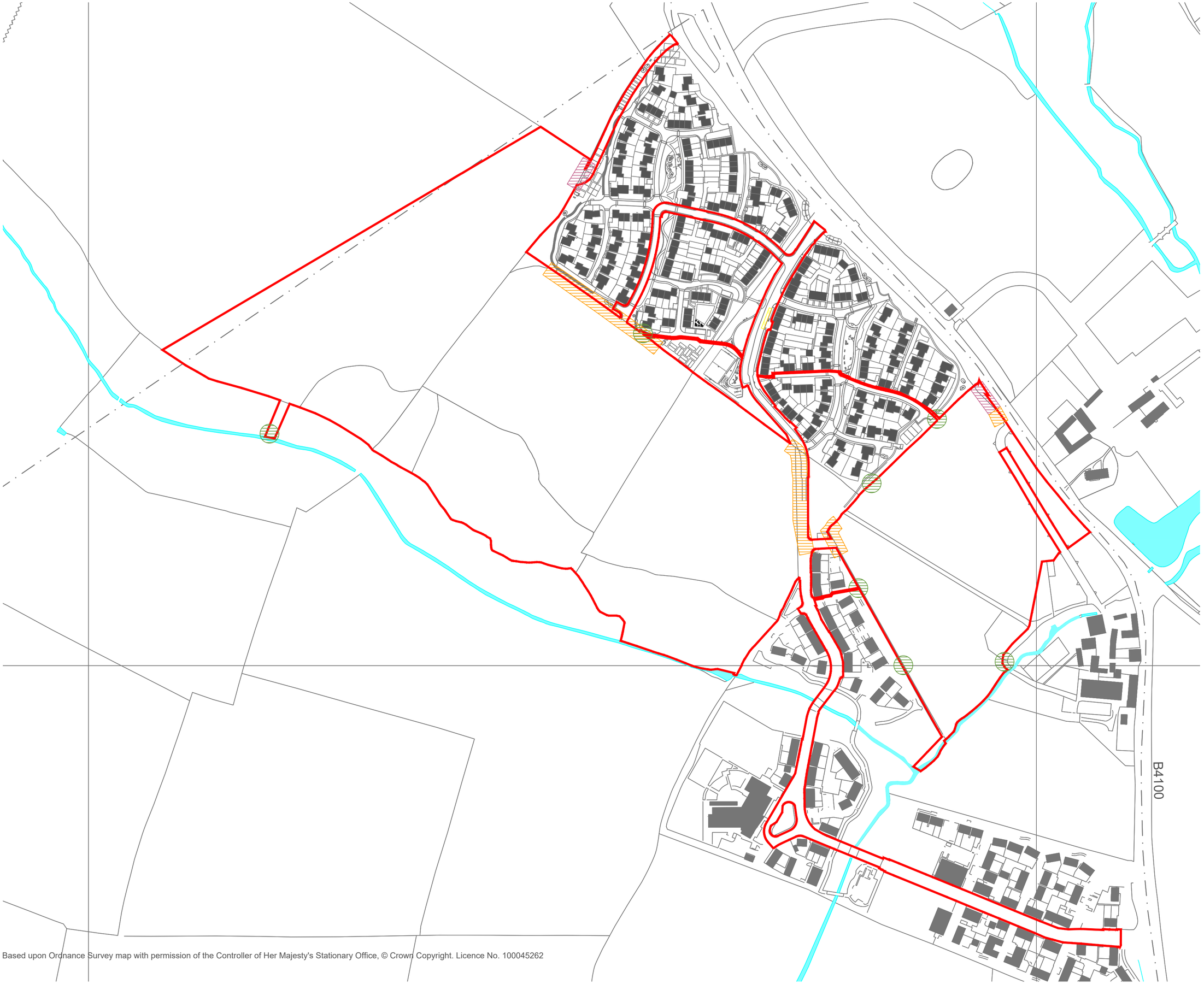
Cherwell District Council
Bodicote House
Bodicote
Banbury
Oxfordshire, OX15 4AA

Tel: 01295 227006
Email: customer.service@cherwell-dc.gov.uk

A.22 Additional paper copies of the ES Addendum can be purchased at a cost of £150. Copies of the ES Addendum can be obtained on data stick for £15. All documents are available from:

Environmental Planning Team
Barton Willmore LLP
7 Soho Square
London, W1D 3QB.

Tel: 020 7446 6888 / Email: IEPenquiries@bartonwillmore.co.uk



Application boundary 24.16 hectares

Vehicular, pedestrian and cycle connection zone

Pedestrian and cycle connection - subject to adoption and/or future development proposals beyond the site boundary

Temporary construction access zone

N

0 metres 100

(1:2,500)

Project

Land at North West Bicester

Drawing Title

Development Parameter Plan 3 : Access and Movement

Date	Scale	Drawn by	Check by
28/03/2022	1:2,500 at A2	LA	LA

Project No	Drawing No	Revision
1192	003	M

Mosaic

CHAPTER

3 B SITE AND DEVELOPMENT DESCRIPTION

Chapter Alterations

The following change has been made to this chapter:

- **Update of the parameter plan Figure 3.3 to reflect the revised potential pedestrian cycle access provision.**

Site Context

3.1 The Site, forming part of a strategic allocation for 6,000 dwellings at North West Bicester[1], is 2.5km to the north west of Bicester Town Centre, south east of the village of Bucknell and north west of Caversfield. The land and boundaries of the Site comprise Banbury Road (B4100) and the ongoing construction works associated with first phase of the North West Bicester allocation (Exemplar Scheme), completed housing associated with the same development, and fields, hedgerows and trees to the north, north west, and west. Further to the south lie fields running up to Lords Lane (A4095) which is approximately 550m to the south and forms the northern edge of Bicester.

3.2 Beyond Banbury Road to the east is the Church of St Laurence Grade II* Listed Building, Caversfield House, which is surrounded by vegetation, and a Public Right of Way (PRoW) beyond that. Home Farmhouse Grade II Listed Building is located approximately 85m to the south east at the closest point to the Site.

3.3 The land separating the two parcels of the Site comprising the first phase of the Exemplar Scheme is part complete and part under construction. The new development includes housing development and a primary school (Gagle Brook). An estate road, Charlotte Avenue, travels north of the new housing development, in between the two parcels of land comprising the Site becoming Braeburn Avenue before joining Banbury Road.

Site Description

3.4 The Site comprises two parcels of land totalling approximately 23.97 hectares (ha) of uncultivated agricultural land. The land is predominantly grassland with fields bounded by hedges with some large trees, woodland and plantation, and is classified as good to moderate value (primarily Grade 3b) under the Agricultural Land Classification system. The

[1] within Policy Bicester 1 of the adopted Cherwell Local Plan 2011-2031[1]

west of the Site contains two distinct areas of woodland, and the most northern area of woodland contains a dry pond. There is a historic hedgerow which runs along the north eastern border of the Site and is a drainage feature running through the south of the Site, which also comprises areas of Flood Zones 2 and 3. The Site is relatively flat rising gradually to the north west.

Sensitive Receptors

3.5 The features which are considered potentially sensitive to the construction and operation of the Development have been identified and the likely significant effects on these potential receptors have been considered by the various technical studies and chapters of this ES. The potential sensitive receptors are identified in Table 3.1.

Table 3.1: Potential Sensitive Receptors

Category	Sensitive Receptor/Land Use
Residential/Buildings	• Existing residential dwellings off Charlotte Avenue/Braeburn Avenue and Caversfield House as well as other roads potentially affected by traffic from the Development; and • Future residents of the Development during the construction process.
Transport Infrastructure	• Banbury Road • Lords Lane; and • Charlotte Avenue/Braeburn Ave.
Landscape and Views	• Existing neighbouring residential dwellings; and • Local Landscape Character.
Ecological Features	• Hedgerows and trees on and surrounding the Site.
Archaeology and Cultural Heritage	• Church of St Laurence Grade II* Listed Building; and • Home Farmhouse Grade II Listed Building.

The Development

Development Parameters

3.6 For an outline planning application where EIA is required, the description of the development must be sufficient to enable the requirements of the EIA Regulations to be fulfilled, and in particular, to enable the potential significant effects of the development to be identified. In the case of the Development, it would not be feasible to make a detailed application at this stage, however, to ensure that as it evolves with the benefit of further approvals (i.e. reserved matters) the Development remains consistent with that assessed within this ES, 'Development Parameters' have been established and assessed. Development Parameters detail all the limits necessary to define and fix those aspects of a development capable of having significant environmental effects. This will enable planning conditions to

be drawn up and agreed to control the implementation of the Development. The Development parameters to be defined by such conditions include:

- the location and types of land use including access; and
- the maximum heights of development as maximum metres Above Ordnance Datum (AOD).

3.7 The Development comprises an outline planning application for:

> *residential development (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination.*

3.8 The description provided in this chapter and chapter 5 of this ES, and the parameter plans, Figure~~s~~ 3.1**A, Figure 3.2A and** ~~to~~ **Figure** 3.3~~A~~**B**, comprise the Development.

Land Use

Residential

3.9 The Development comprises up to 530 residential units (Use Class C3). The range of residential accommodation within the Development may extend from one-bedroom apartments to five bedroomed detached houses, and all formats in between and will include private and affordable homes. All properties will have access to open space within the Development.

Building Heights

3.10 The majority of the Development will be up to 12m above ground level however parts of the Development will comprise buildings with a maximum height of ~~16~~ **14** metres (m) above ground level (up to three storeys). Ground levels are the Site are not expected to require extensive remodelling and therefore a 2m variation has been included in Figure 3.1**A**. The proposed storey heights have been set with reference to their wider context and on a local scale, with the massing changing through iterative feedback throughout the design process, as detailed in Chapter 4 of this ES.

Access

3.11 Access will be provided into the eastern and western parcel of the Development from four

highway connection points, as shown on Figure 3.3**AB**. Pedestrian and cycle connections will be provided at each of the vehicular access points. Safe and attractive environments for walking and cycling will be provided to encourage local journeys to be made sustainably.

Vehicle and Cycle Parking

3.12 Car and cycle parking for the development will be provided in accordance with required standards and in consultation with Oxfordshire County Council.

Green Infrastructure

3.13 The Development includes extensive retained greenspace as shown on Figure 3.2A. Green space, including retained vegetation, buffers and the landscape and visual mitigation zone will comprise a minimum of 40% of the Site area when the Development is complete. The greenspace will include private gardens, landscaping, and structural planting; drainage; ecological and natural areas; parkland; formal and informal recreation areas; orchards and edible landscapes; allotments; equipped and non-equipped play areas; wetlands and watercourses, water features; flood risk management areas; and natural areas.

Drainage

3.14 The majority of the Site is located within Flood Zone 1 and subsequently at low risk of fluvial and tidal flooding however a small portion of the Site (along the eastern boundary of the eastern parcel) lies within the extents of Flood Zone 2 (at medium risk of flooding) and Flood Zone 3 (at high risk of flooding), associated with Town Brook. The Development Parameters include flood attenuation areas within the green spaces as shown on Figure 3.2**A**. Opportunities for sustainable drainage will be maximised across the Development and the existing topography and proposed landscape corridors provide an opportunity to create a system of swales and ponds to mitigate surface water. See Chapter 13 Water Resources and Flood Risk for further information.

Lighting

3.15 The adoption of controlled lighting and implementation of a lighting strategy in accordance with current best practice guidance will ensure that the potential effects on surrounding sensitive receptors from light spill, glare and sky glow are minimised and reduced to an acceptable level.

Energy, Sustainability and Climate Change

3.16 The Development will create a cohesive, permeable and sustainable development. The Development will provide sustainable transport facilities within walking distance of residents and pedestrian and cycling routes that connect to local facilities and will promote sustainable living. A modal shift towards active travel and more sustainable modes would reduce the emissions of greenhouse gases that might otherwise be the case, helping to mitigate climate change.

3.17 The Development will include the following energy efficiency measures, which would also help mitigate climate change: use of air source heat pumps, solar arrays on-site and either off-site solar arrays or carbon offsetting.

3.18 The Development includes measures to increase adaptation to climate change. The Development will include Sustainable Drainage Systems (SuDS) and water efficiency measures to reduce consumption and will include new planting that will provide natural cooling and channel surface water runoff. Buildings will be designed to adapt to climate extremes by reducing water consumption and reducing overheating and improving ventilation.

6 B TRANSPORT AND ACCESS

Chapter Alterations

The following change has been made to this chapter:

- **an interim 2026 scenario was assessed in order to assess a proposed temporary mitigation measure at the A4095 Howes Lane / Bucknell Road junction whilst there is uncertainty regarding the timescales for the delivery of the committed A4095 Strategic Infrastructure Improvements.**

Introduction

6.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of transport and access, including the effects on pedestrians, cyclists and public transport users on the local highway network.

6.2 This chapter has been prepared by Velocity Transport Planning (see Appendix 1.2 Statement of Expertise).

6.3 This chapter describes the assessment methodology; the baseline conditions existing at the Site; the mitigation measures required to prevent, reduce or offset any significant effects; and the likely effects of the Development relating to transport and access.

6.4 A Transport Assessment (TA) has been submitted with the planning application, which is supported by a Technical Note that addresses comments from CDC, OCC, and other stakeholders.

6.4a In response to this Technical Note, further consultation comments were received from OCC on the application and additional material within the Technical Note. In response to these comments, a second Technical Note was produced by Velocity Transport Planning to address the remaining OCC comments.

6.4b The Technical Notes are included at Appendix 6.3.

Policy Context

National Planning Policy Framework[i]

6.5 The latest National Planning Policy Framework (NPPF) was adopted in July 2021 and sets out the Government's planning policies for England, including how these policies should be applied, providing a framework within which locally prepared plans for housing and other development can be produced.

6.6 Chapter 9 of the revised NPPF sets out the requirements for promoting sustainable transport advising that significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. The NPPF advises that planning policies should support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities.

6.7 In Paragraph 110, the NPPF states that on assessing sites that may be allocated for development in plans, it should be ensured that:

- *"appropriate opportunities to promote sustainable transport modes can be or have been taken up, given the type of development and its location;*
- *safe and suitable access to the Site can be achieved for all users;*
- *the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code; and*
- *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."*

6.8 Paragraph 111 of the NPPF states that:

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe"

6.9 Paragraph 112 states that applications for development should:

- *"give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second so far as possible to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that*

encourage public transport use;

- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure and attractive which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."*

Paragraph 113 of The NPPF recognises that a key tool to facilitate the above will be the provision of a Travel Plan such that all developments which generate significant amounts of movement should be required to provide a Travel Plan. Accordingly, a Framework Residential Travel Plan has been prepared and submitted with the planning application as part of a suite of Transport Assessment documents.

Planning Practice Guidance[ii]

6.10 The Government has adopted the national Planning Practice Guidance (PPG) dated March 2014, which provides comprehensive guidance compatible with the NPPF, replacing much of the previous guidance including, in the case of transport, the Department for Transport's Guidance on Transport Assessment[iii] (2007).

6.11 The PPG includes a section dedicated to *"why are Travel Plans, Transport Assessment and Statements important",* citing the following points:

- *"Encouraging sustainable travel;*
- *Lessening traffic generation and its detrimental impacts;*
- *Reducing carbon emissions and climate impacts;*
- *Creating accessible, connected, inclusive communities;*
- *Improving health outcomes and quality of life;*
- *Improving road safety; and*
- *Reducing the need for new development to increase existing road capacity or provide new roads."*

6.12 The guidance specifies that it is linked directly to the NPPF and explains that planning should actively manage patterns of growth in order to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are, or can be made, sustainable.

6.13 Under the section *"What key principles should be taken into account in preparing a Travel Plan, Transport Assessment or Statement?",* the guidance states that "Travel Plans, Transport Assessments and Statements should be:

- *Proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;*
- *Established at the earliest practicable possible stage of a development proposal;*
- *Tailored to particular local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally); and*
- *Brought forward through collaborative ongoing working between the local planning authority/Transport Authority, transport operators, Rail Network Operators, Highways Agency (now known as Highways England) where there may be implications for the Strategic Road Network and other relevant bodies. Engaging communities and local businesses in Travel Plans, Transport Assessments and Statements can be beneficial in positively supporting higher levels of walking and cycling (which in turn can encourage greater social inclusion, community cohesion and healthier communities)."*

6.14 The guidance also sets out the ways in which these documents can be made to be as useful and accessible as possible – by ensuring that any information or assumptions should be set out clearly and be publicly accessible.

Planning Policy Statement – Eco Towns[iv]

6.15 Planning Policy Statements (PPS) set out the national policies on different aspects of spatial planning in England before all, inclusive of the PPS on Eco-Towns, were superseded by the NPPF. It is noted that the Eco-Towns PPS provided the standards any eco-town had to adhere to before it was cancelled for all areas excluding north west Bicester on the 5th March 2015.

6.16 The PPS on Eco Towns supplements PPS1 which outlines the overarching planning policies on delivery of sustainable development through the planning system. It sets out the objectives for sustainable development in the form of large-scale development providing more homes while responding to the impact of climate change as well as a wide range of standards for the delivery of zero carbon development, homes, transport, jobs and other components of an Eco Town.

6.17 The objectives for planning set out in the PPS1 supplement are:

- *"To promote sustainable development by ensuring that eco-town achieve sustainability standards significantly above equivalent levels of development in existing towns and cities by setting out a range of challenging and stretching minimum standards for their development, in particular by:*
- *providing a good quality of green spaces of the highest quality in close proximity to the natural environment;*
- *offering opportunities for space within and around dwellings;*
- *promoting healthy and sustainable environments through `Active Design 2` principles and healthy living choices;*
- *enabling opportunities for infrastructure that makes best use of technologies in energy generation and conservation in ways that are not always practical or economic in other developments;*
- *delivering a locally appropriate mix of housing type and tenure to meet the needs of all income groups and household size; and*
- *taking advantage of significant economies of scale and increases in land value to deliver new technology and infrastructure such as for transport, energy and community facilities; and*
- *To reduce the carbon footprint of development by ensuring that households and individuals in eco-towns are able to reduce their carbon footprint to a low level and achieve a more sustainable way of living."*

6.18 The PPS1 supplement states that Eco Towns should develop unique characteristics by responding to the opportunities and challenges of their location and community aspirations and that all Eco Town proposals should meet the standards as set out in the PPS1 supplement or any standards in the development plan which are of a higher standard. The document identifies at Appendix A that the North West Bicester site allocation will be required to meet the Eco Town standards.

6.19 Policy ET11 – Transport in the PPS1 supplement identifies the standards for transport in an Eco Town. It states that *"Travel in eco-towns should support people's desire for mobility whilst achieving the goal of low carbon living. The town should be designed so that access to it and through it gives priority to options such as walking, cycling, public transport and other sustainable options, thereby reducing residents' reliance on private cars, including techniques such as filtered permeability. To achieve this, homes should be within ten minutes' walk of (a) frequent public transport and (b) neighbouring services. The provision of services within the eco-town may be co-located to reduce the need for individuals to travel by private car and encourage the efficient use of the transport options available."*

6.20 PPS1 states that Travel Plans are required to be included with any planning application with respect to Eco Town development and should demonstrate:

- *"How the town's design will enable at least 50 per cent of trips originating in eco-towns to be made by non-car means, with the potential for this to increase over time to at least 60 per cent;*
- *Good design principles, drawing from Manual for Streets, Building for Life, and community travel planning principles;*
- *How transport choice messages, infrastructure and services will be provided from 'day one' of residential occupation; and*
- *How the carbon impact of transport in the eco-town will be monitored, as part of embedding a long-term low-carbon approach to travel within plans for community governance."*

6.21 PPS1 also states that where an Eco Town is close to an existing higher order settlement, in this case Bicester, planning applications should also demonstrate:

- *"Options for ensuring that key connections around the eco-town do not become congested as a result of the development, for example by extending some aspects of the travel plan beyond the immediate boundaries of the town; and*
- *Significantly more ambitious targets for modal share than the 50 per cent (increasing to 60 per cent over time) mentioned above and for the use of sustainable transport."*

6.22 Eco Towns should be *"designed in a way that supports children walking or cycling to school safely and easily. There should be a maximum walking distance of 800m from homes to the nearest school for children aged under 11."*

Local Planning Policy

Oxfordshire Local Transport Plan 4 2015-2031[v]

6.23 The Oxfordshire Local Transport Plan (LTP4) `Connecting Oxfordshire` includes objectives and policies for improving transport in Oxfordshire to 2031. These objectives and policies look at, in addition to other issues, minimising the need to travel and encouraging active travel.

6.24 The focus of the LTP4 is to attract and support economic investment and growth, deliver transport infrastructure, tackle congestion and improve quality of life. In Connecting Oxfordshire Volume 1, it also sets out policy priorities for parts of Oxfordshire less affected by the Knowledge Spine (which includes Bicester); therefore, it provides a basis

for securing transport improvements to support development across the whole of Oxfordshire.

6.25 LTP4 has been developed with 3 over-arching transport goals.

- ***Goal 1*** *– To support jobs and housing growth and economic vitality;*
- ***Goal 2*** *-To reduce emissions, enhance air quality and support the transition to a low carbon economy; and*
- ***Goal 3*** *– To protect and enhance Oxfordshire's environment and improve quality of life.*

6.26 To achieve these transport goals, 10 objectives for transport have been developed:

- ***Goal 1****: Supporting Growth and economic vitality:*
  - *Maintain and improve transport connections to support economic growths and vitality across the county;*
  - *Make most effective use of all available transport capacity through innovative management of the network;*
  - *Increase journey time reliability and minimise end-to-end public transport journey times on main routes; and*
  - *Develop a high quality, innovative and resilient integrated transport system that is attractive to customers and generates inward investment.*
- ***Goal 2:*** *Reduce emissions, enhance air quality and support the transition to a low carbon economy:*
  - *minimise the need to travel;*
  - *reduce the proportion of journeys made by private car by making the use of public transport, walking and cycling more attractive;*
  - *Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment; and*
  - *reduce per capita carbon emissions from transport in Oxfordshire in line with UK government targets.*
- ***Goal 3:*** *Improving Quality of Life:*
  - *mitigate and wherever possible enhance the impact of transport on the local built, historic and natural environment; and*
  - *improve public health and wellbeing by increasing levels of walking and cycling, reducing transport emissions, reducing casualties, and enabling inclusive access to jobs, education, training and services."*

6.27 A number of policies in the LTP4 are important to Eco Town developments:

- ***Policy 03*** *– Oxfordshire County Council will support measures and innovation that make more efficient use of transport network capacity by reducing the proportion of single occupancy car journeys and encouraging a greater proportion of journeys to be made on foot, by bicycle, and/ or by public transport;*
- ***Policy 19*** *– Oxfordshire County Council will encourage the use of travel associated with healthy and active lifestyles;*
- ***Policy 20****- Oxfordshire County Council will carry out targeted safety improvements on walking and cycling routes to school, to encourage active travel and reduce pressure on school bus transport;*
- ***Policy 22*** *– Oxfordshire County Council will promote the use of low or zero emission transport, including electric vehicles and associated infrastructure where appropriate; and*
- ***Policy 23*** *– Oxfordshire County Council will work to reduce the emissions footprint of transport assets and operation where economically viable, taking into account energy consumption and the use of recycled materials.*

6.28 *Connecting Oxfordshire Volume 8 Part ii* outlines the key strategies for particular local areas within Oxfordshire. The Bicester Area Strategy outlines four key aims for Bicester with respect to the county:

- ***BIC1 -*** *Improve access and connections between key employment and residential sites and the strategic transport system by:*
  - *Continuing to work with Highways England to improve connectivity to the strategic highway;*
  - *Investing a new motorway junction as part of the Garden Town work;*
  - *Reviewing key county road links out of Bicester, including those that cross the county boundary;*
  - *Investigating options for infrastructure improvements and bus priority;*
  - *Delivering effective peripheral routes around the town;*
  - *Investigating solutions to East- West Rail Phase 2 challenges; and*
  - *Supporting the proposal to secure a potential freight interchange at Graven Hill and working with the district and developers to achieve this.*
- ***BIC2 –*** *We will work to reduce the proportion of journeys made by private car though implementing the Sustainable Transport Strategy by:*
  - *Significantly improving public transport connectivity with key areas of economic growth within Oxfordshire;*
  - *Improving Bicester's bus services along key routes and providing improved public transport infrastructure;*
  - *Enhancing pedestrian, cycle and public transport links to the Bicester Village Station, Bicester North Station and key employment sites;*

- *Implementing Bicester town centre highway modifications;*
- *The Bicester Sustainable Transport Strategy has identified a number of new sections of urban pedestrian and cycle routes; and*
- *Progressing a Wayfinding Project for Bicester with the aim of improving signage across the town.*

- ***BIC3 –*** *We will increase people's awareness of the travel choices available in Bicester, which should improve public health and wellbeing by:*
  - *Undertaking travel promotions and marketing measures;*
  - *Developing a coordinated parking strategy in partnership with Cherwell District Council;*
  - *Discourage undesirable routeing of traffic by developing a signage strategy;*
  - *Providing coordinated information and advance notice of construction closures and traffic related issues; and*
  - *Providing new approaches to transport through the North-West Bicester development site.*
- ***BIC4 -*** *To mitigate the cumulative impact of development within Bicester and to implement the measures identified in the Bicester Area Transport Strategy Oxfordshire Council will:*
  - *Secure strategic transport infrastructure contributions from all new development;*
  - *Secure sustainable transport measures through all major new development. For large new or expanded housing development sites, the following principles for cycle provision apply:*
    a) *Developers must demonstrate through master planning how their site has been planned to make cycling convenient and safe for cyclists travelling to, from, within and through the site;*
    b) *Site road network and junctions must be constructed with cycling in mind, including providing space for cycling on main/ spine roads through the provisions of, as a minimum, advisory cycle lane;*
    c) *We will ask developers to fund cyclability, so that the local user view is incorporated into new cycle facilities.*
  - *Secure strategic public transport contributions for new or improved public transport services as well as bus stop infrastructure to supply sustainable development.*

Cherwell Local Plan 2011-2031[vi]

6.29 *The Cherwell Local Plan 2011-2031 Part 1* sets out how Cherwell will grow and change in

the period up to 2031.

6.30 Any development proposals as part of the Eco Town scheme should ensure the below:

- *A zero-carbon development as defined in the Eco Towns PPS and Eco Bicester One Shared Vision;*
- *Delivery of a high quality local environment;*
- *Climate Change adaption: Eco Town standards are met on water, flooding, green infrastructure and biodiversity;*
- *Homes that achieve at least Level 5 of the Code of Sustainable Homes;*
- *Employment: at least 3,000 jobs within the plan period (approximately 1,000 jobs on B use class land on the site within the plan period). An economic strategy will be required and there should be local sourcing of labour, including providing apprenticeships during construction;*
- *Transport: at least 50% of trips originating from the development to be made by means of other than car;*
- *promotions of healthy lifestyles;*
- *Provision of local services and facilities;*
- *Green Infrastructure and biodiversity: 40% of the total gross site area will be provided as green space of which at least half will be public open space;*
- *Sustainable management of waste.*

6.31 Policy Bicester 1 also states that "*a masterplan for the North west Bicester site will be required to demonstrate how proposals will achieve the standards set out in the Eco Towns PPS and Eco Bicester One Shared Vision. Development will be considered on the basis of a masterplan for the whole development area, to ensure that development takes place in an integrate, coordinated and planned way, whilst recognising that phasing of development within the overall masterplan strategy will be required. It will integrate with and complement the function and urban form of Bicester and reinforce the role of Bicester town centre as the primary retail and service centre."* Policy Bicester 1 ensures that the Eco Town scheme will be designed as an exemplar which incorporates best practice and provides a showcase for sustainable living.

6.32 The council will expect the North West Bicester Masterplan and applications for planning permission to meet the following requirements which relate to transport and movement:

- *Proposals should enable residents to easily reduce their carbon footprint to a low level and live low carbon lifestyles;*
- *Layout of development that enables a high degree of integration and connectivity between new and existing communities;*
- *A layout that maximises the potential for walkable neighbourhoods;*

- *New footpaths and cycleways should be provided that link with existing network, the wider urban area and community facilities with a legible hierarchy of routes to encourage sustainable modes of travel;*
- *A layout which makes provisions for and prioritises non-car modes and encourages a modal shift from car use to other forms of travel;*
- *Infrastructure to support sustainable modes of transport will be required including enhancement of footpath and cycle path connectivity with the town centre, employment and rail stations;*
- *Measures to ensure the integration of the development with be remainder of the town including measures to address movement across Howes Lane and Lords Lane;*
- *Good accessibility to public transport services should be provided for, including the provision of a bus route through the site with buses stopping at the railway stations and at new bus stops on the site;*
- *Contributions to improvements to the surrounding road networks, including mitigation measures for the local and strategic highway network, consistent with the requirement of the Eco-Town PPs to reduce reliance on the private car, and to achieve a high level of accessibility to public transport services improvements to facilities for pedestrians and cyclists and the provision and implementation of a Travel plan to maximise connectivity with existing development;*
- *Provision of a Transport Assessment;*
- *Measures to prevent vehicular traffic adversely affecting surrounding communities;*
- *Significant green infrastructure provision, including new footpaths and cycleways, enhancing green modal accessibility beyond the site to the town centre and Bicester Village Railway station, and adjoining developments; and*
- *Public open space to form a well-connected network of green areas suitable for formal and informal recreation.*

6.33 All proposals for development across the Eco Town site will be required to meet the Eco Town development standards set out in Policy Bicester 1: North West Bicester Eco Town and make a degree of contribution towards transport mitigation measures.

North West Bicester Supplementary Planning Document [vii]

6.34 The North West Bicester Supplementary Planning Document (SPD) expands upon Policy Bicester 1 of the adopted Cherwell Local Plan 2011-2031. The SPD provides further detail to the policy and means of implementing the strategic allocation at North West Bicester.

6.35 The SPD sets out the minimum standards to be achieved by proposed development across the Eco Town. It is encouraged that developers exceed these standards where possible and will be expected to apply new higher standards that arise during the life of the document and reflect up to date best practice and design principles.

6.36 The key elements of the SPD that relate to transport are set out within Development Principle 6 – Transport, Movement and Access. These can be summarised as follows:

- *The development should have a robust urban structure, with a network of well-designed, connected spaces and routes that prioritise the movement of pedestrians, cyclists, and public transport;*
- *Principles of "walkable neighbourhoods" and "filtered permeability" have been applied in the Masterplanning to determine the mix of uses and connections to predominantly daily facilities within the new community;*
- *Development proposals must show an understanding of existing routes and provide a considered response that enhances existing access and connections and seeks to improve / remove barriers to movement on and off-site;*
- *It is essential that the accessibility of the overall development internally and externally is designed to a high standard with attractive, direct and overlooked routes. Such routes will be expected to be designed to adoptable standards;*
- *It is crucial proposed developments integrate fully with existing developments and communities in Bicester by making new connections, while improving existing ones; and*
- *The North West Bicester masterplan sets out a framework for movement and access within the site. It includes a street hierarchy and indicative layout of primary streets.*

6.37 It is recognised that the SPD supports the implementation of Policy Bicester 1 of the Cherwell Local Plan 2011-2031 Part 1 and will be a material consideration in determining planning applications on the North West Bicester site. The SPD sets a number of development principles and requirements for the Eco Town.

6.38 Development Principle 6 – Transport, Movement & Access states that the following key considerations for movement should be addressed in planning applications:

- *Reducing car dependency;*
- *Prioritising walking and cycling;*
- *Generating activity and connectivity;*
- *Highways and transport improvements; and*
- *Bus priority and links and infrastructure including real time information (RTI).*

6.39 The SPD states that planning applications are required to illustrate the permeability of the wider North West Bicester masterplan, i.e. the allocated site.

6.40 A key consideration of the SPD is that all planning applications for development in the Eco Town should include a Travel Plan which demonstrates how the design of the development will enable at least 50% of all trips from the development to be made by non-car modes of travel with a potential increase to 60% by 2020. The SPD also states that all planning applications need to be supported by a Transport Assessment which addresses the guidance in the SPD.

Assessment Methodology

6.41 This chapter assesses the significance of transport and access effects, if any, of the Development on key local receptors. The Development will generate vehicular traffic that will distribute across a large geographic area. However, any likely significant effects will be in the local area to the Site.

6.42 The assessment of transport and access related impacts has been carried out in accordance with the Institute of Environmental Assessment '*Guidelines for the Environmental Assessment of Road Traffic*'.[viii]

6.43 As agreed with OCC through the scoping process, the current baseline condition year is 2016 and the baseline traffic flows are those that have been provided from the Bicester Transport Model (BTM). Whilst the BTM does include an interim year of 2026 and a future year of 2031, it does not currently include an up-to-date base year of 2021. As such, the 2016 baseline traffic flows are agreed to be the most sensible to reference for the purpose of the baseline assessment of the operational impacts.

6.44 Traffic data for the following junctions has been provided:

- B4100/A43 Baynards Green Roundabout Junction;
- B4100/A4095/Banbury Road/A4095 Roundabout Junction;
- A4095/Buckingham Road/Skimmingdish Lane/A4421 Roundabout Junction;
- A4095/Middleton Stoney Road/Vendee Drive/B4030 Roundabout Junction;
- B4100/Braeburn Avenue Priority Junction – Site Access 1; and
- B4100/Charlotte Avenue Priority Junction – Site Access 2.

6.45 The TA that supports the planning application describes the highway impact of the Development on the above junctions with particular focus on the two junctions of Braeburn Avenue and Charlotte Avenue with the B4100 Banbury Road.

6.46 Assessments of the pedestrian, cycle and public transport networks have been undertaken and are set out within Section 4 of the TA with further details provided within the Technical Note.

6.47 This Chapter focuses on a more localised study area to assess the environmental impact on transport and access where the significance is likely to be higher.

6.48 The study area for the ES has been identified using the "*Guidelines for the Environmental Assessment of Road Traffic*" where the following two broad rules-of-thumb are to be used to establish which highway links are to be assessed:

- ***Rule 1*** *include highway links where the traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and*
- ***Rule 2*** *include any other specifically sensitive areas where the traffic flows have increased by 10% or more.*

6.49 It is noted that the Guidelines acknowledge that accuracies greater than 10% in traffic forecasting are generally not achievable and that the day-to-day variation of traffic flow on particular roads can be +/- 10%. It is concluded in the Guidelines that on a basic level, a change in traffic of less than 10% will not create a discernible environmental effect.

6.50 Based on the above rules, the highway assessment area includes links and junctions that are subject to changes in daily traffic flow due to the Development's construction and operation.

6.51 The changes in traffic flows on the surrounding highway network have been assessed to determine the likely significant effects of the Development, which includes links and junctions of significant importance to the local road network in the vicinity of the Site, and as agreed with OCC through the scoping process. These are links and junctions that connect the Site to local destinations and the wider strategic road network (A43, A34 and M40 towards Oxford and Banbury), where changes in traffic flows are likely to occur as a result of the implementation of the Development.

Surveys and Scenarios

6.52 This assessment has considered the likely significant effects during the operation and construction of the Development.

6.53 In order to establish the baseline traffic conditions and to enable junction impact analysis, traffic flow information was extracted from the BTM. As agreed with OCC, the BTM also provided traffic flows for the future year of 2031, which coincides with the end of the Local Plan period and ensures that the BTM includes all committed developments identified within the Local Plan and appropriate levels of background growth.

6.54 The list of developments and infrastructure improvements included within the BTM scenarios, is included at Appendix E of the TA, a copy of which supports the planning application.

6.55 As part of the scoping discussions with OCC, three assessment periods were identified and traffic data was provided from the BTM for these three assessments periods, as follows:

- 2016 Base Traffic Flows;
- 2026 'Kingsmere' Reference Case; and
- 2031 'Do Minimum'.

6.56 In addition to the operational assessments, the construction assessment will assume a year of commencement of 2022 and a five year construction programme, with completion in 2027.

6.57 In order to obtain traffic data for the construction assessment years, the difference between the BTM traffic data from the 2016 Base Traffic Flows and 2031 'Do Minimum' flows have been proportionally allocated to determine the traffic growth each year. This has then been applied to the 2016 Base Traffic Flows to reach the future years of 2022 and 2027.

6.58 This will be calculated proportionately from the difference between the 2016 baseline and 2031 'Do Minimum', rather than the interim year of 2026, as this window accounts for all the background strategic growth within the BTM.

6.59 With regards the traffic flows associated with the Development, trip rates and distribution profiles were agreed with OCC through the scoping process, which are in line with previously considered planning applications and as set out within the *North West Bicester Masterplan – Interim Access and Travel Strategy*[ix], which was prepared by Hyder and published in March 2014.

6.60 Furthermore, for the purpose of assessing the potential impact associated with the Site, the following operational assessment scenarios were agreed with OCC and have been

considered in this Chapter:

- 2016 Base Traffic Flows;
- 2031 'Do Minimum' - Without Development; and
- 2031 'Do Something' - With Development.

6.61 The traffic flows associated with the 2016 Base scenario have been provided directly from the BTM. The AM and PM Peak hour flows are presented on Traffic Flow Diagrams 1 and 2 contained at Appendix F of the TA.

6.62 The agreed distribution profile of traffic associated with the Development is presented on Traffic Flow Diagram 3 contained at Appendix F of the TA.

6.63 The traffic flows associated with the Development have been calculated using the agreed trip rates, distribution profile, and mode share targets identified within the appropriate Policy requirements. The AM and PM Peak hour flows are presented on Traffic Flow Diagrams 4 and 5 contained at Appendix F of the TA.

6.64 The traffic flows associated with the 2031 'Do Minimum' scenario have been provided directly from the BTM. These flows include the traffic associated with the cumulative schemes for the cumulative assessment, but exclude any traffic associated with the Development. The AM and PM Peak hour flows are presented on Traffic Flow Diagrams 6 and 7 contained at Appendix F of the TA.

6.65 The traffic flows associated with the 2031 'Do Minimum' plus the traffic flows associated with the Development for the AM and PM Peak hour flows are presented on Traffic Flow Diagrams 8 and 9 contained at Appendix F of the TA.

6.65a In addition to the scenarios noted above and following post-submission discussions with OCC, it is now noted that there is uncertainty regarding the timings and funding for the delivery of the A4095 Strategic Infrastructure Improvements, which were due to be implemented by 2026. On that basis, a temporary mitigation scheme has been developed to provide an interim mitigation solution at the A4095 Howes Lane / Bucknell Road junction to accommodate the traffic associated with the Proposed Development on the network.

6.65b In order to assess this interim scenario, a 2026 'Reference Case' Scenario has been obtained from the BTM for the extent of the A4095 Howes Lane / Bucknell Road junction, which assumes the A4095 Strategic Infrastructure

Improvements are not in place.

6.66 It is noted that 18-hour Annual Average Week Traffic (AAWT) flows are considered for the assessment.

Construction

6.67 In terms of the distribution of construction traffic and routes, reference is made to the agreed routes as part of the permitted Construction Traffic Management Plans (CTMP) for the permitted Exemplar scheme (10-01780-HYBRID) which prevented access for heavy goods vehicles (HGVs) along the A4095 Howes Lane due to the junction constraints.

6.68 On that basis, it is assumed that all HGV construction traffic will route from the north and the Baynards Green roundabout junction of the A43 / B4100. However, due to the physical geometric constraints and presence of a splitter island on the B4100 for any vehicles accessing the temporary construction access to the western parcel from the existing layby arrangement, vehicles will instead have to travel past the site and route back via the B4100 / A4095 roundabout.

6.69 It is noted that CDC are currently in the process of reviewing an application submitted by OCC (21/00263/SO) for an improvement scheme at the B4100 / A4095 roundabout, whereby one of the options involves a traffic signal scheme that subsequently would restrict the ability for vehicles to turn at this junction. Vehicles will therefore have to route to the east and turn at the A421 / Skimmingdish Lane junction, before travelling back along the A4095 and turning right onto the B4100, travelling northbound up the B4100 before slipping left into the layby that facilitates access via the temporary construction access to the western parcel.

6.70 Vehicles accessing the construction access to the eastern parcel would be able to turn right from the B4100 into the temporary construction access; however, as a robust assumption, it will be assumed that all HGVs will be required to follow this routing via the A421 / Skimmingdish Lane junction, as it provides the greatest material impact on the junctions within the study area.

Sensitivity of Receptors

6.71 The significance of likely transport and access effects have been determined with criteria developed from best practice techniques. Table 6.1 sets out the scale of sensitivity that has been applied to receptors, identified as 'affected parties' at page 17 of the Guidelines

and which are considered to be relevant to this assessment.

Table 6.1: Sensitivity of Receptors

Sensitivity	Description of Criteria (Receptors)
High	Educational Institutions (Gagle Brook Primary School), roads that have no footpaths and are likely to be used by pedestrians, accident blackspots
Moderate	Health care facilities, parks and recreational areas, retail areas, roads with narrow footpaths that may be used by pedestrians, links that will be utilised by a number of cyclists, areas of ecological or natural value, roads whereby residential properties front the link
Low	Open spaces, tourist and visitor attractions, places of worship, employment uses, residential properties set back from the link

6.72 In addition, it has been assumed that the residents of the adjacent Exemplar Scheme will have a high sensitivity to the increase in both construction and operational traffic.

Scope of Assessment

6.73 The Guidelines identify that the main transport effects that could arise from the construction and operation of new developments relate to the following:

- Severance;
- Driver Delay;
- Pedestrian Delay;
- Cyclist Delay;
- Pedestrian Amenity;
- Cyclist Amenity;
- Fear & Intimidation;
- Accidents & Road Safety;
- Dust & Dirt; and
- Hazardous Loads.

6.74 Within the above list there are two criteria that are not considered within this assessment. The 'Dust and Dirt' criterion is considered as part of the Air Quality Assessment undertaken in Chapter 7 of this ES. In addition, 'Hazardous Loads' is not considered within this assessment as it is considered unlikely that the construction or operation of the Development will require transportation of hazardous loads.

Magnitude of Change and Significance

6.75 To determine the magnitude of change experienced by the receptors and to determine the likely significance of the effects resulting from the Development, thresholds set out in the Guidelines have been used and interpreted using professional judgement.

6.76 The magnitude of criteria utilised within Table 6.2 is partially based on the Guidelines for the Environmental Impact Assessment, (GEIA, 2004)[x]. In the GEIA guidance, the document acknowledges that not all criteria for the assessment of magnitude is required to be based on percentages, with percentage changes primarily associated with changes in severance. Instead, the guidance suggests that assessors should utilise professional judgment to determine the magnitude of changes, where appropriate.

6.77 As per the GEIA guidance, there is no specific guidance for assessing the magnitude of impacts on pedestrian delay. The guidance does refer to a lower threshold of 10 seconds delay and upper threshold of 40 seconds delay, which for a link with no crossing facilities equates to a lower threshold of approximately 1,400 vehicles per hour. However, as the links within the study area vary considerably and do include crossings, it is proposed to undertake and utilise professional judgement to assess the impact of the Development on pedestrian delay.

6.78 With respect to cyclist delay, professional judgement will again be utilised as there is no specific threshold within the GEIA guidance upon which to assess it. It could be viewed that cyclist delay would operate under a similar scale of magnitude to driver delay, however; the scale of the impact on the individual links will vary considerably based on the characteristics of each link. For example, if dedicated segregated cycle facilities are proposed along a link then the impact on cyclist delay of any increases in traffic could be negligible or in contrast; if the road is narrow with potential for cyclists being integrated in any queueing traffic, then any changes in driver delay could also negatively influence cyclist delay.

6.79 For pedestrian amenity, reference is made to the GEIA guidance which suggests "a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flows (or HGV component) is halved or doubled". This threshold has therefore been applied to the assessment for pedestrian amenity.

6.80 As with the assessment for cyclist delay, there is no specific guidance or threshold for the assessment of cyclist amenity. On this basis, it is again proposed to utilise professional judgment and undertake a qualitative assessment to determine the impacts. This is considered to be the most appropriate assessment to reflect the sensitivity of each link, the associated cycle facilities and the number of vehicles using the link.

6.81 Table 6.2 outlines the thresholds used to determine the magnitude of change.

Table 6.2: Criteria for Magnitude of Change

Impact	Magnitude of Impact/Threshold			
	Negligible	Low	Medium	High
Severance	Less than 30% change in 18-hr AAWT flows	Between 30% and 60% change in 18-hr AAWT flows	Between 60% and 90% change in 18-hr AAWT flows	More than 90% change in 18-hr AAWT flows
Driver Delay	Average vehicle delay changes of less than 30 seconds	Average vehicle delay changes between 30 seconds and 60 seconds	Average vehicle delay changes between 60 seconds and 90 seconds	Average vehicle delay changes of more than 90 seconds
Pedestrian Delay	Qualitative Assessment based on professional judgement			
Cyclist Delay	Qualitative Assessment based on professional judgement			
Pedestrian Amenity	Negligible change to traffic flows	Traffic flows increase/reduce by less than a quarter	Traffic flows increase/reduce by more than a quarter	Traffic flows are double or halved
Cyclist Amenity	Qualitative Assessment based on professional judgement			
ear & Intimidation	Average 18-hr traffic flow of less than 600 vehicles/hr; average 18-hr HGV flow of less than 1,000; or average 18-hr speeds of less than 10mph	Average 18-hr traffic flow of 600-1,200 vehicles/hr; average 18-hr HGV flow of 1,000-2,000; or average 18-hr speeds of 10-15mph	Average 18-hr traffic flow of 1,200-1,800 vehicles/hr; average 18-hr HGV flow of 2,000-3,000; or average 18-hr speeds of 15-20mph	Average 18-hr traffic flow of more than 1,800 vehicles/hr; average 18-hr HGV flow of more than 3,000; or average 18-hr speeds of more than 20mph
Accidents & Road Safety	Expected change in risk of less than 5% at the location of existing accident cluster	Expected change in risk of 5% to 10% at the location of existing accident cluster	Expected change in risk of 10% to 15% at the location of existing accident cluster	Expected change in risk of more than 15% at the location of existing accident cluster

6.82 Table 6.3 sets out the significance criteria and a description of these.

Table 6.3: Significance Criteria

Significance Criteria	Description of Criteria
Major Beneficial	A considerable positive effect to receptor which is of a scale that has more than local importance
Moderate Beneficial	A positive effect on the receptor in terms of extent, duration, or magnitude.
Minor Beneficial	A positive effect on the receptor that is small, localised, or short term.
Neutral/Not Significant	No perceivable impact
Minor Adverse	A negative effect on the receptor that is small, localised, or short term.

Significance Criteria	Description of Criteria
Moderate Adverse	A negative effect on the receptor in terms of extent, duration, or magnitude.
Major Adverse	A negative effect on the receptor that will have an impact on the wider area or that may be in breach of standards or legislation.

6.83 Table 6.4 sets out the degrees of significance considering the sensitivity of the receptor and the magnitude of change.

Table 6.4: Magnitude of Change

Magnitude of Change	Sensitivity of Receptor			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor to Moderate	Negligible
Low	Moderate	Minor to Moderate	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.84 Only effects that are identified as 'Major' or 'Moderate' have been deemed to be significant.

Study Area

6.85 The study area is set out in Table 6.5 which includes information on the receptors at each link and their sensitivity which then informs the sensitivity of the link.

Table 6.5: Link Sensitivity

Link ID	Link Name	Sensitivity of Receptor				Link Sensitivity
		High	Medium	Low	Negligible	
1	B4100 North of Baynards Green				Agricultural Land	Negligible
2	A43 east of Baynards Green				Agricultural Land	Negligible
3	A43 west of Baynards Green				Agricultural Land	Negligible
4	B4100 south of Baynards Green			Residential	Agricultural Land	Low
5	B4100 north of Banbury Road			Residential	Agricultural Land	Low
6	A4095 west of Banbury Road			Residential	Agricultural Land	Low
7	Banbury Road south of A4095		Retail	Residential/ Employment		Medium
8	A4095 east of Banbury Road			Residential	Agricultural Land	Low
9	A4421			Residential/ Employment	Agricultural Land	Low

Link ID	Link Name	Sensitivity of Receptor				Link Sensitivity
		High	Medium	Low	Negligible	
10	Buckingham Road			Residential		Low
11	A4095 east of Buckingham Road			Residential/ Employment	Agricultural Land	Low
12	A4095 Howes Lane			Residential/ Employment	Agricultural Land	Low
13	B4030			Residential/ Employment	Agricultural Land	Low
14	Vendee Drive			Residential	Agricultural Land	Low
15	Middleton Stoney Road			Residential	Agricultural Land	Low
16	Braeburn Avenue	Residential fronting link		Open Space		High
17	Charlotte Avenue	School and residential		Open Space, Employment		High
18	Temporary Construction Access for eastern parcel	Residential properties near link				High
19	Temporary Construction Access for western parcel	Residential properties near link				High

6.86 The sensitivity of Links 16, 17, 18 and 19 have been classified as 'high sensitivity' to reflect the proximity of the residential properties of the Exemplar scheme to the links.

Limitations and Assumptions

6.87 All future forecasts include some degree of uncertainty. This is particularly relevant at the current time due to the pandemic, which has resulted in unprecedented disruption to how people work and travel and the extent to which people will change their behaviour, in particular when it comes to how and when they travel. There is also the extent of uptake/continuation of working from home which remains to be seen.

6.88 The traffic flows, which have been provided from the BTM, do not account for the current pandemic, which is therefore considered to be a limitation. However, as the level of traffic on the local highway network during this unprecedented time is expected to be significantly lower due to the pandemic, it is assumed that the traffic flows from the BTM are robust.

6.89 The baseline traffic flows and future forecasted traffic flows, have been supplied from the BTM. The future forecasted traffic flows are for the year 2031, which coincides with the end of the Local Plan period and includes all development that is expected to have come forward by the end of the Local Plan period. This is confirmed in the uncertainty logs set out within Appendix E of the TA, which supports the planning application.

6.90 The assessment of transport and access effects in this Chapter is based on the TA. The assumptions and technical deficiencies used in the preparation of the TA are set out within the report, which is submitted with the planning application.

Baseline Conditions

Introduction

6.91 Due to the travel restrictions that have been in place intermittently from March 2020, it was not considered appropriate to undertake traffic surveys to establish the baseline traffic flows. Furthermore, as there is a significant number of allocated sites identified within the Local Plan, and specifically in and around Bicester, it is expected that traffic levels will generally increase during the build out of the allocated sites until the end of the Local Plan period, identified as being 2031.

6.92 However, the latest version of the BTM includes a base year of 2016, which was prepared following collection of updated traffic flow data and consideration of the permitted developments that were being constructed and occupied at the time.

6.93 The baseline for future year assessment has been discussed with the highway authorities and it ~~has been~~ **was** agreed that **the** ~~whilst there is an interim year of 2026, which is available from the BTM, the~~ potential impact of the traffic flows associated with the Development should be assessed against the future forecasted year of 2031, which coincides with the end of the Local Plan period.

6.94 The data provided from the BTM includes a 2031 'Do Minimum' scenario, which includes all the identified development within the Local Plan and identified infrastructure improvements to accommodate the growth within the area to the end of the Local Plan period (as identified within the housing trajectory set out within the 2017 Annual Monitoring Report[xi] produced by Cherwell District Council), with the exception of the traffic flows associated with the Development.

6.94a As a further sensitivity test, and following discussions with OCC acknowledging that there is uncertainty regarding the timings and funding for the delivery of the A4095 Strategic Infrastructure Improvements, an interim assessment of the BTM 2026 Reference Case Scenario at the A4095 Howes Lane / Bucknell Road junction will be undertaken to incorporate the proposed interim mitigation scheme.

6.94b The BTM 2026 Reference Case Scenario is an interim scenario that assumes the A4095 Strategic Infrastructure Improvements are not in place. However, the 'end' point for the assessment is still considered to be the BTM 2031 scenarios, which coincides with the end of the Local Plan and accounts for all the strategic infrastructure improvements being in place.

6.94c The assessment for the BTM 2026 Reference Case scenario will focus on the A4095 Howes Lane / Bucknell Road junction and surrounding links only, as the interim mitigation solution only focusses on this area of the network. The BTM 2026 Reference Case scenario does not consider the other links within the other assessment scenarios.

Existing Road Network

6.95 The permitted Exemplar Scheme lies to the south east and north east of the Site, which separates the two development parcels. The larger development parcel is located to the west and the smaller parcel to the east. Further details of the Site are set out within Chapter 3.

6.96 The Exemplar Scheme is accessed to the south east from the B4100 via Charlotte Avenue at an existing priority controlled junction. As the whole of the Exemplar Scheme is within a 20mph zone, the speed limit along Charlotte Avenue is restricted to 20mph. Traffic calming features in the form of raised tables are occasionally located along Charlotte Avenue, which includes adequate footway provision on both sides of the carriageway.

6.97 To the north, the Exemplar Scheme is accessed from the B4100 via Braeburn Avenue, which is also a 20mph road with adequate footway provision on either side of the carriageway.

6.98 An existing bus gate separates Phases 1 & 2 of the Exemplar Scheme from Phases 3 & 4. This bus gate is defined by a narrowing of the carriageway to 4.0m for a distance of

approximately 65.0m and currently only accommodates a footway along the eastern side of the bus only link. It is noted that cyclists are encouraged to use this bus gate and are permitted to share the carriageway with buses. The bus gate is proposed to be enforced by camera, subject to the adoption of the Estate Road.

6.99 At the time of preparing this application, none of the roads, footpaths, or routes through the Exemplar Scheme are currently part of the adopted highway network.

6.100 The B4100 Banbury Road runs to the east of the Site between the A43 to the north and the roundabout junction with the A4095 to the south, where the B4100 continues toward Bicester town centre and joins with Buckingham Road, Field Street and North Street via a 5-arm roundabout.

6.101 The northern section (north of the roundabout junction with the A4095) is predominantly rural in nature and is subject to a speed limit of 40mph until just to the south of its junction with Bainton Road (to the north of the existing junction of Braeburn Avenue with the B4100 Banbury Road) where the national speed limit is introduced.

6.102 There are a number of junctions along this stretch of the B4100 Banbury Road providing direct access to private houses, the Home Farm mixed use development, and Aunt Ems Lane by way of a priority junction located to the north of the Home Farm development.

6.103 The southern section of Banbury Road from the roundabout towards Bicester town centre, is more urban in nature with the presence of footways and traffic calming features. This section of Banbury Road is subject to a speed limit of 40mph, which changes to 30mph on the approach to the town centre.

6.104 The A4095 Lord's Lane is a single carriageway (in each direction from the roundabout junction) that currently acts as a by-pass route between the A4095/Buckingham Road/Skimmingdish Lane/A4421 roundabout junction to the east and the A4095/Middleton Stoney Road/Vendee Drive/B4030 roundabout junction to the west. The road is subject to a 50mph speed limit, street lighting is provided, and a separated pedestrian/cycle route is provided on the southern side.

Existing Pedestrian and Cycle Facilities

6.105 Access by foot and by bicycle is currently provided through the existing Exemplar Scheme via the Estate Road. There is adequate footway provision throughout the Exemplar Scheme with minimum widths of 2.0m provided on either side of the Estate Road

carriageway, with informal uncontrolled pedestrian crossing points with dropped kerbs and tactile paving located at regular intervals. This established network of footways through the Exemplar Scheme provides access to the Gagle Brook Primary School, nearby facilities and amenities, and local bus stops.

6.106 Internally within the site, on-carriageway cycling was deemed as being acceptable by OCC where speeds are reliably below 20mph, which is reinforced and supported by the traffic calming along the Exemplar Estate Road, which includes carriageway narrowing and raised tables.

6.107 Based on the anticipated flows along Braeburn Avenue and guidance set out within Local Transport Note (LTN) 1/20[xii], on-carriageway cycling is generally acceptable for most users where speeds are 20mph and daily traffic flows are below 4,000 total vehicles per day.

6.108 Cyclists benefit from a shared pedestrian/cyclist link to the south of the Charlotte Avenue junction with the B4100, accessed via Chantenay Close, which allows cyclists to bypass the Charlotte Avenue junction and join directly onto the shared footway/cycleway that is provided alongside the northbound carriageway of the B4100 Banbury Road, which provides access on foot and by cycle toward Bicester town centre.

6.109 A signalised crossing is provided on the B4100 Banbury Road to the south of the southern site access junction to enable pedestrians and cyclists to cross the carriageway and head eastwards to another shared footway/cycleway alongside the A4095 which is separated from the carriageway by a grass verge. A segregated shared footway/cycleway adjacent to the western side of Banbury Road continues south towards Bicester town centre.

6.110 The existing shared footway/cycleway along the western side of Banbury Road is linked to Buckingham Road by a dedicated shared link to the north of the railway line and links the Exemplar Scheme with Bicester North Railway Station. Whilst it is acknowledged that there is a lack of shared pedestrian/cycle provision under the existing railway bridge along Buckingham Road (approximately 50m), two footways on either side of Buckingham Road provide segregated access on the existing footways with limited opportunity to widen the eastern footway to provide an improved shared pedestrian/cycle link under the bridge to the rail station. From this point, further pedestrian and cycle connections are provided to Bicester town centre.

6.111 The Exemplar Scheme offers strong sustainable connections in the local area with easy movement by bicycle including shared vehicle/bicycle lanes. As the internal road network

within the Exemplar Site is subject to a 20mph zone, it is considered that the majority of these local roads are conducive to encouraging on-carriageway cycling.

6.112 National Cycle Route 51, which provides long distance connections between towns, connects Bicester with Oxford. Local Cycle Routes provide connections between Bicester and Bicester Village station.

6.113 The adjacent Exemplar Scheme provides comprehensive infrastructure required to promote walking and cycling within the area, such as wide footways, traffic calming measures on Charlotte Avenue and Braeburn Avenue, and cycle parking at all community facilities, including the primary school. Brompton bike storage and Sheffield stands are provided on Charlotte Avenue in close proximity to the current Sales & Marketing Suite near the entrance to the Exemplar Scheme.

6.114 Further details on the existing walking and cycling facilities are provided within the supporting TA and Technical Note, which includes an assessment of the appropriateness of the provision for cyclists internally within the site on Braeburn Avenue and Charlotte Avenue.

Public Transport Network

6.115 The E1 bus service passes through the Exemplar Scheme, entering via the Braeburn Avenue junction with the B4100 Banbury Road, passing along the Estate Road effectively separating the western and eastern parcels, and exiting via the Charlotte Avenue junction with the B4100 Banbury Road. There are a number of existing bus stops located within the Exemplar Scheme.

6.116 To the north of the Exemplar Scheme, a bus stop is located on Braeburn Avenue approximately 130m south of the junction with the B4100 Banbury Road. This existing bus stop includes an area of hard standing for waiting passengers and a solar-powered electronic timetable. The location of this bus stop ensures that the majority of both parcels of the Site are within a 400m distance of a bus stop, with the exception of the westernmost edge of the Western Parcel and the southernmost edge of the Eastern Parcel.

6.117 A further bus stop is located on Charlotte Avenue directly outside the Gagle Brook Primary School. This existing bus stop includes a shelter and a Sheffield stand for cycle parking. The location of this bus stop ensures that the southernmost edge of the Eastern Parcel of the Site is within a 400m distance of a bus stop.

6.118 Bicester has access to two rail stations, Bicester North and Bicester Village station. Bicester North station is located approximately 2km to the southeast of the Site and Bicester Village station is situated approximately 3.1km southeast of the Site. There are regular services throughout the day to a range of destinations. Central London can be reached within a 60-minute train ride from Bicester North with a frequency of four trains per hour. Employment, recreation and shopping opportunities within Oxford are available within a 30-minutes rail journey from Bicester Village station.

Personal Injury Accidents

6.119 Personal Injury Accident (PIA) data has been obtained from OCC for the most-recent three-year period in the vicinity of the Site. A total of 31 accidents were recorded in the study area, 25 resulted in slight injury, 5 in serious injury, and one was recorded as being fatal.

6.120 A detailed assessment of the PIA data is set out within the TA, a copy of which is submitted with the planning application.

Future Baseline - Operational

6.121 The future baseline 18-hour AAWT flows used for this assessment are the 2031 scenarios as set out above. The 2016 baseline and 2031 'Do Minimum' flows will then be used to derive the future years for the construction assessment, as discussed further below.

6.122 The 2031 'Do Minimum' total vehicle and HGV 18-hour AAWT flows are set out in Table 6.6 for each of the identified links, which includes details of the forecast percentage change in flows when compared with the 2016 baseline.

Table 6.6: 2031 Base Flows and Percentage Change

LINK	18-Hour AAWT						
	2016 Baseline			2031 Base (Do Minimum)			% Change (Total Vehicles)
	Total Vehicles	HGV	%HGV	Total Vehicles	HGV	%HGV	
1	6,310	144	2.3%	5,925	88	1.5%	-6.1%
2	29,323	3,006	10.3%	40,348	3,349	8.3%	37.6%
3	27,378	3,082	11.3%	39,053	3,395	8.7%	42.6%
4	10,504	2,003	19.1%	16,288	2,022	12.4%	55.1%
5	9,973	472	4.7%	18,960	527	2.8%	90.1%
6	11,836	195	1.6%	11,642	641	5.5%	-1.6%
7	4,398	34	0.8%	9,060	34	0.4%	106.0%
8	17,044	720	4.2%	21,844	1,076	4.9%	28.2%
9	15,206	683	4.5%	20,349	1,132	5.6%	33.8%
10	6,779	189	2.8%	7,414	213	2.9%	9.4%
11	15,532	861	5.5%	22,568	897	4.0%	45.3%

LINK	18-Hour AAWT						
	2016 Baseline			2031 Base (Do Minimum)			% Change (Total Vehicles)
	Total Vehicles	HGV	%HGV	Total Vehicles	HGV	%HGV	
12	9,620	221	2.3%	10,745	597	5.6%	11.7%
13	4,383	307	7.0%	13,377	377	2.8%	205.2%
14	10,561	282	2.7%	14,828	650	4.4%	40.4%
15	4,449	170	3.8%	12,957	265	2.0%	191.2%
16	0	0	0.0%	1,465	0	0.0%	0.0%
17	703	34	4.8%	4,446	51	1.1%	532.5%
18	*Temporary Construction Access only						
19	*Temporary Construction Access only						

6.123 Table 6.6 demonstrates significant changes in flows along most links within the study area in the 15-year period.

6.124 It is noted that flows for the 2016 baseline of link 16 (Braeburn Avenue) have not been provided as it was not constructed at the time that the 2016 base year was developed as part of the latest BTM.

6.124a Table 6.7 below summarises the BTM 2026 Reference Case Scenario flows obtained from the BTM.

Table 6.7: BTM 2026 Reference Case Traffic Flows

LINK	LINK DESCRIPTION	18 Hour AAWT		
		BTM 2026 Reference Case		
		Total Vehicles	HGV	% HGV
A	**Bucknell Road (South of Railway)**	**16,358**	**1,008**	**6%**
B	**Bucknell Road (South of A4095 Howes Lane)**	**6,244**	**19**	**0%**
C	**A4095 Howes Lane (West of Bucknell Road)**	**13,636**	**1,026**	**8%**
D	**Bucknell Road (North of A4095 Lords Lane)**	**5,547**	**0**	**0%**
E	**A4095 Lords Lane (East of Bucknell Road)**	**17,403**	**1,008**	**6%**
F	**Bucknell Road (North of Railway)**	**16,245**	**1,008**	**6%**

Future Baseline – Construction

6.125 The future baseline 18-hour AAWT flows used for the construction assessment are the 2022 (year of commencement) and 2027 (assumed year of completion). The total vehicle and HGV 18-hour AAWT flows for each base year are set out in Table 6.**8**~~7~~ for each of the identified links.

6.126 The 18-hour flows are used rather than the 24-hour flows, as it will present the greatest proportionate impact, due to the 18-hour flows being lower than the 24-hour flows.

Table 6.8~~7~~: 2022 and 2027 Base Traffic Flows

LINK	18 Hour AAWT					
	2022 Base (year of commencement)			2027 Base (year of completion)		
	Total Vehicles	HGV	%HGV	Total Vehicles	HGV	%HGV
1	6,181	125	2%	6,027	103	2%
2	32,998	3,121	9%	37,408	3,258	9%
3	31,270	3,186	10%	35,940	3,312	9%
4	12,432	2,010	16%	14,746	2,017	14%
5	12,969	490	4%	16,564	512	3%
6	11,771	344	3%	11,693	522	4%
7	5,952	34	1%	7,817	34	0%
8	18,644	838	4%	20,564	981	5%
9	16,920	833	5%	18,978	1,013	5%
10	6,990	197	3%	7,244	206	3%
11	17,877	873	5%	20,692	888	4%
12	9,995	346	3%	10,445	497	5%
13	7,381	330	4%	10,979	359	3%
14	11,984	405	3%	13,690	552	4%
15	7,285	202	3%	10,688	240	2%
16	488	0	0%	1,074	0	0%
17	1,951	40	2%	3,448	46	1%
18	0	0	0%	0	0	0%
19	0	0	0%	0	0	0%

Likely Significant Effects

Construction Phase

6.127 Enabling works will be necessary before construction begins. Construction of the Development is anticipated to take approximately five years and will likely be split into phases, the details of which will be agreed as part of the reserved matters submission.

6.128 Construction of the Development would generate additional traffic on the road network in the vicinity of the site due to the additional construction vehicle movements required.

6.129 As noted in Chapter 5, it is anticipated that the Development would require approximately 10 daily construction HGVs, the equivalent to 20 two-way construction HGV trips per day.

6.130 Using the routing presented above and anticipated levels of construction traffic, the construction traffic assessments for both the 2022 and 2027 years are presented below in Table 6.**9**~~8~~ and Table 6.**10**~~9~~, alongside the projected percentage increase in the number of HGVs from the base year.

Table 6.98: 2022 Base Flows with Construction Traffic Impact

LINK	18-Hour AAWT				
	2022 Base			Construction Traffic	
	Total Vehicles	HGV	% HGV	HGV Flow	% Increase
1	6,181	125	2%	0	**0%**
2	32,998	3,121	9%	10	**0%**
3	31,270	3,186	10%	10	**0%**
4	12,432	2,010	16%	30	**1%**
5	12,969	490	4%	20	**4%**
6	11,771	344	3%	0	**0%**
7	5,952	34	1%	0	**0%**
8	18,644	838	4%	20	**2%**
9	16,920	833	5%	0	**0%**
10	6,990	197	3%	0	**0%**
11	17,877	873	5%	0	**0%**
12	9,995	346	3%	0	**0%**
13	7,381	330	4%	0	**0%**
14	11,984	405	3%	0	**0%**
15	7,285	202	3%	0	**0%**
16	488	0	0%	0	**0%**
17	1,951	40	2%	0	**0%**
18	0	0	0%	10	**100%**
19	0	0	0%	10	**100%**

Table 6.109: 2027 Base Flows with Construction Traffic Impact

LINK	18-Hour AAWT				
	2027 Base			Construction Traffic	
	Total Vehicles	HGV	% HGV	HGV Flow	% Increase
1	6,027	103	2%	0	**0%**
2	37,408	3,258	9%	10	**0%**
3	35,940	3,312	9%	10	**0%**
4	14,746	2,017	14%	30	**1%**
5	16,564	512	3%	20	**4%**
6	11,693	522	4%	0	**0%**
7	7,817	34	0%	0	**0%**
8	20,564	981	5%	20	**2%**
9	18,978	1,013	5%	0	**0%**
10	7,244	206	3%	0	**0%**
11	20,692	888	4%	0	**0%**
12	10,445	497	5%	0	**0%**
13	10,979	359	3%	0	**0%**
14	13,690	552	4%	0	**0%**
15	10,688	240	2%	0	**0%**
16	1,074	0	0%	0	**0%**
17	3,448	46	1%	0	**0%**
18	0	0	0%	10	**100%**

LINK	18-Hour AAWT				
	2027 Base			Construction Traffic	
	Total Vehicles	HGV	% HGV	HGV Flow	% Increase
19	0	0	0%	10	**100%**

6.131 Table 6.**9**~~8~~ and Table 6.**10**~~9~~ demonstrate that across the majority of the links, excluding the temporary construction access points (Link 18 and Link 19), the greatest impact would be 4%, which would be experienced on Link 5 (B4100 Banbury Road), though it is acknowledged this is a receptor of low sensitivity given its relatively low baseline levels of HGV activity, as well as being primarily surrounded by agricultural land.

6.132 With respect to Link 18 and Link 19, the large percentage increase on these links is due to the links both being dedicated temporary construction access roads, purpose built for the construction of the Development only. These links are classified as those of 'high sensitivity' which is due to the proximity of residential properties to the link, rather than there being scope for conflict with vulnerable road users along these links - as access will be controlled and secured when out of use.

6.133 The other links within the assessment will experience a negligible change in HGV proportions.

6.134 An assessment of the effects based on criteria for magnitude of change presented in Table 6.2 is discussed below.

Severance

6.135 Changes in traffic flow or HGV flow by 30%, 60% or 90% can be considered as having a low, medium or high impact respectively on severance.

6.136 Due to the changes in traffic flows presented in Table 6.**9**~~8~~ and Table 6.**10**~~9~~, the majority of the links fall well below the 30% thresholds and therefore the impacts can be considered as insignificant.

6.137 It is noted that traffic flows on both Link 18 and Link 19 increase by 100%, which would typically meet the 'major' criteria in assessing magnitude of change. However, in this instance both Link 18 and Link 19 are temporary construction access points, which serve no other purpose than providing a dedicated access for construction traffic. Therefore, the impact of construction traffic on severance is considered as **insignificant**, as the change in traffic flows along these links will not negatively impact severance for other road uses, as there are no desire lines across the respective links.

Driver Delay

6.138 During the construction, there is likely to be some impact on drivers including delays as a result of additional turning movements at the site entrances and the change in traffic flows on highway links in the vicinity of the site.

6.139 Whilst no localised junction modelling has been undertaken for the construction HGV movements, as it falls well below the operational thresholds and modelling undertaken within the Transport Assessment, reference is made to the uplift in traffic associated with construction presented in both Table 6.**9**~~8~~ and Table 6.**10**~~9~~.

6.140 Across the majority of the links, the construction of the Development will result in less than a 4% increase from the base positions in both 2022 and 2027, which is considered as negligible, particularly when compared to the increases associated with the operational traffic flows.

6.141 Link 18 and Link 19 are to be utilised for construction access only and will therefore not provide a material delay other drivers, despite the increase in flows along these links and them being classified as links of high sensitivity.

6.142 The impact of construction on driver delay is therefore regarded as **insignificant**.

Pedestrian Delay

6.143 During construction, there could be impacts on pedestrians, including delays associated with a change in traffic flows or any closures/diversions of footways.

6.144 The Guidelines state that *"Changes in the volume, composition or speed of traffic may affect the ability of people to cross the roads. In general, increases in traffic levels are likely to lead to greater increase in delay. Delays will also depend upon the general level of pedestrian activity, visibility and general physical conditions of the site."*

6.145 As set out in Table 6.**9**~~8~~ and Table 6.**10**~~9~~, the maximum increase on the wider network would be 4% on Link 5 (B4100 north of Banbury Road), however there are minimal pedestrian desire lines across this link, aside from the Caversfield St Laurence Church, where a new signalised crossing is proposed to be implemented. Both Link 18 and Link 19 will not be accessible for pedestrians so will not negatively impact pedestrian delay.

6.146 Nonetheless, a 4% increase in HGV flows along the B4100 is not considered sufficient to

cause any significant delay to pedestrians along this link.

6.147 In addition, due to the implementation of temporary construction access points at both Link 18 and Link 19, there are unlikely to be any closures of footways required to facilitate construction.

6.148 On that basis, whilst pedestrians are considered to have moderate to high sensitivity, it is considered that construction will result in an **insignificant** impact on pedestrian delay.

Cyclist Delay

6.149 During construction, there could be impacts on cyclists including delays associated with a change in traffic flows or any road closures/diversions.

6.150 Across the majority of the links, the construction of the Development will result in less than a 4% increase from the base positions in both 2022 and 2027, which is considered as negligible, particularly when compared to the increases associated with the operational traffic flows.

6.151 Link 18 and Link 19 are to be utilised for construction access only and will therefore not delay cyclists, despite the increase in flows along these links and them being classified as links of high sensitivity.

6.152 Whilst cyclists are considered to have moderate sensitivity, given the magnitude of the impact across the relevant key links within the study area, it is considered that the effects of construction on cyclist delay would be **insignificant**.

Pedestrian Amenity

6.153 Pedestrian amenity is considered to be affected by changes in traffic flows, footway widths and changes to the overall pedestrian environment.

Pedestrian amenity is broadly defined as *"the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic"*. This definition also considers exposure to air pollution and noise.

6.154 Across the study network, the majority of the links will experience a negligible uplift in HGV proportions, with Link 5 experiencing an increase of up to 4%. However, this uplift is well below the 'quarter' change set out within the criteria for magnitude of change and

is considered as negligible, as again the link is primarily away from key pedestrian desire lines.

6.155 Link 18 and Link 19 will not be used by pedestrians and will therefore have a negligible influence on pedestrian amenity. There may be some residual noise impacts from construction HGVs due to the proximity of the residential properties, but the anticipated volumes of daily construction traffic is not considered significant enough to result in Pedestrian Amenity issues.

6.156 Overall, the impact of construction on pedestrian amenity can be considered as **insignificant**.

Cyclist Amenity

6.157 Cyclist amenity is considered to be affected by changes in traffic flows, road or cycle widths and any changes to the overall cyclist environment within the study area.

6.158 The changes in HGV flows associated with construction presented in Table 6.**9**~~8~~ and Table 6.**10**~~9~~ show an increase by a maximum of 4%, which is likely to be negligible and unlikely to result in any significant changes to the cyclist environment.

6.159 Link 18 and Link 19 will not be used directly by cyclists and the uplift on these links will therefore have a negligible influence on cyclist amenity.

6.160 On that basis, whilst cyclists are considered to have moderate sensitivity, it is considered that construction will result in an **insignificant** impact on cyclist amenity.

Fear and Intimidation

6.161 The presence and movement of construction HGVs, along with changes in volume to the number of HGVs, has the potential to affect the perception of fear and intimidation.

6.162 The Guidelines state that *"A further impact that traffic may have on pedestrians is fear and intimidation. The impact of this is dependent on the volume of traffic, its HGV composition, its proximity to people or lack of protection caused by such factors as narrow pavement widths."*

6.163 The analysis suggests that at most there will be a 4% increase in HGV numbers on the

network, excluding Link 18 and Link 19 – which are for construction access only.

6.164 Whilst it is acknowledged that vulnerable road users, including pedestrians and cyclists, are receptors of moderate-high sensitivity, it is considered that the effect on these receptors in terms of fear and intimidation would be **insignificant**, as there are already existing levels of construction activity within the local area, whilst the overall uplift in HGV proportions is considered as negligible.

Accidents and Road Safety

6.165 The presence of additional construction traffic and movement of HGV vehicles on the road network in the vicinity of the Development has the potential to have an adverse effect on accidents and safety and on vulnerable road users, including pedestrians and cyclists.

6.166 The assessment of accident risk and road safety is based on existing accident rates in the area local to the Site and the circumstances used to identify accident clusters.

6.167 The Guidelines state that professional judgement should be applied to assess the implications of local circumstances.

6.168 A review of the accidents occurring over the most-recent three-year period has been undertaken in order to identify existing accident clusters. A cluster is considered to be identified where more than five accidents occurred over the three-year period within close proximity.

6.169 The review revealed that none of the junctions located within the accident study area had more than five accidents within the three-year period. Furthermore, there were no clusters identified along the links within the study area that had more than five accidents over the period.

6.170 As described above, construction traffic would only access the site via the proposed construction traffic routes and access points, and will consequently avoid the recognised network constraints, where possible. It is also acknowledged that construction and HGV operator staff will be appropriately trained to minimise the propensity for accidents to occur.

6.171 On that basis and using professional judgement it is considered that the presence of additional HGVs on the highway network would have an **insignificant** impact on accidents and road safety.

Operational Phase

6.172 The total person trips associated with the Development have been forecast using agreed trip rates, and an agreed distribution profile, and a mode share profile that was originally set out within the *North West Bicester Masterplan – Interim Access & Travel Strategy* (prepared by Hyder Consulting in March 2014). The full details of these are included within the TA that supports the planning application.

6.173 The potential effects of the Development when it is completed have been determined by comparing the 2031 Base 'Do Minimum' with the 2031 Base 'Do Something' scenarios, which includes all the predicted traffic flows expected on the surrounding highway network, including those associated with the Development.

6.174 The primary assessments have been undertaken on a daily basis (18-hour AAWT) since this reflects the impacts on Severance, Driver Delay, Pedestrian Delay, Cyclist Delay, Pedestrian Amenity, Cyclist Amenity, Fear & Intimidation, and Accidents & Road Safety.

6.175 However, the highway network weekday morning and evening peak hours have also been assessed since these are relevant in terms of Pedestrian Delay and Cyclist Delay, reflecting when the demand for travel will be greatest.

6.176 For the purpose of this assessment, both Link 18 and Link 19 will be removed from the assessment as they are temporary construction access points only and will no longer be in use once the Development is fully operational.

6.176a The interim assessment of the BTM 2026 Reference Case scenarios at the A4095 Howes Lane / Bucknell Road junction is provided at the end of the operational assessment.

Severance

6.177 The measurement and prediction of severance is difficult, but relevant factors include road width, traffic flow, vehicle speed, the presence of crossing facilities, and the number of movements across the affected route.

6.178 The Guidelines refer to the Department for Transport's *'Manual of Environmental Appraisal'*, which suggests that changes in traffic flow of 30%, 60%, and 90% would be likely to produce 'slight', 'moderate', and 'substantial' changes in severance, respectively. It is advised that these broad indicators should be used with care and regard paid to

specific local conditions.

6.179 A quantitative assessment of the links identified within Table 6.5 has been undertaken by comparing the percentage change in total vehicle and HGV flows between the 2031 baseline and the forecast trip generation, and applying the rules set out within the Guidelines. Table 6.1~~0~~**1** sets out the Development impact on each link.

Table 6.1~~0~~1 Severance – Development Impact

LINK	18-Hr AAWT						
	2031 Base (Do Minimum)			2031 Base (Do Something)			% Change (Total Vehicles)
	Total Vehicles	HGV	%HGV	Total Vehicles	HGV	%HGV	
1	5,925	88	1.5%	6,003	88	1.5%	1.3%
2	40,348	3,349	8.3%	40,478	3,349	8.3%	0.3%
3	39,053	3,395	8.7%	39,178	3,395	8.7%	0.3%
4	16,288	2,022	12.4%	16,595	2,022	12.2%	1.9%
5	18,960	527	2.8%	20,620	527	2.6%	8.8%
6	11,642	641	5.5%	12,480	641	5.1%	7.2%
7	9,060	34	0.4%	9,257	34	0.4%	2.2%
8	21,844	1,076	4.9%	22,307	1,076	4.8%	2.1%
9	20,349	1,132	5.6%	20,544	1,132	5.5%	1.0%
10	7,414	213	2.9%	7,414	213	2.9%	0.0%
11	22,568	897	4.0%	22,836	897	3.9%	1.2%
12	10745	597	5.6%	11,583	597	5.2%	7.8%
13	13,377	377	2.8%	13,570	377	2.8%	1.4%
14	14,828	650	4.4%	15,654	650	4.2%	5.6%
15	12,957	265	2.0%	13,069	265	2.0%	0.9%
16	1,465	0	0.0%	2,695	0	0.0%	83.9%
17	4,446	51	1.1%	5,184	51	1.0%	16.6%

6.180 Table 6.1~~0~~**1** demonstrates that only Link 16 – Braeburn Avenue, will experience a **moderate adverse** effect in terms of severance as a result of the Development. The remaining links will experience a **negligible adverse** effect.

Driver Delay

6.181 The Guidelines set out the locations where delays can occur to non-development traffic as a result of a new development coming forward. These locations include site access junctions, the highway link passing the Development, and other key junctions along the highway, as well as minor roads in the vicinity which may experience a reduction in traffic gaps.

6.182 The delay experienced by drivers and buses can be predicted by undertaking junction capacity assessments at key junctions. The delay will be identified as a result of the additional traffic associated with the Development, which will in turn increase vehicle movements at key links and junctions.

6.183 Assessment of junction capacity delay is undertaken with industry standard analytical software such as PICADY, for the assessment of priority junctions, and ARCADY, for the assessment of roundabout junctions (combined in software called Junctions 9) and LINSIG, for the assessment of signal junctions. Driver delay is considered to be an issue that requires mitigation only where junctions are predicted to operate beyond capacity in the future.

6.184 As part of the assessment work undertaken for the TA, the two junctions of the B4100 Banbury Road with Braeburn Avenue and Charlotte Avenue have been assessed using PICADY.

6.185 Table 6.1**2**~~1~~ sets out the results of this assessment and identifies the effect on driver delay for each junction as a result of the traffic associated with the Application Site.

Table 6.1~~**2**~~**1 Driver Delay – Development Impact**

Junction	2031 Base (Do Minimum)		2031 Base (Do Something)		Change in Delay (s)	
	Driver Delay (S)		Driver Delay (S)		AM	PM
	AM Peak	PM Peak	AM Peak	PM Peak		
Braeburn Avenue						
BA to B4100 N	6.63	8.3	9.98	10.68	3.35	2.38
BA to B4100 S	14.52	16.45	22.78	21.98	8.26	5.53
B4100 N to BA/B4100 S	6.66	7.03	6.99	7.71	0.33	0.68
Charlotte Avenue						
CA to B4100 N	8.73	9.79	32.77	16.94	24.04	7.15
CA to B4100 S	23.08	24.37	79.67	56.1	56.59	31.73
B4100 N to CA/B4100 S	7.22	7.11	7.61	7.89	0.39	0.78

6.186 Table 6.1**2**~~1~~ demonstrates that drivers passing through the junction of the B4100 Banbury Road with Braeburn Avenue will only experience a negligible increase in delay, which is significantly less than 30 seconds. The effect in terms of delay to drivers at the junction of the B4100 Banbury Road with Braeburn Avenue is therefore **negligible adverse**.

6.187 For drivers passing through the junction of the B4100 with Charlotte Avenue, only those exiting the minor arm of the junction (i.e. Charlotte Avenue) will experience an increase in delay of between 30 and 60 seconds. The magnitude of the change in delay is low, but as the link has been identified as having receptors that are highly sensitive (i.e. the residents of the Exemplar Scheme), the effect is considered to be **moderate adverse**.

6.188 Braeburn Avenue, Charlotte Avenue, and the B4100 Banbury Road along the frontage of the Exemplar Scheme and the existing Home Farm mixed use development, will experience the greatest proportion of additional development traffic as these are the main access

links to the Development.

6.189 The links and junctions further afield will experience a lesser effect due to the dispersion of Development traffic on to the highway network. The remaining links set out in Table 6.5 are all deemed to have a negligible effect to medium sensitive receptors and given the low increase in traffic due to the Development, they are not considered to experience any perceivable adverse impact and as such, the effect is considered to be **negligible adverse.**

Pedestrian Delay

6.190 The Guidelines state that *"Changes in the volume, composition or speed of traffic may affect the ability of people to cross the roads. In general, increases in traffic levels are likely to lead to greater increase in delay. Delays will also depend upon the general level of pedestrian activity, visibility and general physical conditions of the site."*

6.191 The criterion is set out within the Guidelines for assessing the magnitude of impacts on pedestrian delay, and assessors are advised to use their judgement to determine whether pedestrian delay is a significant impact. However, the Guidelines refer to work undertaken that suggests that a lower threshold of a 10 second delay, and an upper threshold of a 40 second delay is appropriate. For a link with no crossing facilities this equates to two-way traffic flows of approximately 1,400 vehicles per hour.

6.192 The majority of the key links within the network that may be subject to two-way traffic flows greater than 1,400 vehicles per hour have a crossing points.

6.193 Therefore, an assessment of the study area in relation to the number of two-way vehicles per hour and whether crossing points are available is provided in Table 6.1**3**~~2~~.

Table 6.1~~3~~2 Pedestrian Delay – Development Assessment

LINK	Average Hourly Flows - Total Vehicles		
	2031 Base (Do Something)	Exceeds 1,400 two-way vehicles per hour	Crossing points present
1	333	N	-
2	2,249	Y	N
3	2,177	Y	N
4	922	N	-
5	1,146	N	-
6	693	N	-
7	514	N	-
8	1,239	N	-
9	1,141	N	-
10	412	N	-

LINK	Average Hourly Flows - Total Vehicles		
	2031 Base (Do Something)	Exceeds 1,400 two-way vehicles per hour	Crossing points present
11	1,269	N	-
12	644	N	-
13	754	N	-
14	870	N	-
15	726	N	-
16	150	N	-
17	288	N	-

6.194 The assessment suggests that only Link 2 and Link 3 will exceed the indicative thresholds of 1,400 two-way vehicle movements per hour. However, it is noted that both of these links form part of the A43; benefitting from no direct pedestrian links from the Development and are considered being highly unlikely to be used by pedestrians, given the absence of any pedestrian facilities.

6.195 All other links fall below the upper threshold of 1,400 two-way vehicle movements. The links where two-way flows are higher (in excess of 1,000 but below 1,400) are as follows:

- Link 5 (B4100 north of Banbury Road);
- Link 8 (A4095 East of Banbury Road);
- Link 9 (A421); and
- Link 11 (a4095 East of Buckingham Road).

6.196 In relation to these links noted above, the majority of the pedestrians will be able to continue along the footways along the key desire lines without needing to cross the road.

6.197 Where pedestrians are required to cross, there are already suitable crossing facilities in place to enable pedestrians to cross easily without significant delay, including the signalised toucan crossing on the B4100 and signalised pedestrian crossing on the A4095 to the east of the B4100.

6.198 On that basis and given the provision of high quality crossing points within the local area, it is considered that the Development will have an **insignificant** impact on pedestrian delay.

Cyclist Delay

6.199 As noted previously, there is no specified criteria in determining appropriate thresholds to assess cyclist delay. It could be viewed that cyclist delay would operate under a similar scale of magnitude to driver delay, however; the scale of the impact on the individual links will vary considerably based on the characteristics of each link.

6.200 For example, if dedicated segregated cycle facilities are proposed along a link then the impact on cyclist delay of any increases in traffic could be negligible or in contrast; if the road is narrow with potential for cyclists being integrated in any queueing traffic, then any changes in driver delay could also negatively influence cyclist delay.

6.201 Based on the change in vehicles presented in Table 6.1**1**~~0~~ between the Base 2031 'Do Minimum' and Base 2031 'Do Something' scenarios, it is apparent that the greatest impacts will be on Link 16 (Braeburn Avenue) and Link 17 (Charlotte Avenue), where the Development results in an increase in total 18-hour vehicle flows of 83.9% and 16.6% respectively.

6.202 Whilst the driver delay increases at both Braeburn Avenue and Charlotte Avenue (as shown in Table 6.1**2**~~1~~), it is noted that the presence of the dedicated cycle facilities adjacent to Orchard Walk will allow cyclists to bypass this junction and not be impacted by the driver delays, by benefiting from a shared pedestrian/cyclist route. Nonetheless, the Development may generate additional pedestrian trips which may cause some delays to cyclists within the immediate vicinity of the Site where facilities are shared.

6.203 It is therefore considered that the Development will have a **minor adverse** impact on Cyclist Delay.

Pedestrian Amenity

6.204 Pedestrian amenity is broadly defined as *"the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic"*. This definition also considers exposure to air pollution and noise.

6.205 The Guidelines suggest as a tentative threshold for judging the significance of changes to pedestrian amenity would be where traffic flows are either halved or doubled, with this resulting in a high impact. A change in traffic flows by less than a quarter is assumed to represent a low impact and a change in traffic flows by more than a quarter is assumed to represent a moderate impact. Anything below a 10% change is assumed as a negligible impact.

6.206 This criterion has been used for this assessment and Table 6.1**4**~~3~~ sets out the impact of the traffic associated with the Development on each link.

6.207 These impacts are considered for the average hourly flows (total vehicles) which have

been calculated from the 18-hour AAWT flows.

Table 6.14~~3~~ Pedestrian Amenity – Development Impact

LINK	Average Hourly Flows - Total Vehicles			
	2031 Base (Do Minimum)	2031 Base (Do Something)	% Change	Magnitude
1	329	333	1%	Negligible
2	2,242	2,249	0%	Negligible
3	2,170	2,177	0%	Negligible
4	905	922	2%	Negligible
5	1,053	1,146	9%	Negligible
6	647	693	7%	Negligible
7	503	514	2%	Negligible
8	1,214	1,239	2%	Negligible
9	1,131	1,141	1%	Negligible
10	412	412	0%	Negligible
11	1,254	1,269	1%	Negligible
12	597	644	8%	Negligible
13	743	754	1%	Negligible
14	824	870	6%	Negligible
15	720	726	1%	Negligible
16	81	150	85%	Moderate
17	247	288	17%	Low

6.208 Table 6.1**4**~~3~~ demonstrates that the majority of links would experience a negligible change in pedestrian amenity. However, the changes in traffic flows along both Link 16 (Braeburn Avenue) and Link 17 (Charlotte Avenue) would typically result in a moderate-major adverse effect on pedestrian amenity given the receptor sensitivity.

6.209 However, in this instance it is noted that the increase in traffic flows is associated with these links serving as the primary access roads for the Development and existing Exemplar scheme, thus they have relatively low baseline levels of traffic generation, making the uplift appear considerably worse.

6.210 For example, the uplift in traffic on Link 16 which is an 85% increase is only an increase of 69 vehicles, which is just over one additional vehicle every minute over the course of an hour. The links can likely accommodate the additional traffic flows without a significant impact on pedestrian amenity.

6.211 On that basis, it is considered that the Development will have a **minor adverse** impact on pedestrian amenity.

Cyclist Amenity

6.212 As there is no specified criteria for assessing cyclist amenity, professional judgment will be utilised. It is considered that cyclist amenity will be closely related to increases in

traffic volumes, as well as pedestrian amenity where facilities are shared. Reference is made to the Pedestrian Amenity assessment and results presented in Table 6.1**4**~~3~~, which suggests that greatest change in traffic flows will be on Link 16 and Link 17.

6.213 It is considered that very few cyclists will be impacted by the changes in traffic flows on Link 16, given there are no key desire lines for cyclists to the north. With respect to Link 17, it is acknowledged again that cyclists benefit from a shared pedestrian cyclist route adjacent to Orchard Way, which allows cyclists to avoid the Charlotte Avenue junction and the risk of conflict with opposing traffic travelling north along the B4100.

6.214 However, as the facilities along the B4100 are shared with pedestrians, it is considered that the uplift in pedestrians associated with the Development may influence cyclist amenity.

6.215 On that basis, it is considered that the Development will have a **minor adverse** impact on cyclist amenity.

Fear & Intimidation

6.216 The Guidelines state that *"A further impact that traffic may have on pedestrians is fear and intimidation. The impact of this is dependent on the volume of traffic, its HGV composition, its proximity to people or lack of protection caused by such factors as narrow pavement widths."*

6.217 The Guidelines state that there are no commonly agreed thresholds for estimating the level of fear and intimidation but provides a table that could be used as a first approximation as to the likelihood of pedestrian fear & intimidation.

6.218 Table 6.1**5**~~4~~ sets the impact of the traffic associated with the Site on each link.

Table 6.1~~5~~4 Pedestrian/Cyclist Fear & Intimidation – Development Impact

LINK	Total Vehicles – Average Hourly Flows			HGV - 18 Hour AAWT Flows			Magnitude of Impact		Change in Magnitude (Y/N)
	2031 DM	2031 DS	Change	2031 DM	2031 DS	Change	Total Vehicles	HGV	
1	329	333	4	88	88	0	Negligible	Negligible	N
2	2,242	2,249	7	3,349	3,349	0	High	High	N
3	2,170	2,177	7	3,395	3,395	0	High	High	N
4	905	922	17	2,022	2,022	0	Medium	Large	N
5	1,053	1,146	92	527	527	0	Medium	Low	N
6	647	693	47	641	641	0	Medium	Low	N
7	503	514	11	34	34	0	Low	Low	N
8	1,214	1,239	26	1,076	1,076	0	Large	Medium	N
9	1,131	1,141	11	1,132	1,132	0	Medium	Medium	N

LINK	Total Vehicles – Average Hourly Flows			HGV - 18 Hour AAWT Flows			Magnitude of Impact		Change in Magnitude (Y/N)
	2031 DM	2031 DS	Change	2031 DM	2031 DS	Change	Total Vehicles	HGV	
10	412	412	0	213	213	0	Low	Low	N
11	1,254	1,269	15	897	897	0	Large	Low	N
12	597	644	47	597	597	0	Low	Low	N
13	743	754	11	377	377	0	Medium	Low	N
14	824	870	46	650	650	0	Medium	Low	N
15	720	726	6	265	265	0	Medium	Low	N
16	81	150	68	0	0	0	Low	Low	N
17	247	288	41	51	51	0	Low	Low	N

6.219 As shown in Table 6.1**5**~~4~~ only Link 2 and Link 3 have a high impact on fear & intimidation in the 2031 'Do Minimum' scenario due to the large volume of average hourly total traffic flows over an 18-hour period and the average 18-hour flows of HGVs. The minor increase due to Development traffic on each link does not result in a change in the magnitude of impact, and as such the effect is **negligible adverse**.

6.220 For all other links, the traffic flows represent negligible to medium impacts on fear & intimidation and there is no change in magnitude due to the implementation of the Development. The effect on these links is therefore considered **negligible adverse**.

Accidents and Road Safety

6.221 The assessment of accident risk and highway safety is based on existing accident rates in the area local to the Site and the circumstances used to identify accident clusters.

6.222 The Guidelines state that professional judgement should be applied to assess the implications of local circumstances.

6.223 A review of the accidents occurring over the most-recent three-year period has been undertaken in order to identify existing accident clusters. A cluster is considered to be identified where more than five accidents occurred over the three-year period within close proximity.

6.224 The review revealed that none of the junctions located within the accident study area had more than five accidents within the three-year period. Furthermore, there were no clusters identified along the links within the study area that had more than five accidents over the period.

6.225 It is concluded that the increase in traffic due to the Development will have a **negligible adverse** effect on Accident Risk and Road Safety.

Interim Assessment – BTM 2026 Reference Case

6.225a The impact of the Development in the BTM 2026 Reference Case interim assessment is provided below by adding the agreed Development flows onto the flows obtained from the BTM. The impact of the Development is presented within Table 6.16.

Table 6.16 BTM 2026 Reference Case - Development Impact

LINK	LINK DESCRIPTION	18 Hour AAWT							
		BTM 2026 Reference Case			BTM 2026 Reference Case + Proposed Development			PERCENTAGE CHANGE	
		Total Veh	HGV	% HGV	Total Veh	HGV	% HGV	% VEH	% HGV
A	Bucknell Road (South of Railway)	16,358	1,008	6%	17,545	1,008	6%	7%	0%
B	Bucknell Road (South of A4095 Howes Lane)	6,244	19	0%	6,244	19	0%	0%	0%
C	A4095 Howes Lane (West of Bucknell Road)	13,636	1,026	8%	14,823	1,026	7%	9%	0%
D	Bucknell Road (North of A4095 Lords Lane)	5,547	0	0%	5,547	0	0%	0%	0%
E	A4095 Lords Lane (East of Bucknell Road)	17,403	1,008	6%	18,590	1,008	5%	7%	0%
F	Bucknell Road (North of Railway)	16,245	1,008	6%	17,432	1,008	6%	7%	0%

6.225b Using the interim BTM 2026 Reference Case scenario, the impact of the Development reaches a maximum of 9% on Link C (A4095 Howes Lane, west of Bucknell Road). However, it is noted that the impact of the Development falls below the thresholds set out within the "Guidelines for the Environmental Assessment of Road Traffic" guidance discussed within paragraph 6.51. This guidance suggests indicative thresholds of an increase of more than 10% within a sensitive location or 30% within other locations to warrant further assessment.

6.225c On that basis, the Development impact falls below the thresholds to be considered within the assessment of environmental effects. Therefore, it is regarded that the conclusions reached in respect to the 2031 scenarios and the anticipated environmental effects are also applicable to the interim BTM 2026 Reference Case scenario.

Mitigation Measures

Construction Phase

CEMP & CTMP

6.226 A CEMP will be prepared and agreed in advance of the commencement of construction, which will set out measures to manage the traffic associated with the construction of the Site within a Construction Traffic Management Plan (CTMP). The CEMP and the CMTP will be secured by planning condition and developed by the contractor, once appointed, and will be based on best practice. The expected mitigation measures that will be included within the CEMP/CTMP are:

- The contractor will set out the agreed construction vehicle routes in line with what was previously agreed for the Exemplar Scheme and as identified in this ES, ensuring that construction vehicles will keep away from minor roads wherever possible;
- A Travel Plan for construction staff will be prepared to reduce vehicle traffic generated by the construction works;
- Clearly marked pedestrian and vehicle routes will be provided on site and wherever possible be kept separate;
- Main entry and exit points will be signposted;
- Vehicles will be able to enter and exit in forward gear;
- A site map will be provided to all drivers with safety instructions; and
- Vehicle routes on site will be specifically constructed to an appropriate standard for the purposes of construction.

Operational Phase

Framework Residential Travel Plan

6.227 A Framework Residential Travel Plan has been prepared and is submitted with the planning application. A copy is included at Appendix 6.2 of the ES. The Framework Residential Travel Plan sets out measures to reduce reliance on the private car, promote walking and cycling, as well as promoting the use of public transport.

6.228 The Framework Residential Travel Plan sets out an action plan which details the measures proposed, commitments, and obligations that the developer and future occupiers will have to adhere to in order to deliver the Full Residential Travel Plan. The measures include

appointing a Travel Plan Co-ordinator, providing travel information to occupiers, and educating occupiers about smarter travel choices to encourage a change in travel habits.

6.229 The targets identified include the reduction of single occupancy car journeys and an increase in sustainable travel.

6.230 The Framework Residential Travel Plan mitigation measures will be secured through a Section 106 Agreement.

A4095 Howes Lane / Bucknell Road Interim Mitigation Scheme

6.230a Following post-submission discussions with OCC, it is now noted that there is uncertainty regarding the timings and funding for the delivery of the A4095 Strategic Infrastructure Improvements. On that basis, a temporary mitigation scheme has been developed to provide an interim mitigation solution to accommodate the Development on the network.

6.230b The proposed temporary mitigation scheme is in the form of a mini-roundabout arrangement, which seeks to improve operational capacity and road safety at the A4095 Howes Lane / Bucknell Road junction.

6.230c In summary, the proposed mini-roundabout seeks to provide mitigation through the following:

- **Improved provision for pedestrians, cyclists and other road users, by reducing speeds and the number of lanes of traffic that need to be crossed;**
- **Improvements of the operational flows of HGVs, with two HGVs now able to pass simultaneously, as well as the reinforcement of appropriate driver position;**
- **Improvements in road safety, with research suggesting mini-roundabouts reduce the severity of collisions when compared to priority junctions; and**
- **Improvements in junction capacity, with the proposed mitigation scheme providing a nil detriment position in the AM peak and improving overall junction performance, whilst significantly reducing the queues on the A4095 Howes Lane in the PM peak.**

6.230d A copy of the proposed mini-roundabout arrangement is included within the

Technical Note at Appendix 6.1.

6.230e It is regarded that whilst the proposals are for an interim mitigation scheme, the scheme could potentially be permanently implemented by OCC once the A4095 Strategic Highway Improvements are delivered. The proposed mitigation scheme aims to implement a wider array of improvements rather than focusing solely on capacity, so provides residual benefits to the local transport network.

6.230f It is generally accepted that the committed A4095 Strategic Highway Improvements are eventually required to alleviate pressure at the A4095 Howes Lane / Bucknell Road junction and across the local network. However, the proposed mitigation schemes seeks to provide an interim mitigation solution to mitigate the impact of the Development whilst the details of the delivery and funding for the A4095 Strategic Highway Improvements are agreed.

Public Transport

6.231 As part of any planning permission granted for the Development, the Applicant will agree to Section 106 financial contributions to assist with the funding of public transport improvements and services. This approach is consistent with other schemes north of the railway line that have recently been permitted within wider North West Bicester Eco Town.

6.232 As part of the planning permission, the Applicant will also agree to participate in the North West Bicester Bus Forum to plan future bus services as part of the wider public transport strategy for the North West Bicester Masterplan.

6.233 This approach is consistent with local transport policy and strategic objectives, as well as the delivery of other development sites within the North West Bicester Eco Town. It will provide strong public transport links from the Site to the wider Eco Town and surrounding areas, including Bicester town centre and beyond. It therefore supports the wider public transport access strategy of the North West Bicester Masterplan.

6.234 By providing a financial contribution towards the funding of improved public transport provision, this will assist in mitigating the moderate adverse effects identified in relation to Severance on Braeburn Avenue and in relation to Driver Delay at Charlotte Avenue.

Severance

6.235 Braeburn Avenue will experience **moderate adverse** impact in terms of severance due to the increase in traffic when the Development is operational.

6.236 Although drivers travelling through the junction will experience an increase in delay, the junction will still operate within capacity and as such mitigation at the junction is not required as part of the Development .

6.237 It is also worth noting that at present, and as part of the Development, there will be no footway connections through the Braeburn Avenue junction with the B4100 Banbury Road as there are currently no footways along the B4100 Banbury Road. This is due to the fact that there are no identifiable destinations along the B4100 Banbury Road north of its junction with Braeburn Avenue that might warrant pedestrian and/or cycle activity associated with the Site. On that basis, it is considered that no mitigation is required for Braeburn Avenue.

Driver Delay

6.238 Charlotte Avenue will experience **moderate adverse** impact in terms of driver delay due to the increase in traffic when the Development is operational.

6.239 During consultation with OCC, the highway authority introduced plans to upgrade the B4100/A4095/Banbury Road/A4095 roundabout junction located south of Charlotte Avenue. These proposals all assume that the junction of the B4100 Banbury Road with Charlotte Avenue will be signalised in the future, and it was requested that a capacity assessment for the signalisation of the junction is provided as part of the planning application.

6.240 The signalisation of the junction will not result in perceptible changes to the driver delay for vehicles at Charlotte Avenue but will allow the two junctions to be linked in the future which could reduce overall delay along the corridor. As such, the signalisation of the junction of Charlotte Avenue with the B4100 Banbury Road is considered to mitigate the effects on Driver Delay.

Cyclist Delay

6.241 The operational Development will result in a **minor adverse** impact in terms of Cyclist Delay.

6.242 It is noted that OCC have sought financial contributions for improved pedestrian and

cyclist facilities in the local area, including along the B4100 towards Bicester Station. This also includes the plans to signalise the A4095 roundabout junctions, which offers capacity for enhanced cyclist priority.

6.243 With the addition of these future schemes, as well as reductions in traffic associated with a Travel Plan, it is likely the minor adverse impacts will be mitigated.

Pedestrian Amenity

6.244 The operational Development will result in a **minor adverse** impact in terms of Pedestrian Amenity.

6.245 It is considered that with the successful implementation of the Travel Plan and reduction in vehicle trips, as well as uptake in sustainable transport, the minor adverse impacts will be suitably mitigated.

6.246 This conclusion will also be supported by the financial contributions requested by OCC to form part of the Section 106 agreement that would improve walking and cycling infrastructure within the area.

Cyclist Amenity

6.247 The operational Development will result in a **minor adverse** impact in terms of Cyclist Amenity

6.248 As per the above, the provision of financial contributions and delivery of improved pedestrian/cyclist infrastructure, as well general reductions in traffic associated with implementation of a successful Travel Plan, will reduce traffic to improve cyclist amenity and remove any minor adverse effects.

Cumulative Schemes

6.249 The 2031 'Do Something' scenario includes all the cumulative schemes listed in the uncertainty log provided with the BTM traffic data which includes highway infrastructure improvements and associated redistribution of traffic. As such, the cumulative effects have been included in the assessment of the Development.

6.250 This ES has already considered these cumulative effects and the measures proposed to ensure that any cumulative impact is mitigated.

6.251 As part of the North West Bicester allocation, measures have been identified to mitigate the impact of the allocated site of which the Development forms a part of. These mitigation measures include:

- Signalisation of the B4100 Banbury Road/Charlotte Avenue junction;
- Replacement of the B4100/A4095/Banbury Road/A4095 roundabout junction with a potential traffic signal arrangement, which is currently being consulted upon by OCC;
- Traffic management measures on the B4100 Banbury Road/Caversfield unnamed road to reduce traffic levels and accident issues;
- Traffic calming measures in Bucknell and Caversfield to reduce through traffic;
- Measures to further reduce through traffic and assist walkers and cyclists in the Shakespeare Drive area.

6.252 The following strategic improvements were also identified to which all development sites included within the North West Bicester Masterplan would be anticipated to contribute towards in a manner proportionate to the impacts associated with each of these sites:

- The A4095 North West Strategic Link Road (Planning Ref 14/01968/F);
- Town Centre access improvements;
- Modifications to the A4095/Buckingham Road/Skimmingdish Lane/A4421 roundabout junction (as part of the Eastern Peripheral Route being promoted by OCC); and
- Improvements to the Easter Peripheral Route being promoted by OCC.

6.253 As the 2031 'Do Nothing' and the 2031 'Do Something' scenarios include all the cumulative schemes listed in the ES, agreed committed developments identified with the Local Plan as coming forward by 2031, and highway improvement schemes, the assessment of the predicted likely effects fundamentally considers the cumulative effect of the Development, other Local Plan Commitments, and known developments for the Plan Period to 2031.

6.254 Therefore, this ES has already considered these cumulative effects, and the measures proposed ensure that any cumulative impact is mitigated.

Residual Effects

Construction Phase

6.255 The construction of the Development is likely to have insignificant transport impacts based

on the criteria assessed, however with the implementation of the CEMP and the CTMP, the residual effects would remain **insignificant**.

Operational Phase

6.256 No significant residual effects of severance are considered on the local network, with the exception of a slight increase in traffic at the junction of Braeburn Avenue with the B4100 Banbury Road. However, as there will be no pedestrian or cycle activity at the Braeburn Avenue junction with the B4100 Banbury Road, there is considered to be a **moderate adverse** residual effect with regards severance at this junction. This is consistent with the effect identified for the Operational Phase of the Development only. With the reduction in vehicle trips from the Development and other nearby sites associated with the successful delivery of a Travel Plan, the residual effects on severance will likely be **negligible adverse**.

6.257 There is an identified **moderate adverse** residual effect in relation to driver delay at the Charlotte Avenue junction with the B4100 Banbury Road. This is proposed to be mitigated by the introduction of a traffic signal-controlled junction. This is consistent with the effect identified for the Operational Phase of the Development only. With the addition of the proposed traffic signal junction, as well as the reduction in vehicle trips associated with the Travel Plan targets, the residual effects would be **negligible adverse.**

6.258 There are identified **minor adverse** effects on cyclist delay, pedestrian amenity and cyclist amenity. With the addition of the potential future mitigation measures delivered by OCC, by the other cumulative schemes noted above, as well as the successful delivery of the Travel Plan, it is likely the residual effects of the Development on cyclist delay, pedestrian amenity and cyclist amenity will be **insignificant**.

6.259 **Negligible adverse** residual effects were identified in relation to Fear & Intimidation and Accidents & Road Safety as a result of the implementation of the Development. This is consistent with the effect identified for the Operational Phase of the Development only. With the reductions in background traffic associated with the implementation of successful Travel Plans within the area, it is likely the residual effects of the Development on Fear & Intimidation and Accidents and Road Safety would be **insignificant**.

Summary

6.260 A Transport Assessment has been undertaken in the context of scoping discussions with the authorities, including Highways England (HE), Oxfordshire County Council (OCC), and

Cherwell District Council (CDC).

The total person travel demand generated by the Development has been predicted and considered in detail in the context of the transport network by utilising trip rates and distribution profiles agreed with the authorities and consistent with the *North West Bicester Masterplan – Interim Access and Travel Strategy* (prepared by Hyder and published in March 2014).

6.261 This Transport and Access chapter considers the effects of the traffic associated with the construction and operation of the Site in relation to Severance, Driver Delay, Pedestrian Delay & Amenity, Fear & Intimidation, and Accidents & Safety. The traffic associated with the Development in 2031 was used to identify key highway links with regard to the thresholds.

6.261a In addition to the 2031 assessments, an interim 2026 scenario was assessed in order to assess a proposed temporary mitigation measure at the A4095 Howes Lane / Bucknell Road junction whilst there is uncertainty regarding the timescales for the delivery of the committed A4095 Strategic Infrastructure Improvements.

6.262 The majority of links were identified as minor and adversely affected or negligible in relation to Severance, with Braeburn Avenue being identified as having potential to experience a minor to moderate adverse effect. However, due to the fact that there would be no pedestrian or cycle activity at this junction, it is not considered that mitigation would be necessary as the junction has been demonstrated to still operate within capacity. Beyond this local junction, the Development is predicted to have a negligible adverse effect on Severance.

6.263 There is an identified residual effect in relation to Driver Delay at the Charlotte Avenue junction with the B4100 Banbury Road. This is proposed to be mitigated by the introduction of a traffic signal-controlled junction. Beyond this local junction, the Development is predicted to have a negligible adverse effect on Driver Delay.

6.264 There are identified **minor adverse** effects on cyclist delay, pedestrian amenity and cyclist amenity.

6.265 There are identified **negligible adverse** effects on Fear & Intimidation and Accidents & Road Safety as a result of the implementation of the Development.

6.266 Table 6.1**7**~~5~~ contains a summary of the likely significant effects of the Development, as

well as residual effects with the implementation of the appropriate mitigation measures.

Table 6.17~~5~~: Table of Significance – Transport and Access

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	B	L	
Construction											
Severance	Temporary	Insignificant	Implementation of CEMP/CTMP							X	Insignificant
Driver Delay	Temporary	Insignificant								X	Insignificant
Pedestrian Delay	Temporary	Insignificant								X	Insignificant
Cyclist Delay	Temporary	Insignificant								X	Insignificant
Pedestrian Amenity	Temporary	Insignificant								X	Insignificant
Cyclist Amenity	Temporary	Insignificant								X	Insignificant
Fear & Intimidation	Temporary	Insignificant								x	Insignificant
Accidents & Road Safety	Temporary	Insignificant								x	Insignificant
Completed Development											
Severance	Permanent	Negligible to Moderate Adverse	Travel Plan							X	Negligible Adverse
Driver Delay	Permanent	Negligible to Moderate Adverse	Signalised junction provided at Charlotte Avenue in the future and Travel Plan							X	Negligible Adverse
Pedestrian Delay	Permanent	Insignificant	Travel Plan							X	Insignificant
Cyclist Delay	Permanent	Minor Adverse	Travel Plan and future planned pedestrian / cyclist infrastructure							x	Insignificant
Pedestrian Amenity	Permanent	Minor Adverse								x	Insignificant
Cyclist Amenity	Permanent	Minor Adverse								x	Insignificant
Fear & Intimidation	Permanent	Negligible Adverse	Travel Plan							x	Insignificant
Accidents & Road Safety	Permanent	Negligible Adverse	Travel Plan							x	Insignificant

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

REFERENCES

[i] Ministry of Housing, Communities and Local Government, *National Planning Policy Framework (July 2021)*
[ii] Ministry of Housing, Communities and Local Government, *Planning Practice Guidance - Travel Plans, Transport Assessments and Statement (March 2014)*
[iii] Department for Transport's *Guidance on Transport Assessment (March 2007)*
[iv] Ministry of Housing, Communities and Local Government, *Planning Policy Statement: eco-towns – A supplement to Planning Policy Statement 1 (July 2009)*
[v] Oxfordshire County Council, *Connecting Oxfordshire Local Transport Plan 2015 – 2031 (October 2015)*
[vi] Cherwell District Council, *Local Plan 2011 – 2031 (July 2015)*
[vii] Cherwell District Council, *North West Bicester Supplementary Planning Document (February 2016)*
[viii] Institute of Environmental Assessment, *Guidelines for the Environmental Assessment of Road Traffic (1993)*
[ix] NW Bicester Masterplan, *Interim Access and Travel Strategy (March 2014)*
[x] Institute of Environmental Management and Assessment, *Guidelines for Environmental Impact Assessment (2004)*
[xi] Cherwell District Council, *Annual Monitoring Report (December 2017)*
[xii] Department for Transport, *Local Transport Note 1/20 Cycle Infrastructure Design (July 2020)*

APPENDICES

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4 February 2022

Sarah Green
Environment Agency
Thames Sustainable Places Team
Environment Agency
Red Kite House
Wallingford
OX10 8BD

Ref: L01/205550D/NB

Dear Sarah

NW Bicester – Response to Environment Agency Comments

Thank you for your letter dated 24 January 2022 (ref WA/2021/129106/03-L01), which was prepared following a review of the:

- Hydraulic modelling submitted to the Environment Agency on 11th November 2021.
- Flood Modelling Report, Firethorn Developments Limited, Land at North West Bicester, Vectos, October 2021
- Flood Risk Assessment and Surface Water Drainage Strategy, Firethorn Developments Limited, Land at North West Bicester, Vectos, Issue 3, April 2021 (Appendix 13.1 of the Environmental Statement)

In your letter you confirm that the Environment Agency maintain an objection to the application because a review of the hydraulic model and associated hydrology has highlighted several issues that need addressing before the results can be accepted.

We have reviewed the Environment Agency model review response for both the hydrological and hydraulic analysis. We have populated a response to each comment where necessary in the spreadsheets provided.

You will note that the comments relating to the hydrological analysis have not resulted in the need to revise the flows incorporated into the hydraulic model. Some minor changes have been made to the hydraulic model to address the Environment Agency comments. The revised hydraulic model (rev 27) has therefore been created and has been uploaded onto the Environment Agency data portal, for all design storm events. Appendix A includes a series of flood maps which have been prepared for the key design simulations associated with the revised hydraulic model (rev 27).

Given the minor changes, it was not considered necessary to re-run the original sensitivity analysis.

It is not the purpose of this letter to outline what changes were made to the hydrological and hydraulic analysis, as this is populated in the spreadsheets. Instead, it is the purpose of this letter to address the more general queries outlined in the Environment Agency letter dated 24 January 2022.

Finished Floor Levels

The Environment Agency letter dated 24 January 2022 states:

"In addition, the FRA advises that finished floor levels of all properties are set at least 150mm above existing ground level. While this should be sufficient if no development is proposed within areas of flood risk, we would advise as a precaution against any unpredicted flooding, finished floor levels of properties should be at least 300mm above the appropriate climate change flood level."

No development is proposed within areas of flood risk. However, it is still accepted that finished floor levels of properties should be at least 300mm above the appropriate climate change flood level. This may be appropriate for properties in the more low-lying parts of the site but given that the developments parcels have been set back from the floodplain and that ground levels rise steeply, it is anticipated that existing ground levels will already be sufficiently elevated. Nevertheless, this will be checked and will inform the proposed finished floor levels for the Reserved Matters application.

Greenfield Runoff Rates

The Environment Agency letter dated 24 January 2022 states:

"We also note that the hydraulic modelling undertaken employs flood flow estimates which equate to approximately 1.3l/s/ha during a 1% annual probability event and 0.4l/s/ha in a 50% annual probability event. This is what we would expect of such a permeable catchment. However, the allowable discharge from the proposed attenuation ponds is detailed to be significantly higher at 2l/s/ha for all events; including the 50% event. The implication being that post development flows will be greater than existing for all flood events up to and including the 1% event, including an appropriate allowance for climate change. There seems to be a disconnect between the methods used to determine appropriate site runoff and the flood flow estimates used in the hydraulic modelling. The FRA argues that detailed site investigations show that the site is more impermeable than implied by the data sets normally used to estimate runoff. However, this logic has not been carried through when the flood estimates for the hydraulic models have been derived. We are concerned that either the flood estimates used in the hydraulic model underestimate flood flows or that the allowable discharge from the proposed attenuation ponds is too high. We consider this should be brought to the attention of the Lead Local Flood Authority in their capacity of commenting on the surface water drainage proposals."

Based on the ground conditions encountered, the QBAR greenfield runoff rate (which is approximately equivalent to a 50% annual probability event), was estimated to be 1.63 l/s/ha for the site.

The OCC Local Standards states "*limit discharge rates for rainfall events up to and including the 1 in 100 year event (including climate change allowances) to the agreed QBAR rate (or 2 l/s/ha whichever is greater)*". A rate of 2 l/s/ha was therefore adopted.

We have now undertaken further consultation with the LLFA on the matter, who has confirmed that we have followed the OCC Local Standards to achieve a greenfield run-off rate with appropriate application of soil type. The greenfield runoff rates were agreed with the LLFA as part of a pre-app exercise and they approved the surface water drainage strategy, as part of the FRA.

The hydrological analysis has been undertaken based on standard methods and we are under the impression that the Environment Agency are satisfied with this. The greenfield runoff rates reflect methods outlined in the OCC Local Standards.

A clayey topsoil was encountered across the entire site. This is identified in the ground investigation for the site. Extracts of the ground investigation are enclosed in the FRA, but the full documentation (including extensive borehole logs showing the clay topsoil), is available on the planning portal.

Clayey topsoil would result in greenfield runoff rates greater than would be expected based on desktop data alone. However, the ground conditions on site are not necessarily indicative of what is present across the entire catchment, so some disparity is anticipated. In fact, we have looked at the ground investigation for the Exemplar site immediately north, where topsoil is described as sand. See Section 5.1 using the link below for ground investigation:

https://planningregister.cherwell.gov.uk/Document/Download?module=PLA&recordNumber=39912&planId=816647&imageId=1581&isPlan=False&fileName=6958836.PDF

Therefore, we would expect the greenfield runoff rates for the Exemplar site to the north to be much lower.

As previously noted, the hydrological analysis used to define flows in the hydraulic model has been based on standard methods, but it is accepted that the impact of the clayey topsoil on site was not considered. This was because, based on readily available information, these ground conditions are anticipated to be localised and therefore not significant. However, a simple sensitivity test has been undertaken in the hydraulic model with respect to the hydrological flows used to examine any potential uncertainty.

Sensitivity Test

The hydraulic modelling employs catchment flood flow estimates which equate to approximately 1.29 l/s/ha during a 1% annual probability event (i.e. 0.98 m^3/s for the 760 ha catchment). The equivalent greenfield rate estimated in the FRA for the site, based on the ground conditions encountered, is 5.19 l/s/ha. Table 1 presents theoretical flow rates based upon arbitrary extents of clayey topsoil across the catchment.

Table 1 - 1% annual probability event peak flows

% of Catchment with Clayey Topsoil	l/s/ha	m^3/s
0	1.29	0.98
10	1.68	1.28
25	2.27	1.72

The catchment is known to be permeable and because of this, the clayey topsoil is anticipated to be limited to the site and perhaps some of the immediate surrounds.

The site (22.2 ha) makes up almost 3% of the total catchment area (760 ha).

If we were to conservatively say that 10%, or even 25% of the catchment is underlain by a clayey topsoil, a peak flow rate of 1.28 m^3/s and 1.72 m^3/s would apply, respectively. This has increased by a factor of approximately 1.30 and 1.75, respectively.

In the Flood Modelling Report, the event that resulted in the most extensive flooding on site was attributed to the 0.1% annual probability event. The peak flow for this event was estimated to be 1.74 m^3/s. Based on the same approach outlined above, using a factor of 1.30 and 1.75, the 0.1% annual probability event peak flows are identified in Table 2.

Table 2 - 0.1% annual probability event peak flows

% of Catchment with Clayey Topsoil	Factor	m^3/s
0	0	1.74
10	1.30	2.26
25	1.75	3.04

To test the impact of this potential uncertainty and demonstrate the robust nature of the model and parameters applied to the masterplan for the site, we have re-run the 0.1% annual probability event with both a 10% and 25% allowance of clay topsoil.

Whilst it was discovered that the flood extents for the 0.1% annual probability event have increased, this was not significant on site. The resultant flood maps are enclosed in Appendix B.

Discussion

As outlined in the Flood Modelling Report (see paragraph 4.5 to 4.9), the modelling demonstrated that the parameters originally used to inform the masterplan were robust. These parameters included:

1. Interpolated climate change floodplain based on JFLOW data
2. Risk of Flooding from Surface Water map

These layers were overlaid in the masterplanning process and are identified on the constraints and opportunities plan (see Appendix C). Therefore, all development (including SuDS) was steered out of the floodplain.

The very conservative sensitivity test outlined above has not changed this conclusion. The resultant flood extent associated with a theoretical 25% clay topsoil coverage is still smaller than that defined by the two data sources identified above. This is shown in Figure 1 and 2.

Whilst it is accepted that the findings of the ground investigation for the site has introduced a little uncertainty with respect to the hydrological calculations, this has no bearing on the conclusions or purpose of this study. There is no desire to update the Flood Map for Planning and it has been shown that the masterplan is robust and any potential uncertainty will not introduce developed parts of the site into the floodplain.

Figure 1 – Comparison of the 0.1% Event with 25% Topsoil and Surface Water Flood Extent

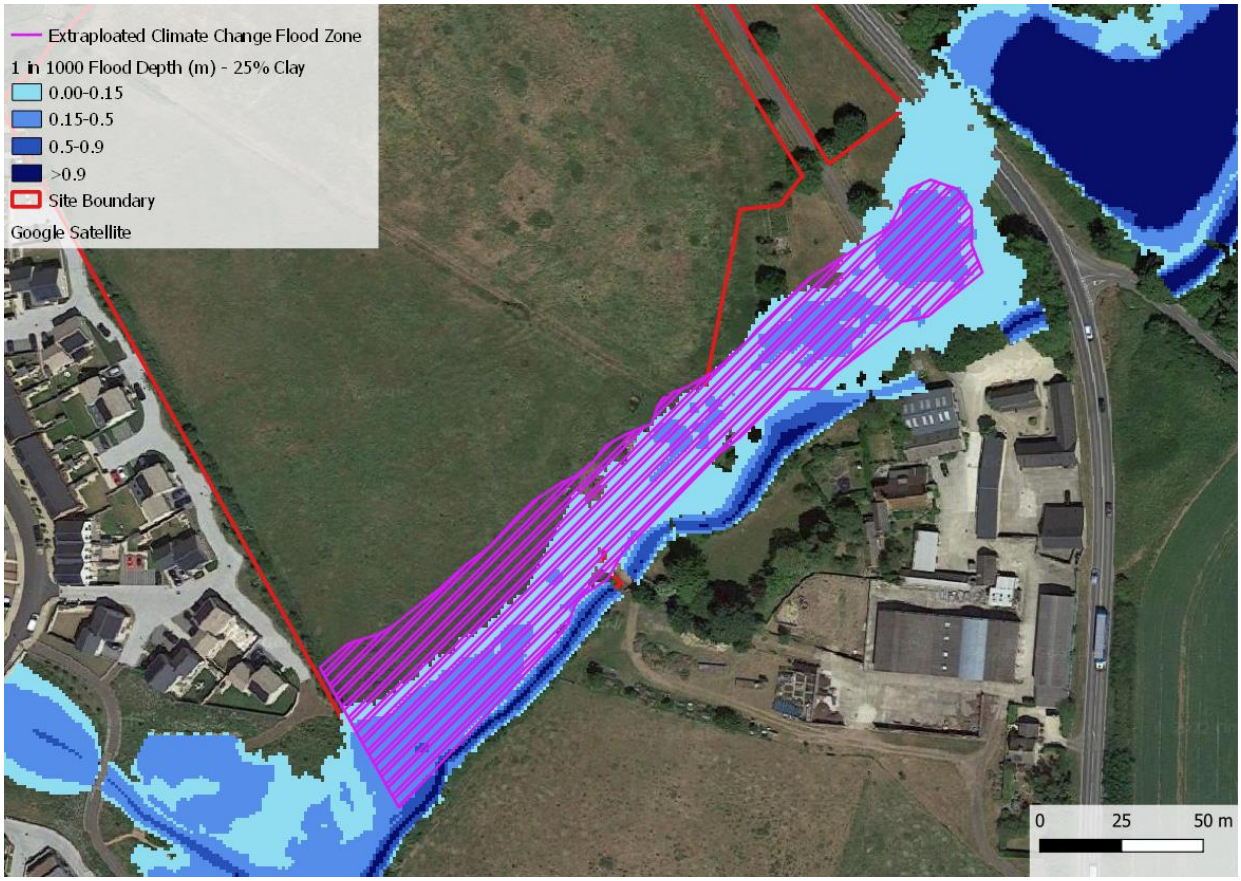

Figure 2 - Comparison of the 0.1% Event with 25% Topsoil and FRA Extrapolated Flood Zone

We hope that you are now satisfied with the revised hydraulic modelling, accept the robust development proposals and can remove your current objection.

Yours sincerely

Nick Bosanko

Nick Bosanko
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Appendix A – Revised Flood Maps


1 in 20 Depth (m) - Rev 27
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m


1 in 100 Depth (m) - Rev 27
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m


1 in 100_CC Depth (m) - Rev 27
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m


1 in 100+HC-CC Depth (m) - Rev 27
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m

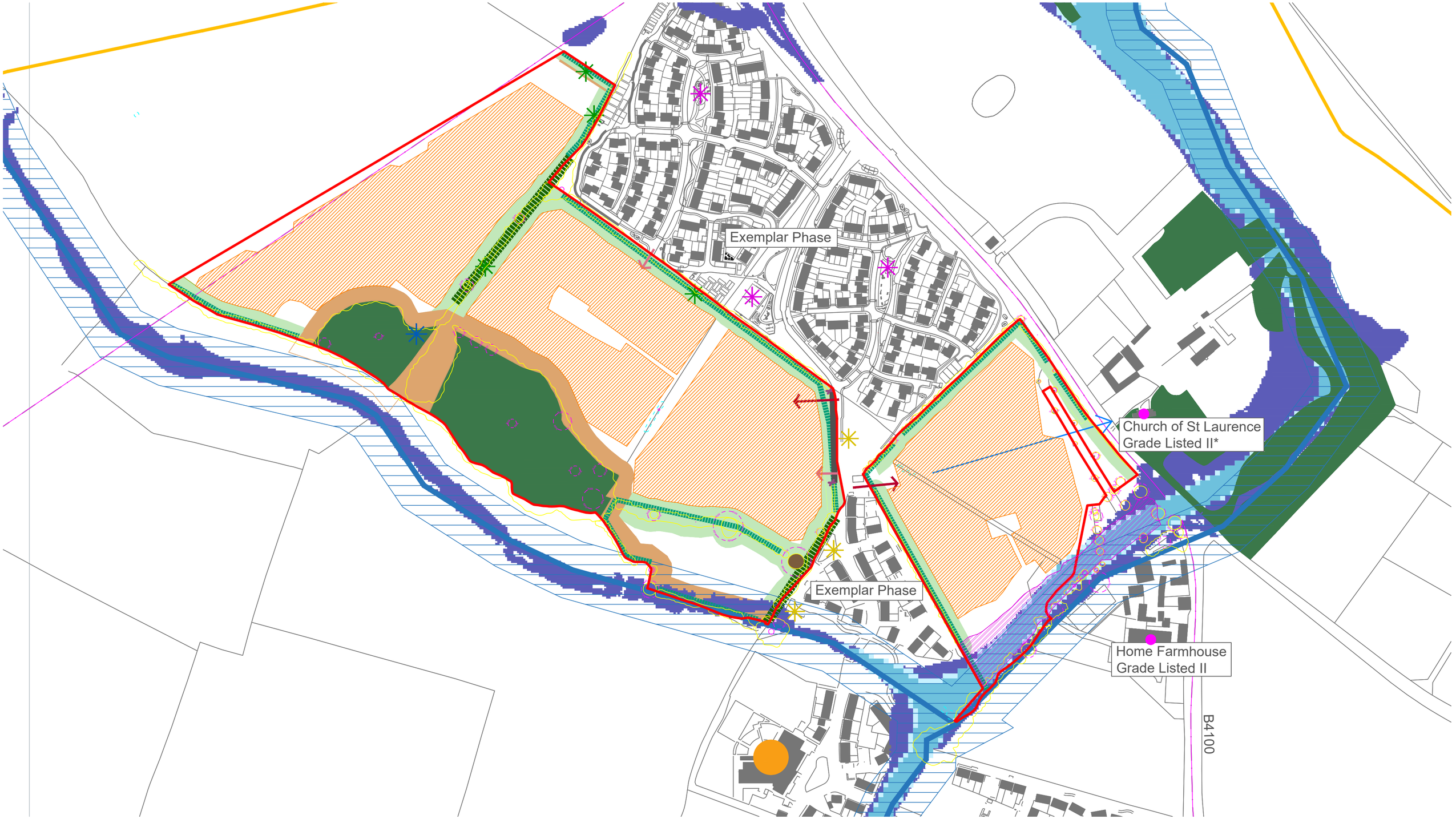

1 in 1000 Depth (m) - Rev 27
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m

Appendix B – Revised Flood Maps – Sensitivity Testing


1 in 1000 Depth (m) - Rev 27 - 10% Clay
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m


1 in 1000 Depth (m) - Rev 27 - 25% Clay
0.00-0.15
0.15-0.5
0.5-0.9
>0.9
Site Boundary
Google Satellite
0
250
500 m

Appendix C – Opportunity and Constraints Plan



N

0 metres 100
(1:2,500)

- Site boundary
- Tree line (Aspect)
- Hedgerow (Aspect)
- Watercourse (OS)
- Priority Habitat Woodland (desktop)
- Dry ditch (Aspect)
- Dry pond (Aspect)
- Tree with High Bat Roosting Potential (Aspect)
- 30m watercourse buffer (SPD)
- Listed buildings (desktop)
- Public right of way (desktop)
- Flood zone 2 (Vectos)
- Flood zone 3 (Vectos)
- Parish boundary (desktop)
- Gagle Brook Primary School
- 15m woodland buffer and bat corridor (Aspect)
- 10m hedgerow buffer (SPD/Aspect)
- Historic hedgerow (Cotswold)
- Potential NDA
- Surface water flooding 1 in 1000 extent
- Servient Land (Velocity)
- Flood zone for the 1 in 100 year event + 35% climate change
- Potential access points (RP)
- Potential secondary access points (RP)
- View towards the Church of St Laurence (Cotswold)
- Access to be provided between this points (Velocity)
- Indicative tree root protection area - retention trees only (Flac)
- Trees for removal to facilitate development (Flac)
- Vegetation canpopy (Flac)
- Exemplar Phase Children's Play
- Exemplar Phase Growing Spaces

Project
Land at North West Bicester

Drawing Title
Considerations

Date	Scale	Drawn by	Check by
17/02/2021	1:2,5000 at A3	ML	LA

Project No	Drawing No	Revision
1192	002	H

Mosaic

Key

- 01 Vehicular, pedestrian and cycle access point
- 02 View to church
- 03 Sustainable Drainage System(SuDS)
- 04 Play
- 05 Small new copses
- 06 Trim trail
- 07 Edible landscapes
- 08 Wetland habitat
- 09 Woodland with some limited public access
- 10 Pedestrian connection
- 11 Potential oedestrian connection
- 12 Modern farmstead interpretation
- 13 Lower density rural edge
- Site boundary

0m 100m

N.

CLIENT:
Firethorn

PROJECT:
North West Bicester

DRAWING:
Illustrative masterplan

PROJECT NUMBER:
1192

DRAWING NUMBER: SK004
CHECKED BY: ML/LA
REVISION: C
STATUS: Draft
DATE: 14/04/2021
SCALE: 1:2,000

MOSAIC
Urban Design & Masterplanning