

A40 Smart Corridor

Environmental Statement - Non-Technical Summary

Oxfordshire County Council

November 2021

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1. Introduction

Overview

- 1.1 This document is the Non-Technical Summary of the Environmental Statement (ES) that accompanies the full planning application for the construction of the 'A40 Smart Corridor' scheme (hereafter referred to as 'the proposed development').
- 1.2 The A40 is the main route for general traffic and buses between Carterton and Witney, the two largest towns in West Oxfordshire; and Oxford. The Oxfordshire County Council (OCC) Local Transport Plan 2015-2031 (LTP4)¹ recognises that traffic flows on the A40 regularly exceed the capacity of the road resulting in congestion. The proposed development forms part of OCC's wider investment strategy for the A40 between Witney and Duke's Cut, which aims to improve travel times and journey reliability along the A40 corridor, support housing development, stimulate economic growth, and improve safety.
- 1.3 OCC (hereafter referred to as the 'Applicant') is therefore seeking full planning permission for the following three elements which form the proposed development:
 - **Element 1: A40 Dualling** – dualling of an approximately 3.2km long section of the A40 between the junction at Hill Farm east of Witney and the proposed Park and Ride junction at Eynsham together with a new roundabout at Barnard Gate, a new developer (western) roundabout to the east of Eynsham Motocross, and new accesses for properties adjoining the A40. There will also be a major upgrade and improvement of the shared path on the northern verge of the carriageway;
 - **Element 2: A40 Integrated Bus Lanes (IBL)** – installation of an approximately 6.5km long section of integrated eastbound and westbound bus lane between the separately proposed Park and Ride at Eynsham and Duke's Cut with associated junction alterations and improvements, as well as improvements to the shared footpaths/cycleway alongside the carriageway; and
 - **Element 3: A40 Duke's Cut** – capacity and connectivity improvements over the four structures at Duke's Cut (Earl's Culvert, Duke's Cut Canal Bridge, Wolvercote Canal Bridge and Wolvercote Railway Bridge) to enable the eastbound bus lane to be extended over the bridges, as well as a shared path link to the National Cycle Network (NCN) 5 at Duke's Cut Cottages.
- 1.4 The site of the proposed development (hereafter referred to as 'the site') covers an approximately 103 hectares (ha) section of the A40 between the junction with Hill Farm near Witney in the west, passing the villages of Eynsham and Cassington, to the Duke's Cut canal bridges in the east.
- 1.5 The site is mostly located within the administrative boundary of West Oxfordshire District Council (WODC), with the exception of the eastern most 2km of the A40 IBL works, which are within the administrative boundary of Cherwell District Council (CDC) and Oxford City Council.

What is an Environmental Impact Assessment?

- 1.6 Environmental Impact Assessment (EIA) is a process to ensure that planning decisions are made with full knowledge of the likely significant environmental effects of a proposed development. The outcome of the EIA process is reported within the ES.
- 1.7 The objective of the EIA is to identify any likely significant effects which may arise from the proposed development and to identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process for the proposed development, opportunities and management measures have been identified and incorporated within the development proposals to prevent or reduce any adverse effects and to enable sustainable design and construction principles to be embedded within the proposed development.
- 1.8 The EIA informs the decision of whether to give consent for the proposed development to proceed and helps frame any planning conditions.
- 1.9 The ES for the proposed development comprises the following documents:

¹ OCC, 2015, Local Transport Plan 2015-2031 (LTP4): A40 Route Strategy (Volume 7a)

- *Non-Technical Summary (NTS)* – This document, which provides a summary of the proposed development and the findings of the ES in non-technical language;
 - *ES Volume I: Environmental Statement Main Document* – This presents the findings of the EIA and is divided into a number of background and technical chapters supported with figures and tabular information for clarity of reading; and
 - *ES Volume II: Technical Appendices* – Additional reports and survey data that provide further detail on the technical assessments undertaken and information used to inform *ES Volume I*.
- 1.10 The ES complies with the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the ‘EIA Regulations’)² (as amended) and forms part of a suite of documents submitted as part of the planning application for the proposed development.

2. Existing Site and Surroundings

The Existing Site

- 2.1 The A40 Dualling is located at the western extent of the site starting at the junction with Hill Farm. The existing site along the extents of the A40 Dualling comprises a single carriageway road lined with trees and hedgerows. An existing footpath is located along the eastbound and westbound lanes. The A40 is bordered to the north and south mostly by agricultural fields and associated farm buildings and houses. The hamlet of Barnard Gate is situated to the north of the A40, as well as an approximately 27ha solar farm. To the west of the Hill Farm Junction, the A40 comprises existing dual carriageway. The A40 Dualling will extend this dual carriageway eastward for 3.2km to the junction of the separately proposed Park and Ride site north of Eynsham, which is located on land west of Cuckoo Lane at Eynsham.
- 2.2 The A40 IBL is located in the centre of the site. It extends 6.5km eastwards along the A40 from the separately proposed Eynsham Park and Ride to just before the Duke’s Cut canal, which is approximately 400m to the west of Wolvercote roundabout. The A40 is mostly bordered by agricultural land, but the villages of Eynsham and Cassington are also located along this section, with some residential properties backing onto the A40.
- 2.3 The Cassington to Yarnton Gravel Pits are located north of the A40 towards the eastern extent of the site.
- 2.4 The A40 Duke’s Cut is located at the eastern extent of the site. It extends along the A40 over the Earl’s Culvert, Duke’s Cut Canal Bridge, Wolvercote Canal Bridge and Wolvercote Railway Bridge, which are all existing bridge structures. A footpath is located along the A40 behind a barrier on both sides.

Existing Surroundings

- 2.5 The following section briefly summarises some of the statutory designations and residential receptors located near to the proposed development. Sensitive receptors are described in further detail where relevant to the assessment in each technical chapter in *ES Volume I*.
- 2.6 An overview of the main environmentally sensitivity areas relating to air quality, ecology, geology, and noise within the site and in the surrounding area is provided in Figure 1 of this NTS. The main heritage features and designations are shown in Figure 2 of this NTS, and flood zones shown in Figure 3.

Ecology Designations

- 2.7 The Oxford Meadows Special Area of Conservation (SAC) is an internationally designated site of ecological importance located south of the A40 IBL adjacent to the site. The site is designated as an SAC due to the presence of lowland hay meadow, which is a Habitat Directive³ Annex I Habitat (a habitat that has priority status due a danger of disappearance and for which there is a particular responsibility to conserve). This site also holds the only population of Creeping marshwort (*Apium repens*) in the UK, which is an Annex II species.
- 2.8 There are also seven Sites of Special Scientific Interest (SSSIs) located within 2km of the site. Their locations in relation to the proposed development are:

² Her Majesty’s Statutory Office (HMSO) 2017; ‘The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

- Pixey and Yarnton Meads SSSI (directly adjacent to the south);
 - Cassington Meadows SSSI (approximately 200m to the south);
 - Wytham Ditches and Flushes SSSI (approximately 600m to the south);
 - Wolvercote Meadows SSSI (approximately 600m to the south east);
 - Wytham Woods SSSI (approximately 900m to the south);
 - Port Meadow with Wolvercote Common and Green SSSI (approximately 900m to the south east); and
 - Hook Meadow and The Trap Grounds SSSI (approximately 1.5km to the south east).
- 2.9 Some of the SSSIs within 2km of the site overlap with the Oxford Meadows SAC. This includes the Pixey and Yarnton Meads SSSI and the Cassington Meadows SSSI. Pixey and Yarnton Meads SSSI is designated as the best surviving example of lowland, neutral meadows in lowland England. The Cassington Meadows SSSI is designated for its species-rich, semi-natural neutral grassland and fen habitats, which are rare in the UK.
- 2.10 The locations of ecologically designated sites within 2km of the site are shown in Figure 1.

Heritage Designations

- 2.11 There are two Scheduled Monuments located within 2km of the proposed development. Both of these monuments are located within Eynsham to the south of the A40 IBL. These are Eynsham Abbey (NHLE ref. 1006332), located approximately 700m south of the A40 IBL and Eynsham Market Cross (NHLE ref. 1015170), located 900m south of the A40 IBL.
- 2.12 The site is not located within a conservation area, although the Cassington Conservation Area is located to the north adjacent to the site boundary and the Eynsham Conservation Area is located to the south, approximately 500m from the site boundary.
- 2.13 A total of 26 Grade II listed buildings and one Grade I listed building have been identified within approximately 500m of the site, however, these are mostly confined within Eynsham and Cassington. The closest Grade II listed buildings to the site are located at the entrance to the grounds of Eynsham Hall in Barnard Gate, and the Grade II listed lock infrastructure adjacent to the route of the proposed NCN5 north link.
- 2.14 The locations of heritage designations within 1km of the site are shown in Figure 2.

Landscape Designations

- 2.15 The site is not located within an Area of Outstanding Natural Beauty (AONB). The boundary of the Cotswolds AONB is located approximately 4.7km north of the site.

Drainage and Flood Risk

- 2.16 The A40 IBL and A40 Duke's Cut are located predominately within Flood Zone 3 (land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%)), with portions also located within Flood Zone 2 (land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding).
- 2.17 The A40 Dualling is mostly within Flood Zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river flooding).
- 2.18 The locations of flood zones within 1km of the site are shown in Figure 3.

Residential Receptors

- 2.19 Residential properties in close proximity to the site are primarily clustered around Barnard Gate, Eynsham and Cassington. However, there are additional farm buildings, including residential properties, located adjacent to the A40 Dualling. Some commercial properties are located adjacent to the A40 IBL, including a public house, two petrol stations, a motorcycle accessories shop and a car dealership.

- 2.20 A new garden village called the Salt Cross Garden Village is proposed to the north of the A40, adjacent to the separately proposed Eynsham Park and Ride. The West Eynsham Strategic Development Area (SDA) is allocated for development on the west side of Eynsham.

3. Alternatives and Design Evolution

- 3.1 Consideration of alternatives is a key part of the EIA process and serves to ensure that a development can avoid or reduce significant environmental effects through the project design.
- 3.2 The alternatives to the proposed development that have been considered by the Applicant include:
- 'Do nothing scenario' – The consequences of the proposed development not taking place;
 - 'Modal alternatives' – The rationale behind choosing this type of solution; and
 - 'Design alternatives' – The modifications that have taken place and the environmental considerations that had led to those modifications.

The 'Do nothing scenario'

- 3.3 The 'do nothing scenario' refers to the option of leaving the site in its current state. Should the proposed development not be built then this option is anticipated to result in the following:
- Increased pressure on already congested roads, as a result of planned development within West Oxfordshire, as part of the Oxfordshire Local Economic Plan, which is likely to increase traffic levels and result in further traffic congestion and longer journeys;
 - Further reduction in the appeal of public transport as an alternative to private car use due to the congestion along the route, which would contribute to increased traffic levels;
 - Reduction in attractiveness of the district for future development and investment due to congested and unreliable local transport connections, which would impact the delivery of the overall countryside economic and development strategy;
 - Undermine the ability of WODC and Oxford City Council to meet their housing needs; and
 - Fail to improve the current situation of inadequate walking and cycling facilities along the A40, which further discourages those means of transport.
- 3.4 The 'do nothing scenario' was therefore not considered a viable option.

Modal Alternatives

- 3.5 The A40 Witney-Oxford Corridor Route Strategy³ was prepared in September 2014. Analysis indicated that the traffic flows on the A40 would continue to grow for the foreseeable future. In order to manage this growth and to give a clear strategic direction for the future, the Route Strategy identified a range of potential schemes to:
- Influence travel behaviour through better informed travellers who will be better equipped to decide when, where and how to travel;
 - Make best use of existing and emerging technology, such as improvements in tram and rail technology, to improve operational efficiency by gathering data on the use of the route and by providing information to road users and the operators of other networks;
 - Improve the A40 in order to make best use of the capacity of the existing highway; and
 - Develop physical improvements to the network to address both strategic and local traffic demand for the route.
- 3.6 Within this process, alternative options for relieving congestion on the A40 were investigated. The following early options were presented at an initial public consultation on the long-term strategy for the A40, which

³ OCC, 2014 A40 Witney-Oxford Corridor Route Strategy.

ran from the 26th September to the 8th November 2015. The public consultation had a high response rate of nearly 800 views.

- Bus lanes along the A40 in both directions between Witney and the Duke's Cut canal bridge;
- A two-way guided busway track between Ducklington Roundabout and Duke's Cut canal using specially adapted buses. The route would use the line of the old railway from Witney to Cassington, except through Eynsham, but would continue alongside the A40 to Duke's Cut canal bridge;
- Converting the A40 into a dual carriageway by widening the A40 into two lanes in both directions, separated by a central reservation between Witney to Duke's Cut canal;
- A train service between Witney to Oxford by joining the Cotswold line at Yarnton, either by re-instating the old line or building a new route entirely to the north of the A40; and
- A tram service between Ducklington Roundabout and Duke's Cut canal bridge in both directions along the alignment of the old railway line.

3.7 The train service option was the second most favoured option in the public consultation; however, there were key concerns about whether such a service, with an estimated low frequency of trains per hour, would be commercially viable. The two-way guided busway received little support in the public consultation due to the service limitations this option would provide. The tram service option also received little support.

3.8 Although the dual carriageway option received the greatest level of support from respondents to the public consultation, the costs were found to be high with a low value for money for the section between Eynsham and Duke's Cut without an additional project to improve the congestion around north Oxford.

3.9 The bus lanes were the third most favoured option. This option would have involved building 3m wide bus lanes in both directions adjacent to the existing A40 between the Hill Farm Junction in the west and the Duke's Cut canal bridge in the east. This was assessed as having both the highest value for money, however the installation of bus lanes between the Hill Farm Junction to proposed Eynsham Park & Ride was ruled out as this would not address road capacity issues on the A40 at Barnard Gate affecting all vehicles.

3.10 Therefore, in considering the capacity issues on the A40 between Witney and Eynsham, and having ruled out a full dual carriageway between Witney and Duke's Cut; a shorter section of dual carriageway from Witney to the proposed Eynsham Park and Ride was identified as a preferred solution. This would reduce the potential environmental impacts of a dual carriageway on sensitive local environmental receptors between Eynsham and Duke's Cut, including the Oxford Meadows SAC. From Eynsham to the Duke's Cut Canal bridge, bus lanes in both directions are proposed, which would provide a congestion free alternative travel option as well as provide additional capacity to support local economic growth.

Alternative Designs

3.11 A robust selection process was undertaken to ensure that the design options chosen for specific sections of the proposed development represented the best way to meet the project objectives. The options were measured against each other by comparing the strategic, economic, financial, management, commercial and environmental criteria. Once an option was selected, further design work was undertaken to ensure that environmental impacts could be avoided, reduced or mitigated where necessary. The following areas in particular were considered:

- the Alignment of the A40 Dualling;
- Barnard Gate Junction;
- The Park and Ride junction;
- Cassington New Bridge;
- Cassington Halt Bridge; and
- National Cycle Network (NCN) Link.

3.12 Further details are available in *ES Volume 1 Chapter 3: Alternatives and Design Evolution*.

3.13 In addition to the above, throughout the design process there has been frequent consultation with OCC as the local planning authority (hereafter referred to as 'the Authority') and other statutory stakeholders including the Environment Agency, Natural England and other local public stakeholder groups. A

comprehensive engagement programme has been undertaken to inform the design process, which is described further in the Statement of Community Involvement (SCI) submitted to accompany the planning application for the proposed development.

- 3.14 The consultation process resulted in amendments to the design of the proposed development and informed the planning application submission. A virtual exhibition from the 10th May 2021 to the 7th June 2021 was held, including two live webinar events where members of the public could participate in a question and answer session with members of the project team. The virtual exhibition also provided the opportunity for participants to complete a feedback form online via the OCC consultation portal. A dedicated email address was also set up to provide the opportunity for comments and questions to be submitted to the project team.

4. Description of the Proposed Development

A40 Dualling

- 4.1 The A40 Dualling will comprise 3.2km of dual carriageway from the Hill Farm Junction to the separately proposed Eynsham Park and Ride, which is located on land west of Cuckoo Lane at Eynsham.
- 4.2 The alignment of the A40 Dualling will follow the existing alignment of the A40, with the western half (largely to the west of Barnard Gate) aligned slightly to the south of the existing A40, avoiding properties to the north, mainly Salutation farm and Whitehouse farm. The eastern dual section will gradually taper to the north from Barnard Gate away from farms to the south; Ambury Close farm and Fir tree farm and the flood plain. The proposed roundabout at Barnard Gate will connect properties to the north and south providing access to the existing properties in this area from the A40, including Hill Farm, Salutation Farm, and Whitehouse Farm, Barnard Gate Farm and Home Farm in the north. In the south access to Ambury Close Farm and Fir Tree Farm from the A40 will be via a new track running east from a realigned South Leigh Road linked to the southern arm of the proposed Barnard Gate Roundabout.
- 4.3 Key aspects of the A40 Dualling include:
- Construction of the new **Barnard Gate Roundabout** to the south. The junction will comprise a new four arm roundabout. The roundabout is proposed to be located slightly to the east of the existing staggered junctions that led onto to Barnard Gate North and Barnard Gate South; and
 - Construction of the new **Developer (Western) Roundabout** to provide access from the A40 to the Salt Cross Garden Village, subject to funding for this being available.
- 4.4 The speed limit along the A40 Dualling will be reduced compared to the existing situation. this section will be 50mph, except between the developer roundabout and the Park and Ride junction, where it will be 40mph.

A40 Integrated Bus Lanes

- 4.5 The A40 IBL will comprise widening of the existing highway to provide two-way single carriageway for general traffic and include dedicated eastbound and westbound priority lanes for buses, as well as foot/cycleway enhancements.
- 4.6 Key aspects of the A40 IBL include:
- Construction of the **Park and Ride Junction** comprising a signalised junction. The junction will be able to accommodate a fourth arm to serve the future West Eynsham SDA, although the design and construction of any fourth arm would be the responsibility of the West Eynsham SDA developer.
 - Construction of the **Eynsham Underpass** beneath the A40 to facilitate pedestrian access from Old Witney Road to the separately proposed Eynsham Park and Ride without needing to use pedestrian crossings on the A40. This aspect will require the existing road level to be raised by 1m at this location in order to limit the potential for the underpass to flood. This aspect of the A40 IBL is subject to funding being available.
 - The **Cassington New Bridge** is an existing bridge structure that passes over the River Evenlode. The proposed development will involve widening of Cassington New Bridge to include a shared use facility up to 3m wide on both the southern and northern sides of the bridge. This will be accomplished by widening the existing bridge by approximately 5.9m on the southern side only.

- The **Cassington Halt Bridge** is an existing bridge structure that passes over a former railway line. The former railway line now forms part of an access road to sand extraction sites, with left-in/left-out accesses to the A40 east of Horsemere Lane. The proposed development will involve the installation of the eastbound and westbound bus lanes within the existing parapets, with the foot/cycleway provided via separate footbridge structures on both the northern and southern side set slightly apart from the existing bridge.
- 4.7 The speed limit along the A40 IBL will be reduced compared to the existing situation. The existing speed limit through here is 60mph, which will be lowered past Eynsham to 40mph and east of Eynsham Roundabout to 50mph.

A40 Duke's Cut

- 4.8 The A40 Duke's Cut will comprise works within the existing bridge structures along this section of the A40, which includes the Duke's Cut Canal Bridge, Wolvercote Railway Bridge and Wolvercote Canal Bridge that pass over the Duke's Cut Canal, Wolvercote Railway and Oxford Canal respectively.
- 4.9 The A40 Duke's Cut will involve the installation of an eastbound bus lane alongside the existing eastbound and westbound general traffic lanes. There is not enough space to also provide a westbound bus lane at this location. The widths within the existing parapets of these bridges will be used, and so there is no requirement for bridge widening.
- 4.10 Alongside the above works, the OCC 'Transport Strategy'⁴ aspires to make cycling and walking a central part of transport, planning, health and clean air strategies. It is therefore proposed to create a link on both the northern and southern sides of the A40 to connect the A40 to the existing National Cycle Network (NCN) Route 5 (NCN5) to increase the viability of cycling from Eynsham towards Oxford city centre.
- The **NCN5 North Link** will provide a new shared use path that will exit the A40 highway to the north through an existing field access approximately 580m west of the A34 flyover, travel along the southern boundary of the meadows east of Cassington to Yarnton Pits Local Wildlife Site (LWS), and join up with the existing towpath along the northern bank of the Duke's Cut Canal and connecting up with NCN5; and
 - The **NCN5 South Link** will provide access from A40 approximately 70m to the east of the A34 underpass, connecting with NCN5 to the south. The track will run on a gentle gradient towards the NCN5.
- 4.11 The NCN5 North Link has a proposed width of up to 2.5m including the verge on both sides of the path, whilst the NCN5 South Link has a proposed width of up to 4m including the verge on both sides. A fence will be located either side of each NCN5 link.

Design of the proposed development

Drainage

- 4.12 The A40 drains into a series of gullies which collect water from the road surface and discharge it into a series of ditches or culverts that run along the road. These ditches and culverts discharge into several watercourses local to the site which ultimately discharge south towards the Chil Brook/River Thames. The current drainage system is in a poor condition due to a lack of maintenance.
- 4.13 The drainage strategy for each of the main elements is summarised below. Further detail can be found in the Surface Water Drainage Strategy Report in *ES Volume II Appendix 14-C*.

A40 Dualling

- 4.14 The A40 Dualling will drain to roadside swales or ditches. These swales and ditches will drain into attenuation ponds located either side of the A40 before discharging to local watercourses. The proposed drainage systems will discharge at a rate 40% lower than the current situation by catchment. Where catchments are wholly new impermeable areas, the discharge rate for vegetated land (also known as

⁴ OCC, 2015, Local Transport Plan 2015-2031 (LTP4): A40 Route Strategy (Volume 7a)

greenfield runoff) has been applied. Flows will be restricted by flow control valves due to the need for shallow attenuation to feed into the receiving watercourses.

A40 IBL

- 4.15 On the A40 IBL, the widened A40 will drain via dropped kerbs into a grassed swale. The swale will be permeable, with a trench underneath it to provide a filter and water storage. Where the trench does not provide sufficient storage volume, geo-cellular crates will be used to supplement the storage in the trenches. The swale system will discharge to a silt trap with a flow control valve, and then into existing drainage features (such as ditches and pipes). The discharge rates from the drainage system will be maintained at existing rates.

A40 Duke's Cut

- 4.16 On the A40 Duke's Cut, existing gullies will be relocated to the new kerb lines, maintaining the existing drainage regime whereby gullies outfall onto the highway embankments. The shared surface will continue to drain directly onto the highway embankments as the footway currently does.

Landscaping and biodiversity net gain

- 4.17 The landscape strategy for the proposed development aims to reduce vegetation loss wherever possible, and to provide the best opportunities for new planting, such as designing roadside swales in a way that would accommodate planting.
- 4.18 Every opportunity to enhance biodiversity and visual amenity has been taken, including replacing areas of hatching on the road with planted central islands, which increase groundcover and provision of new trees. Wherever vegetation loss has been unavoidable, new planting has been proposed to replace it and reduce significant visual effects. A strategy of new hedgerow planting along the Integrated Bus Lanes section has increased the overall amount of new hedgerow planting considerably, which the use of species rich grassland rather than amenity grass in most locations also increased biodiversity.
- 4.19 The proposed development has a target of achieving 10% biodiversity net gain. While the general approach of the landscape design has been to maximise the amount of landscaping that can be incorporated within the red line boundary, the constrained nature of the existing A40 corridor means that there will inevitably be a large amount of vegetation clearance required. Therefore, opportunities for habitat creation and enhancements on third party land in close proximity to the scheme have been identified, in order to achieve a biodiversity net gain. Areas outside of the site boundary, but within the local area, have therefore been identified for enhancements in conjunction with third parties.
- 4.20 Details of other environmental enhancements are given in *ES Volume 1 Chapter 3: Alternatives and Design Evolution*.

Structures

- 4.21 Works will include widening Cassington New Bridge to the south and adding footway/ cycle bridges parallel to Cassington Halt Bridge on both sides. The existing available space between the parapets of the bridges along the A40 Duke's Cut will be used, therefore there is no requirement for widening of those bridges. For more information, see Section 4.8 above.
- 4.22 An underpass will be constructed between Old Witney Road and Cuckoo Lane, which will allow pedestrians to pass under the A40. It is anticipated that the northern end of the underpass will be constructed first. Sheet piling may be required to support excavations. The southern end of the underpass will be excavated and constructed once the temporary carriageway alignment has been constructed over the northern portion of the underpass. The carriageway at this location will be raised by approximately 1m in order to reduce the depth of excavation and limit the potential for flooding.
- 4.23 Approximately 21 culverts will need to be modified or extended in order to ensure that surface water continues to pass underneath the A40 once widened. For the majority of the culverts along the A40 IBL and A40 Duke's Cut sections, this will involve an extension of approximately 0.5m to 1m along the south side of the A40 whilst maintaining the existing culvert diameters. Exceptions to this are listed below:

- Catsbrain Culvert just to the east of Lower Road Roundabout will require an extension of approximately 4m, which will need to be on both the northern and southern side;
- White House Culvert to the west of Whitehouse Farm will be demolished. A new structure will be put in place, either in the existing position or to the side, realigning the brook after construction. This will increase its length to the south of the A40 by approximately 30m; and
- Barnard Gate New Culvert will either require an extension or be demolished, providing a new structure, either in the existing position or to the side, realigning the brook after construction. This will increase its length to the south of the A40 by approximately 37m.

Lighting

- 4.24 The inclusion of lighting has been restricted to areas considered to key for safety reasons, which includes the following:
- Barnard Gate Roundabout;
 - The Developer (Western) Roundabout;
 - Park and Ride Junction to Witney Road;
 - Tesco Express Toucan Crossing;
 - Hanborough Road Toucan Crossing;
 - Lower Road Roundabout;
 - Two uncontrolled crossing points where PRow footpaths cross (remote solar lighting is proposed here);
 - Cassington Road/ Eynsham Road Junction; and
 - Horsemere Lane Toucan Crossing.
- 4.25 All lighting will be LED lighting. The LED colour temperature will be restricted to 3000k (often called warm) with dimming applied overnight. Lighting has been considered in the landscape and visual impact assessment within *ES Volume 1 Chapter 10*.
- 4.26 Further details on the lighting design are in the Lighting Scheme which is part of the suite of documents submitted as part of the planning application.

Construction Programme

- 4.27 Subject to grant of planning permission, the proposed development is anticipated to commence enabling works and mobilisation, which include diverting utilities and setting up construction sites from Spring 2022 until Autumn 2023. Construction of the IBL and Duke's Cut elements are anticipated to start in Spring 2023 and finish in early 2025. Construction of the Dualling element will commence in Summer 2023 and also complete in early 2025. Overall, the total construction time for the proposed development will be approximately two years.
- 4.28 The main construction site compound is proposed to be located at the Eynsham Park & Ride site. When the main construction works are complete, the site compound would be downsized to allow the final stages of the Eynsham Park & Ride construction to be completed and the combined scheme opened in full.
- 4.29 Satellite compounds are proposed to be installed along the length of the highway. This will include site compounds to be used west of Cassington New Bridge and Cassington Halt Bridge. Site compounds will be required either side of the structure to allow for fabrication works and sufficient space for the subsequent lifting operations. At these locations, small office set ups with welfare provision will be established. A satellite compound area will also be located immediately south west of Eynsham Roundabout, as well as north east and south west of the proposed Barnard Gate Roundabout.

5. EIA Methodology

- 5.1 The environmental effects of the proposed development were assessed both during construction and once the proposed development is complete and operational. The effects are described in terms of changes to

the existing situation (the baseline). EIA assesses environmental effects on resources (such as archaeology) and receptors (such as human beings or animals such as great crested newt). The significance of the environmental effects were assessed by judging the sensitivity (that is, the importance) of a resource or receptor against the magnitude (that is, the scale or extent) of the predicted impact. The duration and geographic scale of the effects were also taken into account.

- 5.2 The content or 'scope' of the EIA was agreed through the production of an EIA Scoping Report. Following the preparation of a 'EIA Scoping Opinion' by the Authority, the following environmental topics have been addressed in detail in the ES:
- Air Quality;
 - Biodiversity;
 - Climate;
 - Cultural Heritage;
 - Geology and Soils;
 - Landscape and Visual;
 - Material Assets and Waste;
 - Noise and Vibration;
 - Population and Human Health;
 - Road Drainage and Water Environment; and
 - Traffic and Transport.
- 5.3 There were two topics scoped out of the EIA as it is considered that the effects to arise from the proposed development on these topics are not likely to be significant and as such do not require further assessment within the EIA. The topics scoped out were Heat and Radiation, and Major Accidents and Disasters.
- 5.4 The EIA has assumed certain aspects of the design, such as landscaping proposals and drainage design that will help to limit the extent of potential environmental effects. It also assumes mandatory application of a Construction Environmental Management Plan (CEMP) which the Applicant will require contractors to prepare and implement. This would be based upon the construction mitigation and control measures set out in the ES and would be prepared before they start any construction work, as agreed by an appropriately worded planning condition.
- 5.5 A development of this nature is certain to have some effects on the environment, both beneficial and adverse. What is important is that 'significant' adverse effects are identified and reduced through the design process, or through other mitigation measures. 'Significant' effects are considered to be those effects which represent key factors or material influences in the decision-making process.
- 5.6 Where significant adverse environmental effects are still likely to occur, additional measures are proposed to reduce effects where practicable. Any effects that remain, once these measures are taken into account, are reported as 'residual effects'.
- 5.7 The beneficial effects are also reported in the ES to ensure the benefits arising from the proposed development are realised and the balance of issues is understood. The remainder of this Non-Technical Summary sets out the findings of the ES, on a topic by topic basis.

6. Findings of the Environmental Statement

Air Quality

- 6.1 *ES Volume 1 Chapter 5: Air Quality* presents the findings of an assessment of the likely significant effects of the proposed development on air quality of the site and surrounding area. The assessment considers the potential for the proposed development to generate dust during the construction phase, as well as the potential air quality impacts of additional road traffic generated by the proposed development when complete and operational. The assessment focuses on the pollutants nitrogen dioxide (NO₂), nitrogen oxides (NO_x) and particulates (PM₁₀ and PM_{2.5}), since these are the main pollutants from vehicle emissions. The assessment has been conducted in line with guidance in *DMRB LA 105 Air quality*.

Baseline

- 6.2 Baseline air quality data has been collected from a mixture of existing online information available from Defra and air quality monitoring completed for the proposed development in 2021. This baseline shows that existing background concentrations of two pollutants, nitrogen dioxide (NO₂) and particulates (PM₁₀ and PM_{2.5}) within the site are below the relevant UK air quality strategy (AQS) objectives in the study area.
- 6.3 The site is located within the City of Oxford Air Quality Management Area (AQMA)⁵. It is also located within close proximity of the Witney AQMA. At both AQMAs, there are existing exceedances of the NO₂ annual mean AQS objective.

Methodology

- 6.4 For this assessment, a qualitative assessment of construction dust was completed including receptors within 200m of the site boundary and a quantitative assessment of air quality during operation was conducted to predict NO₂ and PM₁₀ concentrations at 111 selected public exposure receptors (residential properties and schools) within 200m of the study area (referred to as 'the Affected Road Network'⁶). Nitrogen oxide (NO_x) concentrations and nitrogen deposition rates (i.e. where excess nitrogen in the air is deposited to land) were also predicted for 32 ecological habitats and 17 ancient and veteran trees during operation.

Construction Phase Effects

- 6.5 The proposed development has the potential for adverse effects during construction from construction dust and emissions from plant equipment and vehicles. The size of the development is large and as there are more than 1,000 sensitive receptors located within 200m of the scheme boundary, the sensitivity from the proposed development to dust emissions is high.

Complete and Operational Phase Effects

- 6.6 Annual mean concentrations of PM₁₀ are predicted to be below the annual mean objective of 40µg/m³ at all public exposure receptors in the base year with a maximum concentration of 19.9µg/m³ at a property close to the A40. This means that PM_{2.5} concentrations (which are a subset of the PM₁₀ particulate size fraction) will also be below the annual mean objective of 25µg/m³.
- 6.7 Annual mean concentrations of NO₂ are predicted to be below the annual mean objective at all receptors in the opening year within and without the proposed development, except within the Witney AQMA. Within this AQMA, five public exposure receptors are predicted to have concentrations above the air quality objective with and without the proposed development. Thirteen receptors in Witney AQMA are predicted to experience a small worsening of concentrations with eight receptors predicted to have a new exceedance with the proposed development.
- 6.8 Significant air quality impacts are not anticipated with the operation of the proposed development and therefore specific air quality monitoring or mitigation is not considered to be required.
- 6.9 A compliance risk assessment has been undertaken for the four Pollution Climate Mapping (PCM) links within the Affected Road Network (ARN). Concentrations were not predicted to exceed the EU Limit Value with or without the proposed development. Therefore, the results of the compliance risk assessment show that there is no reported risk to compliance.
- 6.10 Annual mean NO_x concentrations are predicted to be above the annual mean value of 30µg/m³ at many ecological habitats located close to the road, and the lower boundary of the nitrogen deposition critical load is exceeded across all ecological sites. At the Oxford Meadows Special Area of Conservation (SAC), the nitrogen deposition rate is 0.2kgN/ha/yr up to 20m from the edge of the road. However, the dose due to the proposed development is imperceptible (i.e. 1% of the critical load or below) throughout the transect and is effectively zero by 50m into the SAC. Further information is provided in *ES Volume 1 Chapter 6: Biodiversity*.

⁵ AQMA means that, within that area, the levels of a certain pollutant are above those required by legislation for health reasons.

⁶ The Affected Road Network is the extent of roads potentially affected by changes in air quality, which are subject to further air quality modelling.

Mitigation and Monitoring

- 6.11 The proposed development would be subject to measures and procedures as defined within the Construction Environmental Management Plan (CEMP) to mitigate potential environmental impacts. The measures detailed within the CEMP will be developed by the selected construction contractor, which would be implemented for the duration of the construction phase.
- 6.12 The CEMP would include a range of industry standard good practice dust mitigation measures that would be required during all works undertaken, such as spraying stockpiles with water to avoid wind-blown dust and wheel washing of vehicles to reduce transfer of dirt and dust around the site. Monitoring of particulates or dust may be required during particularly dusty activities. The procedures for this would be set out specifically in a Dust Management Plan, which would be an appendix to the CEMP.
- 6.13 During operation, there are no requirements for any mitigation or monitoring of significant effects.

Biodiversity

- 6.14 *ES Volume I Chapter 6: Biodiversity* presents the findings of an assessment of the likely significant effects of the proposed development on the ecology of the site and surrounding area. The assessment considers effects on designated sites, habitats and protected species. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 108 Biodiversity*.

Baseline

- 6.15 The ecological baseline of the site was identified through the following desk-based studies and field surveys:
- previous observations of protected species obtained from the local biodiversity records centre;
 - an extended Phase 1 habitat survey was completed between June and September 2020 covering all accessible areas of the site plus an approximate 100m buffer either side of the existing A40; and
 - protected species surveys completed during 2021.
- 6.16 Based on the results of the field surveys, the protected species likely to be affected by the proposed development are listed below:
- Great crested newts;
 - Tree 60; Tree 125;
 - Roosting bats identified within Tree 60 and Tree 125 (see *ES Volume II Appendix 6-E*);
 - Foraging and commuting bats;
 - Hazel dormouse; and
 - Water vole and otter.
- 6.17 For the assessment of impacts to the Oxford Meadows SAC, a Habitat Regulations Assessment (HRA) has been completed. This has assessed the potential for the Oxford Meadows SAC to be affected by the following:
- loss of vegetation along the boundary (but outside of) the SAC;
 - increased nitrogen deposition within the SAC resulting from increased traffic flows on the nearby A40; and
 - increased surface water run-off discharging into the SAC with potential for effects on hydrology and water quality.

Construction Phase Effects

- 6.18 Construction of the A40 Dualling will result in the loss of a total of four waterbodies at the Eynsham Motorcross site where the presence of great crested newt has been confirmed and the loss of an area of approximately 1.5ha of high quality terrestrial habitat. The loss of aquatic and terrestrial habitats for great crested newt at Eynsham Motorcross will be mitigated through the creation of eight ponds, eight refugia/

hibernacula, 250m of hedgerow, 1.75ha of species rich grassland and 0.75ha of scrub/ woodland within land adjoining the Eynsham Motocross track. Habitats will be created/ enhanced to provide optimum habitat for great crested newt, and ensure that the favourable conservation status of the population is maintained. With the implementation of the mitigation described above the likely level of impact is No Change; therefore, this is assessed to result in a neutral (not significant) effect.

- 6.19 Tree 60 has been confirmed to support a non-breeding common pipistrelle bat roost. Trees 85, 125 and 133 have been confirmed to support non-breeding soprano pipistrelle bat roosts. Both Tree 60 and Tree 125 will be lost to facilitate the proposed development. The design of the proposed development has avoided loss of Trees 85 and 133, such that these bat roosts will be retained.
- 6.20 Trees 60 and 125 will be felled under licence from Natural England. In order to provide replacement roosting opportunities, bat boxes will be provided as suitable locations within the site which will be agreed with Natural England as part of the licencing process.
- 6.21 For foraging and commuting bats, the CEMP will ensure that construction lighting is sensitively designed in order to minimise light spillage onto key retained bat foraging/commuting routes. Therefore, disturbance of bat routes at these locations will be temporary, and potential disturbance impacts minimised. The permanent loss of habitat prior to mitigation would result in a level of impact of Major adverse on a resource with importance classified as up to County (Low). This is assessed to result in a slight adverse (not significant) effect.
- 6.22 Construction of the proposed development will result in the loss of nesting and foraging habitat for hazel dormouse, south of the A40 between the western extent and Eynsham. Removal of habitats suitable to support hazel dormouse will be undertaken under an appropriate licence to minimise the risk of killing and injury. This will be mitigated by provision of replacement nesting and foraging habitat.
- 6.23 The River Evenlode corridor, Duke's Cut Canal and Oxford Canal all support otter, although there are no signs of holts or lay-ups were recorded within the proposed working areas. Assuming the implementation of the CEMP, construction lighting will be minimised and will seek to avoid light spill into the river corridor except during key works where this is unavoidable. Based, on the above any disturbance of otters using the River Evenlode will be temporary and given no works are proposed in the channel are unlikely to act as an absolute barrier to movement. On that basis they are expected to result in a temporary Minor adverse effect on otters using the River Evenlode at the County level that is a neutral or slight (not significant) effect.
- 6.24 Prior to the commencement of construction works at Cassington New Bridge, White House Culvert and A40 Duke's Cut, pre-construction checks will be undertaken for water vole. Two visits will be undertaken during the period May or June. During each visit a check will be made for signs of water vole activity, to confirm that they remain absent from the proposed works area. In the unlikely event that otter is found to be present within the working area then a mitigation strategy will be prepared. Assuming the implementation of the CEMP, construction lighting will be minimised and will seek to avoid light spill into the river corridor except during key works where this is unavoidable. Based, on the above any disturbance of water voles using the River Evenlode will be temporary and given no works are proposed in the channel are unlikely to act as an absolute barrier to movement. On that basis they are expected to result in a temporary Minor adverse effect on water voles using the River Evenlode at the County (Low) level that is a Neutral or slight (not significant) effect.
- 6.25 No construction works are required within the boundary of the Oxford Meadows SAC.

Complete and Operational Phase Effects

- 6.26 In order to avoid potential adverse impacts on habitat corridors adjoining the site, the lighting strategy for the proposed development will aim to reduce light spill at the margins of the site so that boundary hedgerows and surrounding habitats do not become illuminated. Lighting design will be undertaken with reference to best practice guidelines of the Institute of Lighting Engineers and the Bat Conservation Trust to reduce adverse effects on the bat species by avoiding directional lighting and light spill onto existing habitat corridors adjoining the site, and those areas of habitat creation included in the proposed development around the margins of the site. Overall, this would lead to a neutral (non-significant) effect.
- 6.27 Operational lighting could affect bat foraging or commuting routes. The operational proposed development will incorporate new lighting at six locations which has potential to impact on bat foraging and commuting as follows: Barnard Gate Roundabout, the Garden Village Roundabout, Layby on south of A40 to Elm Place/Cuckoo Lane opposite the Park and Ride, Pedestrian crossing west of Tesco Express, Footpath 500m

east of Eynsham Roundabout and Meterage 4000. This lighting will be in line with the best practice guidelines. Lighting levels at each of these locations will be kept to the lowest level possible to achieve safety requirements. No lighting will be incorporated at, or within 10m of any 'hop-overs'. Where possible, lighting will be dimmed by 75% between the hours of 00:00 and 06:00. Lighting of hedgerows and trees will be avoided. LED technology will be used to create lighting that is directional, limiting light spill onto adjacent areas. Luminaires will be mounted on the horizontal, with no upward tilt. With the implementation of such measures this is assessed as a minor adverse level of impact on a receptor of County (Low) importance, resulting in a neutral (not significant) effect.

- 6.28 The HRA concluded that there are no likely significant effects on the Oxford Meadows SAC. Vegetation removal along the boundary of the SAC will be required, however, this vegetation is not a qualifying feature of the SAC and reinstatement will be provided. At the Oxford Meadows SAC, the nitrogen deposition rate is 0.2kgN/ha/yr up to 20m from the edge of the road. However, the dose due to the proposed development is imperceptible (i.e. 1% of the critical load or below) throughout the transect and is effectively zero by 50m into the SAC. The drainage design for the proposed development includes swales along the A40, which will ensure that discharge rates of surface water runoff into the SAC are not increased above existing rates. The effects on the Oxford Meadows SAC are discussed further in *ES Volume I Chapter 6: Biodiversity* and *ES Volume II Appendix 6-Q: Habitat Regulations Assessment*.
- 6.29 In line with local planning policy, the proposed development is aiming to achieve a net gain in biodiversity. Whilst the landscape design for the proposed development has sought to maximise the amount of planting within the site boundary, in order to achieve the 10% net gain target some enhancements outside the site boundary are required. Therefore the Applicant has engaged with local stakeholders and identified options outside of the site boundary for enhancement that will allow the proposed development to achieve the 10% net gain target.

Mitigation and Monitoring

- 6.30 Mitigation measures have been included within the design of the proposed development to minimise impacts on ecological receptors once it is complete and operational. This includes:
- Impacts to great crested newts located at the Eynsham Motocross will be mitigated through the provision of eight new ponds and associated hibernacula and terrestrial habitat on land to the west of the Motocross site. As this mitigation requires third party land, the Applicant is exploring options to mitigate this through a district licence approach. This is a centralised conservation scheme which aims to conserve great crested newt populations across Oxfordshire.
 - The lighting strategy for the proposed development will aim to reduce light spill at the margins of the site so that boundary hedgerows and surrounding habitats do not become illuminated. Lighting design will be undertaken with reference to best practice guidelines of the Institute of Lighting Engineers and the Bat Conservation Trust to reduce adverse effects on the bat species.
 - The landscape design that maintains connectivity for foraging and commuting bats, particularly around the Barnard Gate Roundabout.
 - The lighting design that includes lighting columns with a colour temperature of 3000K, which is designed to limit disturbance to foraging and commuting bats.
 - Installation of mammal ledges at Cassington New Bridge and the Chil Brook (at Barnard Gate) within the existing box culvert to ensure safe passage for otter. Where possible and in accordance with best practice guidance, new or extended culverts will include a mammal ledge of 500mm width to allow passage of otter.
 - Removal of habitats suitable to support hazel dormouse will be undertaken under an appropriate licence to minimise the risk of killing and injury. Provision will be made for the replacement nesting and foraging habitat.
- 6.31 During construction, mitigation measures documented within the CEMP will be implemented, which will include mitigation measures to minimise impacts on ecological receptors, reducing dust emissions, appropriate management of waste, secure storage of fuels, sensitive temporary lighting (to avoid disturbing bats and other species) and appropriate training for construction workers on protected species awareness and spill response.

Climate

- 6.32 *ES Volume 1 Chapter 7: Climate* presents the findings of an assessment of the likely significant effects of the proposed development on the climate. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 114 Climate*.

Baseline

- 6.33 The GHG emission sources for the baseline assessment reflect the existing activities and site conditions, by modelling current volumes of traffic. The current baseline GHG emissions are in the order of 493,095 tCO₂e (tonnes of carbon dioxide equivalent) per year.

Construction Phase Effects

GHG Emissions

- 6.34 Based on the maximum parameters and build out of the proposed development, the total GHG emissions related to construction activities are calculated to be in the order of 70,005 tCO₂e, of which 4.9% are associated with embodied carbon in construction materials. When annualised over the total construction period (i.e. 2 years), this equates to 35,000 tCO₂e per year. The emissions resulting from construction and demolition contribute less than 1% towards the UK's GHG Inventory and associated relevant five-year carbon budgets, and is therefore not considered to be significant.

Climate Change Vulnerability

- 6.35 During enabling and construction works, receptors such as the construction workforce, construction plant, vehicles, materials and workplan may be vulnerable to a range of climate-related risks.
- 6.36 In consideration of the embedded and design mitigation and management measures, such as the main construction contractor developing and implementing a plan to prevent or reduce the likelihood of climatic hazards affecting construction staff and assets; no significant vulnerability impacts have been identified for the construction phase.

Complete and Operational Phase Effects

GHG Emissions

- 6.37 Annual GHG emissions associated the operational activities of the proposed development are calculated to be in the order of 28,780,190 tCO₂e over the course of the 60-year period.
- 6.38 The net GHGs estimated to be emitted from the operations associated with the proposed development have been re-calculated to be a reduction of 1,934,284 tCO₂e. Average annual emissions are therefore expected to be a reduction of approximately 32,240 tCO₂e. This results from a reduction in vehicle kilometres travelled as a result of the increased capacity and capacity relief, which encourage more direct routes. Furthermore, the increased use of the park and ride site would reduce the lengths of trips before passengers switch modes of transport.
- 6.39 An assessment of the magnitude and significance of these emissions have been deemed as **minor adverse** (not significant). The significance of operational emissions in the future may become more significant as the UK moves towards net zero in 2050.
- 6.40 The GHG emissions resulting from operational phase will contribute less than 1% towards the UK's GHG Inventory and associated relevant five-year carbon budgets, and is therefore not considered to be significant.

Climate Change Resilience

- 6.41 Once complete and operational, receptors such as the road users, physical assets, maintenance workers, maintenance plant and maintenance vehicles may be vulnerable to a range of climate risks.

- 6.42 In consideration of the embedded and design mitigation and management measures, such as maintenance of the drainage system, net gain of biodiversity and the design to withstand a 1 in 100 year flood event, no significant vulnerability impacts have been identified for the operational phase of work.

Mitigation and Monitoring

- 6.43 Applicable measures for the reduction of energy and carbon emissions during the construction phase will be included within the CEMP. The implementation of a Site Waste Management Plan (SWMP) will enable the re-use of materials wherever feasible. A waste minimisation and circular economy workshop was held with client and design team representatives in April 2021, to ensure materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste. The waste minimisation and circular economy opportunities identified during the workshop are recorded in the Waste Minimisation Statement submitted with this planning application (see *ES Volume II Appendix 11-B*).
- 6.44 Due to the minor significance of the GHG emissions and the climate change resilience design measures that are included within the design of the proposed development, no additional mitigation measures are required.

Cultural Heritage

- 6.45 *ES Volume I Chapter 8: Cultural Heritage* presents the findings of an assessment of the likely significant effects of the proposed development on buried archaeology and built heritage assets within the site and surrounding area. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 106 Cultural heritage*.

Baseline

- 6.46 The baseline for cultural heritage was identified through completion of a desk-based assessment, which included a walkover survey to view assets in the vicinity of the proposed development from publicly accessible locations. The desk-based assessment was informed by data collected from various sources, including the Oxfordshire Historic Environment Record (HER) and Historic England's National Heritage List for England (NHLE). The buried archaeology baseline was further supplemented by completion of geophysical surveys in 2021.
- 6.47 In terms of buried archaeology, the desk-based assessment concluded there was evidence of archaeological assets within the 1km study area dating from 10,000BC to the modern era.
- 6.48 In terms of built heritage, within the 1km study area of the site, there are a total of 135 Grade II listed buildings and one Grade I listed building.

Demolition and Construction Phase Effects

- 6.49 In terms of buried archaeology, a Romano-British cemetery is located at the junction between the A40 and Cassington Road (Cassington Ring Settlement and Funerary Complex) along the A40 IBL. While the cemetery has been excavated and no longer survives, there is a possibility that further burials could be located during construction activity. Disturbance of this during construction is anticipated to result in a **moderate adverse (significant)** effect. This would be mitigated during the construction phase via a programme of archaeological mitigation to record and evaluate known archaeological assets.
- 6.50 Other archaeological sites are located along the site. However, these have been assessed to have low value in heritage terms and their disturbance will not result in significant effects. These assets will be similarly recorded and evaluated during the construction phase.
- 6.51 In terms of built heritage, the historic centres of both the Eynsham and Cassington, and all designated and non-designated heritage assets within them, are entirely screened from the road by existing fencing, vegetation and modern housing. There is therefore no impact on built heritage assets, including conservation areas, in Eynsham or Cassington.
- 6.52 Eynsham Hall is a Grade II Registered Park and Garden located north of Barnard Gate. The southern extent of this is located approximately 100m north of the site boundary. Due to its distance from the proposed development and intervening features, there is not considered to be any impact on the setting of the park.

- 6.53 The Grade II listed lock infrastructure along the proposed NCN5 north link at the A40 Duke's Cut will not be directly affected by the construction of the new NCN5 north link.

Complete and Operational Phase Effects

- 6.54 Impacts to buried archaeology will be limited to the construction phase.
- 6.55 In terms of built heritage, there are no operational effects anticipated during operation of the proposed development on any built heritage assets.

Mitigation and Monitoring

- 6.56 A programme of trial trenching based on the results of the geophysical survey will be undertaken and will be submitted to the local authority prior to determination of the planning application. This will date and characterise archaeological assets likely to be impacted by the proposed development and to ground truth the geophysical survey results. The results of these investigations will feed into a mitigation strategy that will minimise impacts on archaeological heritage assets and their setting as far as possible.
- 6.57 An overarching Written Scheme of Investigation (WSI) detailing proposed mitigation works will be submitted to the Authority by the Principle Contractor for review following receipt of the results of the evaluation trenching works. Once agreed, this document would establish the objectives for the historic environment works. The WSI will also set out the mechanisms for the appointed archaeological contractor to design the investigation, undertake evaluation, analysis, reporting and deposit the archive prior to construction.

Geology and Soils

- 6.58 *ES Volume 1 Chapter 9: Geology and Soils* presents the findings of an assessment of the likely significant effects of the proposed development on geology and soils, which includes the potential for the proposed development to mobilise land contamination and affect human health, surface water and groundwater, as well as the effects on soil resources and agricultural land. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 109 Geology and soils*.

Baseline

- 6.59 Data to inform this assessment was obtained from a combination of desk-based study and the results of a ground investigation completed in 2021.
- 6.60 Desk-based sources have been reviewed to identify current and historical land use of the site and identify any potential sources of contamination that could affect nearby receptors. Potential sources of contamination within the site includes Made Ground around Barnard Gate and on the A34 flyover embankment, the dismantled railway of the former Witney Branch of the Great Western Railway, and Wolvercote Railway near Duke's Cut.
- 6.61 Based on a review of the baseline conditions, potential sensitive receptors include:
- Residents at existing properties, and commercial/retail/industrial uses near the proposed development;
 - Surface water;
 - Groundwater;
 - Underground structures;
 - Flora and fauna; and
 - Soils resources and agricultural land.
- 6.62 The proposed development will also require permanent land take within agricultural fields, therefore surveys were undertaken to confirm the Agricultural Land Classification (ALC) of agricultural land within the site boundary.

Demolition and Construction Phase Effects

- 6.63 During construction, a number of standard environmental mitigation measures will be carried out to minimise impacts to both human health and environmental receptors as a result of mobilising land contamination. These will be documented within the CEMP completed by the main construction contractor. Further site specific mitigation measures will likely be recommended following completion of further ground investigation and environmental risk assessments.
- 6.64 Impacts to soil resources will also be mitigated via the implementation of a soil resources plan, which will include mitigation measures for the handling, storing and replacing of soils on site.
- 6.65 Despite this, there will be the loss of some soil resources. ALC Grade 3b land was identified in some parts of the site. This is considered best and most versatile (BMV) agricultural land. Since the proposed development will involve the permanent development of between 1ha – 20ha of Grade 3b land, this is anticipated to result in a moderate adverse (significant) effect.

Complete and Operational Phase Effects

- 6.66 Once the proposed development is complete and operational, there is considered to be no potential for further effects on geology and soils as a result of the mitigation measures implemented during the construction phase.

Mitigation and Monitoring

- 6.67 A Soil Resource Plan would need to be prepared by the contractor prior to the start of construction. The Soil Resource Plan would detail the areas and type of topsoil/subsoil to be stripped, stripping method, haul routes and the management of the soil stockpiles.
- 6.68 The aim of a Soil Resource Plan will be to re-use as much of the surplus soil resources on-site in the detailed design of the proposed development. Any surplus soils will be used in a sustainable manner (i.e. as close to the proposed development as possible and to an after-use appropriate to the soils quality) in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- 6.69 The proposed development would have significant adverse residual effects upon agricultural land, primarily due to the proportion of temporary and permanent land take required to construct the proposed development.
- 6.70 Where agricultural land taken on a temporary basis is restored and returned to the landowner for continued agricultural use, post-construction monitoring would be required to determine whether pre-existing agricultural soil capability had been reinstated.

Landscape and Visual Impact Assessment

- 6.71 *ES Volume 1 Chapter 10: Landscape and Visual* presents the findings of an assessment of the likely significant effects of the proposed development on landscape and visual receptors.
- 6.72 In this assessment, 'landscape receptors' includes consideration of local and published landscape or townscape character areas. Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character. This relates to both rural landscapes and urban landscapes.
- 6.73 Visual receptors relate to 'people' and their existing views. Visual effects relate to the potential for there to be changes to the composition of existing views, from the addition or loss of elements within the view.
- 6.74 The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in the *Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3)* and *DMRB LA 107 Landscape and visual effects*.

Baseline

- 6.75 The site is not located within an AONB.

- 6.76 Following a desk-based review and a site visit, the published landscape character assessments considered relevant to this assessment were:
- National: Natural England, National Character Area 108 (NCA 108)⁷: Upper Thames Clay Vales, 2014;
 - County: Oxfordshire Wildlife and Landscape Study⁸ (OWLS);
 - District: West Oxfordshire Landscape Assessment⁹, 1998;
 - Oxfordshire Historic Landscape Characterisation Project¹⁰, 2017; and
 - Local: Local Landscape Character Areas defined by the Applicant.
- 6.77 The site predominately comprises the A40. The wider study area is characterised by undulating topography, which rises from the flatter plains of several rivers. Woodland cover is sparse, but hedges, hedgerow trees and field trees are frequent.
- 6.78 For the visual assessment, from the fieldwork completed it was assessed that between the Hill Farm junction and Eynsham, the extent of vegetation cover alongside the site and in surrounding study area limited long-distance views of the site, particularly from the north, such that visibility of the site is generally from within or adjacent to the site, along with close range views from PRow close to site.
- 6.79 Between Eynsham and Duke's Cut, the tall mature hedgerows either side of the site generally screen or substantially soften views of the site from PRow and residents in Eynsham and Cassington. Additionally, the site is not visible from the PRow adjacent to the River Thames due to the intervening vegetation.
- 6.80 At Duke's Cut, the extent of vegetation within the site and alongside the canals, rivers, lakes, roads and railway limits the visibility of the site in mid to long range views from across the study area. The exception is that the site is visible in close range views from PRow that are adjacent to the site boundary. There are no views towards the eastern end of the site from the River Thames due to the intervening vegetation and undulating landform.
- 6.81 Following a review of the visual baseline, 34 sensitive visual receptors were identified to be likely to experience visual effects as a result of the proposed development. These are listed below and shown in Figure 10-4 in *ES Volume I Chapter 10: Landscape and Visual*.

Methodology

Assessment Methodology

- 6.82 In summary, the landscape and visual impact assessment methodology assesses the sensitivity of landscape and visual receptors, via an assessment of their value and susceptibility. The magnitude of impacts (or change) caused by the proposed development is then assessed, in relation to matters including scale, extent and duration of the impact. The combination of the sensitivity of the landscape and visual receptors and the magnitude of impact is used to determine the significance of effects, i.e. whether the effects are significant or not. A guide to this relationship between the sensitivity of the receptor, the magnitude of impact and the significance of effect is set out in *ES Volume I Chapter 10: Landscape and Visual*.
- 6.83 The assessment of impacts once the proposed development is complete and operational is undertaken for two time periods. The first period is the 'year 1' assessment, which assesses the impacts of the proposed development in its first year of operation. This assessment is based on winter conditions, when existing deciduous vegetation is not in leaf and therefore the extent of visibility and perception of the proposed development is greater in comparison to summer conditions. The second period is the 'year 15' assessment. The assessment is based on summer conditions and assumes the successful establishment of the proposed planting, such that the planting would be taller in height, ranging between 1m and 8m in height.

⁷ Natural England, National Character Area 108: Upper Thames Clay Vales (2014). Available at: <http://publications.naturalengland.org.uk/publication/5865554770395136>

⁸ Oxfordshire Wildlife and Landscape Study. Available at <http://owls.oxfordshire.gov.uk/wps/wcm/connect/occ/OWLS/Home/>

⁹ West Oxfordshire Landscape Character Assessment (1998). Available at: <https://www.westoxon.gov.uk/planning-and-building/planning-policy/local-plan/local-plan-evidence-base/>

¹⁰Oxfordshire Historic Landscape Characterisation Project, 2017. Available at: <https://www.oxfordshire.gov.uk/residents/environment-and-planning/archaeology/landscape-characterisation>

Photomontage Methodology

- 6.84 *ES Volume 1 Chapter 10: Landscape and Visual* includes several visualisations of the proposed development, which superimpose a computer generated image of the proposed development on an existing photograph (view) of the site. This is based on surveyed photography to enable the proposed development to be accurately located within the existing photographs via computer rendering software.

Construction Phase Effects

- 6.85 For landscape receptors, at the site level, there would be changes to the surface landform within the A40 corridor to break-out the existing road and footways and implement the A40 Dualling, A40 IBL and shared footways and associated junctions. There would also be excavation of fields to construct the attenuation ponds, as well as formation of embankments to construct the pedestrian access between the A40 and the canal. On the basis of the above this is assessed to result in a moderate adverse (significant) effect.
- 6.86 In relation to the published landscape character areas the scale of the construction activity would be small and localised to the A40 corridor and some adjacent fields. In combination with the temporary duration, the construction activity would not result in significant adverse effects to the published landscape character areas.
- 6.87 For the visual assessment, the construction activity would be visible for most of the visual receptors, either due to their proximity to the site, or the height of tall lifting equipment and cranes being visible above intervening vegetation. The construction activity would be seen in the context of vehicles on the A40, the scale and extent of the machinery, particularly the vegetation removal and parts of the A40 in varying stages of construction. This is predicted to result in significant adverse visual effects for 20 receptors.

Complete and Operational Phase Effects (Landscape)

- 6.88 In terms of the landscape effects 1 year after opening to traffic (winter), the A40 Dualling would increase the number of vehicle lanes along the existing road corridor and implement a larger and more engineered junction with Barnard Gate via the roundabout, in comparison to the existing junction. Along the IBL, there would be other structures, via the Eynsham Underpass and the Cassington New Bridge, signage and lighting columns. At Duke's Cut, the recreational value of the site would be improved via the shared cycleway and footway between the A40 and the Oxford canal. Overall, the increase in highways infrastructure would reflect the existing character of the site. The main change would be from the reduction of vegetation with any new planting low in height, such that the proposed development would represent a partial loss to distinctive features of the site.
- 6.89 On the basis of the above, as the sensitivity the landscape is classified as low and the magnitude of impact is considered to be moderate, this is assessed to result in a moderate adverse (significant) effect.
- 6.90 In relation to the published landscape character assessments and their management guidance, the proposed development would be in keeping with these. The proposed development will involve the planting of new woodlands strips, retaining existing vegetation where possible and providing additional planting in comparison to the existing vegetation cover. Therefore, the proposed development is assessed as not resulting in significant adverse landscape effects at year 1.
- 6.91 Compared to the year 1 assessment, the proposed planting would have established by year 15 (summer) to integrate the proposed development into the landscape to a greater degree. The establishment of the new planting would be in line with the character of the area and increase the vegetation structure through additional hedgerows, trees and grassland in comparison to the existing vegetation.
- 6.92 Due to the above, there would be no significant adverse landscape effects at year 15.

Complete and Operational Phase Effects (Visual)

- 6.93 In terms of year 1 visual effects (winter), the additional hardstanding, associated infrastructure, lighting columns and improved structures would be visible for close range receptors, including residents and recreational users due to the reduced amount of roadside vegetation and the low height of the proposed planting. The A40 Duke's Cut would not be visible for visual receptors in the wider landscape, due to being within the existing road corridor and not within the direct line of sight. On this basis, significant adverse visual effects at year 1 of operation are predicted at the following:

- VR2: Recreational users on PRow (bridleway) 353/19/10 and residents within Hill Farm;
 - VR3: Recreational users on PRow (footpath) 353/3/10;
 - VR4: Residents at Whitehouse Cottages;
 - VR6: Residents at Green House Farm and cyclists on South Leith Road; and
 - VR12: Recreational users on PRow (footpath) 206/11/10.
- 6.94 Compared to the year 1 (winter) assessment, the proposed planting in the year 15 (summer) assessment would have established to be taller in height, such that hedgerow planting would be approximately 1.5m tall and trees would range between 5.5m and 8m in height. In combination with the existing retained vegetation being in leaf, views of the proposed development would be largely softened or filtered in views. Where visible, the proposed development would result in views of additional highways infrastructure and vehicles, but in relation to existing views would be in the same part of the view as the A40 and seen in this context. Due to this, the proposed development is not predicted to result in any significant adverse visual effects at year 15 of operation.

Mitigation and Monitoring

- 6.95 No additional mitigation or monitoring is considered to be required for landscape and visual effects. This is because the impacts from the construction phase are inevitable due to the nature of construction activity. Impacts at year 1 of operation are mitigated by the embedded design measures, such that there would not be adverse landscape or visual effects at year 15 of operation.

Material Assets and Waste

- 6.96 *ES Volume I Chapter 11: Material Assets and Waste* presents the findings of an assessment of the likely significant effects arising from consumption of materials and generation of waste as a result of the proposed development. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 110 Material assets and waste*.
- 6.97 The receptors for this assessment are waste management infrastructure in South East region (specifically landfill capacity in this area), and the material assets used to construct the proposed development.

Baseline

- 6.98 The receptors for this assessment are:
- Waste management infrastructure in South East region (specifically the landfill capacity); and,
 - Material assets used for the proposed development construction.
- 6.99 Oxfordshire has permitted and operational capacity for producing approximately 1 million tonnes per annum of recycled and secondary aggregates. This total comprises 0.9 million tonnes of aggregates from recycling of construction, demolition and excavation waste and 0.1 million tonnes per annum for producing secondary aggregates.
- 6.100 For the non-hazardous waste management, total landfill capacity within the study area (inert, non-hazardous and non-hazardous SNRHW) at the end of 2019 was approximately 66.7 million m³. For the hazardous waste management, total hazardous merchant landfill capacity within the study area was approximately 18.4 million m³.
- 6.101 In addition, a waste minimisation and circular economy workshop was held with the client and design team representatives in April 2021. The waste minimisation and circular economy opportunities identified during the workshop are recorded in the Waste Minimisation Statement submitted with this planning application (see *ES Volume II Appendix 11-B*).

Demolition and Construction Phase Effects

- 6.102 For the majority of highways schemes, the largest quantities of materials and waste are generally those associated with earthworks, especially in those cases where a balance between excavation (“cut”) and material placement (“fill”) cannot be achieved. The proposed development will continue to be progressed

during detailed design to optimise the requirements for cut and fill and where possible this will be minimised to reduce the import and export of materials and waste.

- 6.103 It is likely that the proposed development will achieve between 70-99% potential recovery percentage, which exceeds the national target to recover at least 70% (by weight) of non-hazardous construction and demolition waste. Accordingly, the magnitude of impact is considered to be slight, which is assessed to result in a **slight adverse (not significant)** effect.
- 6.104 Construction is expected to generate approximately 27,940 m³ of non-hazardous construction waste (14,647m³ construction waste based on construction value and 13,293m³ of clearance waste). A worst-case scenario where all waste is disposed of to landfill has been applied. This equates to 0.04% of the 66,700,00m³ of landfill capacity within the waste management study area. In practice, a large proportion of non-hazardous and inert waste from the proposed development is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal. Based on the above, the proposed development would result in less than a 1% reduction of landfill capacity within the waste management study area. There is considered to be adequate disposal capacity available to accommodate the non-hazardous and inert waste predicted to arise from construction of the proposed development.

Complete and Operational Phase Effects

- 6.105 An assessment of material assets and waste during the operational phase was scoped out of the assessment as waste generated from the maintenance of the proposed development is expected to be generally the same (in both type and quantity) to that generated currently by the existing road.

Mitigation and Monitoring

- 6.106 As no material assets and waste significant effects have been identified, no further or additional mitigation or monitoring of significant effects is proposed. The main construction contractor will prepare a Site Waste Management Plan based on the Outline SWMP submitted with this planning application (see *ES Volume II Appendix 11-A*). The SWMP will set out monitoring to be undertaken during the construction stage to ensure that the mitigation measures embedded in the proposed development design, and those considered essential to mitigate the effects of construction activities, are appropriately implemented.

Noise and Vibration

- 6.107 *ES Volume I Chapter 12: Noise and Vibration* presents the findings of an assessment of the likely significant effects of the proposed development on noise and vibration. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 111 Noise and vibration*.

Baseline

- 6.108 In the vicinity of the proposed development, environmental noise is dominated by traffic on the A40. Some residential receptors in the wider operational noise study area will have a noise environment influenced by traffic from other roads as well as the A40. There are six Noise Important Areas (NIAs)¹¹ for road traffic noise on the A40 within the 600m calculation area, with four of these being within extent of the proposed development.
- 6.109 A baseline noise monitoring survey was completed along the A40 IBL in November and December 2018. Monitored noise levels at these locations, primarily close to the A40 in the vicinity of Eynsham, indicated that existing background noise levels close to the A40 were 70-80 dB LA_{10,18h}¹². A further noise monitoring survey was completed along the A40 Dualling in June 2021 at three locations in the vicinity of Barnards Gate. This indicated that background noise levels were between 74 and 79 LA_{10,18h}.
- 6.110 Approximately 8,776 noise sensitive receptors have been identified through Ordnance Survey information and included in noise modelled within the 600m study area. Of these, all but 14 are identified as residential properties.

¹¹ NIAs are designated areas that highlight "hotspot" locations where the highest 1% of noise levels at residential locations can be found.

¹² The A-weighted noise level exceeded 10% of the time between 06:00 and 00:00 on a weekday.

Demolition and Construction Phase Effects

- 6.111 The impact of construction activities on noise sensitive receptors will vary. For instance, earthworks, drainage installation and road pavement construction will be transitory, with high noise levels only experienced at nearby receptors for a limited amount of time. However, other activities, such as installation of new parapets works, will be confined to specific locations for longer periods and hence impacts of these activities on nearby receptors may be greater due to the duration of noise exposure. The potentially worst affected receptors are residential properties situated close to the existing A40, where there is the potential for moderate impacts (significant) during the day, and major impacts (significant) at night.
- 6.112 However, the exact significance, duration and frequency of any adverse noise impact resulting from the construction works will be highly dependent upon the methods, timing and duration of the works required. For instance, significant adverse effects due to construction noise are likely where moderate and/or major impacts are predicted to be above the high limit thresholds for long durations (defined in BS 5228-1 as either 10 days out of 15 consecutive days, or 40 days in a consecutive 6 month period), or where very high noise levels prevail for short periods (for a few days/nights for example). Although exact durations and timings of the construction activities are not available at this stage, their transitory and short-term nature is unlikely to result in these trigger thresholds being met. Therefore, significant adverse effects are considered unlikely to occur at the residential properties.
- 6.113 There is the potential for some vibration impacts upon buildings, structures and their occupants within close proximity to the proposed development. The potentially worst affected receptors are residential properties situated close to the existing A40. These residential properties have the potential to be affected by vibration should vibratory rollers be used for nearby earthworks and road construction compaction. In terms of annoyance due to vibration, there is the potential for these properties to experience minor impacts during both the day and night. However, due to the distance between these activities and the closest receptors, significant adverse effects due to vibration during construction are unlikely to occur.

Complete and Operational Phase Effects

- 6.114 All operational traffic noise conclusions reported here are based on the façade at each building, which undergoes the greatest magnitude of change in traffic noise level as a result of the proposed development. Receptors along the A40 Dualling are predicted to experience a range of impacts.
- 6.115 With the inclusion of additional mitigation at Hill Farm there are not expected to be any residual significant effects from operational road traffic noise. Adverse (not significant) effects are expected in the vicinity of Barnard Gate and south Cassington while beneficial (not significant) effects are expected throughout most of Eynsham and north Cassington.

Mitigation and Monitoring

- 6.116 During the construction phase, the CEMP would include a range of industry standard good practice noise mitigation measures that would be required during all works undertaken.
- 6.117 Additional mitigation is required to remove the significant adverse effects predicted at Hill Farm. This could be achieved through the installation of two 3m high noise barriers either side of the access road to the farm as shown in Figure 12-1 in *ES Volume I Chapter 12: Noise and Vibration*. Although the barriers would not remove the increase in traffic noise on the rear façade of the properties, they would reduce traffic noise levels on the façades facing the A40. With the barriers in place the impact of the proposed development on these façades would be beneficial at the two properties closest to the road and **negligible** at the two properties set further back, removing any significant adverse effects.
- 6.118 The significant adverse effects on the south facing façades could also be removed through the use of quieter surfacing between Hill Farm and Whitehouse Cottage. In this case the noise barriers would not be required. This will be considered further at the detailed design stage. If a material is identified to show that operational noise changes at the properties would be no more than negligible, then it could be considered an acceptable alternative form of mitigation at this location.
- 6.119 Surveys will be undertaken to ensure that mitigation measures are installed as required.

Population and Human Health

6.120 *ES Volume I Chapter 13: Population and Human Health* presents the findings of an assessment of the likely significant effects of the population and human health as a result of the proposed development. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 112 Population and human health*.

6.121 The assessment considers the effects on the following:

- land use and accessibility:
 - private property and housing;
 - community land and assets;
 - development land and businesses;
 - agricultural land holdings; and
 - walkers, cyclists and horse riders.
- human health:
 - environmental conditions relevant to health such as changes to noise, air quality and landscape amenity; and
 - severance, which is the ability of communities to access community land, assets and employment.

Baseline

6.122 The proposed development was assessed against the existing socio-economic conditions at the site and the surrounding area and, where relevant, the local context within West Oxfordshire, Cherwell, Vale of White Horse and Oxford. Existing socio-economic conditions have been established by drawing on nationally recognised data and research including (but not limited to) Census 2011, Office for National Statistics employment data, and statistics released by the Department for Education and National Health Service.

Demolition and Construction Phase Effects

6.123 During the construction phase, the proposed development will have an effect on some private property and housing receptors; Barnard Gate Farm and Hill Farm, due to construction noise. There will be no effect on community land and assets; or development land. The proposed development may have a temporary effect on existing businesses located along the A40, but this is assessed to be a slight adverse (not significant) effect.

6.124 The impact on agricultural land holdings refers to the potential loss of or damage to farm capital, such as property, buildings and structures, and the consequential effects that the proposed development has upon land use and agricultural enterprise. The scale of effect is based on the proportion of land required from the holding, the degree of severance and the consequence for the viability of the individual holdings. Land west of Barnard Gate will experience permanent significant adverse effects during the construction of the proposed development, as 100% of the holding will be taken up by construction activity, and will not be given back to the landowner following construction as the land will also be completely taken up by the proposed development (new Barnard Gate Roundabout). All other receptors will experience either neutral and slight adverse (non-significant) effects. The effects of severance are judged on the ease and availability of access to severed land once construction is completed. Two bridleways cross the A40 in proximity of the Eynsham service station, which are Bridleway BR206/31/20 on the northern side of the A40, and Bridleway BR206/9/10 which connects Lower Road to the A40. Under a worst-case scenario, where these would both be temporarily closed during the construction phase, users would not be able to cross the A40 using this route to continue their journeys as no alternative route is available. Overall, the temporary effect of the proposed development upon the crossing during construction is assessed to be moderate adverse, which is significant.

6.125 Health indicators show that the population within the study area is in good health. The sensitivity of the health of the population to change during the construction phase has been assessed. This assessment has been made in accordance with *DMRB LA 112 Population and human health* and the Oxfordshire Health

Impact Assessment Toolkit. Overall, due to the temporary nature of the construction phase, the effect of the proposed development on health is assessed to be a neutral.

Complete and Operational Phase Effects

- 6.126 Once complete and operational, the proposed development will have no further effect on private property and housing. There is assessed to be a slight beneficial effect on community land and assets, as the proposed development would improve local connectivity to community facilities, particularly facilities by improving foot/cycle links and public transport across the study area. The proposed development will also have a slight beneficial effect on local connectivity to development land for employment purposes.
- 6.127 The proposed development will introduce new Walking, Cycling and Horse riding (WCH) infrastructure across the study area. In some instances, this new infrastructure could increase the length of journeys between homes, places of work and community facilities. In line with DMRB guidance such increases to journey lengths are assessed as negative impacts, however, it should be recognised that the new WCH infrastructure has benefits in terms of improved user safety, user experience and participation in active travel.
- 6.128 The proposed development is assessed to have a positive impact on health, as it will improve access to healthcare and social infrastructure, improve the health of residents who increase their amount of exercise through use of pedestrian/cycle links and improve road safety.

Mitigation and Monitoring

- 6.129 With regards to the impacts during the construction phase on human health, the CEMP would include a range of industry standard good practice construction phase measures required during all works. No monitoring is required additional to that detailed in *ES Volume 1 Chapter 5: Air Quality* and *ES Chapter 12: Noise and Vibration*.
- 6.130 During operation, there are no requirements for any monitoring of significant effects.

Road Drainage and the Water Environment

- 6.131 *ES Volume 1 Chapter 14: Road Drainage and the Water Environment* presents the findings of an assessment of the likely significant effects of the proposed development on the water environment. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with guidance in *DMRB LA 113 Road drainage and the water environment*.

Baseline

- 6.132 Generally, the topography of the study area is flat, as the majority of the land is associated with the floodplain of the River Thames. The land use within the proposed development is generally agricultural, comprising arable fields and improved grassland for grazing animals.
- 6.133 The study area includes several key Water Framework Directive (WFD) classified surface water bodies such as the River Evenlode, Chil Brook and Oxford Canal, all of which would be crossed by the proposed development. Other non-WFD classified water bodies crossed by proposed development include Eynsham Mead Ditch, Kingsbridge Brook, Old Canal and West Mead Ditch (note that these are still covered by the WFD but in association with other classified water bodies).
- 6.134 The River Thames is located downstream, to the south, of the proposed development and not directly impacted by the proposed development. However, the watercourses crossed by the proposed development all eventually flow into the River Thames. There are also a number of gravel quarry lakes, ponds and pools, some of which are natural features and others associated with industry.

Demolition and Construction Phase Effects

- 6.135 With mitigation as described in this ES chapter, and which will be defined in more detail in a future CEMP and Water Management Plan (WMP), short term, temporary, indirect and direct impacts on local watercourses may occur from construction site runoff (excess sediments and risk from chemical pollutants). Depending on the importance of the receiving watercourses, the resulting effects are generally neutral or

slight adverse (not significant), except for the River Evenlode, where a moderate adverse effect (significant) has been predicted due to the potential for piling to be required in close proximity to the river bank in order to facilitate the extension of Cassington New Bridge.

- 6.136 In terms of assessment of groundwater flow and level, for Oxford Meadows SAC and Port Meadow SSSI, it is considered that the potential effects are not significant. As the proposed development is not anticipated to require significant dewatering of groundwater from trenches, together with the general best practice measures in the CEMP and WMP, impacts on groundwater dependant terrestrial ecosystems are not anticipated.

Complete and Operational Phase Effects

- 6.137 Highway runoff is a major contributor to diffuse pollution to the aquatic environment because roads collect a wide range of pollutants which accumulate on the carriageway. These contaminants can be transported to watercourses surrounding the roads after periods of rainfall generate surface water runoff. Loadings of contaminants can be particularly high in the 'first flush' of runoff following periods of dry weather. They can also become stored in neighbouring buffer zones (i.e. vegetated verges and banks and even in the channel of receiving watercourses) and are later mobilised under suitable conditions.
- 6.138 For the A40 Dualling, with mitigation in the form of new SuDS treatment measures that will be implemented as part of the drainage design and maintained by the Applicant, a no significant adverse effects are predicted on Chil Brook, which as a receptor of high importance. Likewise, no significant effects are predicted on the Tributary of Chil Brook, which as a receptor of medium importance.
- 6.139 For the A40 IBL and A40 Duke's Cut, with mitigation in the form of new SuDS treatment measures that will be implemented as part of the drainage design and maintained by the Applicant, no significant adverse effects are predicted for most watercourses receiving road runoff. The exceptions are Eynsham Mead Ditch and Horsemere Lane Ditch, where the proposed development results in an improvement by providing treatment of existing dissolved metal/sediment-bound pollutant impacts identified for the existing situation.

Mitigation and Monitoring

- 6.140 To supplement existing site-specific water quality data further pre-construction and during construction water quality monitoring is proposed. The scope of the water quality monitoring, action and reporting procedure will be set out in a Water Quality Monitoring Plan. The LLFA and Environment Agency will be consulted on the scope of the Water Quality Monitoring Plan.
- 6.141 It is proposed that a minimum of six water quality monitoring visits are undertaken in advance of any construction works. These visits would be spread out over up to six months to ensure a range of conditions and flow states are captured, with monitoring locations including key receptors where construction works are proposed in, adjacent to, over or under a watercourse including as a minimum, the River Evenlode, Chil Brook and tributaries, Eynsham Mead Ditch, Old Canal, West Mead Ditch, Kingsbridge Brook, and the Oxford Canal. They should be located close to the location of the works (e.g. nearby outfall).
- 6.142 During construction, it is proposed to undertake further water quality monitoring to ensure that the proposed mitigation measures in the CEMP and WMP are operating as planned and preventing pollution. During the operational phase, there will be regular inspection and maintenance of the drainage systems and culverts.
- 6.143 The maintenance regime for ponds, swales, infiltration basins, culverts and road drainage networks will be identified to reduce the residual risk from failure or improper function of the drainage system due to blockages. This risk of flooding can also be alleviated during design by improving the existing drainage system where impermeable areas are increased.

Traffic and Transport

- 6.144 *ES Volume 1 Chapter 15: Traffic and Transport* presents the findings of an assessment of the likely significant effects of the proposed development on traffic and transportation. The assessment considers both the impacts during construction and operation of the proposed development and is conducted in line with methodology set out in the Institute of Environmental Assessment (IEA, now IEMA) 'Guidelines for Environmental Assessment of Road Traffic', and withdrawn but still relevant guidance in *DMRB, Volume 11, Section 3, Part 9* and updated guidance *DMRB LA 112 Population and human health*.

Baseline

- 6.145 The existing baseline traffic and transport conditions and sensitive receptors were identified during the preparation of this assessment. The effects on traffic and transport during the operational phase of the proposed development was assessed by comparing predictions of traffic flows with and without the proposed development.
- 6.146 The assessment was informed by traffic data obtained from the Oxfordshire Strategic Model (OSM) and a cordoned A40 Corridor Highway Assignment model as well as other data sources.

Demolition and Construction Phase Effects

- 6.147 Given the nature of the proposed development, it is anticipated that impacts would be experienced by travellers along the A40 within the extents of the proposed development in the first instance. This could include car drivers on the A40, users of the Eynsham Park & Ride, bus passengers using the bus lane, or pedestrians/cyclists using the adjacent pedestrian/cycle links or crossings.
- 6.148 Due to the high flows on the A40 and the average journey speed the majority of links/approaches are considered to currently result in 'high' driver stress. While driver stress may increase due to the presence of construction activity adjacent to the carriageway, the forecast additional traffic flow associated with the construction period and potential reduction in speed limit during the highways works is not anticipated to result in a significant change in driver stress compared to the baseline situation.
- 6.149 It is expected that as part of the CEMP / CTMP, HGVs will be routed to the A40 and to avoid local towns/villages, including Eynsham, unless they are delivering from local suppliers and therefore impacts on the surrounding area would be minimal. Information provided by the ECI Contractor, indicates that there may be up to 125-150 daily staff vehicles accessing the site between Winter 2023 and Summer 2024. Staff would be expected to work in shifts and therefore not all travel in the same hour and therefore it is not considered that the change in level of traffic flow would be significant in the context of the existing traffic flows on the A40.
- 6.150 The potential reduction in speed limit during the works, the presence of the construction and additional HGV movements are not anticipated to result in a significant change in driver stress, driver delay or bus delay compared to the baseline situation.
- 6.151 Therefore, for driver stress and delay, it is considered that the overall change compared to the baseline situation is adverse but the magnitude of change is small and will be short-term.
- 6.152 For bus users during the construction period, it may be necessary to temporarily suspend or relocate the existing bus stops on the A40 within the proposed development extents over the short term.

Complete and Operational Phase Effects

- 6.153 The effect on driver stress has been assessed for the A40, and also for side roads at key junctions along the route. The driver stress assessment is based on average traffic flows (average of the AM & PM peak hours) taken from the approaches to the junctions on the highway network along the A40. Overall, the proposed development will have a beneficial effect on driver stress, although the effects will be felt the most by road users travelling eastbound, followed by drivers on approaches to junctions along the A40, and then drivers travelling westbound on the A40. The effect on driver delay is measured at the junctions (A40/Barnard Gate Roundabout, A40/Eynsham Western Roundabout, A40 Park & Ride Signalised Junction, A40/Witney Road Signalised Junction, A40/B4449 Eynsham Roundabout, and A40/Cassington Signalised Junction) on the highway network along the A40 in the vicinity of the proposed development. During the AM peak, all six junctions along the A40 are forecast to have a major beneficial (significant) effects as a result of the proposed development. During the PM peak, one junction is forecast to have a major beneficial (significant) effect, with one minor beneficial (not significant) effect, two minor adverse (not significant) effects, one moderate adverse (significant) effect and one major adverse (significant) effect as a result of the proposed development.
- 6.154 The effect on bus delay has been assessed for the A40. The westbound bus journey time will remain approximately the same. This is mainly due to the additional bus stops along the westbound A40 and the additional signalised crossings on the A40 that form part of the proposed development. Also, the buses are required to enter the Park & Ride Site which also increases the westbound journey time. The addition of the westbound bus stops and the Park & Ride increases the accessibility of the bus routes along the A40,

which provides a benefit of the proposed development. For eastbound bus journeys, the journey time will reduce. Overall, the combined effect of the proposed development on eastbound and westbound bus passengers is considered major beneficial (significant).

Mitigation and Monitoring

- 6.155 No primary environmental design and management recommendations have been identified as part of the assessments reported within this chapter.
- 6.156 However, it should be noted that the scheme is designed to significantly improve the reliability, frequency and variety of destinations in Oxford served by public transport, thereby encouraging a reduction in car travel into Oxford. The proposed design includes a number of elements which will help to reduce potential environmental effects including;
- dualling section of the A40;
 - improvements to the Barnard Gate junctions;
 - bus prioritisation and improved bus facilities;
 - enhance active travel opportunities and facilities;
 - new crossings for NMUs;
 - new bus stops; and
 - footway / cycleway improvements.
- 6.157 A CTMP will be required for each phase of the construction. This will identify the strategy for controlling/ minimising traffic related impacts of the construction, in particular the effects of highways works on the A40 and associated with deliveries to the site.

7. Cumulative Effects and Effect Interactions

- 7.1 The assessment draws upon guidance within *DMRB LA 104 Environmental assessment and monitoring*¹³.
- 7.2 The assessment methodology for cumulative effects also draws upon the Planning Inspectorate Advice Note Seventeen which describes a four-stage approach to the assessment of cumulative effects¹⁴.
- 7.3 The EIA Regulations require that an EIA considers combined effects and cumulative effects. These two types of effect are defined below:
- The combined effects, being the combined effects of individual impacts of the proposed development, for example noise, airborne dust or traffic effects on a single receptor; and
 - The cumulative effects, assess the effects of other development projects which may, on an individual basis, be not significant but, cumulatively, have a significant effect on a receptor.

Combined Effects

- 7.4 A review of the residual effects presented in this ES has been undertaken in order to identify the potential for interactions and so, combined effects of individual impacts.

Demolition and Construction Phase Effects

- 7.5 Some temporary moderate adverse visual (significant) effects would be experienced by some pedestrian and cycle network receptors during the construction phase, and these may be exacerbated by additional temporary slight (not significant) and moderate (significant) effects relating to temporary closures of the existing pedestrian and cycle network. Together, these lead to a combined temporary moderate adverse (significant) residual effect on some pedestrian and cycle network receptors. These effects will be temporary,

¹³ DMRB, Part L: LA 104 Environmental assessment and monitoring

¹⁴ Planning Inspectorate Advice Note 17: Cumulative Effects

and it is possible that the diversion routes for the temporarily closed walking and cycling routes would avoid the construction works and equipment that lead to the adverse visual effects. This would, in some instances, avoid the in-combination effects noted in the assessment.

- 7.6 No additional mitigation has been identified above the measures as outlined within *ES Volume I Chapter 13: Population and Human Health*, and *ES Volume I Chapter 10: Landscape and Visual*.

Complete and Operational Phase Effects

- 7.7 Some slight (not significant) and moderate (significant) adverse visual effects would be experienced by some pedestrian and cycle network receptors during the operational phase year 1 (slight adverse only during year 15), and these may be exacerbated by additional slight adverse (not significant) effects relating to operational accessibility. Combined, these would lead to a combined slight adverse (not significant) residual effects, although once the proposed landscape planting has had the time to establish, these effects will become less prominent as the planting grows and views of the new carriageway are obstructed.
- 7.8 No additional mitigation has been identified above the measures as outlined within *ES Volume I Chapter 13: Population and Human Health*, and *ES Volume I Chapter 10: Landscape and Visual*.

Cumulative Effects

- 7.9 Other known nearby developments that are of a sufficient scale to have the potential to combine their effects with the proposed development were identified and agreed through pre-application consultations with the Authority.

Demolition and Construction Phase Effects

- 7.10 Based on the review of environmental information available for the proposed development and the 13 shortlisted other developments, there are likely to be the following significant cumulative effects.
- 7.11 ID 48: Salt Cross Garden Village: The ES for the Salt Cross Garden Village reports a minor adverse effect to the PRoW to the north east of the site and a major adverse effect on the PRoW that goes through the site (206/9/10, 206/31/20, 206/20/10). In *ES Volume I Chapter 10: Landscape and Visual Impact*, a slight adverse visual effect will occur in relation to 206/9/10 and 206/31/20 (206/20/10 is not assessed). The impact will be felt most prominently in those areas where the PRoW goes through the Salt Cross Garden Village site. Cumulatively, the effects from each development on these sensitive receptors are deemed to lead to a moderate adverse (significant) effect. There would be some softening of views from the retained vegetation being in leaf, as well as the additional planting reaching maturity within the other development at year 15. Whilst these mitigation measures will provide some screening, the views from these sensitive receptors will still be materially different due to the presence of both developments. Therefore, the in-combination visual effect of the proposed development at construction will be temporary moderate adverse (significant).
- 7.12 ID 48: Salt Cross Garden Village: The ES for the Salt Cross Garden Village assesses that there will be a moderate beneficial (significant) effect on employment generation during the construction phase. In *ES Volume I Chapter 13: Population and Human Health*, it reports a that there will be a slight adverse effect on the existing businesses which are located along the existing A40 corridor. Employment generation is not specifically assessed, however it is likely that the construction of the proposed development would also generate a large amount of employment due to its size. The combined effect of the construction of the other development will bring additional employment as it is large in nature. Therefore, the overall cumulative effect is likely to become a temporary moderate beneficial (significant).

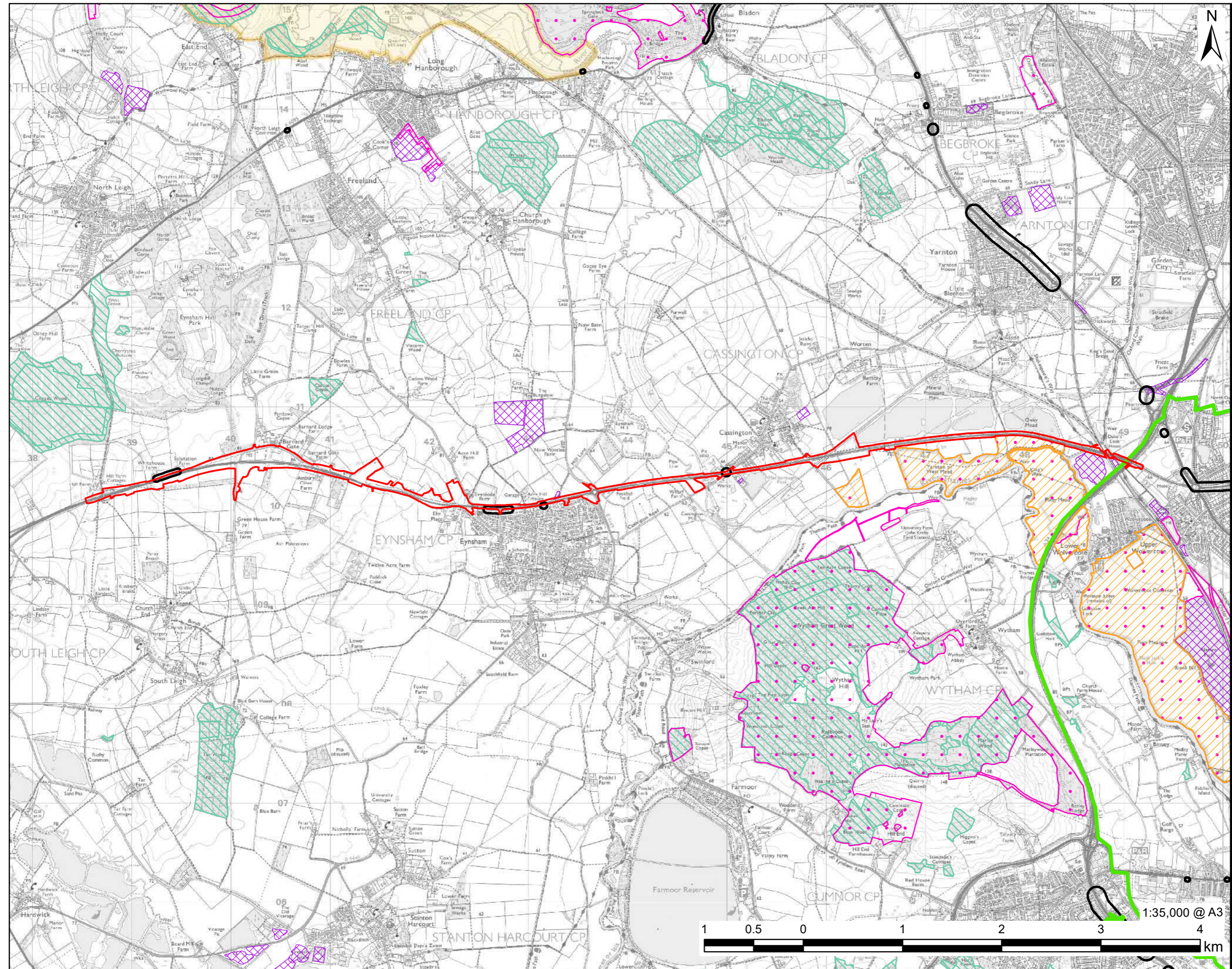
Complete and Operational Phase Effects

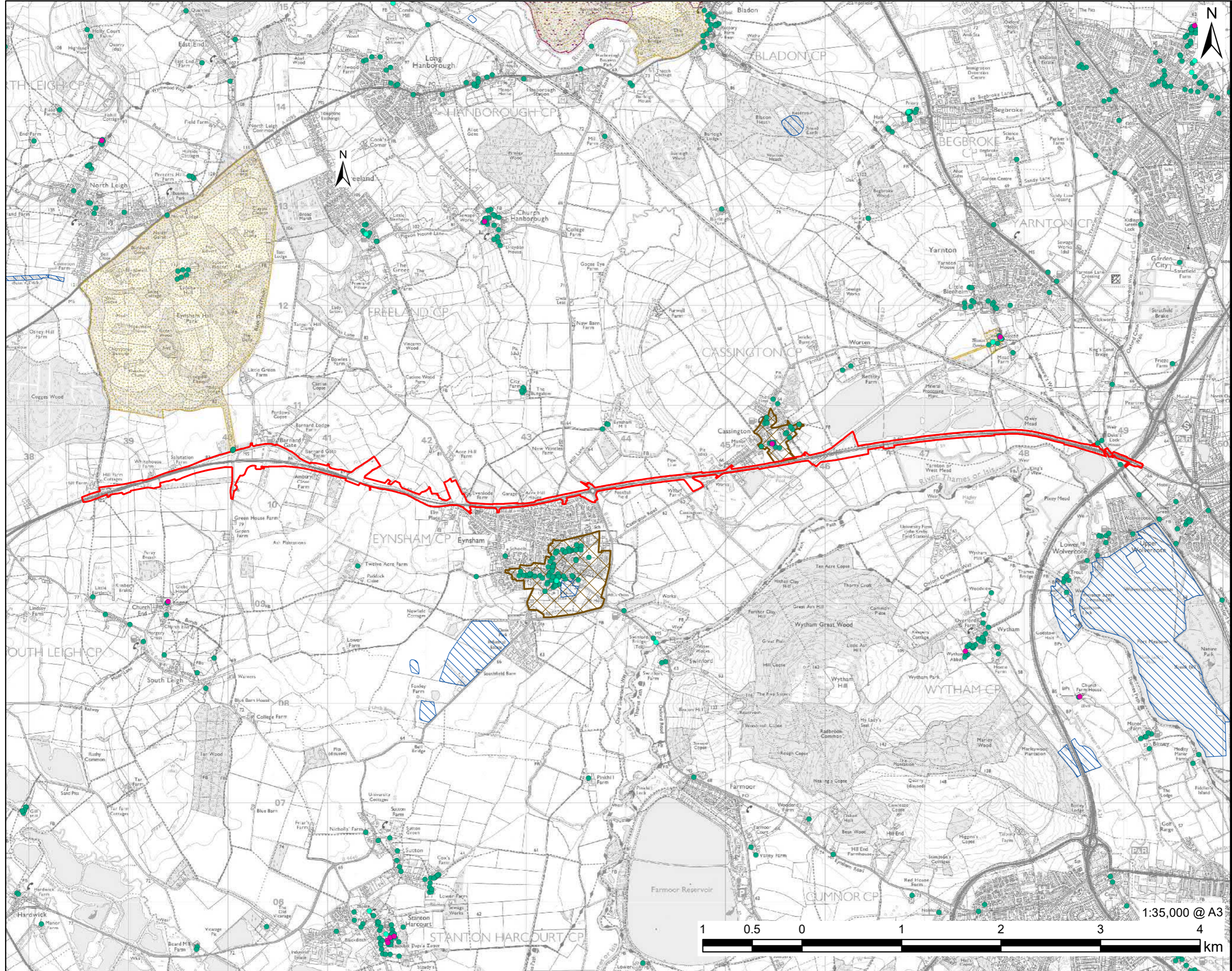
- 7.13 Based on the review of environmental information available for the proposed development and the 13 shortlisted other developments, there are likely to be the following significant cumulative effects.
- 7.14 ID 48: Salt Cross Garden Village: The ES for the Salt Cross Garden Village assesses that there will be a moderate beneficial (significant) effect on employment generation during the operational phase. As stated in *ES Volume I Chapter 13: Population and Human Health*, there will be a neutral effect on private property and housing, there will be a neutral effect on community land, slight beneficial effect on access to community

land, slight beneficial effect on development land for employment purposes, and a positive effect on health effects due to severance, changes in pedestrian delay, fear and intimidation, physical activity and road safety. Overall, the effect of the proposed development during the operational phase development land for employment purposes may interact cumulatively with the effect of the other development on employment generation. It is therefore considered that this would result in a moderate beneficial (significant) cumulative effect on employment generation.

8. Environmental Statement Availability

- 8.1 This ES is available for viewing by the public via the OCC public access portal: https://www.oxford.gov.uk/info/20066/planning_applications/328/view_and_comment_on_planning_applications.
- 8.2 OCC should be contacted by telephone (01865 792422) or by email (planning@oxfordshire.gov.uk) to make arrangements to view the ES in hard copy.
- 8.3 Comments on the planning application should be made via the OCC public access portal: https://www.oxford.gov.uk/info/20066/planning_applications/328/view_and_comment_on_planning_applications.





LEGEND

- Site Boundary
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Conservation Area
- Parks and Gardens
- Scheduled Monument
- World Heritage Site

NOTES

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ISSUE PURPOSE
ENVIRONMENTAL
IMPACT ASSESSMENT

PROJECT NUMBER
60615257

SHEET TITLE
Heritage Designations

SHEET NUMBER
Figure 2

