

5.0 Transport and Access

5.1 Introduction

- 5.1.1 This chapter of the ES will identify and describe the nature and significance of the potential effects in relation to transport and access to the site as a result of the Proposed Development.
- 5.1.2 Jubb UK is instructed by Hallam Land Management to undertake a Transport Assessment as part of the Environmental Statement (ES) submitted as part of the proposed development at North West Bicester (north east of the Marylebone- Birmingham railway line).
- 5.1.3 The transport and access ES chapter will refer to the detailed Transport Assessment (TA), which is attached as an Appendix to this chapter of the ES.
- 5.1.4 Chapter 8 of the TA sets out the forecast trip rates using the Predict & Provide approach and compares these against the previous application (14/01384/OUT) which was made by A2Dominion and in relation to which the Council resolved to grant consent. The review indicates that a much higher traffic flow was previously assessed for the previous application and that the proposal which proposes additional residential units will result in materially less external traffic than was envisaged in 2014.
- 5.1.5 The approach undertaken for the Transport ES Chapter that supported the previous application has been used to produce this Transport ES Chapter.

Competency

- 5.1.6 In accordance with the Environmental Impact Assessment (EIA) Regulations (2017) the ES chapter have been carried out by competent experts, comprising Members of the Chartered Institute of Highways and Transportation, and is in accordance with guidance of the professional institution and Guidelines for the Environmental Assessment of Road Traffic¹ published by The Institute of Environmental Assessment in 1993 (now the Institute of Environmental Management and Assessment (IEMA).
- 5.1.7 Jubb is a multi-disciplinary engineering consultancy with a team of specialist transport planners with over 50 years' experienced and is frequently called upon to provide expert evidence at Public and Local Plan Inquiries. Jubb have experience and expertise of the EIA process.

5.2 Regulatory and Policy Context

5.2.1 This impact assessment has been undertaken in accordance with current legislation, national and local plans and policies.

National Planning Policy Framework and Planning Practice Guidance

National Planning Policy Framework, 2021

5.2.2 The revised NPPF was updated in July 2021 and replaces the previous NPPF. The document sets out the Government's planning policies for England and how these should be applied.

5.2.3 The NPPF states that the "*purpose of the planning system is to contribute to the achievement of sustainable development*", which itself is defined as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*". The NPPF is based on a "*presumption in favour of sustainable development*", as detailed in paragraph 11.

5.2.4 Considering transport, the NPPF guides that transport issues should be considered at the earliest stage of development proposals. It is noted that "*The planning system should actively manage patterns of growth*", with significant development sited "*on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes*".

5.2.5 Paragraph 110 of the NPPF states the following:

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

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

5.2.6 Crucially, paragraph 111 states that "*Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe*".

National Planning Practice Guidance: Travel Plans, Transport Assessment and Statement in decision taking (2014)

5.2.7 Published in 2014, the Government's Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements in Decision-Taking' outlines the fundamental principles that form the basis of Travel Plans (TPs), TAs, and Transport Statements (TSs). The guidance states that producing these documents provides a means to assess, and mitigate, the negative transport impacts of development; in this way, sustainable development can be achieved.

5.2.8 The guidance sets out that whilst TPs promote the implementation of sustainable travel into the planning process, TAs and TSs assess the potential transport implications of developments and significantly whether the residual transport impacts of a proposed development are "severe".

Other Guidance

5.2.9 Guidelines for the Environmental Assessment of Road Traffic² published by The Institute of Environmental Assessment in 1993 (now the Institute of Environmental Management and Assessment (IEMA) – this chapter has been carried out in accordance with this guidance to assess the transport environmental impact of the Proposed Development.

5.2.10 The IEMA Guidelines set out two rules that are used to establish whether an environmental assessment of traffic effects should be carried out:

- Rule 1 - Include road links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)
- Rule 2 - Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

5.2.11 In this instance it is considered that as the Development forms part of North West Bicester allocation, and is adjacent to sensitive residential areas and communities, the 10% threshold should apply.

5.2.12 TRICS Guidance Note on the Practical Implementation of the Decide and Provide Approach (February 2021) - this approach is vision-led and seeks to provide a preferred future of reduced car dependence through providing a development path best suited to achieving it.

5.2.13 In contrast to the previous Predict & Provide (P&P) approach, which often delivered schemes based on unrealistic worst case traffic assumptions, the Decide and Provide (D&P) approach, develops schemes based on more realistic traffic assumptions, taking into account changes in general travel patterns through technological advances and changes in the perception relating to the esteem associated with car ownership and use.

5.2.14 The TRICS D&P Guidance Note emphasises that:

"The D&P approach provides the opportunity for more positive and integrated transport and land use planning. It also provides the opportunity to meaningfully implement the modal hierarchy, giving greater centrality to the up-front consideration of walking and cycling, rather than a more cursory treatment as residual or less considered modes that has sometimes, historically, been the case.

It is important that, as transport professionals, we engage fully with this paradigm shift. We need to take decisions and make provisions that respond to the following key drivers including the following:

- *The drive towards Net Zero climate change or greenhouse gas (GHG) emissions.*
- *Strategies to decarbonise the transport sector, being progressed in the UK's Transport Decarbonisation Plan.*
- *In terms of health and wellbeing, respond to the UK's obesity crisis (also further compounded by Covid-19) and further promote active travel provision."*

5.2.15 'Manual for Streets' (MfS), launched in March 2007, superseded 'Design Bulletin 32', first published in 1977 and its accompanying guide "Places, Streets and Movement" providing new advice for the design of residential streets in England and Wales. A further document "Manual for Streets 2: Wider Application of Principles" was subsequently published in October 2010. The document builds on the original philosophies and demonstrates how they can be extended to encompass the design of busier streets and non-trunk roads. It provides a flexible and pragmatic guidance to assist Local Planning and Highway Authorities in managing their urban highway network.

5.2.16 The overarching theme of MfS is to increase the quality of life through good design which creates people-orientated streets with a focus on the 'place function' of a street. It highlights the importance of interactions between all road users and states that:

"Streets should not be designed just to accommodate the movement of motor vehicles. It is important that designers place a high priority on meeting the needs of pedestrians, cyclists and public transport users, so that growth in these modes of travel is encouraged"

5.2.17 Manual for Streets aims to assist in the creation of zones for movement that:

- Help to build and strengthen the communities they serve;
- Meet the needs of all users, by embodying the principles of inclusive design;
- Form part of a well-connected network;
- Are attractive and have their own distinct identity;
- Are cost-effective to construct and maintain; and
- Are safe.

Local Policy

Cherwell Local Plan Part 1 2011-2031 (Adopted 2015)

5.2.18 The Cherwell Local Plan 2011 - 2031 sets out how the district will grow and change up to 2031.

5.2.19 The underpinning vision is as follows:

"By 2031, Cherwell District will be an area where all residents enjoy a good quality of life it will be more prosperous than it is today. Those who live and work here will be happier, healthier and feel safer."

5.2.20 The document then outlines what needs to be done to ensure that the vision can be achieved, in relation to transport the following are relevant:

- *"We will develop a sustainable economy that is vibrant and diverse with good transport links and sound infrastructure, supported by excellent educational facilities. Our economy will grow to provide more diverse employment for our increasing population and reduce the need for our residents to travel outside the district for work."*
- *We will improve road, rail and public transport links and provide increased access to services and facilities to cater for the needs of the district. In particular, we will focus on measures aimed at managing road congestion, improving public transport and improving access to town centres and other shops and services."*

5.2.21 In Section B of the document, Policy SLE 4: Improved Transport and Connections provides details on what can be done to improve transport in the district:

"The Council will support the implementation of the proposals in the movement strategies and the Local Transport Plan to deliver key connections, to support modal shift and to support more sustainable locations for employment and housing growth."

We will support key transport proposals including:

- *Transport Improvements at Banbury, Bicester and at the Former RAF Upper Heyford in accordance with the County Council's Local Transport Plan and Movement Strategies*
- *Projects associated with East-West rail including new stations at Bicester Town and Water Eaton*
- *Rail freight associated development at Graven Hill, Bicester*
- *Improvements to M40 junctions.*

Consultation on options for new link and relief roads at Bicester and Banbury will be undertaken through the Local Transport Plan (LTP) review process. Routes identified

following strategic options appraisal work for LTP4 will be confirmed by the County Council and will be incorporated in Local Plan Part 2.

New development in the District will be required to provide financial and/or in-kind contributions to mitigate the transport impacts of development.

All development where reasonable to do so, should facilitate the use of sustainable modes of transport to make the fullest possible use of public transport, walking and cycling. Encouragement will be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. Development which is not suitable for the roads that serve the development, and which have a severe traffic impact will not be supported."

5.2.22 The principal policy in relation to North West Bicester is Bicester1 which allocates a site of 390 hectares for a for a new zero carbon mixed use developmnet including 6000 new homes at North West Bicester. Among the additional expectations set out in the policy are the following:

- At least 3,000 jobs (approximately 1,000 jobs on B use class land on the site) within the plan period
- *Up to four primary schools and one secondary school;*
- *Forty percent green space, half of which will be public open space;*
- *Pedestrian and cycle routes;*
- *proposals to include appropriate crossings of the railway line to provide access and integration across the North West Bicester site. Changes and improvements to Howes Lane and Lords Lane to facilitate integration of new development with the town.*
- *Good accessibility to public transport services should be provided for, including the provision of a bus route through the site with buses stopping at the railway stations and at new bus stops on the site*
- *New links under the railway line and to the existing town;*
- *Local Centres to serve the new and existing communities; and*
- *Integration with existing communities."*
- *Contributions to improvements to the surrounding road networks, including mitigation measures for the local and strategic highway network,*
- *Measures to prevent vehicular traffic adversely affecting surrounding communities.*

North West Bicester Supplementary Planning Document, 2016

5.2.23 North West Bicester Supplementary Planning Document (SPD) provides more detailed guidance for what will be provided at North West Bicester amplifying the policy as set out in Bicester1 in the Local Plan.

5.2.24 Section 3 of the SPD outlines North West Bicester Vision and objectives, it states that the vision:

"The Vision for North West Bicester has been guided to a large extent by the Eco-towns Planning Policy Statement (PS)"

5.2.25 Section 3 goes on to describe the overarching vision for North West Bicester:

"In this SPD, the vision for North West Bicester is for a high-quality development, well integrated with the existing town, which provides homes, jobs and local services in an attractive landscape setting, conserves and enhances heritage assets including historic landscape features, increases biodiversity, and addresses the impact of climate change. It is based on the principles of sustainable zero carbon development designed to meet the effects of future climate change including extreme weather events and reduced energy and water use."

Oxfordshire Local Transport Plan

5.2.26 Connecting Oxfordshire: Local Transport Plan 2015 to 2031 (LTP4) sets out the policy and strategy for developing the transport network in Oxfordshire up until 2031. LTP4 has been developed with input from a number of parties including district and city councils, businesses, MPs and public consultation.

5.2.27 Four main over-arching transport goals have been outlined within the document; these include:

- *"To support jobs and housing growth and economic vitality;*
- *To reduce transport emissions and meet our obligations to Government;*
- *To protect, and where possible enhance Oxfordshire's environment and improve quality of life; and*
- *To improve public health, air quality, safety and individual wellbeing."*

5.2.28 In order to reach these goals ten objectives for transport have been developed, these goals are as follows:

- *"Maintain and improve transport connections to support economic growth and vitality across the county*
- *Make most effective use of all available transport capacity through innovative management of the network*
- *Increase journey time reliability and minimise end-to-end public transport journey times on main routes*
- *Develop a high-quality, innovative and resilient integrated transport system that is attractive to customers and generates inward investment*
- *Minimise the need to travel*
- *Reduce the proportion of journeys made by private car by making the use of public transport walking and cycling more attractive*

- *Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment*
- *Reduce per capita carbon emissions from transport in Oxfordshire in line with UK 'Government targets*
- *Mitigate and wherever possible enhance the impacts of transport on the local built, historic and natural environment*
- *Improve public health and wellbeing by increasing levels of walking and cycling, reducing transport emissions, reducing casualties and enabling inclusive access to jobs, education, training and services."*

5.3 Assessment Methodology

Overview of Approach

- 5.3.1 The aim of the assessment has been to identify, as far as reasonably possible, the nature of the transport changes within the area of the proposed development, to assess significance and to identify any appropriate mitigation measures. The assessment will include consideration of traffic and transport impacts during construction as well as impacts during the operation of the proposed development.
- 5.3.2 The study area of the transport-related elements of the ES will be determined in accordance with the recommendation of the "Guidelines for Environmental Assessment of Road Traffic". In this instance the study area is effectively defined by the County Council Bicester Transport Model (BTM).
- 5.3.3 Typical daily and peak hour peak construction movements will be assessed with reference to a programme of development and infrastructure construction activities, and the likely trip generation associated with these movements. These additional construction movements would be assessed with reference to the Baseline movements.
- 5.3.4 The Post Development Completion effects will be assessed by reference to the local highway authority's BTM, using the 2031 Do Something peak hour movements. For the purposes of assessment completion will be assumed to be in 2031.
- 5.3.5 Consideration will be given to the peak time impacts within the TA whilst the ES will consider the impact of daily traffic flows.
- 5.3.6 In determining the likely Post Development completion effects, allowance will be made for internalisation, innovation and homeworking and for behavioural change.

Scoping and Response

- 5.3.7 A Scoping request was submitted to Cherwell District Council, who consulted Oxfordshire County Council (OCC) on transport matters, in September 2021.

5.3.8 A summary of OCC's response that forms part of the District Councils issued Screening Opinion is provided as follows:

- For transport purposes, committed development to be included in the cumulative assessment will need to include permitted non-Local Plan development, which is not currently included in the Bicester Transport Model. This includes the Great Wolf leisure resort at Chesterton. The impact of the proposed Oxfordshire SFRI and logistics proposals at nearby Baynards Green should also be taken into account. This, as well as whether there are any other projects that should be included, should be discussed further with OCC.
- Whilst National Highways seem to have agreed that the potential impacts on J9 and J10 of the M40 could be scoped out of the ES, OCC have advised that before this decision is taken, a proportionate impact assessment should be undertaken. National Highways will expect to consider, through the application, the impact of the development on the Strategic Road Network as it will be important to ensure that it can continue to operate safely and efficiently. It is requested that this matter form part of the discussions to agree the scoping of the Transport Assessment.
- Please note with respect to para 2.19 that the realignment of the A4095 has not commenced.
- OCC refer to the need for the assessment to take into account differences between the proposed location for accesses and those identified by the NW Bicester Masterplan.
- The proposal will need to include connections to the new cycle and pedestrian link already in place to allow connectivity with future development south of the railway. A link to the north will also need to be facilitated (towards application site 21/01630/OUT, over the watercourse).
- In addition to the documents referenced at paragraph 5.8, reference should also be made to LTN1/20 and consideration must also be given to the Bicester Local Cycling and Walking Improvement Plan.
- Reference is made to a 'North West Bicester Transport Model' the model that needs to be used is the Bicester Transport Model.
- Any allowances for innovation, homeworking and behavioural change will need to be made in line with relevant current guidance.
- At 5.25, reference to the IEMA Guidelines is made. Whilst these are the industry standard, they are dated and focus on pedestrian amenity. The amenity of other Non-Motorised Users should additionally be considered.
- The extent of the assessment referred to at paragraph 5.27 should be determined by proportionate impact analysis and agreed with OCC.
- The assessment will need to be undertaken in accordance with the requirements of the DfT Circular 02/2013 Strategic Road Network and the Delivery of Sustainable Development.

- The OCC Education Team have advised that the EIA should consider travel patterns from the development to local schools including during any period between occupations commencing and a new school opening on site. This may be relevant to both the transport and socio-economic topics.

5.3.9 Consultations Undertaken

5.3.10 A Transport Scoping Note was submitted to OCC in September 2021 setting out movement and public transport strategy, parking provision and a vehicle trip generation based on the Decide and Provide approach set out within the TRICS Guidance Note on the Practical Implementation of the Decide & Provide Approach (February 2021). OCC have not provided a response.

Surveys Undertaken

5.3.11 Baseline and future year traffic flows have been extracted from the BTM.

Method for Assessing Baseline and Future Baseline Conditions

Baseline

5.3.12 Baseline conditions for the surrounding highway network have been established using the Bicester Transport Model (BTM) run by White Young Green (WYG) on behalf of OCC. The model had a base year of 2012 and the outputs from the model were made available in February 2014 to provide a baseline for NW Bicester. The use of the baseline model was set out and endorsed by OCC in the Scoping response.

5.3.13 Key road links in relation to the Application are shown on Figure 5.3.1.

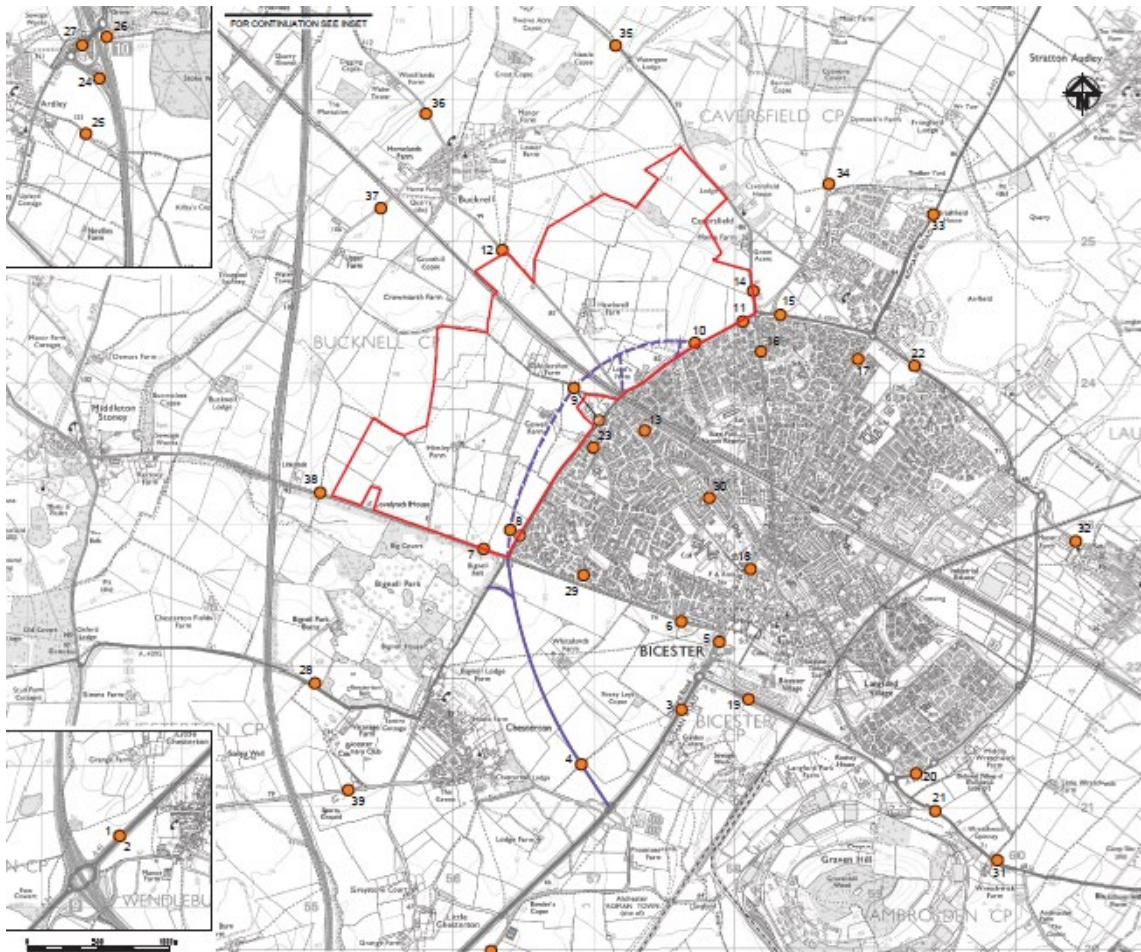


Figure 5.3.1: Key Road Links

5.3.14 The BTM was built using 2007 traffic data, and hence the model has a 2007 base year. In order to validate the use of the model with a 2012 Base Year, a series of vehicle counts were carried out by OCC in 2012/2013 and supplied to Halcrow who undertook a validation exercise. In total 35 automatic traffic counts were undertaken. The validation report was included as part of the evidence base for the Cherwell Local Plan.

5.3.15 The 2012/2013 observed count data was compared to modelled traffic flow data from the 2007 base year Bicester AM and PM peak scenarios. The validation checks showed that the model practically validates to the criteria set out in DMRB. The most significant issue is the overestimation of modelled flows on the B4030. When considering the validation of the model within the town itself, the DMRB criteria were met.

5.3.16 The BTM was recommended and agreed with OCC and the Highways Agency (HA) as the appropriate tool for assessing the impacts of the previous planning application.

5.3.17 The baseline traffic analysis uses the BTM Flows to provide the evidence of 2012 traffic levels.

Future Baseline

- 5.3.18 A future year / Reference Case was developed by WYG for 2031 using the BTM. The reference case included all committed and planned developments and represented the maximum growth of the town without NW Bicester. For the purposes of environmental assessment, this scenario is to be used as the Future Year Baseline against which the impacts of the NW Bicester Masterplan will be assessed as endorsed by OCC in the Scoping response.
- 5.3.19 Plate 5.3.1 sets out the committed and planned development that has been considered as part of the 2031 Reference Case in the BTM. This table is extracted from the Bicester Peripheral Routes Study (WYG on behalf of OCC) as development included within the model in 2031.
- 5.3.20 Additionally, a sensitivity test has been undertaken to consider the impact of the two developments identified by OCC in the ES scoping response – the Great Wolf leisure resort at Chesterton and the proposed Oxfordshire SFRI and logistics proposals at Baynards Green.

Plate 5.3.1: Committed and Planned Development

Input	Uncertainty	Comments
393 house/2,900sqm employment development at NW Bicester exemplar	Near certain	Site approved and S106 signed. Expecting to implement by the end of 2013.
4,607 house/25.5Ha employment development at NW Bicester Masterplan	Near certain	Site accepted by central government for eco-development. Is in the emerging Local Plan as BICESTER 1. Masterplan to be submitted for SPD in Spring 2014.
Additional 1,000 houses on NW Bicester Masterplan	More than likely	This is additional housing numbers than Cherwell District Council have previously discussed but can be fitted within the red line boundary of the Masterplan site
1,900 house/104,000 sqm employment development at Graven Hill	Near certain	BICESTER 2 in the proposed Local Plan. Approved subject to S106
1,631 house development at SW Bicester	Near certain	Under construction.
720 house development at SW Bicester	More than likely	Site identified in emerging Local Plan as BICESTER 3. Application going to Planning Committee imminently
Additional 100 houses at SW Bicester	More than likely	Currently being considered
46,200 sqm employment development at Bicester Business Park, including relocation of Tesco store	More than likely	Outline permission granted in 2010. Identified in the proposed Local Plan as BICESTER 4.
Town centre redevelopment phase 1	Certain	Has just opened, including superstore, cinema and smaller retail units
Town centre redevelopment phase 2	Reasonably foreseeable	Proposed in the emerging Local Plan as BICESTER 6. CDC considering now that phase 1 is open.
RAF Bicester	Near certain	In the Local Plan as BICESTER 8. Plans being drawn up.
19,800 sqm employment at Bicester Gateway	More than likely	Identified in the proposed Local Plan submission as BICESTER 10.
26,400 sqm employment development at NE Bicester Business Park	More than likely	Identified in the proposed Local Plan submission document as BICESTER 11.
800 houses / 64,812 sqm employment development at SE Bicester	More than likely	Identified in the emerging Local Plan as BICESTER 12.
Bicester Village phase 4	Near certain	Approval subject to S106
Caversfield, Fringford Lane	Near Certain	200 dwellings
RAF Bicester (new houses in Caversfield)	Certain	Under construction

5.3.21 In addition there were various proposals for transport infrastructure included in the reference case:

- Town centre access improvements (these have already been implemented but were not in the base year model 2012);
- Changes implemented as part of the town centre redevelopment (as above);
- Traffic calming and 30mph speed limit on Middleton Stoney Road;
- Changes at the Pingle Drive junction, A41 / Oxford Road (ESSO) junction and along the A41 corridor as part of the mitigation measures from Tesco's move and Bicester Village phase 4;
- Park & ride entrance/exit at the junction of Vendee Drive and the A41;
- A4095/B4100 junction alterations as part of NW Bicester Exemplar site;
- Alterations to the A41/London Road (Rodney House) junction as part of Graven Hill mitigation;
- M40 Junction 9 Phase 2 improvements;
- M40 Junction 10 Pinch Point Scheme;
- London Road level crossing would be closed permanently to through traffic at points immediately north and south of the current rail level crossing; and
- Removal of the existing level crossing at Charbridge Lane.

Method for Assessing Impacts and Magnitude and Significance of Effects

Importance / Sensitivity of Resource

5.3.22 Resources are the assets and facilities which may be affected by the Development such as the highway network. Receptors are the users or beneficiaries of those resources such as pedestrians and drivers who travel within the Study Area. Table 5.3.1 summarises the resources, corresponding receptors and their importance / sensitivity as part of this assessment.

Importance/sensitivity of resource or receptor	Resource	Receptor
High	Traffic flows on highway network near schools, colleges, playgrounds, accident blackspots, retirement homes and roads where without footways that are used by pedestrians.	Residents/workers travelling to and from work on foot and by vehicle, school children, leisure walkers.
Medium	Traffic flows at congested junctions and on highway network near doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, recreation facilities.	Residents/workers travelling to and from work on foot and by vehicle, school children, leisure walkers, people visiting shops etc.
Low	Traffic flows: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.	Residents of or workers travelling to these places.
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.	Residents/workers travelling by foot or by vehicle.

Table 5.3.1: Importance / Sensitivity of Resource

5.3.23 The impacts of traffic may be on the following receptors (as set out in the 'Guidelines for the Environmental Assessment of Road Traffic') as:

- People at home
- People at work
- Sensitive groups including children, elderly and disabled
- Sensitive locations such as hospitals, churches, schools, and historical buildings
- People walking
- People cycling
- Open spaces, recreational areas, shopping areas

- Sites of ecological/nature conservation value
- Sites of tourist/visitor attraction.

Methodology for Assessing Impact

5.3.24 The environmental effects of road traffic resulting from the proposals have been assessed upon the local highway network in accordance with the IEMA guidelines. The assessment has been carried out for a total of 46 links within the identified study area.

5.3.25 Assessments have been undertaken across a typical working day with the effects compared across the peak morning and evening hours. On any link where increases in traffic flow are in excess of the above IEMA impact thresholds (30% on any link or 10% on sensitive links), a detailed environmental assessment against the assessment criteria has been undertaken.

5.3.26 The IEMA Guidelines state that an environmental assessment of traffic effects should be carried out when there is an increase in flow by more than 30% (or the number of heavy goods vehicles would increase by more than 30%) and where there is an increase of traffic flow of 10% in sensitive areas.

5.3.27 In this instance it is considered that as the Development forms part of the NW Bicester Masterplan which aims to meet PPS1 targets and is proximate to sensitive residential areas and communities, therefore the 10% threshold has been applied.

5.3.28 In order to determine the significance of effects, the following parameters have been considered:

- The sensitivity of each link on the preferred route;
- The percentage increase in total traffic and/or HGVs as a result of the Scheme along each link on the preferred route; and
- The environmental effects as set out within IEMA Guidelines on each link where the impacts of the scheme are above the significance thresholds.

5.3.29 The environmental effects as set out in the IEMA Guidelines cover the following areas of concern:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation;
- Accidents and safety;
- Hazardous loads; and
- Dust and dirt.

- 5.3.30 In addition, the Design Manual for Roads and Bridges (DMRB) guidelines include the need to separately assess the impact of a scheme on pedestrians, cyclists and equestrians. This is related specifically to the impact of the A4095 Strategic NW Link Road and will have been dealt with in the ES for that separate application. A commentary on the impact on Public Rights of Way is however included in this Chapter for completeness.
- 5.3.31 Severance occurs when there is difficulty experienced in crossing a heavily trafficked road. The guidelines refer to the Department for Transport's 'Manual of Environmental Appraisal', which suggests that changes in traffic flow of 30%, 60%, and 90% would be likely to produce 'slight', 'moderate', and 'substantial' changes in severance, respectively. Severance change is therefore measured in terms of percentage change in traffic rather than in actual flow.
- 5.3.32 Driver delay is determined through use of changes in congested link speeds including junction delay.
- 5.3.33 The IEMA Guidelines suggest that pedestrian delay is experienced at a lower threshold when pedestrians experience a 10 second delay crossing a carriageway with no crossing facilities for a two-way flow of 1,400 vehicles per hour. The upper threshold amounts to a 40 second delay, also where no crossing facilities exist.
- 5.3.34 The pedestrian amenity threshold, as set out in the IEMA Guidelines to assess the significance of change, is where the traffic flow is doubled.
- 5.3.35 Fear and intimidation can be established through a combination of traffic flow, speed and composition. The criteria from the IEMA Guidelines for assessing this have been set out in Table 5.3.2.

Importance / sensitivity of resource or receptor	Average Traffic Flow over 18 Hour Day (Vehicle/hour)	Total 18 Hour Goods Vehicle Flow	Average Speed over 18 Hour Day (Mile/hour)
Major	1,800+	3,000+	20+
Moderate	1,200 – 1,800	2,000 – 3,000	15 - 20
Minor	600 – 1,200	1,000 – 2,000	10 - 15

Table 5.3.2: Magnitude of Impact of Fear and Intimidation

- 5.3.36 Accidents and safety is assessed using the personal injury accident data obtained from highway authority records. The IEMA Guidelines recommend that professional judgement will be needed to assess the impacts.
- 5.3.37 There are no hazardous loads associated with the Development so this section does not apply.

Limitations and Assumptions

- 5.3.38 The following assumptions regarding the baseline data have been made:
- All committed developments and proposed highway schemes will be built by 2031 and associated traffic flows will be on the highway network

- No further developments, new highway schemes or changes to public transport services, other than those previously committed, will be introduced within the area as this could affect traffic flow and pedestrian movement.

5.4 Baseline Conditions

Highway Network

5.4.1 The key roads within the study area are described below:

A4095

5.4.2 The main points of vehicular access will be via the A4095 to the south of the site. The A4095 forms part of a ring road around Bicester and runs from the A4421/Buckingham Road/A4095 Roundabout in the east to the Howes Lane/B4030/Middleton Stoney Road Roundabout to the southwest. Importantly, this road will allow future residents of NWB to drive around Bicester when travelling outside of the town.

5.4.3 This is a single lane carriageway with a 50mph speed limit, however there are sections of the road the reduce to 30-40mph where it is in close proximity to more residential areas where pedestrians are likely to be present. The road varies in width from approximately 7.2m to 9.5m; the wider sections of the road are there to accommodate right turn lanes into minor roads. The road is generally well lit along the length that it spans and has footway/cycleways along various sections of the carriageway.

5.4.4 This road provides connection to a number of roads leading into and out of Bicester, these include: Buckingham Road, Skimmingdish Lane, A4421, B4100, Banbury Road, Bucknell Road, B4030, Shakespeare Drive Middleton Stoney Road and Vendee Drive.

5.4.5 As set out in Section 4.3 of the TA, a section of the A4095 will be realigned to enable access to NWB and address the expected congestion between Howes Lane and Bucknell Road, ensuring capacity would accommodate the housing and economic development in and around Bicester.

5.4.6 Phase 1 of the scheme, funded by Homes England and the Oxfordshire Housing and Growth Deal, has been completed and has delivered the rail underbridge to accommodate the realigned Howes Lane and a separate underpass which will provide a new route for pedestrians, cyclists and horse riders.

Bucknell Road

5.4.7 This road runs from near Bicester Town Centre in the south and eventually turns into Bicester Road in the north and runs adjacent to the western side of the site boundary.

5.4.8 Within the ring road, Bucknell Road is a single carriageway road with 30mph speed limit and varies in width. The road runs through Highfield residential area and is well lit with footways running along its length within the built-up area. To the south this road forms a priority

junction with B4100 and to the north forms a priority junction with Howes Lane/A4095 and then a roundabout with the A4095.

- 5.4.9 North of the roundabout, the road exits Bicester and there is a speed increase to 60mph. The road continues for approximately 730m until it turns into Bicester Road which can be used for onward travel to Bucknell and Junction 10 of the M40.

B4100

- 5.4.10 This road runs from near Bicester Town Centre in the South to Adderbury in the northwest. A small section of this road to the southeast of the site abuts the site boundary. This road also forms one of the main routes into Bicester from the north.
- 5.4.11 To the south, within the ring road, the B4100 is also known as the Banbury Road, it forms a roundabout with Queens Avenue and St John's Street near Bicester Town centre, this can be followed into the town centre or toward the A41. The majority of the B4100 within the ring road has a speed limit of 30mph and is well lit.
- 5.4.12 Approximately 1.2km north of the B4100/Queens Avenue/St John's Street roundabout there is a speed limit change from 30mph to 40mph. A further 0.5km north of this point, the B4100 forms a roundabout with the A4095 ring road and continues to the north.
- 5.4.13 North of the B4100/A4095 roundabout, the road leads towards rural Oxfordshire and continue to be a 40mph road for approximately 1.6km. The road eventually reaches the A43 to form a roundabout and the A43 provides onward Access to Junction 10 of the M40.

Bainton Road

- 5.4.14 Bainton road is situated just north of the proposed site and is on an east to west alignment. It is a connecting road between the B4100, and a crossroads junction formed by Bicester Road/Middleton Road/Bainton Road/Ardley road. and is approximately 1.7km long. The road is a country lane with a width of approximately 5m. To the east, the speed limit is 60mph and to the west the road reduces speed to 30mph as it approaches Bucknell.

Shakespeare Drive

- 5.4.15 Shakespeare Drive is a 30mph single carriageway road situated to the southwest of the site and is approximately 1.2km long; the road connects A4095 and Middleton Stoney Road. The road is approximately 6.5m in width with footways on either side and is well lit.
- 5.4.16 To the north it forms a signalised junction with the A4095/Howes Lane and to the south it forms the northern arm of the Shakespeare Drive/Middleton Stoney Road/Whitelands Way Roundabout.

Middleton Stoney Road

- 5.4.17 Middleton Stoney Road runs on an east to west alignment and is approximately 1.6km long. The road is a single carriageway with a 30mph speed limit and is approximately 5.5m wide

with on-road cycle lanes in both directions and a footway along the northern side of the carriageway.

- 5.4.18 To the east the road connects with Kings End and Oxford Road to form a three-arm roundabout and in the west the road connects with the B4030 and A4095 to form a four-arm roundabout.

B4030

- 5.4.19 The B4030 forms the southwestern section of ring road which is also known as Vendee Drive. The road runs from the A41/B4030 Roundabout in the south to Enstone, outside of Bicester to the west.

- 5.4.20 Vendee Drive is approximately 1.9km long with a speed limit of 50mph and is approximately 7.2m in width. There is a footway/cycleway on the eastern side of the carriageway.

- 5.4.21 At the Vendee Drive/Middleton Stoney Road/Howes Lane/B4030 roundabout, the B4030 exits Bicester towards the west. The road follows similar characteristics as the Vendee Drive section, and approximately 3.1km west the road meets the B430 to form a priority junction.

A41

- 5.4.22 The A41 has two alignments coming into Bicester, one from the southwest to northeast and one from the southeast to northwest.

- 5.4.23 To the southwest the A41 provides access to Junction 9 of the M40 and the A34. Travelling from the M40 toward Bicester, the road is a segregated dual carriageway and is subject to a 70mph speed limit that reduces to 50mph and then 40mph on approach to Bicester.

- 5.4.24 Continuing towards Bicester, the A41 eventually turns into the Oxford Road and forms a roundabout with Esso garage/Oxford Road and A41.

- 5.4.25 The eastern arm of the roundabout is where the A41 changes course and continues in a south-eastern direction and eventually reaching Aylesbury.

M40

- 5.4.26 The M40 is on a north to south alignment and passes by Bicester to the west. From the proposed site there are two points of access, these include; Junction 9 and Junction 10. Junction 9 is approximately 6km southwest of the site and is accessed by using the Bicester ring road and A41, whereas junction 10 is situated approximately 7.5km north of the site and is accessed by utilising the B4100 and A43.

- 5.4.27 The M40 runs from Birmingham to London and more locally provides access to Banbury and High Wycombe.

2012 Baseline Traffic Flows

- 5.4.28 Baseline flows for the peak hours on links across the study area were obtained from the BTM 2012 Base Year. This gives AM and PM peak hour flows and these have been factored to give

12 hour (07:00 to 19:00) and 18 hour flows (06:00 to 00:00) using a factor of 4.33 and 5.21 respectively on the total of AM plus PM peak hour flows. The factors were derived from Automatic Traffic Count (ATC) data collected locally to NW Bicester for the NW Bicester Exemplar Development Transport Assessment. Separate factors were derived for the M40 using locally derived Highways Agency TRADS data, giving factors of 6.03 for the 12 hour flows and 7.04 for the 18 hour flows. It should be noted that the factors have been rounded to two decimal places in the text thus there will be minor differences to the calculated flows from the use of the full factors. The flows are set out in Table 5.4.1.

Link Ref	Link Description	Base Year 2012			
		AM Peak Hour	PM Peak Hour	12 Hour Flows	18 Hour Flows
1	A41 northbound, N of M40 J9	1210	1493	11705	14088
2	A41 southbound, N of M40 J9	1205	1109	10021	12060
3	A41 Oxford Rd, S of A41 junction	2562	2490	21878	26331
4	Vendee Drive, W of A41 junction	353	249	2607	3138
5	A41, N of Pingle Drive	1496	1678	13745	16543
6	Middleton Stoney Rd, W of Kings End	970	846	7864	9465
7	Middleton Stoney Rd, W of Howes Lane	556	655	5244	6312
8	Howes Lane, N of Middleton Stoney Rd	618	697	5695	6854
9	Howes Lane, E of Shakespeare Drive	750	848	6920	8329
10	Lords Lane, E of Bucknell Road	1003	1118	9185	11055
11	Lords Lane, W of Banbury Road	1108	1215	10060	12107
12	Bucknell Road, N of Lords Lane	247	192	1901	2288
13	Bucknell Road, S of Howes Lane	540	833	5946	7156
14	Banbury Road, N of Lords Lane	1117	1186	9973	12003
15	A4095 E of Banbury Road	1885	1886	16330	19654
16	Banbury Road, S of A4095	457	634	4725	5686
17	Buckingham Road, S of Skimmingdish Lane	717	842	6751	8125
18	Queens Avenue, S of Bucknell Road	1035	1454	10779	12973
19	A41 E of A41 Oxford Road	2129	2265	19028	22901
20	A4421 Neunkirchen Way	1370	1661	13126	15797
21	A41, E of London Road roundabout	2293	2396	20306	24439
22	A4421, E of Skimmingdish Lane	1471	1688	13680	16465

Link Ref	Link Description	Base Year 2012			
		AM Peak Hour	PM Peak Hour	12 Hour Flows	18 Hour Flows
23	Shakespeare Drive, S of Howes Lane	142	152	1273	1532
24	M40 J10 northbound off slip road	482	599	4681	5634
25	Ardley Road (E of B430)	207	195	1741	2095
26	M40 J10 southbound on slip road (from A43)	658	354	4382	5274
27	B430 M40 over bridge	2184	2170	18855	22693
28	A4095 N of Chesterton	602	553	5002	6020
29	Shakespeare Drive, E of Middleton Stoney Road	611	455	4616	5556
30	The Approach, W of Bucknell Road	320	243	2438	2934
31	A41 East of Pioneer Road	2141	2378	19570	23553
32	Bicester Road, E of A4421 junction	663	617	5543	6671
33	A4421 N of Skimmingdish Lane	1311	1132	10579	12733
34	Fringford Road, N of Caversfield	74	112	805	969
35	B4100 Banbury Road, N of Bainton Road	1117	1186	9973	12003
36	Ardley Road, N of Bucknell	207	195	1741	2095
37	Middleton Road, W of Bucknell	27	12	169	203
38	B4030 Middleton Stoney Road, NW of NWB	556	655	5244	6312
39	Green Lane, W of Chesterton	407	360	3321	3998
40	Wendlebury Road, E of M40	331	207	2330	2804
41	M40 northbound (mainline only), S of J9	3876	4332	49454	57812
42	M40 southbound (mainline only), S of J9	4424	4012	50828	59418
43	M40 northbound (mainline only), S of J10 / N of J9	5513	6271	71000	83000
44	M40 southbound (mainline only), S of J10 / N of J9	5500	5101	63872	74667
45	M40 northbound (mainline only), N of J10	5259	5849	66927	78238
46	M40 southbound (mainline only), N of	4842	5102	59914	70040

Link Ref	Link Description	Base Year 2012			
		AM Peak Hour	PM Peak Hour	12 Hour Flows	18 Hour Flows
	J10				

Table 5.4.1: Base Year 2012 Traffic Flows

Personal Injury Collisions

5.4.29 To assess the safety level of the adjoining highway network and thus identify any potential conflict points and highway safety issues, Personal Injury Collision (PIC) data has been obtained from Oxfordshire County Council along the neighbouring highway network in the vicinity of the proposed site for the most recently available five-year period, between 11th January 2016 and 30th January 2021. The full report is included within Appendix B of the TA.

5.4.30 A large area surrounding Bicester has been selected to provide a robust accident data analysis, the network includes several junctions on the ring road to the north and northeast of the Bicester. The study area is shown below in Figure 5.4.1 below, as well as the severity and location of the reported incidents.

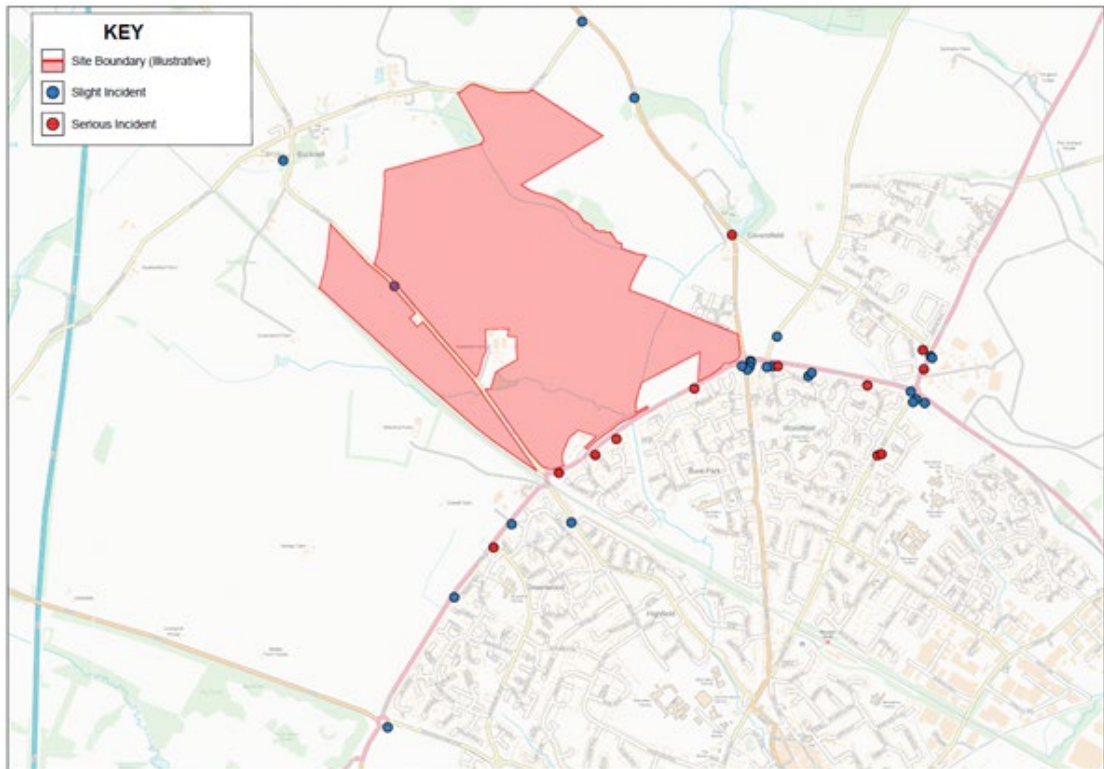


Figure 5.4.1: Personal Injury Collision Locations

5.4.31 A total of 38 incidents were recorded along study network for the last 5-year period within the vicinity of the site giving rise to 14 serious and 24 slight injuries. This equates to, on average, less than eight collisions per year. No fatal collisions were recorded.

5.4.32 A yearly breakdown of the reported incidents is summarised in Table 6.1 below:

Year	Serious	Slight	Total
2016	7	6	13
2017	1	5	6
2018	1	3	4
2019	1	3	4
2020	2	7	9
2021	2	0	2
Total	14	24	38

Table 5.4.2: Personal Injury Collision Summary

5.4.33 The location and classification of the collisions within the proposed study area are illustrated in Figure 5.4.1 above with details summarised in Table 5.4.3.

Location	Serious	Slight	Total
A4095 / A4421 / Skimmingdish Lane / Buckingham Road (Roundabout)	-	4	4
A4095 / B4100 / Banbury Road (Roundabout)	-	5	5
Bucknell Road / A4095 (Roundabout)	1	-	1
Howes Lane / B4030 / Vendee Drive / Middleton Stoney Road (Roundabout)	-	1	1
Howes Lane / Shakespeare Drive	1		1
Howes Lane	1	2	3
Bucknell Road / Kingsley Road	-	1	1
A4095 / Purslane Drive	1	-	1
A4095 / Trefoil Drive	1	-	1
A4095 (Near A4095 / Germander Way)	1	-	1
A4095 / Fringford Road	1	2	3
Fringford Road	-	1	1
A4095 / Heather Road	-	2	2
A4095 / Hornbeam Road	1	-	1
A4221	1	-	1
A4221 / Skimmingdish Lane	1	2	3
Buckingham Road	2	-	2
B4100	2	1	3
B4100 / Bainton Road	-	1	1
Bicester Road / New Road	-	1	1
Bucknell Road	-	1	1
Total	14	24	38

Table 5.4.3: Location and Severity of Personal Injury Collisions

5.4.34 A review of the location of collisions indicates that there are no significant clusters observed within the study area with incidents scattered across the network. Whilst 5 slight collisions

are shown at A4095 / B4100 / Banbury Road Roundabout and 4 slight collisions at A4095 / B4100 / Banbury Road Roundabout the collision rate at these junctions would still only equate to, on average, to 1 or just under 1 incident every year. Thus, it is evident that there is not a significant pattern of collisions at these junctions.

5.4.35 Given the dispersed nature of these accidents, both in terms of geographical location and timescale, the proposed development site does not include any geometric features that can be specifically linked to recorded collisions.

Public Transport

Bus

5.4.36 The site is located in close proximity to bus routes of the existing bus services that pass-through Bicester, and as a result there is an opportunity to encourage the use of the existing bus services for day-to-day journeys to and from the site.

5.4.37 The closest bus stops to the site are located along Charlotte Avenue and are referred to as 'Tayberry Close' and 'Gagle Brook School'. Another bus stop is located along the B4100 and referred to as 'Charlotte Avenue'.

5.4.38 Bus stops on Charlotte Avenue (i.e. that stop at one or more of these stops) encompass service E1. Bus services operating along the B4100 include the 505 and E1 bus services.

5.4.39 A summary of the services stopping at these bus stops is provided in Table 5.4.4. This table presents the service, bus stop, route, approximate frequency and operating hours of these services. In addition, Figure 5.4.2 illustrates the routes of these services in the vicinity of the site.

Service	Bus Stop	Route	Weekday	Saturday	Sunday
505	Charlotte Avenue	Brackley - Bicester	120 mins	120 mins	No Service
E1	Charlotte Avenue, Tayberry Close, Gagle Brook School	Elmsbrook Estate - Bicester Village Station	30 mins	30 mins	No Service

Table 5.4.4: Summary of Bus Services

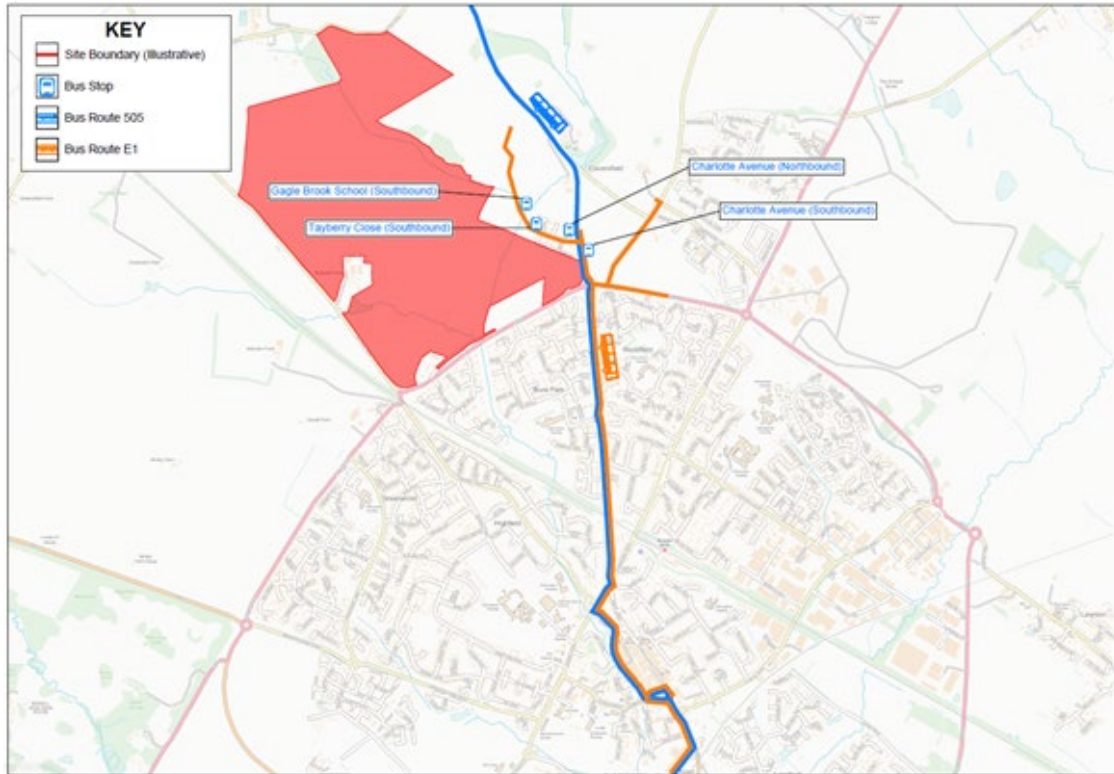


Figure 5.4.2: Existing Bus Service Routes

5.4.40 In combination the bus services stopping in close proximity to the site provide a combined frequency equating to 2-3 buses an hour (i.e. 1 bus every 20-30 minutes).

5.4.41 The approximate journey times, from the bus stops close to the site, to a selection of destinations are summarised below:

- Bicester - From Charlotte Avenue - via 505 service - 9 minutes;
- Elmsbrook - From Charlotte Avenue - via E1 service - 30 minutes; and
- Brackley - From Charlotte Avenue - via 505 - 14 minutes.

5.4.42 It is evident from the above review that bus services that pass-through Bicester in the vicinity of the site provide regular connections to the towns in the surrounding area and also provide a link to Bicester Railway station for onward connection. As such, it is considered that the site is well-positioned to tie into the existing bus network of Bicester, via a variety of options, and as such creates the opportunity for journeys to and from these destinations to be undertaken sustainably.

Rail

5.4.43 The site is well situated in relation to Bicester North Railway Station, which lies broadly 2.3km approximately 10-minute cycle from the centre of the site to the south. Approximately 3.4km or 15-minute cycle south of the site lies Bicester Village Railway Station.

5.4.44 Furthermore, convenient connections to these stations can be obtained via the aforementioned E1 and 505 bus services.

5.4.45 Bicester North Railway Station is on the Chiltern Main Line and services are operated by Chiltern Railways. The station also offers sheltered, secure bicycling parking facilities by way of cycle stands which are monitored by CCTV; there is capacity for 65 bicycles. As such, there is the opportunity for journeys to the station to be made by bicycle for onwards travel by rail.

5.4.46 Table 5.4.5 below sets out a summary of these services, including key destinations, approximate journey times and approximate frequencies on a typical weekday.

Destination	Approximate Journey Time	Approximate Frequency
Banbury	15 minutes	Every 50 minutes
London Marylebone	60 minutes	Every 30 minutes
Birmingham Snow Hill	70 minutes	Every 180 minutes

Table 5.4.5: Summary of Train Services

5.4.47 Bicester Village Railway Station is on the Oxford-Bedford Line and services are operated by Chiltern Railways. The station also offers sheltered, secure bicycling parking facilities by way of cycle stands which are monitored by CCTV; there is capacity for 50 bicycles. As such, there is the opportunity for journeys to the station to be made by bicycle for onwards travel by rail.

5.4.48 Table 5.4.6 below sets out a summary of these services, including key destinations, approximate journey times and approximate frequencies on a typical weekday.

Destination	Approximate Journey Time	Approximate Frequency
Oxford Parkway	10 minutes	Every 30 minutes
London Marylebone	60 minutes	Every 25 minutes

Table 5.4.6: Summary of Train Services

5.4.49 As such, it is considered that the services that call at Bicester North and Bicester Village Railway Stations provide the opportunity for travel by sustainable means to a number of destinations. These stations are accessible from the site by sustainable modes, creating the opportunity for multi-modal travel and representing an alternative to the private car.

Walking and Cycling

Walking

- 5.4.50 Walking is the primary mode of travel for local journeys and is widely recognised as the most sustainable form of travel (IHT, 2000). As such, walking forms an important part of sustainable growth, with the NPPF guiding that opportunities to promote walking are identified and maximised.
- 5.4.51 Therefore, by locating developments to minimise the need to travel, and to maximise the use of sustainable modes of transport, sustainable growth can be encouraged.
- 5.4.52 As set out above the location of the site is conducive to the creation of a sustainable development, with a range of everyday facilities and services lying within 'reasonable' walking distance.
- 5.4.53 The site is linked to these facilities by way of the existing continuous network of footways and footpaths that run through Bicester which facilitate journeys to and from the site on foot. Generally, this network provides streetlights, footways/footpaths and pedestrian crossing facilities of a reasonable quality.
- 5.4.54 Figure 5.4.3 shows a non-exhaustive plan of the existing pedestrian network. The plan shows the main footways and existing crossing points which future residents will utilise to get to the existing services and facilities. In addition to the existing footways, it shows the proposed footways either side of the carriageway along the realigned A4095, and the proposed signalised crossing points at A4095 / B300 / Banbury Road roundabout, the site access points along A4095 and Bucknell Road.

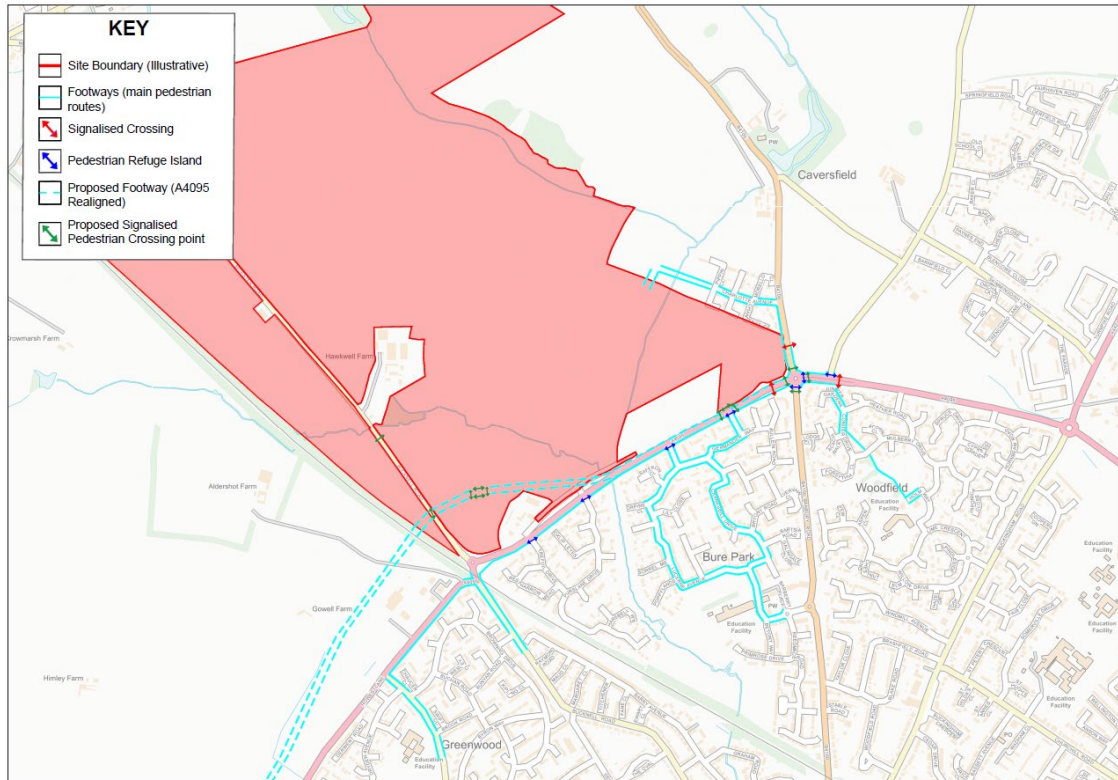


Figure 5.4.3: Pedestrian Infrastructure

- 5.4.55 It is thought that pedestrians are most likely to travel within the North West Bicester development to the future services and facilities it would offer, however, other predominant pedestrian movements would include movements to the south towards Bicester.
- 5.4.56 To the east of the site lies a new estate to which the proposed development will facilitate connections via Cranberry Avenue. The new estate has 2m footways either side of the primary roads and provides a link to Gagle Brook primary school and the B4100.
- 5.4.57 The B4100 has a shared use footway/cycleway along the western side of the carriageway which continues in a southerly direction toward the A4095. On the approach to the A4095/B4100/Banbury Road Roundabout there is a pelican crossing providing pedestrians a safe and convenient opportunity to travel eastward along the A4095.
- 5.4.58 Travelling east of the A4095/B4100/Banbury Road Roundabout, pedestrians will cross Fringford Road via an uncontrolled pedestrian crossing with a central refuge which then provides access to a staggered controlled crossing across the A4905 carriageway. At this point, there is a shared use access point into the Woodford residential area which provides access to a convenience store.
- 5.4.59 To the west of the A4095/B4100/Banbury Road Roundabout, there is a short section of footway along the northern side of the carriageway and another Pelican crossing which facilitates safe crossing of the A4095.

- 5.4.60 Continuing west along the southern side of the A4095, a footway/cycleway is present which provides access to Germander Way and Lucerne Avenue that continue southward toward Bure Park residential area that hosts a number of services and facilities. All minor roads along this section of the A4095 include dropped kerbs, tactile paving and pedestrian refuge islands.
- 5.4.61 Further west along the A4095, on the approach to the A4095/Bucknell Road roundabout, the footway continues to the south underneath rail bridge and in a southerly direction along Bucknell road. Underneath the railway bridge there is an uncontrolled pedestrian crossing point with dropped kerbs and tactile paving which facilitates crossing towards Howes Lane and thus providing access to Kings Meadow Primary school.
- 5.4.62 As such, it is considered that there is a suitable existing pedestrian network that the site can utilise and tie into to access a range of existing services and facilities within northern Bicester. Furthermore, with the introduction of the North West Bicester Eco-Town there will be a whole new network of pedestrian connections introduced that will encourage walking as a primary mode of transport.
- 5.4.63 A network of PROW partially run through and surrounds the site, Figure 5.4.4 below shows the public footpaths within the area of the site.

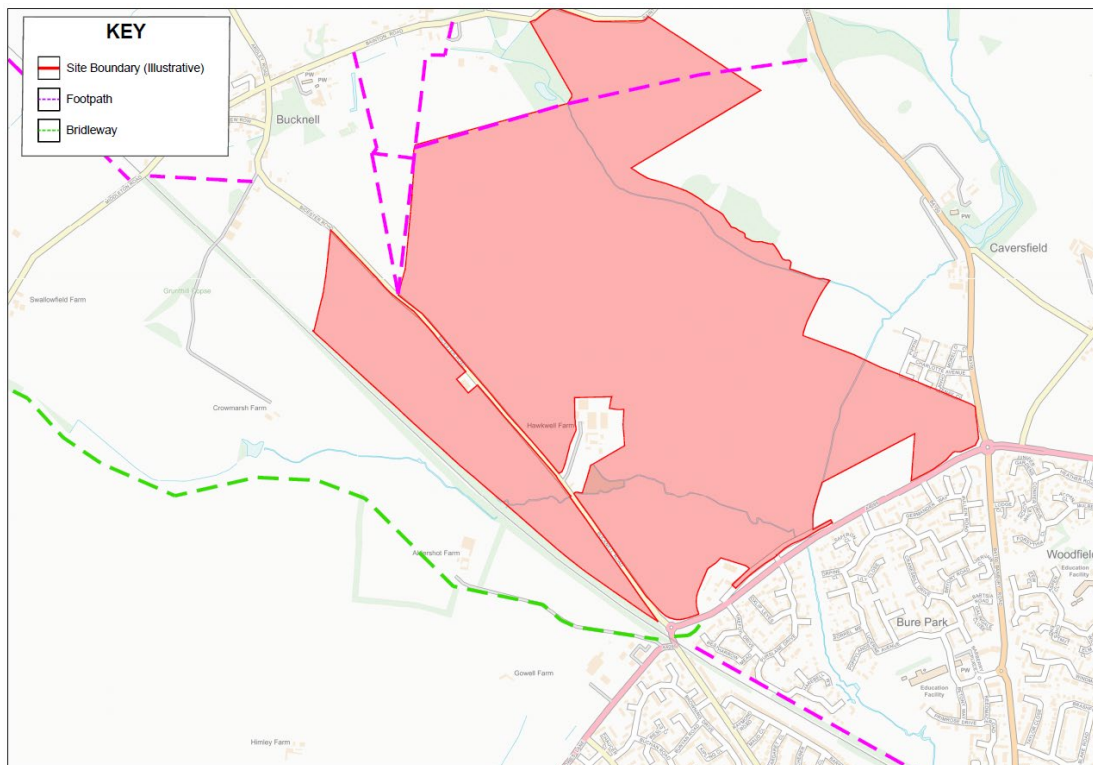


Figure 5.4.4: Public Rights of Way

- 5.4.64 As shown, there is a series of PROW comprising footpaths and bridleways in Bicester. To the northwest of the site there is a PROW route which runs along the boundary of the site, linking

Bicester Road with Bainton Road to the north. To the north of the site a footpath runs through the most northerly section of the site.

Cycling

5.4.65 Cycling is recognised as one of the most sustainable forms of transport (CIHT's Planning for Cycling, 2015). In general, given the compact nature of Bicester, it is considered that cycling offers a real alternative to the private car for day-to-day journeys to and from the site. Indeed, the entirety of Bicester lie within a 5km cycle of the site, with this distance widely recognised as a reasonable cycling distance. As such, the facilities, services and employment opportunities within these villages lie within a reasonable cycling distance of the site.

5.4.66 It is also noted that The Cooper School Secondary School is located approximately 2.5km to the south of the site and therefore can be reached within a 'reasonable' cycling distance of the site. As such, there is the opportunity for day-to-day journeys to this destination to be made sustainably.

5.4.67 Figure 5.4.5 below demonstrates the area surrounding the site which lies within a 5km cycle.

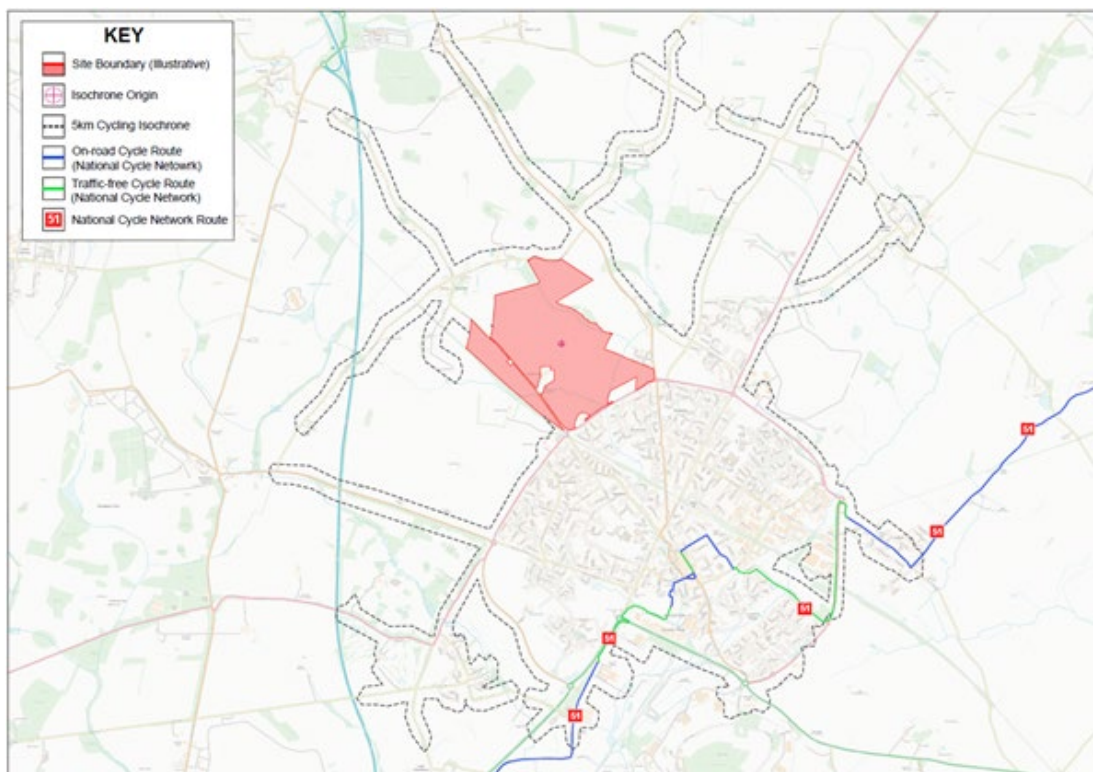


Figure 5.4.5: 5km Cycling Isochrone

5.4.68 In addition to the NCN, there is a network of local cycle routes which are either on-road cycle lanes or shared use footway/cycleway routes, these routes have been extracted from the Bicester Local Cycling and Walking Infrastructure document and can be seen in Figure 5.4.6.

5.4.69 These local routes provide additional cycle connections across Bicester which aids to provide continuous cycle routes to Bicester Town Centre and a range of services and facilities.

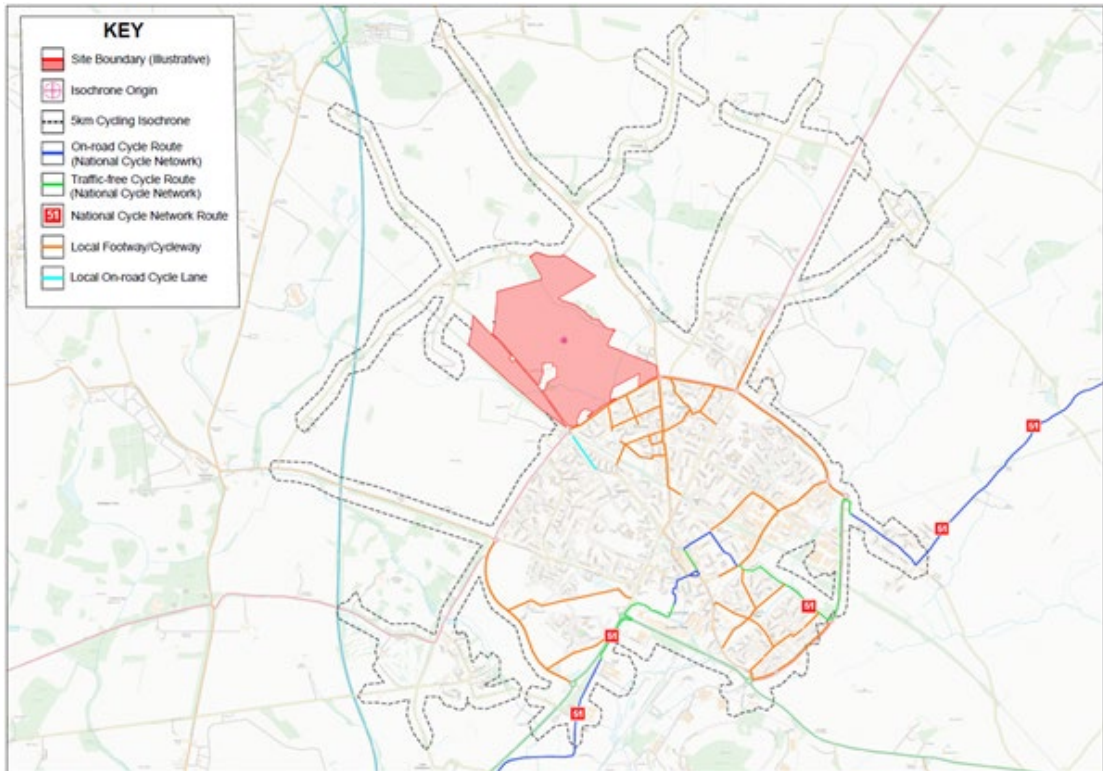


Figure 5.4.6: Local Cycle Network

Future Baseline Conditions (DO Nothing Scenario)

Highway Network

5.4.70 A 2031 Future Baseline / Reference Case (without the Application Development) was assessed by WYG using the BTM. This included all committed and planned developments which represents maximum growth of the town without NW Bicester. For the purposes of environmental assessment, this scenario is to be used as the Future Year Baseline against which the impacts of the Application will be assessed.

5.4.71 It is predicted that there would be a significant increase in traffic flow for the majority of links assessed by 2031 compared to the Base Year. Table 5.4.7 provides the predicted 2031 Future Baseline / Reference Case traffic flows, with flows shown for the AM and PM peak hours and over a 12 and 18 hour period. The percentage increase in flow is shown. The increase in flows is the direct result of planned development in Bicester and growth in traffic movements on the wider network.

Link Ref	Link Description	2031 Future Baseline (without development)				Percentage Change of Traffic Flow compared to Base 2012			
		AM Peak Hour	PM Peak Hour	12 Hour Flow	18 Hour Flow	AM Peak Hour	PM Peak Hour	12 Hour Flow	18 Hour Flow
1	A41 northbound, N of M40 J9	1510	1575	13360	26079	25%	5%	14%	14%
2	A41 southbound, N of M40 J9	1242	1269	10874	13087	3%	14%	9%	9%
3	A41 Oxford Rd, S of A41 junction	4324	4016	36116	43468	69%	61%	65%	65%
4	Vendee Drive, W of A41 junction	757	989	7561	9100	114%	297%	190%	190%
5	A41, N of Pingle Drive	2229	2235	19331	23266	49%	33%	41%	41%
6	Middleton Stoney Rd, W of Kings End	966	1158	9198	11070	0%	37%	17%	17%
7	Middleton Stoney Rd, W of Howes Lane	519	642	5028	6051	-7%	-2%	-4%	-4%
8	Howes Lane, N of Middleton Stoney Rd	1075	1198	9843	11847	74%	72%	73%	73%
9	Howes Lane, E of Shakespeare Drive	1077	1173	9744	11727	44%	38%	41%	41%
10	Lords Lane, E of Bucknell Road	1391	1409	12125	14593	39%	26%	32%	32%
11	Lords Lane, W of Banbury Road	1384	1448	12264	14760	25%	19%	22%	22%
12	Bucknell Road, N of Lords Lane	257	432	2984	3591	4%	125%	57%	57%
13	Bucknell Road, S of Howes Lane	516	932	6271	7547	-4%	12%	5%	5%
14	Banbury Road, N of Lords Lane	1522	1755	14191	17080	36%	48%	42%	42%
15	A4095 E of Banbury Road	2106	2163	18487	22250	12%	15%	13%	13%
16	Banbury Road, S of A4095	764	929	7332	8824	67%	47%	55%	55%
17	Buckingham Road, S of Skimmingdish Lane	1258	1252	10870	13082	75%	49%	61%	61%
18	Queens Avenue, S of Bucknell Road	1998	2109	17785	21405	93%	45%	65%	65%
19	A41 E of A41 Oxford Road	3505	3447	30106	36233	65%	52%	58%	58%
20	A4421 Neunkirchen Way	1849	1938	16400	19738	35%	17%	25%	25%
21	A41, E of London Road roundabout	1969	1632	15594	18768	-14%	-32%	-23%	-23%
22	A4421, E of Skimmingdish Lane	2154	2453	19951	24011	46%	45%	46%	46%
23	Shakespeare Drive, S of Howes Lane	138	85	966	1162	-3%	-44%	-24%	-24%
24	M40 J10 northbound off slip road	759	523	5552	6682	57%	-13%	19%	19%
25	Ardley Road (E of B430)	364	532	3880	4670	76%	173%	123%	123%
26	M40 J10 southbound on slip road (from A43)	565	240	3486	4196	-14%	-32%	-20%	-20%

Link Ref	Link Description	2031 Future Baseline (without development)				Percentage Change of Traffic Flow compared to Base 2012			
		AM Peak Hour	PM Peak Hour	12 Hour Flow	18 Hour Flow	AM Peak Hour	PM Peak Hour	12 Hour Flow	18 Hour Flow
27	B430 M40 over bridge	2376	2579	21458	25825	9%	19%	14%	14%
28	A4095 N of Chesterton	1076	976	8886	10695	79%	76%	78%	78%
29	Shakespeare Drive, E of Middleton Stoney Road	950	873	7894	9501	55%	92%	71%	71%
30	The Approach, W of Bucknell Road	401	507	3932	4732	25%	109%	61%	61%
31	A41 East of Pioneer Road	3075	3009	26347	31710	44%	27%	35%	35%
32	Bicester Road, E of A4421 junction	421	580	4335	5217	-37%	-6%	-22%	-22%
33	A4421 N of Skimmingdish Lane	1780	1641	14815	17830	36%	45%	40%	40%
34	Fringford Road, N of Caversfield	99	188	1243	1496	34%	68%	54%	54%
35	B4100 Banbury Road, N of Bainton Road	1353	1599	12784	15386	21%	35%	28%	28%
36	Ardley Road, N of Bucknell	349	533	3819	4597	69%	173%	119%	119%
37	Middleton Road, W of Bucknell	32	30	268	323	19%	150%	59%	59%
38	B4030 Middleton Stoney Road, NW of NWB	522	642	5041	6067	-6%	-2%	-4%	-4%
39	Green Lane, W of Chesterton	611	561	5075	6108	50%	56%	53%	53%
40	Wendlebury Road, E of M40	450	254	3049	3669	36%	23%	31%	31%
41	M40 northbound (mainline only), S of J9	4001	4310	50075	58538	3%	-1%	1%	1%
42	M40 southbound (mainline only), S of J9	4387	4077	50997	59616	-1%	2%	0%	0%
43	M40 northbound (mainline only), S of J10 / N of J9	5786	6269	72633	84908	5%	0%	2%	2%
44	M40 southbound (mainline only), S of J10 / N of J9	5398	4693	60800	71075	-2%	-8%	-5%	-5%
45	M40 northbound (mainline only), N of J10	5243	6053	68060	79562	0%	3%	2%	2%
46	M40 southbound (mainline only), N of J10	5877	5133	66337	77548	21%	1%	11%	11%

**Table 5.4.7: 2031 Future Baseline / Reference Case (without Development)
Forecast Traffic Flows**

5.4.72 A further assessment has been undertaken to include the two additional developments requested by OCC through the scoping process. Table 5.4.8 provides the amended predicted 2031 Future Baseline / Reference Case traffic flows, with flows shown for the 18 hour period. The percentage increase in flow is shown. The increase in flows is the direct result of planned development in Bicester and growth in traffic movements on the wider network.

Link Ref	Link Description	2031 Future Baseline (without development)	Percentage Change of Traffic Flow compared to Base 2012
		18 Hour Flow	18 Hour Flow
1	A41 northbound, N of M40 J9	16079	16%
2	A41 southbound, N of M40 J9	13087	11%
3	A41 Oxford Rd, S of A41 junction	43468	65%
4	Vendee Drive, W of A41 junction	9100	211%
5	A41, N of Pingle Drive	23266	41%
6	Middleton Stoney Rd, W of Kings End	11070	17%
7	Middleton Stoney Rd, W of Howes Lane	6051	-4%
8	Howes Lane, N of Middleton Stoney Rd	11847	75%
9	Howes Lane, E of Shakespeare Drive	11727	48%
10	Lords Lane, E of Bucknell Road	14593	40%
11	Lords Lane, W of Banbury Road	14760	29%
12	Bucknell Road, N of Lords Lane	3591	58%
13	Bucknell Road, S of Howes Lane	7547	10%
14	Banbury Road, N of Lords Lane	17080	64%
15	A4095 E of Banbury Road	22250	20%
16	Banbury Road, S of A4095	8824	64%
17	Buckingham Road, S of Skimmingdish Lane	13082	67%
18	Queens Avenue, S of Bucknell Road	21405	65%
19	A41 E of A41 Oxford Road	36233	58%
20	A4421 Neunkirchen Way	19738	25%
21	A41, E of London Road roundabout	18768	-23%
22	A4421, E of Skimmingdish Lane	24011	51%
23	Shakespeare Drive, S of Howes Lane	1162	-23%
24	M40 J10 northbound off slip road	6682	23%

Link Ref	Link Description	2031 Future Baseline (without development)	Percentage Change of Traffic Flow compared to Base 2012
		18 Hour Flow	18 Hour Flow
25	Ardley Road (E of B430)	4670	123%
26	M40 J10 southbound on slip road (from A43)	4196	-16%
27	B430 M40 over bridge	25825	21%
28	A4095 N of Chesterton	10695	91%
29	Shakespeare Drive, E of Middleton Stoney Road	9501	71%
30	The Approach, W of Bucknell Road	4732	61%
31	A41 East of Pioneer Road	31710	35%
32	Bicester Road, E of A4421 junction	5217	-21%
33	A4421 N of Skimmingdish Lane	17830	40%
34	Fringford Road, N of Caversfield	1496	54%
35	B4100 Banbury Road, N of Bainton Road	15386	50%
36	Ardley Road, N of Bucknell	4597	119%
37	Middleton Road, W of Bucknell	323	59%
38	B4030 Middleton Stoney Road, NW of NWB	6067	-4%
39	Green Lane, W of Chesterton	6108	53%
40	Wendlebury Road, E of M40	3669	31%
41	M40 northbound (mainline only), S of J9	58538	2%
42	M40 southbound (mainline only), S of J9	59616	1%
43	M40 northbound (mainline only), S of J10 / N of J9	84908	3%
44	M40 southbound (mainline only), S of J10 / N of J9	71075	-4%
45	M40 northbound (mainline only), N of J10	79562	2%
46	M40 southbound (mainline only), N of J10	77548	11%

Table 5.4.8: 2031 Future Baseline including two additional developments / Reference Case (without Development) Forecast Traffic Flows

5.5 Assessment of Likely Significant Effects

Construction Effects

Construction Traffic

- 5.5.1 The construction phase of development is anticipated to commence in 2024 and build out over approximately a 15-year period (whilst the period to 2031 is used for the purposes of the traffic assessment).

Other Environmental Effects

- 5.5.2 The other Environmental Effects including noise, vibration and air quality are addressed in other chapters of the ES.

Operational Effects

- 5.5.3 The permanent traffic and transport operational impacts associated with the additional traffic flow generated by the development in 2031 have been assessed by firstly identifying those links expected to see an increase in traffic of more than 10% in either a peak hour or daily flow.

Traffic Generation and Assignment

- 5.5.4 The anticipated generation of the traffic from the Development was calculated. The BTM was then used to assign traffic to the highway network with the Reference Case 2031 traffic. This was undertaken for the full NW Bicester development of 6,000 homes.
- 5.5.5 The proportion of traffic generated by the development in relation to the overall masterplan was calculated as 38.14% in the AM peak hour, 41.48% in the PM peak hour and 39.48% in the 12-hour period. Note that whilst these percentages have been used in this assessment the new trip rates produce percentages of 22.77% in the AM peak hour and 37.52% in the PM peak hour.
- 5.5.6 These percentages were applied to link and junction flows to identify the percentage impact of the Development on Reference Case 2031 traffic levels.
- 5.5.7 Table 5.5.1 shows the total predicted number of trips generated by the Development for each link and compared to the predicted increase in traffic flow from the Reference Case 2031. The percentage change on each link in the different time periods is then identified.
- 5.5.8 Table 5.5.1 shows in highlight those links where a 10% or more increase in traffic is forecast from the Development compared to the Reference Case in 2031. The impact on the following links would therefore be further considered:

- Banbury Road, N and S of Lords Lane
- Buckingham Road, S of Skimmingdish Lane
- Shakespeare Drive

- M40 J10 northbound off slip road
- Ardley Road (E of B430)
- The Approach, W of Bucknell Road
- Ardley Road, N of Bucknell
- Middleton Road, W of Bucknell
- B4030 Middleton Stoney Road, NW of NW Bicester Masterplan

Link Ref	Link Description	2031 Future Baseline / Reference Case Flows		Development Flows		2031 Future Baseline with Development Flows		Percentage Change	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	A41 northbound, N of M40 J9	1510	1575	21	-24	1531	1551	1%	-2%
2	A41 southbound, N of M40 J9	1242	1269	-6	22	1236	1291	0%	2%
3	A41 Oxford Rd, S of A41 junction	4324	4016	122	132	4446	4148	3%	3%
4	Vendee Drive, W of A41 junction	757	989	25	88	782	1077	3%	9%
5	A41, N of Pingle Drive	2229	2235	91	94	2320	2329	4%	4%
6	Middleton Stoney Rd, W of Kings End	966	1158	21	78	987	1236	2%	7%
7	Middleton Stoney Rd, W of Howes Lane	519	642	347	408	866	1050	67%	64%
8	Howes Lane, N of Middleton Stoney Rd	1075	1198	-53	-125	1022	1073	-5%	-10%
9	Howes Lane, E of Shakespeare Drive	1077	1173	50	18	1127	1191	5%	2%
10	Lords Lane, E of Bucknell Road	1391	1409	-90	-84	1301	1325	-6%	-6%
11	Lords Lane, W of Banbury Road	1384	1448	-88	-139	1296	1309	-6%	-10%
12	Bucknell Road, N of Lords Lane	257	432	-45	-112	212	320	-18%	-26%
13	Bucknell Road, S of Howes Lane	516	932	77	33	593	965	15%	4%
14	Banbury Road, N of Lords Lane	1522	1755	50	201	1572	1956	3%	11%
15	A4095 E of Banbury Road	2106	2163	8	53	2114	2216	0%	2%
16	Banbury Road, S of A4095	764	929	126	109	80	1038	17%	12%
17	Buckingham Road, S of Skimmingdish Lane	1258	1252	148	115	1406	1367	12%	9%
18	Queens Avenue, S of Bucknell Road	1998	2109	47	114	2045	2223	2%	5%
19	A41 E of A41 Oxford Road	3505	3447	98	113	3603	3560	3%	3%
20	A4421 Neunkirchen Way	1849	1938	59	88	1908	2026	3%	5%

Link Ref	Link Description	2031 Future Baseline / Reference Case Flows		Development Flows		2031 Future Baseline with Development Flows		Percentage Change	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
21	A41, E of London Road roundabout	1969	1632	23	28	1992	1660	1%	2%
22	A4421, E of Skimmingdish Lane	2154	2453	58	134	2212	2587	3%	5%
23	Shakespeare Drive, S of Howes Lane	138	85	54	53	192	138	39%	62%
24	M40 J10 northbound off slip road	759	523	114	72	873	595	15%	14%
25	Ardley Road (E of B430)	364	532	48	9	412	541	13%	2%
26	M40 J10 southbound on slip road (from A43)	565	240	13	-3	578	237	2%	-1%
27	B430 M40 over bridge	2376	2579	11	79	2387	2658	0%	3%
28	A4095 N of Chesterton	1076	976	42	33	1118	1009	4%	3%
29	Shakespeare Drive, E of Middleton Stoney Road	950	873	71	145	1021	1018	7%	17%
30	The Approach, W of Bucknell Road	401	507	153	86	554	593	38%	17%
31	A41 East of Pioneer Road	3075	3009	4	25	3079	3034	0%	1%
32	Bicester Road, E of A4421 junction	421	580	-14	12	407	592	-3%	2%
33	A4421 N of Skimmingdish Lane	1780	1641	68	16	1848	1657	4%	1%
34	Fringford Road, N of Caversfield	99	188	2	2	101	190	2%	1%
35	B4100 Banbury Road, N of Bainton Road	1353	1599	51	14	1404	1613	4%	1%
36	Ardley Road, N of Bucknell	349	533	54	9	403	542	16%	2%
37	Middleton Road, W of Bucknell	32	30	109	182	141	212	340%	606%
38	B4030 Middleton Stoney Road, NW of NWB	522	642	88	161	610	803	17%	25%
39	Green Lane, W of Chesterton	611	561	11	13	622	574	2%	2%
40	Wendlebury Road, E of M40	450	254	32	-8	482	246	7%	-3%
41	M40 northbound (mainline only), S of J9	4001	4310	12	1	4013	4311	0%	0%
42	M40 southbound (mainline only), S of J9	4387	4077	1	1	4388	4078	0%	0%

Link Ref	Link Description	2031 Future Baseline / Reference Case Flows		Development Flows		2031 Future Baseline with Development Flows		Percentage Change	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
43	M40 northbound (mainline only), S of J10 / N of J9	5786	6269	119	63	5905	6332	2%	1%
44	M40 southbound (mainline only), S of J10 / N of J9	5398	4693	16	-2	5414	4691	0%	0%
45	M40 northbound (mainline only), N of J10	5243	6053	11	0	5254	6053	0%	0%
46	M40 southbound (mainline only), N of J10	5877	5133	6	5	5883	5138	0%	0%

Table 5.5.1: Development Flows / Future Baseline

5.5.9 A further assessment has been undertaken to include the two additional developments requested by OCC through the scoping process. Table 5.5.2 shows the total predicted number of trips generated by the Development for each link and compared to the predicted increase in traffic flow from the Reference Case 2031 for the 18-hour time period.

5.5.10 The assessment shows that when the two additional developments are included the Development has a lesser impact i.e. there is only a 10% or more increase on nine links against the assessment for the previous application and where there is an impact of 10% above it is generally slightly less.

Link Ref	Link Description	2031 Future Baseline With two additional developments	Development Flows	2031 Future Baseline with Development Flows	Percentage Change
		18 Hour Flow	18 Hour Flow	18 Hour Flow	18 Hour Flow
1	A41 northbound, N of M40 J9	16388	-16	16373	0%
2	A41 southbound, N of M40 J9	13422	83	13505	1%
3	A41 Oxford Rd, S of A41 junction	43484	1323	44807	3%
4	Vendee Drive, W of A41 junction	9761	589	10350	6%
5	A41, N of Pingle Drive	23300	964	24263	4%

Link Ref	Link Description	2031 Future Baseline With two additional developments	Development Flows	2031 Future Baseline with Development Flows	Percentage Change
		18 Hour Flow	18 Hour Flow	18 Hour Flow	18 Hour Flow
6	Middleton Stoney Rd, W of Kings End	11104	516	11619	5%
7	Middleton Stoney Rd, W of Howes Lane	6051	3939	9990	65%
8	Howes Lane, N of Middleton Stoney Rd	11993	-927	11066	-8%
9	Howes Lane, E of Shakespeare Drive	12364	354	12718	3%
10	Lords Lane, E of Bucknell Road	15508	-906	14602	-6%
11	Lords Lane, W of Banbury Road	15675	-1182	14493	-8%
12	Bucknell Road, N of Lords Lane	3605	-818	2787	-23%
13	Bucknell Road, S of Howes Lane	7899	571	8470	7%
14	Banbury Road, N of Lords Lane	19720	1298	21018	7%
15	A4095 E of Banbury Road	23583	318	23901	1%
16	Banbury Road, S of A4095	9333	1220	10553	13%
17	Buckingham Road, S of Skimmingdish Lane	13534	1372	14906	10%
18	Queens Avenue, S of Bucknell Road	21405	839	22244	4%
19	A41 E of A41 Oxford Road	36283	1099	37382	3%
20	A4421 Neunkirchen Way	19738	766	20504	4%
21	A41, E of London Road roundabout	18784	266	19050	1%

Link Ref	Link Description	2031 Future Baseline With two additional developments	Development Flows	2031 Future Baseline with Development Flows	Percentage Change
		18 Hour Flow	18 Hour Flow	18 Hour Flow	18 Hour Flow
22	A4421, E of Skimmingdish Lane	24892	1000	25892	4%
23	Shakespeare Drive, S of Howes Lane	1172	566	1738	48%
24	M40 J10 northbound off slip road	6929	968	7897	14%
25	Ardley Road (E of B430)	4670	298	4968	6%
26	M40 J10 southbound on slip road (from A43)	4456	52	4508	1%
27	B430 M40 over bridge	27388	469	27857	2%
28	A4095 N of Chesterton	11469	391	11859	3%
29	Shakespeare Drive, E of Middleton Stoney Road	9501	1119	10620	12%
30	The Approach, W of Bucknell Road	4732	1244	5976	26%
31	A41 East of Pioneer Road	31726	151	31877	0%
32	Bicester Road, E of A4421 junction	5268	-10	5257	0%
33	A4421 N of Skimmingdish Lane	17830	438	18268	2%
34	Fringford Road, N of Caversfield	1496	21	1517	1%
35	B4100 Banbury Road, N of Bainton Road	18026	339	18364	2%
36	Ardley Road, N of Bucknell	4597	335	4932	7%
37	Middleton Road, W of Bucknell	323	1513	1836	468%
38	B4030 Middleton Stoney Road, NW of	6067	1295	7362	21%

Link Ref	Link Description	2031 Future Baseline With two additional developments	Development Flows	2031 Future Baseline with Development Flows	Percentage Change
		18 Hour Flow	18 Hour Flow	18 Hour Flow	18 Hour Flow
	NWB				
39	Green Lane, W of Chesterton	6108	125	6233	2%
40	Wendlebury Road, E of M40	3669	125	3794	3%
41	M40 northbound (mainline only), S of J9	59095	68	59163	0%
42	M40 southbound (mainline only), S of J9	60211	10	60221	0%
43	M40 northbound (mainline only), S of J10 / N of J9	85155	948	86103	1%
44	M40 southbound (mainline only), S of J10 / N of J9	71335	73	71408	0%
45	M40 northbound (mainline only), N of J10	79926	57	79983	0%
46	M40 southbound (mainline only), N of J10	77905	57	77963	0%

Table 5.5.2: Development Flows / Future Baseline (including two additional committed developments)

5.5.11 As the environmental impact of the Development is slightly less than the environmental impact assessed for the previous application this ES Chapter proceeds with the findings from the ES Chapter that supported the previous application as this offers a worst-case scenario.

Severance

5.5.12 Table 5.5.3 identifies the likely impact on pedestrian severance and amenity for each of the selected links. Severance occurs when there is difficulty experienced in crossing a heavily trafficked road. The guidelines refer to the Department for Transport's 'Manual of Environmental Appraisal', which suggests that changes in traffic flow of 30%, 60%, and 90%

would be likely to produce 'slight', 'moderate', and 'substantial' changes in severance, respectively.

5.5.13 It can be seen that the increased traffic flow from the Development would be likely to impact on four of the links. Middleton Road would be likely to have a major impact on pedestrian severance in both peak hours in terms of percentage impact and Middleton Stoney Road NW of Howes Lane a moderate impact. Middleton Stoney Road at this location has no development alongside it to create a desire to cross the road and therefore this severance would not be experienced by more than small numbers of pedestrians. The other links are more sensitive with residential properties and other land uses such as schools and shops nearby.

Link Ref	Link Description	Percentage Change from 2031 Baseline		Impact on level of Pedestrian Severance	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
7	Middleton Stoney Rd, W of Howes Lane	67%	64%	Moderate	Moderate
13	Bucknell Road, S of Howes Lane	15%	4%	-	-
14	Banbury Road, N of Lords Lane	3%	11%	-	-
16	Banbury Road, S of A4095	17%	12%	-	-
17	Buckingham Road, S of Skimmingdish Lane	12%	9%		-
23	Shakespeare Drive, S of Howes Lane	39%	62%	Minor	Moderate
24	M40 J10 northbound off slip road	15%	14%	-	-
25	Ardley Road (E of B430)	13%	2%	-	-
29	Shakespeare Drive, E of Middleton Stoney Road	7%	17%	-	-
30	The Approach, W of Bucknell Road	38%	17%	Minor	-
36	Ardley Road, N of Bucknell	16%	2%	-	-
37	Middleton Road, W of Bucknell	340%	606%	Major	Major
38	B4030 Middleton Stoney Road, NW of NWB	17%	25%	-	-

Table 5.5.3: Impact on Level Of Pedestrian Severance

Driver delay

5.5.14 In order to assess driver delay on the links identified for assessment, link speeds were used. Where there is a reduction in link speed with the Development compared to the Reference Case this gives an indication of increased driver delay.

5.5.15 Congested speeds by link (including junction delay) were provided from the BTM. Table 5.5.4 shows the speed in the Reference Case 2031 and with the Development. These speeds are for the full 6,000 home NW Bicester Masterplan and thus represent a worst case in terms of delay on each link for the Development.

5.5.16 The links where speed in kilometres per hour reduces significantly with development are highlighted. This indicates that there would be an increase in driver delay on Middleton Stoney Road, west of Howes Lane and the NW Bicester development, Banbury Road, Buckingham Road and Shakespeare Drive.

5.5.17 With regard to the significance of the impacts, the following assessment by examining the level of change against the current speeds and using professional judgement is made:

- Middleton Stoney Road: minor adverse and not significant;
- Banbury Road, both north and south of Lord's Lane: moderate adverse and significant;
- Buckingham Road: minor adverse and not significant;
- Shakespeare Drive: moderate adverse and significant.

5.5.18 It is emphasised that these impact assessments are for the full NW Bicester development for this factor. For the Development, particularly given that it would not directly connect to Shakespeare Drive as it is on the eastern side of the railway, it is considered that the impacts on these links would be minor adverse. The assessment for the Development is therefore:

- Middleton Stoney Road: minor adverse and not significant
- Banbury Road, both north and south of Lord's Lane: moderate adverse and significant
- Buckingham Road: minor adverse and not significant
- Shakespeare Drive: minor adverse and significant.

Link Ref	Link Description		No NW Bicester kph		With Full NW Bicester kph		Change in Speed kph	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
7	Middleton Stoney Rd, W of Howes Lane	EB	76.6	76.56	72.08	73.38	-4.52	-3.18
		WB	76.58	75.98	69.69	68.1	-6.89	-7.88
13	Bucknell Road, S of Howes Lane	NB	48	48	48	48	0	0
		SB	48	48	48	48	0	0
14	Banbury Road, N of Lords Lane	NB	73.35	67.86	71.13	63.46	-2.22	-4.4
		SB	27.12	44.25	14.37	38.21	-12.75	-6.04
16	Banbury Road, S of A4095	NB	32.34	29.73	32.29	19.65	-0.05	-10.08
		SB	44.28	44.56	43.26	44.40	-1.02	-0.16
17	Buckingham Road, S of Skimmingdish Lane	NB	46.76	43.12	46.76	39.13	0	-3.99
		SB	57.41	57.53	57.35	57.52	-0.06	-0.01
23	Shakespeare Drive, S of Howes Lane	NB	48	48	32	32	-16	-16
		SB	48	48	31.92	31.98	-16.08	-16.02
24	M40 J10 northbound off slip road	NB	43.22	43.55	42.62	43.37	-0.6	-0.18
25	Ardley Road (E of B430)	NB	43.81	36.42	43.61	37.43	-0.2	1.01
		SB	47.96	47.97	47.69	47.68	-0.27	-0.29
29	Shakespeare Drive, E of Middleton Stoney Road	NB	48	48	31.32	31.67	-16.68	-16.33
		SB	48	48	28.08	28.95	-19.92	-19.05
30	The Approach, W of Bucknell Road	NB	22.02	21.35	19.48	20.97	-2.54	-0.38
		SB	32	32	31.73	31.05	-0.27	-0.95
36	Ardley Road, N of Bucknell	NB	43.81	36.42	43.61	37.43	-0.2	1.01
		SB	47.96	47.97	47.69	47.68	-0.27	-0.29
37	Middleton Road, W of Bucknell	NB	63.99	63.96	63.56	63.79	-0.43	-0.17
		SB	61.76	61.66	61.83	61.73	0.07	0.07
38	B4030 Middleton Stoney Road, NW of NWB	EB	80	80	80	80	0	0
		WB	79.21	78.02	77.21	72.22	-2	-5.8

Table 5.5.4: Change in Link Speed with Development

Pedestrian Delay

5.5.19 The IEMA Guidelines suggest that pedestrian delay is experienced at a lower threshold when pedestrians experience a 10 second delay crossing a carriageway with no crossing facilities for a two-way flow of 1,400 vehicles per hour. The upper threshold amounts to a 40 second delay, also where no crossing facilities exist.

5.5.20 The likely impact of pedestrian delay based on the predicted traffic flows of the Development has been assessed. A commentary on each link is provided in Table 5.5.5. A minor adverse impact is anticipated on Banbury Road (north of Lord's Lane), Buckingham Road and Shakespeare Drive.

Link Ref	Link Description	2031 Future Baseline with Development Flows		Commentary
		AM Peak Hour	PM Peak Hour	
7	Middleton Stoney Rd, W of Howes Lane	866	1050	The flow level is below the threshold volume of traffic. There are no destinations for pedestrians on the west side of Middleton Stoney Road. The impact would be negligible.
13	Bucknell Road, S of Howes Lane	593	965	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.
14	Banbury Road, N of Lords Lane	1572	1956	The flow level is above the threshold volume of traffic. A new toucan crossing is to be provided as part of the Exemplar development. The impact would be minor adverse.
16	Banbury Road, S of A4095	890	1038	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.
17	Buckingham Road, S of Skimmingdish Lane	1406	1367	The flow level is just above the lower threshold volume of traffic. There are various crossing locations provided. The impact would be minor adverse.
23	Shakespeare Drive, S of Howes Lane	192	138	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.
24	M40 J10 northbound off slip road	873	595	The flow level is below the threshold volume of traffic. There are no pedestrian routes given that it is part of the motorway. The impact would be negligible.
25	Ardley Road (E of B430)	412	541	The flow level is well below the threshold volume of traffic. The impact would be negligible.
29	Shakespeare Drive, E of Middleton Stoney Road	1021	1018	The flow level is below the threshold volume of traffic but there are limited crossing facilities. The impact may be minor adverse.
30	The Approach, W of Bucknell Road	554	593	The flow level is well below the threshold volume of traffic. The impact would be negligible.
36	Ardley Road, N of Bucknell	403	542	The flow level is well below the threshold volume of traffic. The impact would be negligible.
37	Middleton Road, W of Bucknell	141	212	The flow level is well below the threshold volume of traffic. The impact would be negligible.
38	B4030 Middleton Stoney Road, NW of NWB	610	803	The flow level is below the threshold volume of traffic. There are no destinations for pedestrians on the west side of

Link Ref	Link Description	2031 Future Baseline with Development Flows		Commentary
		AM Peak Hour	PM Peak Hour	
				Middleton Stoney Road. The impact would be negligible.

Table 5.5.5: Impact on Pedestrian Delay

Pedestrian Amenity

5.5.21 Table 5.5.6 sets out each link and identifies where there would be a likely impact on pedestrian amenity based on the predicted increase in traffic flows with the Development Flows. The pedestrian amenity threshold, as set out in the IEMA Guidelines to assess the significance of change, is where the traffic flow is doubled.

5.5.22 It can be seen that of the links assessed there would be likely to be an adverse impact on pedestrian amenity on Middleton Stoney Road, Shakespeare Drive and Middleton Road.

Link Ref	Link Description	2031 Future Baseline with Development Flows		Percentage Change from 2031 Future Baseline		Impact on Level of Pedestrian Amenity	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
7	Middleton Stoney Rd, W of Howes Lane	866	1050	67%	64%	Impact	Impact
13	Bucknell Road, S of Howes Lane	593	965	15%	4%	-	-
14	Banbury Road, N of Lords Lane	1572	1956	3%	11%	-	-
16	Banbury Road, S of A4095	890	1038	17%	12%	-	-
17	Buckingham Road, S of Skimmingdish Lane	1406	1367	12%	9%	-	-
23	Shakespeare Drive, S of Howes Lane	192	138	39%	62%	-	Impact
24	M40 J10 northbound off slip road	873	595	15%	14%	-	-
25	Ardley Road (E of B430)	412	541	13%	2%	-	-
29	Shakespeare Drive, E of Middleton Stoney Road	1021	1018	7%	17%	-	-
30	The Approach, W of Bucknell Road	554	593	38%	17%	-	-
36	Ardley Road, N of Bucknell	403	542	16%	2%	-	-
37	Middleton Road, W of Bucknell	141	212	340%	606%	Impact	Impact
38	B4030 Middleton Stoney Road, NW of NWB	610	803	17%	25%	-	-

Table 5.5.6: Impact on Level of Pedestrian Amenity

Fear and Intimidation

5.5.23 Fear and intimidation can be established through a combination of traffic flow, speed and composition. The criteria from the IEMA Guidelines for assessing this have been set out in Table 5.3.2.

5.5.24 Table 5.7.7 shows the predicted 2031 traffic flows with the Development over an average 18-hour period and identifies the likely impact of fear and intimidation. The sensitivity of the link is summarised in terms of the receptors in the vicinity, as set out earlier in Table 5.3.1

5.5.25 The assessment of impact shows a potential minor adverse impact on Bucknell Road south of Howes Lane, Banbury Road north of Lord's Lane and Buckingham Road, south of Skimmingdish Lane.

Link Ref	Link Description	Average Flow over 18 hours	Sensitivity of Link	Average Speed (PM peak average of two-way)	Assessment of Impact
7	Middleton Stoney Rd, W of Howes Lane	555	Negligible	70.7	Negligible
13	Bucknell Road, S of Howes Lane	451	Medium	48	Minor adverse
14	Banbury Road, N of Lords Lane	1021	Negligible	50.8	Minor adverse
16	Banbury Road, S of A4095	558	Low	32.0	Negligible
17	Buckingham Road, S of Skimmingdish Lane	803	Low	48.3	Minor adverse
23	Shakespeare Drive, S of Howes Lane	96	Medium	44.8	Negligible
24	M40 J10 northbound off slip road	425	Negligible	43.4	Negligible
25	Ardley Road (E of B430)	276	Low	42.6	Negligible
29	Shakespeare Drive, E of Middleton Stoney Road	590	Medium	30.3	Negligible
30	The Approach, W of Bucknell Road	332	Medium	26.0	Negligible
36	Ardley Road, N of Bucknell	274	Low	42.6	Negligible
37	Middleton Road, W of Bucknell	102	Low	62.8	Negligible
38	B4030 Middleton Stoney Road, NW of NWB	409	Negligible	76.1	Negligible

Table 5.5.7: Impact on Level of Fear and Intimidation

Accidents and Safety

5.5.26 The increase in traffic flows generated by the Development may increase the potential for collisions on the highway network. Areas of existing collisions can be assessed to identify whether mitigation measures are required to improve facilities for vulnerable road users.

5.5.27 An analysis of personal injury accidents has been undertaken for the past five years. The study area for the accident analysis did not include all of the links being assessed in detail. As such a precautionary approach has been taken with this small number of links, assuming there may be a significant impact.

5.5.28 Of the links assessed, a minor adverse impact may potentially be experienced on Middleton Stoney Road, Shakespeare Drive and the Approach, Ardley Road and Middleton Road and Banbury Road north of the A4095 junction.

Link Ref	Link Description	Existing Accident Issues	Assessment of Impact
7	Middleton Stoney Rd, W of Howes Lane	Not included in the assessment	Minor adverse
13	Bucknell Road, S of Howes Lane	One slight incident	Negligible
14	Banbury Road, N of Lords Lane	One serious and two slight incidents	Minor adverse
16	Banbury Road, S of A4095	Not included in the assessment	Negligible
17	Buckingham Road, S of Skimmingdish Lane	Two serious incidents	Negligible
23	Shakespeare Drive, S of Howes Lane	Not included in the assessment	Minor adverse
24	M40 J10 northbound off slip road	Not included in the assessment	Negligible
25	Ardley Road (E of B430)	Not included in the assessment	Minor adverse
29	Shakespeare Drive, E of Middleton Stoney Road	Not included in the assessment	Negligible
30	The Approach, W of Bucknell Road	Not included in the assessment	Minor adverse
36	Ardley Road, N of Bucknell	Not included in the assessment	Minor adverse
37	Middleton Road, W of Bucknell	Not included in the assessment	Minor adverse
38	B4030 Middleton Stoney Road, NW of NWB	Not included in the assessment	Minor adverse

Table 5.5.8: Impact on Accidents and Safety

Impact on Public Rights of Way

5.5.29 In addition to the impact on links where an increase in traffic flows generated by the Development of more than 10% is identified, the impact on the public rights of way network has been considered. Within the Development there are no PROW directly impacted. New footpath connections would be provided through the Bure stream area and under the railway to the western side, for example, which would have a beneficial impact on the network.

5.5.30 The A4095 Strategic NW Link Road would cross the Bicester Bridleway 4 (via Aldershot Farm) which is a key strategic walking, cycling and equestrian route. There could be severance caused by the new road/building construction. It is proposed that a controlled crossing of the new road for walkers, cyclists and equestrians is provided to minimise any severance impacts of the Development.

Summary

5.5.31 Table 5.5.9 summarises the assessment of each of the links against each of the factors. This is on the basis that no mitigation has been taken into account in the assessment.

Link Ref	Link Description	Pedestrian Severance	Pedestrian Amenity	Driver Delay	Pedestrian Delay	Fear and Intimidation	Accident And Safety
7	Middleton Stoney Rd, W of Howes Lane	Moderate adverse	Moderate adverse	Minor adverse	Negligible	Negligible	Minor adverse
13	Bucknell Road, S of Howes Lane	Negligible	Negligible	Negligible	Negligible	Minor adverse	Negligible
14	Banbury Road, N of Lords Lane	Negligible	Negligible	Moderate adverse	Minor adverse	Minor adverse	Minor adverse
16	Banbury Road, S of A4095	Negligible	Negligible	Moderate adverse	Negligible	Negligible	Negligible
17	Buckingham Road, S of Skimmingdish Lane	Negligible	Negligible	Minor adverse	Minor adverse	Minor adverse	Negligible
23	Shakespeare Drive, S of Howes Lane	Moderate adverse	Moderate adverse	Minor adverse	Negligible	Negligible	Minor adverse
24	M40 J10 northbound off slip road	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
25	Ardley Road (E of B430)	Negligible	Negligible	Negligible	Negligible	Negligible	Minor adverse
29	Shakespeare Drive, E of Middleton Stoney Road	Negligible	Negligible	Minor adverse	Minor adverse	Negligible	Negligible
30	The Approach, W of Bucknell Road	Minor adverse	Negligible	Negligible	Negligible	Negligible	Minor adverse
36	Ardley Road, N of Bucknell	Negligible	Negligible	Negligible	Negligible	Negligible	Minor adverse
37	Middleton Road, W of Bucknell	Major adverse	Major adverse	Negligible	Negligible	Negligible	Minor adverse
38	B4030 Middleton Stoney Road, NW of NWB	Negligible	Negligible	Minor adverse	Negligible	Negligible	Minor adverse

Table 5.5.9: Traffic and Transport Impact Summary Table

5.5.32 The other Environmental Effects including noise, vibration and air quality are addressed in other chapters of the ES.

5.6 Mitigation Measures

Embedded Mitigation in Proposed Development

5.6.1 The Development is reliant on the delivery of the realignment of the A4095 for which planning permission has been granted to OCC.

5.6.2 The Development layout includes good connections for walking and cycling within the site and from the site as well as a frequent bus service between the Development and the town centre and rail station(s). The Development will therefore benefit from a high level of connectivity to the wider NW Bicester development as well as the rest of the town. The mix of land uses and provision for sustainable modes, together with travel plan measures to encourage 'smarter choices' will enable the targets for mode share to be achieved.

5.6.3 The improvements to and/ or contributions to support off-site walking and cycling links of particular relevance in providing good connectivity to and from the development are as follows:

- Upgrade of the route alongside the railway from Lord's Lane to Banbury Road as a surfaced cycleway and footpath
- Improvements along Banbury Road, some of which are being delivered as part of the Exemplar development
- Minor improvements to the existing cycleway on the south side of Lord's Lane to remove vegetation that impacts on feelings of personal security for users
- Contributions to improvements to the routes through Bure Park to encourage their use as leisure walking and cycling routes.

5.6.4 A frequent bus service is proposed between the development and the town centre, aiming to provide six services per hour by full occupation subject to viability at that point in time, with a minimum of four per hour. A circular loop will be provided looping from and to the A4095. There is also an option from the A4095 through the Exemplar site to the B4100.

5.6.5 A crucial means of mitigating traffic impacts will be to achieve modal share and containment of trip targets, and this will also help the NW Bicester vision to be achieved. The strategy for sustainable travel measures is fully detailed in the Framework Travel Plan but includes a mobility hub, employment space, support for a car club, electric vehicle charging points, promotion of electric vehicles, cycling and walking and support as well as a management and monitoring structure to give confidence that targets can be achieved.

Mitigation of Construction Effects of Development

- 5.6.6 As a large proportion of the construction traffic is anticipated to be heavy goods vehicles it is essential that residential areas are avoided during the course of construction by heavy goods vehicle drivers associated with the proposals. It is therefore considered appropriate to have a lorry routing agreement to ensure drivers use the peripheral road/ A4095 and would be prohibited from passing through the centre of Bicester unless they are transporting locally sourced materials/goods. This would be included within the Construction Environmental Management Plan.
- 5.6.7 It is anticipated that over the life of the construction period, virtually all construction traffic for the Development would use the A41/Vendee Drive from the M40 Junction 9 and the A4421 around the eastern side of Bicester.
- 5.6.8 It would be ensured that regular wheel cleaning / dirt control would be undertaken at key stages of the construction to minimise spillage on the road surface. Arrangements for regular road maintenance and cleaning, e.g. road sweeping in the vicinity of the site access point as necessary would be included within the Construction Environmental Management Plan.
- 5.6.9 Temporary road signs and traffic management control would be provided where necessary to ensure construction vehicles have a clear route to and from Site and do not affect the safety of other road users.

Mitigation of Operational Stages of Development

- 5.6.10 The assessment of impacts has identified that there are a number of locations where moderate adverse impacts may arise and there is a need to consider further mitigation to reduce the significance of these impacts. These are discussed in turn below.

Middleton Stoney Road, West of Howes Lane

- 5.6.11 The level of traffic increase forecast on this link is anticipated to have a significant impact on pedestrian severance and amenity. It should be highlighted however that the level of traffic increase forecast for the Development is unlikely to arise in reality from the Development assessed in this chapter as the increase from the Masterplan in this area is due to the access points into the western parts of the overall NW Bicester development (a number of which already have planning permission). Moreover, Middleton Stoney Road forms the western extent of NW Bicester and there are no properties on the western side of the road. Thus the actual impact of severance is likely to be minimal. Nonetheless, as access points are provided from Middleton Stoney Road west of Howes Lane, there would be a need to introduce the built-up area speed limit to the north west and appropriate speed reduction measures on this section.

Banbury Road, north and south of A4095

- 5.6.12 Driver delay is anticipated to be increased on Banbury Road both north and south of the A4095 junction, given the increase in traffic in this area from both the Reference Case and the NW Bicester development. A potential scheme, designed and to be constructed by OCC

to replace the roundabout junction with a traffic signalised cross roads is set out in the Transport Assessment, in order to increase the junction capacity and reduce driver delay in this area. A planning application for this scheme has been submitted with a decision awaited.

Shakespeare Drive, South of Howes Lane

- 5.6.13 The level of traffic increase forecast on this link is anticipated to have a significant impact on pedestrian severance and amenity. It should be highlighted however that the level of traffic increase forecast for the Development is unlikely to arise in reality from the Development assessed in this chapter as the increase from the NW Bicester Masterplan in this area is largely due to the connections into the land to the south of the railway from Shakespeare Drive. However, it is proposed that measures are introduced in the area to mitigate impacts on pedestrians and cyclists which may include speed reduction measures (built outs for example), widened footways/ cycle route and crossing points.

Middleton Road, West of Bucknell

- 5.6.14 The BTM forecasts an increase in traffic routeing through Bucknell village and using Middleton Road both in the Reference Case and with the Development. It is considered likely that the model does not fully take account of the difficult alignment of Bainton Road as an access to the village and may be over-predicting traffic movements. Nonetheless it is recognised that the Development is in close proximity to the village and the routes westwards towards J10 of the M40/ south to the A34 via the village may be used to an extent by Development traffic. In order to minimise this impact it is proposed to introduce traffic calming measures on route to the village, the nature and extent of which would be agreed with OCC and the Parish Council.

5.7 Residual Effects

Construction Effects

Construction Traffic

- 5.7.1 The potential impacts during the construction phase are identified as:
- Potential impact on pedestrian amenity and fear and intimidation due to the increase in vehicle flows and the change in flow composition i.e. an increase in large type vehicles. A lorry movement plan would be prepared to carefully phase construction vehicles to and from Site.
 - Potential increase in pedestrian and driver delay due to the additional vehicles associated with the Development on the highway network together with possible temporary traffic management. However, possible disruption would be minimised by ensuring working times are outside of peak periods, convoy systems are in place to group vehicle movements, movements are restricted away from schools start and closing times and temporary facilities are designed to minimise disruption to traffic.

- Potential reduction in public safety, particularly vulnerable road users, due to the introduction of large type vehicles travelling to and from Site. Construction traffic would be restricted from travelling past schools and where this is not possible; vehicles would be restricted during start and closing times. A convoy system and banks man would be used where vehicle movements need assistance to reduce the potential effect on the safety of road users and potential traffic management control.

5.7.2 The assessment of impacts associated with the construction phase of the Development has identified that there are likely to be minor adverse impacts for residents and business relating to the increase in construction vehicles on the local highway network. Potential delays to journey times for pedestrians and drivers may be experienced due to the volume of traffic and potential need to introduce temporary traffic management controls on route to the development site. The safety of road users may also be affected by the increase of large type construction vehicles. A Construction Traffic Environmental Plan would be produced to mitigate these impacts, effectively routing construction vehicles away from sensitive residential areas where possible.

Operational Effects

5.7.3 With the implementation of measures as identified above the residual effects would be further reduced.

5.7 Cumulative Effects

5.7.1 All planned and committed developments have been considered when generating the traffic flows for the Reference Case 2031 and included in the assessment with the Development (including Great Wolf and the Oxfordshire SFRI).

5.7.2 The full impact of NW Bicester is dealt with in the TA Chapter 10.

5.7.3 The list of schemes considered as part of the cumulative effects within the ES chapter are listed in section 1.

5.8 Summary Statement of Effects

5.8.1 This section has presented and assessed the likely traffic and transport impacts likely to arise as a result of the Development. The relevant regulatory and policy framework has been summarised and the methodology used to set out current and future baselines.

5.8.2 The traffic flow for the base case year of 2012 and the predicted 2031 Future Baseline / Reference Case (without development) have been identified using the BTM for the highway network.

5.8.3 Minor adverse construction impacts have been identified and include the effect on residents and businesses due to the increased traffic flows consisting of a high proportion of heavy

goods vehicles. Mitigation measures would be put in place to reduce the severity of the impacts such as producing a Construction Environmental Management Plan which would identify lorry routes away from residential roads and schools and ensure operations are during off-peak periods.

- 5.8.4 The traffic flows with the Development have been generated and then been compared to the Future Baseline / Reference Case 2031. Links have been identified where the percentage increase in traffic is more than 10%. The impact on these links in terms of pedestrian severance, amenity, delay and fear and intimidation together with driver delay and accidents and safety have been assessed.
- 5.8.5 Following the assessment of impacts, further mitigation has been considered to address those areas where impacts are significant (i.e. a moderate or major adverse impact). No major adverse impacts are considered likely following mitigation.

Table 5.XX: Assessment of Significance of Residual Effects

Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
Construction					
Severance	Temporary		Local	CEMP	Minor Adverse
Driver Delay	Temporary		Local	CEMP	Minor Adverse
Pedestrian Delay	Temporary		Local	CEMP	Minor Adverse
Pedestrian Amenity	Temporary		Local	CEMP	Minor Adverse
Accidents and Safety	Temporary		Local	CEMP	Minor Adverse
Fear and Intimidation	Temporary		Local	CEMP	Minor Adverse
Operational Development					
Severance	Permanent	Major Adverse	Local	Crossing points, OCC signalisation scheme	Moderate Adverse
Driver Delay	Permanent	Moderate Adverse	Local	Travel Plan, Mobility Hub, OCC signalisation scheme	Minor Adverse
Pedestrian Delay	Permanent	Minor Adverse	Local	Crossing points	Minor Adverse

Pedestrian Amenity	Permanent	Major Adverse	Local	Speed reduction measures, crossing points, widening of footways	Minor Adverse
Accidents and Safety	Permanent	Minor Adverse	Local	Speed reduction measures, crossing points, widening of footways, OCC signalisation scheme	Minor Adverse
Fear and Intimidation	Permanent	Minor Adverse	Local	Speed reduction measures, crossing points, widening of footways	Negligible