# Outline Application

## NW Bicester Planning Application 1

## Transport Assessment

north west bicester | a2dominion

THINKING ABOUT TOMORROW

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# A2 Dominion

# NW Bicester Application 1: Land North of the Railway Line

## Transport Assessment

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# 1 Introduction

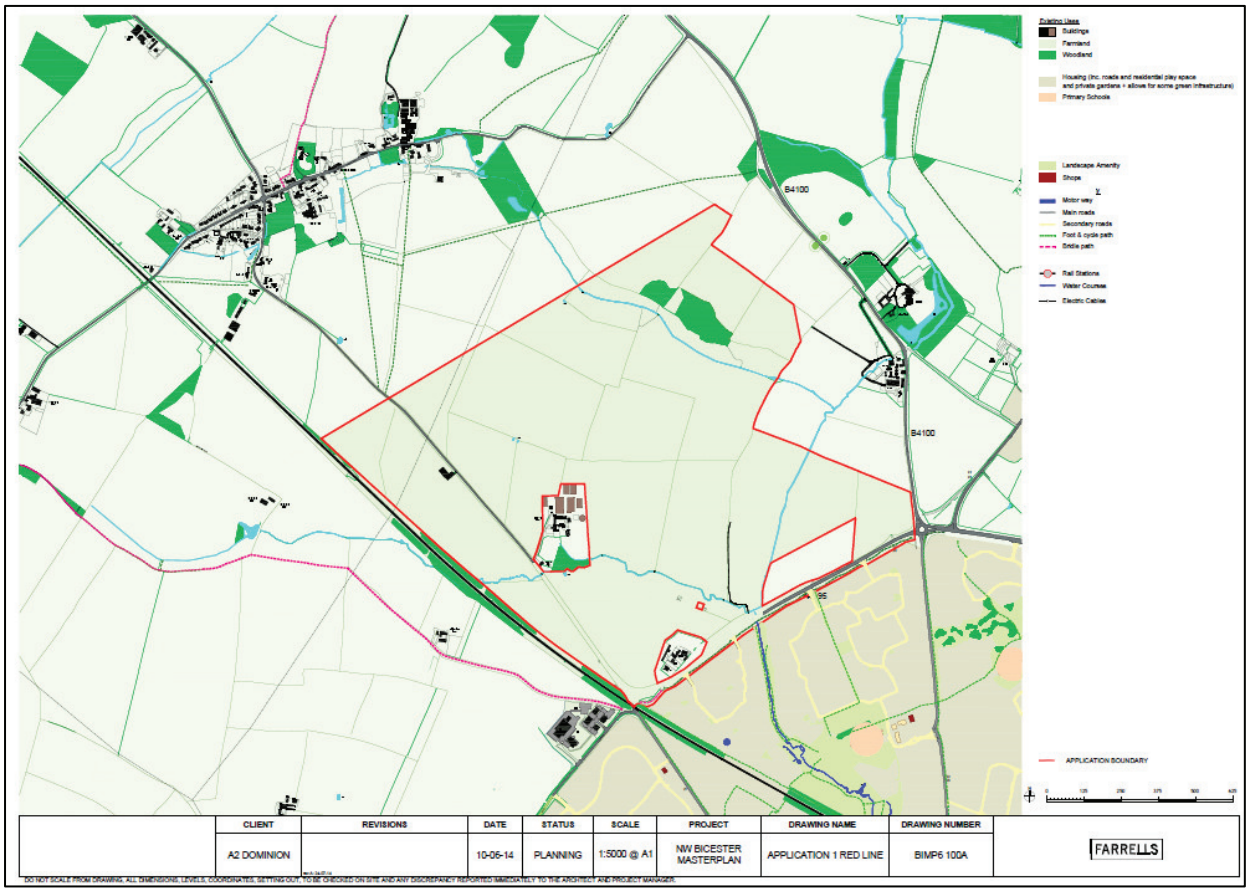
## 1.1 Overview

Hyder Consulting has been commissioned by A2 Dominion to prepare a Transport Assessment in support of their proposals for Application 1 comprising the land north of the railway line in North West Bicester, forming part of the NW Bicester Masterplan. The Application 1 development comprises approximately 2,600 homes including extra care housing, employment, shopping and community facilities, a primary school and an extension of the capacity of the Exemplar primary school. The total site area comprises 154.8 hectares of land.

Transport documents have been submitted as part of the submission for the 6,000 home NW Bicester Masterplan. This has been submitted to the Council who are looking to adopt SPD. This Transport Assessment has been produced using the same principles and methodology as have been established for the Masterplan, recognising that Application 1 sits within the overall framework and should not be considered in isolation.

There will be a separate planning application for a A4095 NW Strategic Link Road which will provide an improved route around the NW of Bicester and link through the NW Bicester development. This proposal is integrated into the Access Strategy for Application 1. Figure 1.1 shows the red line boundary for Application 1.

**Figure 1.1: Application 1 Land North of the Railway Line Site Location**



## 1.2 The Site

The site, as shown in Figure 1.2 (provided at the end of the document) in relation to the road network, is located to the west of the B4100 Banbury Road and is bound to the south by the A4095. The site lies adjacent to the existing residential areas of Bicester of Bure Park and west Bicester and is 2.7km from the town centre (measured to the existing Hawkwell Farm enclosed within the land north of the railway).

The town of Bicester lies approximately 24km to the north east of Oxford and 28km to the south east of Banbury. The M40 is located 2km to the south west, with access to the town from Junction 9 via the A41. The site can also be accessed via Junction 10 of the M40 Motorway, which is located approximately 7km to the north west. The site comprises agricultural land and woodland. The villages of Bucknell and Caversfield are located to the north and east of the site respectively.

## 1.3 Development Proposal

The proposed development quantum, which forms this application, is set out in Table 1.1. The 2,600 dwellings includes 250 units of extra care housing.

**Table 1.1: Development Quantum**

| | **Quantum** | **Units** |
|---|---|---|
| Residential – Privately Owned * 70% | 1820 | Dwellings |
| Residential – Affordable Housing * 30% | 780 | Dwellings |
| | | **2600** |
| Children's Nursery | 63 | Children |
| Primary School | 630 | Pupils |
| B1 Commercial Office | 3850 | $m^2$ |
| B2 Industrial Units | 974 | $m^2$ |
| Local Shops/restaurants/A2 business | 1771 | $m^2$ |
| Community Hall/Multi Faith Centre | 2220 | $m^2$ |
| Energy Centre | 440 | $m^2$ |

Source: Farrell's BIMP6 116 10/06/2014

The proposals for access are set out in Chapter 6 for walking, cycling and public transport together with highway access. Sustainable travel measures to achieve modal share targets are also identified and set out in more detail in the Framework Travel Plan which accompanies this application.

## 1.4 Study Scope

The scope of this Transport Assessment has been structured by numerous discussions and meetings with Oxfordshire County Council and Cherwell District Council relating to traffic and highway infrastructure matters relevant to the Masterplan which sets the framework for Application 1. A Transport Assessment Scoping Note (008-UA005241-UE31-01) was submitted to Oxfordshire County Council and the Highways Agency on 26th June 2014 setting out the content of this report for the outline application. The scoping note is included as Appendix 1.1.

## 1.5 Report Structure

This Transport Assessment report follows the structure identified below:

- **Chapter 2** – provides an overview of national and local policy in relation to the site and the proposal for development;
- **Chapter 3** – describes the existing conditions of the surrounding area, including existing transport facilities and road traffic conditions;
- **Chapter 4** – describes the baseline mode share and containment of trips in Bicester;
- **Chapter 5** – summarises current transport and land use proposals in Bicester;
- **Chapter 6** – provides details of the development proposals for the site;
- **Chapter 7** – assesses the accessibility of the site, both in terms of the availability of opportunities and facilities internal and external to the proposed development;
- **Chapter 8** – describes the trip and traffic generation methodology and sets out the forecast generation from the proposed development;
- **Chapter 9** – outlines the traffic modelling work undertaken to assess the impact of the development;
- **Chapter 10** – outlines the traffic impacts;
- **Chapter 11** – sets out network capacity assessments and proposed mitigation; and
- **Chapter 12** – provides an overall summary and conclusion.

# 2 Policy Context

## 2.1 Introduction

This chapter sets out the key strategies and policies relating to transport at national and local (County and District) level.

## 2.2 National Policy

### 2.2.1 Government White Paper

A Government White Paper ***Creating Growth, Cutting Carbon***[1] was released in 2011 which outlines a vision for a transport system that is an engine for economic growth, and one which is greener and safer. The White Paper states that by improving transport links and targeting projects that promote green growth, a dynamic, low carbon economy can be created.

### 2.2.2 National Planning Policy Framework (March 2012)

The National Planning Policy Framework sets out the Governments planning policies for England and how these are expected to be applied. The NPPF sets out 12 core planning principles that should underpin decision taking. The principle which relates to transport planning, and in the turn the Development is:

*"Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling and focus significant development in locations which are or can be made sustainable."*

**Chapter 4 'Promoting sustainable transport'** and specifically **Paragraph 29** states that "the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel".

**Paragraph 32** states that "decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe."

**Paragraph 34** states that "decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised."

[1] Department for Transport. *Creating Growth, Cutting Carbon White Paper* (2011) Available at: http://www.dft.gov.uk/pgr/regional/sustainabletransport/pdf/whitepaper.pdf

**Paragraph 35** states that "developments should be located and designed where practical to:

- Accommodate the efficient delivery of goods and supplies;
- Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;
- Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- Consider the needs of people with disabilities by all modes of transport."

Finally, **Paragraph 38** states that for larger scale residential developments in particular "key facilities such as primary schools and local shops should be located within walking distance of most properties."

### 2.2.3 Planning Policy Statement 1 – Eco-Towns Annex

Planning Policy Statement 1 on sustainable development has an Annex specifically setting out a range of minimum standards for Eco-towns, with NW Bicester identified as one of the four Eco-town locations. The document states that many of the principles and standards are more challenging and stretching than would normally be permitted for new development, with the aim of acting to ensure that eco-towns are exemplars of good practice and provide a showcase for sustainable living.

**Section ET11** – Transport sets out the standards to be achieved for transport as follows:

**"ET11.1** – Travel in eco-towns should support people's desire for mobility whilst achieving the goal of low carbon living. The town should be designed so that access to it and through it gives priority to options such as walking, cycling, public transport and other sustainable options, thereby reducing residents' reliance on private cars, including techniques such as filtered permeability. To achieve this, homes should be within ten minutes' walk of (a) frequency public transport and (b) neighbourhood services. The provision of services within the eco-town may be co-located to reduce the need for individuals to travel by private car and encourage the efficient use of the sustainable transport options available.

**ET11.2** – Planning applications should include travel plans which demonstrate:

a) How the site's design will enable at least 50% of trips originating in eco-towns to be made by non-car means;

b) Good design principles, drawing from Manual for Streets , Building for Life , and community travel planning principles;

c) How transport choice messages, infrastructure and services will be provided from 'day one' of residential occupation; and

d) How the carbon impact of transport in the eco-town will be monitored, as part of embedding a long term low-carbon approach to travel within plans for community governance.

**ET11.3** – Where an eco-town is close to an existing higher order settlement, planning applications should also demonstrate:

(a) Options for ensuring that key connections around the eco-town do not become congested as a result of the development, for example by extending some aspects of the travel plan beyond the immediate boundaries of the town, and

(b) Significantly more ambitious targets for modal share than the 50 per cent (increasing to 60 per cent over time) mentioned above and for the use of sustainable transport.

**ET11.4** – Where eco-town plans intend to incorporate ultra-low carbon vehicle options, including electric car schemes to help achieve a sustainable transport system, planning applications should demonstrate that:

(a) There will be sufficient energy headroom to meet the higher demand for electricity; and

(b) The scheme will not add so many additional private vehicles to the local road network that these will cause congestion.

**ET11.5** – Eco-towns should be designed in a way that supports children walking or cycling to school safely and easily. There should be a maximum walking distance of 800m from homes to the nearest school for children aged under 11, except where this is not a viable option due to natural water features or other physical landscape restrictions."

### 2.2.4 Circular 02/13 The Strategic Road Network and the Delivery of Sustainable Development

The DfT Circular explains how the Highways Agency (HA) will participate in all stages of the planning process with Government Offices, regional and local planning authorities, local highway/transport authorities, public transport providers and developers to ensure national and regional aims and objectives can be aligned and met.

The Circular sets out that proposals should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

It is identified that a robust travel plan that promotes use of sustainable modes is an effective means of managing the impact of development on the road network and reducing the need for major transport infrastructure. The Highways Agency expects the promoters of development to put forward initiatives that manage down the traffic impact of proposals to support the promotion of sustainable transport and the development of accessible sites.

## 2.3 Local Policy

### 2.3.1 Oxfordshire Local Transport Plan 2011-2030 (Revised April 2012 and Chapter 16 Bicester – May 2014)

The Oxfordshire Local Transport Plan (LTP) sets out objectives and plans for developing transport in their area from 2011 to 2030. In May 2014 a revised chapter on Bicester was produced.

The LTP strategy supports the *Local Plan*. It is set out that the implementation of the *Local Plan* will be helped by proposals and initiatives in the *Bicester and Northwest Bicester Eco town Masterplans*. These documents promote an enlarged and vibrant town with a comprehensive range of employment opportunities and local amenities to complement its substantial role in the wider region's economy. The *Local Plan* stresses the importance of securing jobs-led growth in the town to address the critical employment shortfall, and the high levels of out-commuting.

It is highlighted that enhancing access to the strategic transport network and making it easier for people to travel between homes and jobs is critical in accelerating and accommodating future growth in Bicester. Investment in core transport infrastructure will boost the attractiveness and desirability of Bicester as a Place where businesses want to locate and grow, and where people want to live and work.

#### Transport Strategy Aims

The priority for Bicester is set out as being to provide the transport infrastructure which supports the aspirations set out in the *Local Plan* and the initiatives for their implementation in the forthcoming *Bicester and North West Bicester Eco-Town Masterplans*. This includes tacking the challenges identified in the *Bicester Movement Study* and those specific to Central Government standards for transport in Eco Towns. This will enable the town to thrive and realise its full growth potential, and its essential role in Oxfordshire's economy.

The strategy identifies a series of improvements to increase the overall capacity of transport networks and systems within the locality, enabling them to accommodate the additional trips generated by development; to adapt to their cumulative impact and to mitigate the local environmental impact of increased travel.

It is established that where schemes are needed to mitigate one particular development, the developer will be expected to either construct or provide funding for the scheme; where a scheme is required due to the impact of more than one development, each developer will be expected to make a contribution proportional to the scale of their impact. Additional funding may also be sought via the Local Transport Board to the Local Growth Fund and other sources. It is noted that Oxfordshire County Council are working towards a strategic transport contribution rate for developer funding, which will be adopted in a future update of this strategy.

Oxfordshire County Council will:

- Provide highway infrastructure which effectively reduces current and predicted transport congestion in Bicester;

- Increase highway capacity on perimeter routes to make these attractive to employment and longer distance traffic and hereby reducing the strain on the town centre and central corridor;

- Accommodate proposed strategic rail initiatives, including East West Rail and plans for electrification, and a possible future Rail Freight Interchange, in order to strengthen Bicester's position on the national rail network and maximise access to regional economic centres, such as Milton Keynes;

- Strengthen the town's walking, cycle and bus networks to reduce congestion, improve air quality and ensure good links to local employment opportunities and amenities within the town, as well as transport hubs.

The policies are summarised below as they are of particular relevance to the NW Bicester development.

**BIC1 – We will seek opportunities to improve access and connections between key employment and residential sites and the strategic transport system by:**

- Increasing capacity at Junction 9 of the M40 and supporting plans to improve Junction 10

- Delivering a strategic perimeter route around the town is the key component of this strategy.

- Working closely with partners to facilitate the delivery of proposed strategic rail initiatives, especially East West Rail.

- Working with the rail industry and developers to deliver solutions at the Charbridge Lane and London Road railway level crossing points

- Supporting the proposals to secure a potential freight interchange at Graven Hill and working with the district and developers to achieve this.

- Working with developers to improve the A41 Oxford Road, including enhancements to the Pingle Drive junction, new site accesses, new bus stops and footpath and cycleway improvements.

- Creating a Park & Ride facility adjacent to the A41, close to the Vendee Drive junction.

- Providing measures to reduce congestion through the central corridor (from Kings End (B4030) to the 3-arm Field Street, Buckingham Road and Banbury Road roundabout).

- Implementing focused enhancements to the A4421 (between the junctions with Bicester Road and Launton Road)

- Improvements to the Buckingham Road / A4221 junction

- Increasing capacity at the Howes Lane / Bucknell Road junction and approaches

- South East Link Road

It is noted that bus priority measures may be required at anticipated pinch points on the main approaches to the town centre as future developments come forward. This is likely to include the Bucknell Road/Field Street junction, and the Buckingham Road approach to the three arm roundabout.

**BIC2 – We will work with strategic partners to develop the town's walking, cycling and bus networks and links between key development sites and the town centre and railway stations by:**

- Enhancing pedestrian, cycle and public transport links to the two railway stations, in particular Bicester Town Station.
- Improving Bicester's bus services along key routes
- Significantly improving public transport connectivity with other key areas of economic growth within Oxfordshire
- Providing improved public transport infrastructure
- Public realm improvements in Bicester Market Square and The Causeway
- Securing green links between proposed development sites on the outskirts of the town and existing Public Rights of Way, providing a series of leisure / health walks.

With respect to sustainable travel, the LTP3 chapter states that:

**BIC3 - We will work to get the most out of Bicester's transport network by investigating ways to increase people's awareness of the travel choices available in Bicester by:**

- Undertaking travel promotions and marketing measures
- Developing a coordinated parking strategy in partnership with Cherwell District Council
- Discourage undesirable routeing of traffic by developing a signage strategy,

### 2.3.2 Cherwell Proposed Submission Local Plan

The Proposed Submission Local Plan was submitted to the Secretary of State for Communities and Local Government for formal Examination on 31 January 2014. It sets out the broad planning framework for meeting the future needs of Cherwell and would replace the Cherwell Local Plan 1996.

During the Examination in Public on the emerging Local Plan, the Inspector requested that Cherwell District Council (CDC) objectively assesses its housing needs against the Oxfordshire Strategic Housing Market Assessment (2014). Accordingly, the Examination in Public was suspended whilst the Council explores options to increase the housing delivery within the plan period. Moving forward, the Council is reviewing its evidence base. It is anticipated that the emerging Local Plan (Main Modifications) will be consulted on in August 2014 and submitted in October 2014, with the Examination

in Public resuming in Winter 2014. Subject to Examination, it is understood that the emerging Local Plan is likely to be adopted in 2015.

### 2.3.3 Bicester Masterplan

Cherwell DC has also produced a **draft masterplan for Bicester** (consultation draft in September 2012) to eventually form Supplementary Planning Guidance. The Masterplan challenges are addressed in the OCC LTP3 chapter. The Bicester Masterplan is the subject of ongoing review and consultation.

### 2.3.4 NW Bicester Masterplan

Documents have been submitted to Cherwell District Council in March 2014 with additional information submitted in May 2014. A further iteration of the Access and Travel Strategy was submitted in July 2014. The 'master plan' sets out the Vision for NW Bicester and provides a framework for development. The Access and Travel Strategy and its appendices provide a framework for the development of land north of the railway. The relevant sections are extracted or referred to as appropriate throughout this Transport Assessment.

## 2.4 Guidance Documents

In addition to the policy framework, various guidance and supporting documents are available which provide good practice examples and advice on eco developments. The following have been reviewed and taken account of in the development of the proposals:

- DfT Guidance on Transport Assessment;
- Building Sustainable Transport into New Developments: A menu of options for growth points and Eco-towns, DfT, April 2008;
- Design to Delivery: eco-towns transport worksheet, Town and Country Planning Association, March 2008; and
- Manual for Streets.

## 2.5 Summary

The objectives for the site have taken account of prevailing national and local policies. The development proposal will seek to fulfil the objectives of the policy documents noted in this chapter by providing an accessible and sustainable environment for pedestrians, cyclists, public transport users and vehicles and mitigating the impacts of development on the highway network.

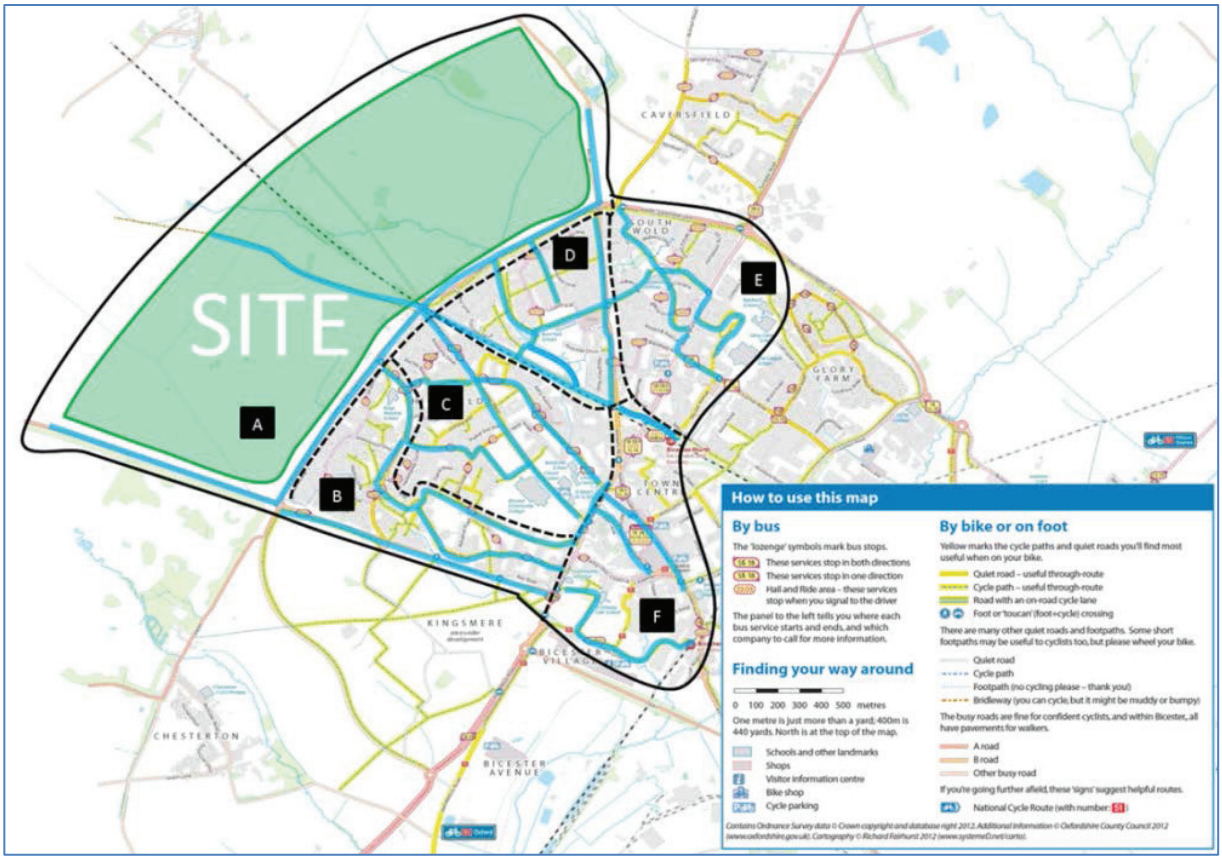
# 3 Existing Conditions

This chapter explores the existing transport conditions surrounding the site including a description of the local transport network available for travel on foot, by bicycle, bus, rail and car.

## 3.1 Walking

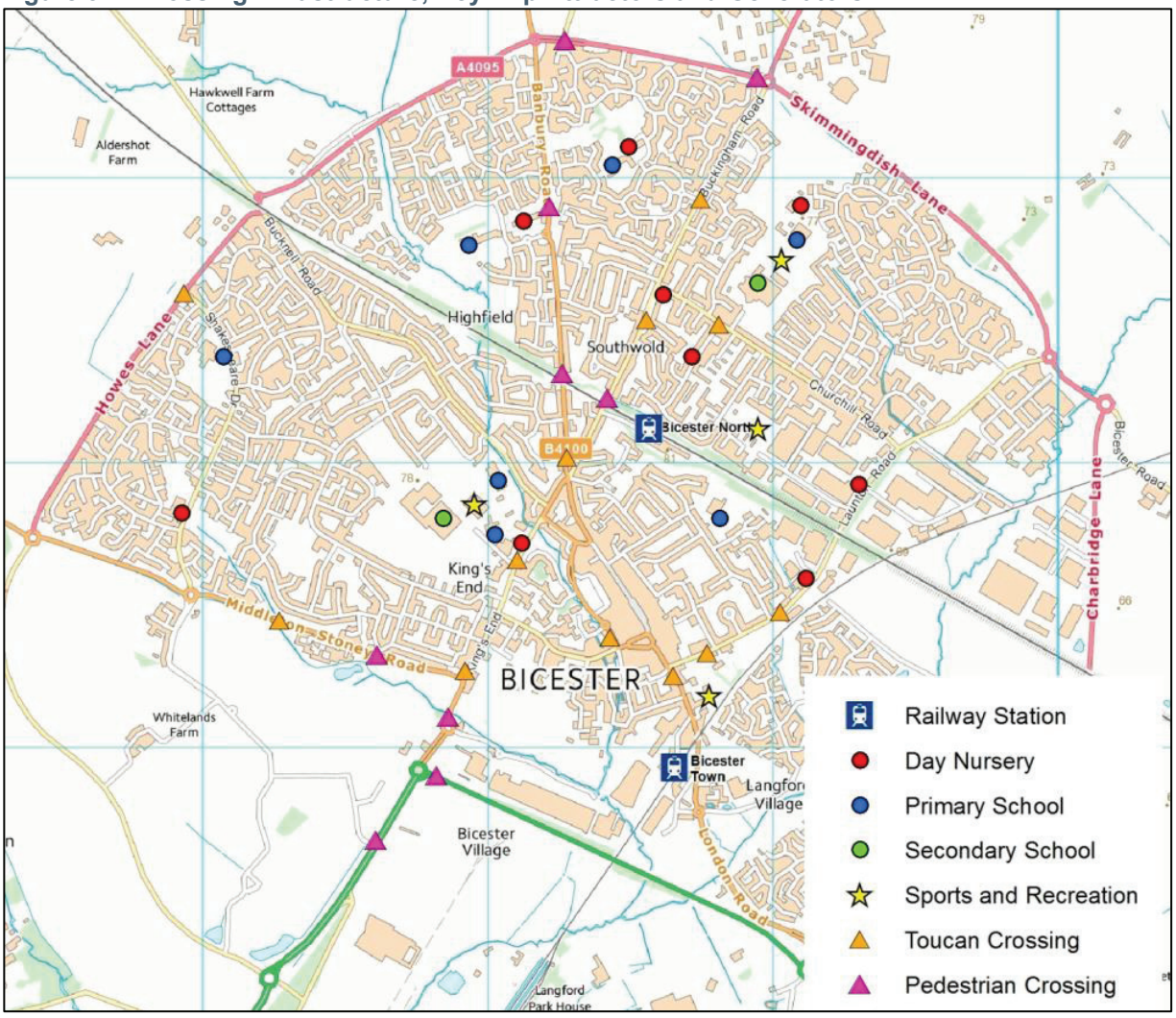
A comprehensive review of the walking infrastructure locally has been undertaken and is provided in Appendix 1 of the NW Bicester Masterplan Access and Travel Strategy. The study area with the existing routes that were assessed is shown in Figure 3.1. Each of these routes has been audited and this is included in the Masterplan Appendix referred to above.

**Figure 3.1: Walking Audit Zones and Routes**




These routes connect to Bicester town centre and other attractors and generators, as shown in Figure 3.2 which outlines the key education, transport and existing crossing infrastructure in Bicester. It can be seen that there are a number of **pedestrian** and **'toucan'** (foot and cycle) crossings in Bicester.

**Figure 3.2: Crossing Infrastructure, Key Trip Attractors and Generators**




Source: Produced by Hyder – Contains Ordnance Survey data © Crown copyright and database right (2012)

The figure shows that the majority of Bicester is located within a radius of approximately 3.2km (or 2 miles) from the centre of the site (one grid square equals 1km).

The nearest footpath to the Site is located adjacent to A4095 Lord's Lane that bounds the site to the south. This footway aligns the entire southern extent of the A4095 carriageway between the roundabout with Bucknell Road (to the south west) and the A4421 to the south east. Included in photographs 3.1 and 3.2 are images of the pedestrian facilities that adjoin the A4095 Lord's Lane and Southwold Lane routes.

**Photograph 3.1 & 3.2: Pedestrian facilities the A4095 carriageway**

The pedestrian route that aligns the A4095 carriageway is considered to benefit from a good horizontal alignment, street lighting, tactile paving and pedestrian refuges at junctions (as shown in photograph 3.1). There are however some sections that are secluded by vegetation. In addition, the footways that form the route are considered to be of an appropriate width and are well maintained in terms of their surface condition. A toucan crossing (shown in photograph 3.2) has been installed on the A4095 Southwold Lane approximately 100m to the east of the A4095 / B4100 roundabout convergence. This facility allows both pedestrians and cyclists to cross at this location.

A footpath and cycleway is to be constructed along the west side of Banbury Road to serve the Exemplar development and a new toucan crossing will be provided west of the B4100/ A4095 roundabout.

Pedestrians wishing to access the north of Bicester town centre can follow footpaths on both sides of the B4100 Banbury Road. The B4100 Banbury Road carriageway is generally aligned by footways along both sides for the entirety of the route, varying in width between 1.2 and 2.0 metres, which is substandard in places. The footways do however benefit from a generally good horizontal alignment, street lighting, tactile paving and appropriate crossing infrastructure and are considered to be well maintained in terms of their surface condition. Images of footways aligning the B4100 carriageway are shown in photographs 3.3 and 3.4.

**Photographs 3.3 & 3.4: Pedestrian facilities adjoining the B4100 Banbury Road carriageway**

Approximately 150m south of the priority controlled junction with Lodge Close, the footways that align both sides of the B4100 carriageway are guided away from the highway carriageway by hedge line boundaries, as shown in photographs 3.3 and 3.4. These pedestrian routes benefit from a generous width, a good surface condition and the presence of street lighting. The presence of formal crossing infrastructure at a number of locations along the B4100 corridor assists in the movement of pedestrians

and cyclists. A pelican crossing (shown in photograph 3.5) is in place approximately 100m north of the B4100 Banbury Road/Lucerne Avenue roundabout, whilst a zebra crossing (shown in photograph 3.6) has been installed along the B4100 Banbury Road between its junctions with Almond Road (to the north) and the Buckingham Road roundabout (to the south).

**Photographs 3.5 & 3.6: Pedestrian crossing infrastructure in place along the B4100 Banbury Road**


Bucknell Road has footways along both sides of the carriageway, varying in width between 1.2 and 2.0 metres, which is substandard in places. The footways do generally benefit from a good horizontal alignment, street lighting, appropriate crossing infrastructure and a well maintained surface condition.

There are also various pedestrian routes through the Bure Park residential area that lies between the site and Bicester town centre. These are shown in photograph 3.7 and photograph 3.8.

**Photograph 3.7 & 3.8: Pedestrian routes throughout the Bure Park area of Bicester**



Photographs 3.9 and 3.10 show the footpath that runs parallel to the Birmingham to London railway line in an easterly direction towards Bicester North Station. The route emerges onto Banbury Road. Site observations indicate that this route is well used and it provides a linkage between the A4095 Lord's Lane and the B4100 Banbury Road, and beyond. It is recognised however that it is not well lit and in places is not a properly surfaced route and proposals to improve the route are discussed later in the document.

**Photograph 3.9 & 3.10: The pedestrian route running parallel to the railway line**

## 3.2 Public Rights of Way

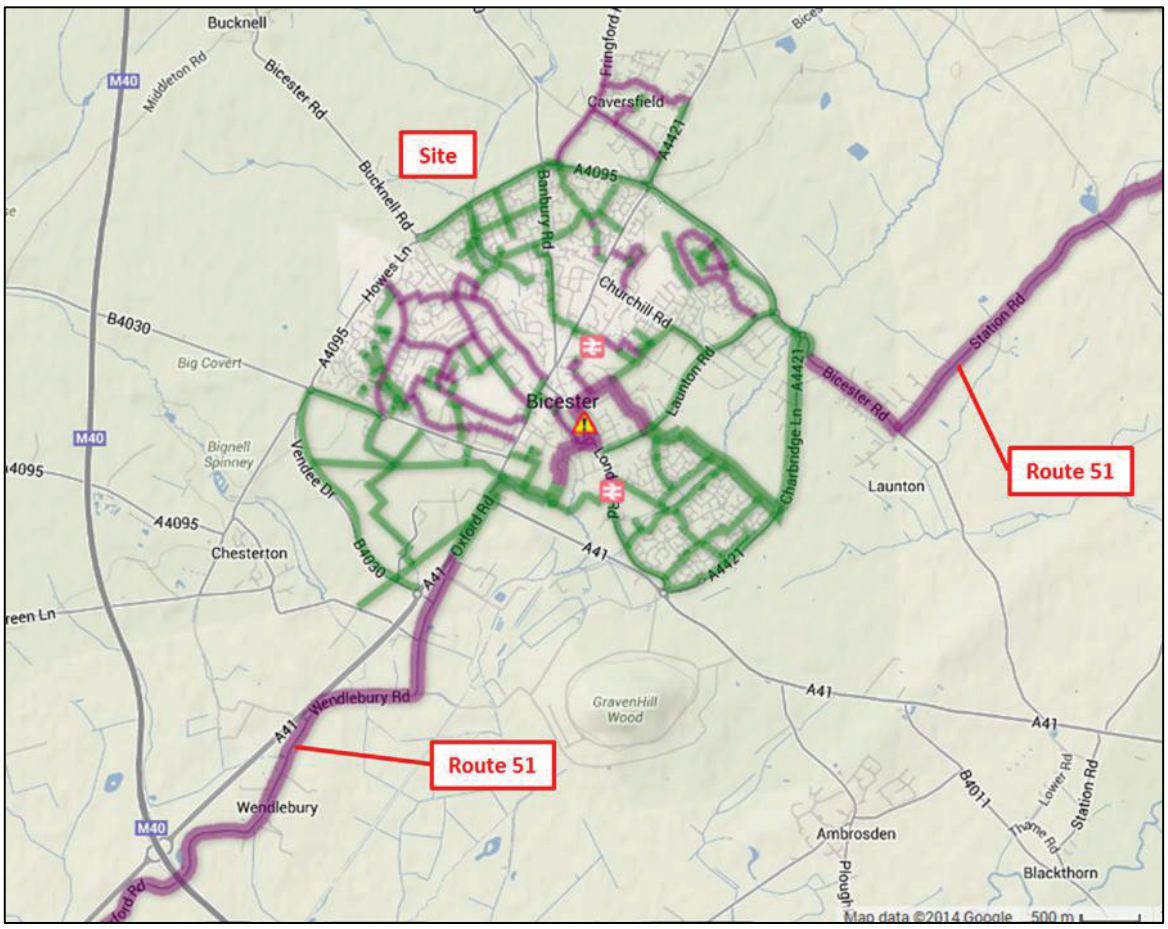
The Definitive Map of Public Rights of Way Map (included as Figure 3.3 at the end of this document) outlines footpaths and bridleways in the vicinity of the site. A public footpath is located from the south west of the site, dissecting Bicester in a north-west to south-east alignment connecting the A4095 and Buckingham Road. Public footpaths are also located to the north of the site serving Bucknell.

A public bridleway is located at the south western extent of the site, passing through the land south of the railway (the subject of Application 2).

## 3.3 Cycling

It can be seen from Figure 3.4 below that route 51 of the National Cycle Network (NCN) passes through Bicester in a south west to north east alignment. A combination of on-road (green) and off-road (purple) sections form the route as it passes in close proximity to Bicester town centre and via both railway stations. A number of routes currently exist to the south and east of the site, providing connectivity to Bicester and Caversfield respectively.

**Figure 3.4: Local Cycle Routes**

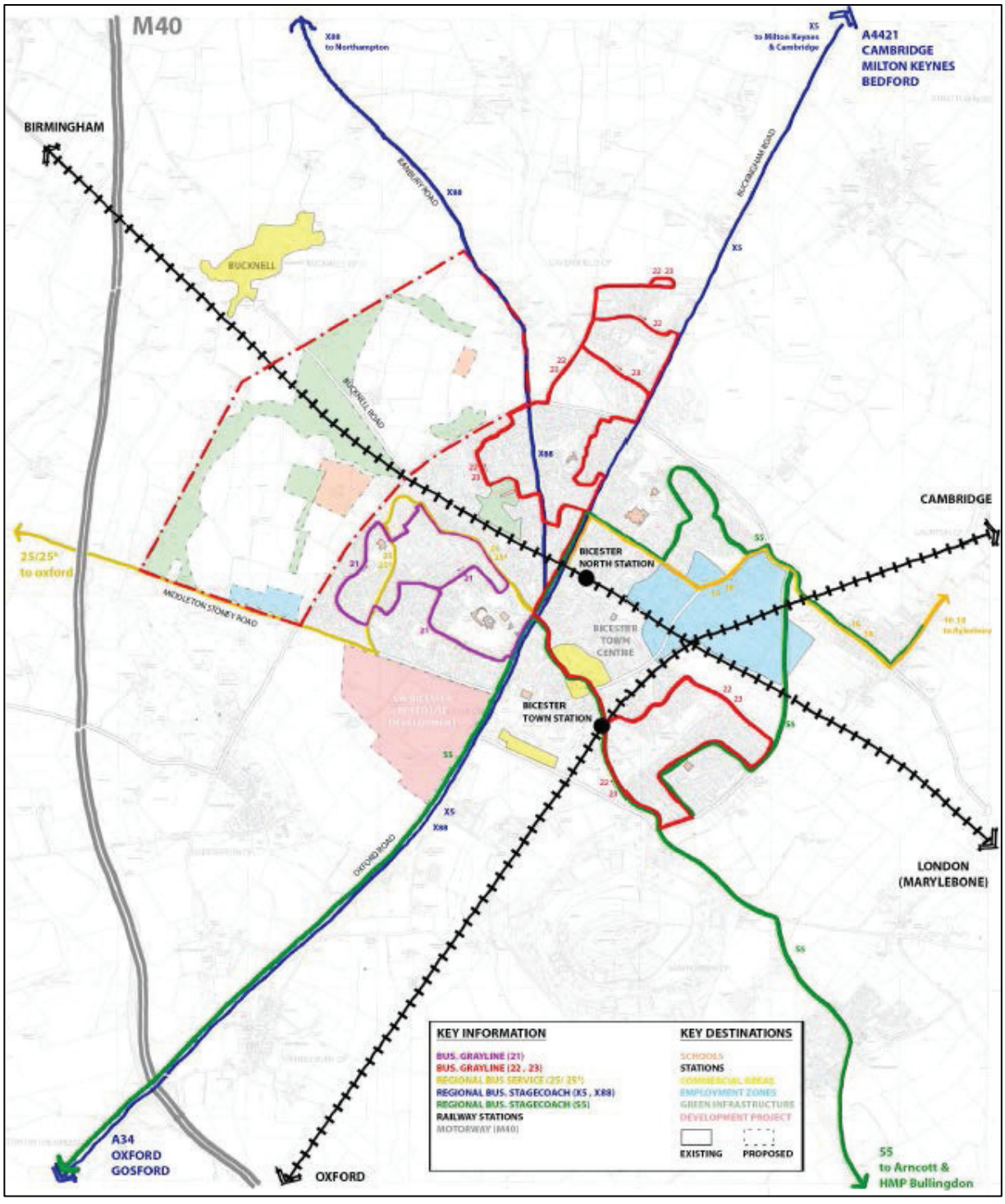



Source: Sustrans

## 3.4 Bus Services

Bus Services in the town are shown in Figure 3.5. The bus station facilities in Bicester town centre have been redeveloped to provide bus bays on Manorsfield Road adjacent to the new retail centre.Table 3.1 provides a summary of the bus routes that currently operate from Manorsfield Road in Bicester town centre. The X88 showing on the plan appears to have recently ceased as a service.

## Figure 3.5: Existing Bus Services




Source: collated by Farrell's from Traveline data

**Table 3.1: Bus Routes from Bicester Town Centre**

| Service | Route | First | Last | Approximate Daytime Frequency |
|---|---|---|---|---|
| **8** | Cambridge - Bedford - Oxford | 0635 | 2145 | Every two hours |
| **8** | Oxford - Bedford - Cambridge | 0740 | 2305 | |
| **18** | Buckingham - Steeple Claydon - Bicester | 0830 | 1745 | Every two hours |
| **18** | Bicester - Steeple Claydon - Buckingham | 0835 | 1800 | |
| **21** | Bicester - Chesterton - Bicester (Circular) | 0755 | 1755 | Every 30 minutes |
| **21** | Bicester - Chesterton - Bicester (Circular) *arrivals* | 0750 | 1820 | |
| **22** | Bicester - Caversfield - Bicester (Circular) | 0735 | 1825 | Hourly |
| **22** | Bicester - Caversfield - Bicester (Circular) *arrivals* | 0755 | 1900 | |
| **23** | Bicester - Caversfield - Bicester (Circular) | 0845 | 1745 | Hourly |
| **23** | Bicester - Caversfield - Bicester (Circular) *arrivals* | 0930 | 1830 | |
| **24** | Bicester - Churchill Road - Bicester (Circular) | 0800 | 1830 | Every 30 minutes |
| **24** | Bicester - Churchill Road - Bicester (Circular) *arrivals* | 0812 | 1842 | |
| **25** | Kidlington / Oxford – Bicester *arrivals* | 0725 | 1907 | Hourly |
| **25** | Bicester - Oxford / Kidlington | 0625 | 1910 | |
| **S5** | Oxford - Gosford - Bicester - Glory Farm / Launton / Arncott / Langford | 0645 | 0011 | Every 15 minutes |
| **S5** | Glory Farm / Arncott / Launton / Langford - Bicester - Gosford - Oxford | 0555 | 2311 | |
| **X5** | Cambridge - Bedford - Oxford | 0635 | 2145 | Every 30 minutes |
| **X5** | Oxford - Bedford - Cambridge | 0740 | 2305 | |

Source: Traveline South East, times taken from Manorsfield Road, correct as of 30/10/2013

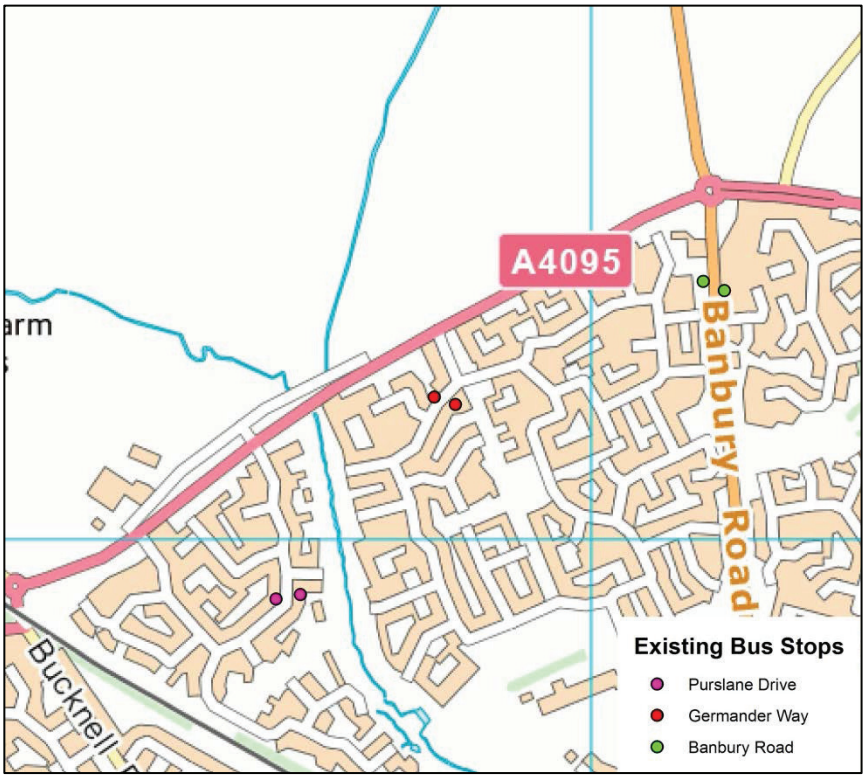
In the vicinity of the site there are bus services serving the Bure Park estate approximately three times per hour. This route circulates through the estate and Caversfield. Local services are shown in Table 3.2.

**Table 3.2: Local Bus Services**

| Service | Bus Stop Name | Route | First | Last | Approximate Daytime Frequency |
|---|---|---|---|---|---|
| **Banbury Road** | | | | | |
| 37 | Barberry Place Shops (N-Bound) | Bicester – Hardwick - Finmere | 1130 | 1430 | Every 20 minutes (Tuesday Only) |
| 37 | Barberry Place Shops (S-Bound) | Finmere – Hardwick - Bicester | 0945 | 1245 | Every 20 minutes (Tuesday Only) |
| **Germander Way** | | | | | |
| 3 | Bure Park, Germander Way Hail & Ride (SW-Bound) | Bure Park – Bicester North Rail Station | 0602 | 0808 | ½ hourly |
| 22 | Bure Park, Germander Way Hail & Ride (SW-Bound) | Bicester – Caversfield – Bicester (Circular) | 0735 | 1715 | Hourly |
| 23 | Bure Park, Germander Way Hail & Ride (NE-Bound) | Bicester – Caversfield – Bicester (Circular) | 0910 | 1745 | Hourly |
| **Purslane Road** | | | | | |
| 3 | Bure Park, Purslane Drive (NE-Bound) | Bure Park – Bicester North Rail Station | 0602 | 0808 | ½ hourly |

Bus stops are located some distance from the site, namely on Banbury Road, Germander Way and Purslane Drive as shown in Figure 3.6.

**Figure 3.6: Location of Existing Bus Stops**




## 3.5 Bus Occupancy

Bus occupancy surveys were undertaken by Hyder Consulting on 14th June 2013 in Bicester town centre to establish occupancy levels of buses arriving and departing. Surveys were conducted during the AM peak (07:30-09:00), inter peak (09:30-12:30) and the PM peak (15:00-18:00) to provide an overview of bus use across the day. The surveys were conducted on a Market Day (Friday), the busiest day of the week, to account for highest patronage numbers.

It can be seen from Table 3.3 that the average occupancy levels for buses arriving at Market Square were relatively low throughout the day, with averages exceeding 50%. The X5 service is the most utilised service, with maximum utilisation percentages of 92% during the inter peak and peak periods.

**Table 3.3: Occupancy Levels of Bus Services Arriving at Market Square, Bicester**

| Service | Operator | Occupancy levels arriving at Market Square (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | AM Peak (07:30-09:00) | | Inter Peak (09:30-12:30) | | PM Peak (15:00-18:00) | |
| | | Average | Maximum | Average | Maximum | Average | Maximum |
| 8 | Stagecoach in Northants | No service | No service | 11 | 13 | No service | No service |
| 18 | Langston & Tasker | 25 | 25 | 25 | 40 | 3 | 6 |
| 21 | Grayline Coaches | 26 | 32 | 31 | 48 | 5 | 16 |

| Service | Operator | Occupancy levels arriving at Market Square (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | AM Peak (07:30-09:00) | | Inter Peak (09:30-12:30) | | PM Peak (15:00-18:00) | |
| | | Average | Maximum | Average | Maximum | Average | Maximum |
| 22 | Thames Travel | 10 | 10 | 14 | 31 | 4 | 7 |
| 23 | Thames Travel | 2 | 3 | 5 | 24 | 0 | 0 |
| 24 | Thames Travel | 0 | 0 | 23 | 52 | 6 | 14 |
| 25/25A | Thames Travel | No service | No service | 46 | 72 | 10 | 21 |
| S5 | Stagecoach in Oxfordshire | 10 | 25 | 13 | 36 | 15 | 35 |
| X5 | Stagecoach in Bedford | 29 | 41 | 35 | 92 | 46 | 92 |

Table 3.4 outlines the percentage occupation for buses departing from Market Square. Similarly to buses arriving at Market Square, no average occupation percentage exceeds 50%. Again, the X5 service displays the highest maximum occupation percentage at the inter peak (88%) and PM peak (90%). During the inter peak period, the 21, 25/25A and the X5 were the most popular services.

**Table 3.4: Occupancy Levels of Bus Services Departing Market Square, Bicester**

| Service | Operator | Occupancy levels departing Market Square (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | AM Peak (07:30-09:00) | | Inter Peak (09:30-12:30) | | PM Peak (15:00-18:00) | |
| | | Average | Maximum | Average | Maximum | Average | Maximum |
| 8 | Stagecoach in Northants | No service | No service | 11 | 13 | No service | No service |
| 18 | Langston & Tasker | 0 | 0 | 8 | 16 | 5 | 6 |
| 21 | Grayline Coaches | 2 | 6 | 42 | 81 | 22 | 68 |
| 22 | Thames Travel | 17 | 17 | 15 | 24 | 4 | 7 |
| 23 | Thames Travel | 4 | 7 | 16 | 79 | 12 | 24 |
| 24 | Thames Travel | 21 | 21 | 6 | 17 | 6 | 14 |
| 25/25A | Thames Travel | No service | No service | 34 | 62 | 18 | 45 |
| S5 | Stagecoach in Oxfordshire | 11 | 28 | 13 | 32 | 14 | 35 |
| X5 | Stagecoach in Bedford | 28 | 39 | 35 | 88 | 45 | 90 |

## 3.6 Rail Stations and Services

The town has two rail stations, namely Bicester North and Bicester Town. Bicester North station is located approximately 2.9km south east of the centre of the site, whilst Bicester Town station is sited approximately 3.7km south east of the centre of the site. At the time of writing, Bicester Town rail station was closed due to improvements being undertaken in relation to the Chiltern Railways Evergreen3 project. This will provide a passenger train service between Oxford and London Marylebone via Bicester. The station is due to re-open in summer 2014 with the Oxford-London link opening in spring 2016. This will see improvements to the station itself including level access, two new platforms, a rebuilt car park, cycle parking, bus stops and improved access roads.

Bicester North Station offers passengers a range of facilities including coffee and snack shop, undercover cycle storage (20 racks, shown in photograph 3.11) and open air racks (10 racks, shown in photograph 3.12) and a fast ticket machine. There are also car parking facilities available on a pay and display basis with the opportunity for monthly, quarterly, bi-annual and annual season tickets available. Observations indicate that the cycle racks are very well used.

**Photograph 3.11 & 3.12: Cycle parking provision at Bicester North Railway Station**

Bicester Town station is unmanned with the nearest staffed station located in Oxford. Undercover cycle storage is available with four racks provided near the station entrance. Table 3.5 summarises the direct services available from Bicester North and Bicester Town stations.

**Table 3.5: Summary of Rail Services**

| Station | Route | Journey Time (approximate) | Frequency |
|---|---|---|---|
| Bicester North | To London Marylebone<br>To High Wycombe<br>To Banbury/ Birmingham | 60 minutes<br>30 minutes<br>20 minutes | 4 per hour<br>2 per hour<br>4 per hour |
| Bicester Town | To Oxford | 30 minutes | 1 every 2 hours |

As can be seen from Table 3.5 above, the regular services throughout the day ensure a good range of destinations are readily accessible from Bicester North and Bicester Town rail stations. The employment, recreational and shopping opportunities within Oxford are available within a 30 minutes rail journey from Bicester Town station although services are only every two hours at present. There is a service approximately every 15 minutes to Banbury, Birmingham and London from Bicester North station. Once the Evergreen3 proposals are finished there will be half hourly

services to London and Oxford from Bicester Town Station and a reduction in the journey time to London.

## 3.7 Highway Network

The existing highway network in the vicinity of the site is illustrated in Figure 1.2 which is included at the end of this document, and it is considered that the site is well located in terms of the local road network (B4100, B4030, Bucknell Road and A4095) as well as strategic routes (A4421, A41, A34 and M4 Motorway).

### M40

The M40 is a motorway connecting London to Birmingham from the M25 to the M40. It passes Bicester to the west in a south to north alignment providing access to High Wycombe to the south east and Warwick to the north west. Two junctions of the M40 can be used to access NW Bicester, namely Junction 10 located 7.4km to the north west of the site and Junction 9 located 6.1km south west of the site.

### A41

The A41 connects the south west of Bicester to the M40. It is a dual carriageway subject to the national speed limit for most of its length and 40 mph on approach to Bicester. This segment of carriageway is predominantly bound by fields, with the exception of Wendlebury in the south west, Bicester Garden Centre and the Kingsmere development and Bicester Village at the north east of the segment. The A41 changes alignment at Bicester Village, taking an easterly alignment towards Aylesbury.

### A41 Oxford Road

The A41 Oxford Road is a dual carriageway that provides access to Middleton Stoney Road and central Bicester via a mini roundabout. A second roundabout along the route enables access to Tesco and the Bicester Village outlets. A third roundabout on the A41 Oxford Road facilitates access to the Esso Petrol Filling Station. The eastern arm of this roundabout continues as the A41 which forms Bicester's eastern perimeter road.

### A34

The A34 is accessible via Junction 9 of the M40, and extends in a south easterly direction towards Oxford. The A34 intersects with the A40 Northern Bypass Road to the north of Oxford, and then forms the Western Bypass Road. The A34 route between Bicester and the fringes of Oxford is dualled in each direction, and is subject to speed limits that range between 50mph to 70mph.

### B4030 Vendee Drive

Vendee Drive connects the A41 to the south to Middleton Stoney Road and Howes Lane at a roundabout in the south western boundary of the site. It is a single carriageway road subject to a 50mph speed limit and there is an adjacent segregated footpath/ cycleway.

### A4095 Howes Lane

The A4095 Howes Lane is a single lane carriageway that extends from Bucknell Road to the junction with the B4030 Middleton Stoney Road. It is rural in character with a speed limit varying between 40 and 50mph, predominantly no street lighting and no footways or adjacent path.

### A4095 Lord's Lane

The A4095 Lords Lane is a single lane carriageway (in each direction) that extends between its roundabout junctions with the B4100 Banbury Road and Bucknell Road. The road is subject to a 50mph speed limit and street lighting is provided.

### Bucknell Road

Bucknell Road connects the B4100 in the south to the roundabout between the A4095 Howes Lane and Lords Lane in a south east to north west alignment. It is a street lit single carriageway benefitting from footways on both sides of the road, providing access to a number of residential roads. North of the A4095 it becomes a rural lane providing access to Bucknell village.

### B4100 Banbury Road

The B4100 Banbury Road carriageway extends in a south to north alignment, from its convergence with Buckingham Road and Field Street via a roundabout (southern extent) to its roundabout convergence with the A4095 Lords Lane and Southwold Lane and then past the NW Bicester development. The northern section (north of the roundabout junction with the A4095) is predominately rural in character and subject to the national speed limit. The B4100 connects to the A43 at Baynards Green and is a route used to access the M40 Junction 10.

### B4030 Middleton Stoney Road

Middleton Stoney Road is a single carriageway bounding the west of Bicester in a south east to north-west alignment. It is subject to the national speed limit until a point east of the Howes Lane/Vendee Drive roundabout where the route is proposed to be traffic calmed as part of the SW Bicester development: it will then become a 30mph route. Residential dwellings exist to the north of Middleton Stoney Road, with fields and new development to the south. North west of Bicester the B4030 connects to the B430 at Middleton Stoney with a route north to the M40 J10 and south to the A34 west of J9.

### Shakespeare Drive

Shakespeare Drive is a single carriageway local distributor road connecting Middleton Stoney Road to the A4095 Howes Lane, providing access to the residential area of west Bicester. It is subject to a 30mph speed limit and benefits from street lighting and a continuous footway on the western extent of the road. HGVs are restricted from using this route except for access.

### Bainton Road

The Bainton Road carriageway follows a general west to east alignment between the village of Bucknell and the B4100 Banbury Road carriageway. The carriageway is approximately 5.5m in width although there are places where passing bays are provided and there are sharp bends. It is subject to a 60mph speed limit until the fringes of Bucknell village, where the speed limit reduces to 30mph. The carriageway is not illuminated and there is an absence of formal footpaths adjoining the carriageway, although pedestrians were observed to walk on the grass verge throughout the village on the day the site visit was conducted.

## 3.8 Baseline Traffic

### 3.8.1 Bicester Saturn Model Base Year 2012

The Bicester SATURN model 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 Oxfordshire County Council (OCC) in 2012/2013 and supplied to Halcrow who undertook a validation exercise. In total 35 automatic traffic counts were undertaken. The validation report is included as part of the evidence base for the Cherwell Local Plan.

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 is the model nearly validates to the criteria set out in DMRB. The most significant issue is the overestimation of modelled flows on the B430. When considering the validation of the model within the town itself, the DMRB criteria were met.

The Bicester Saturn Model has been recommended and agreed with OCC and the HA as the appropriate tool for assessing the impacts of NW Bicester Application 1 (Land North of the Railway) within the submission timescale.

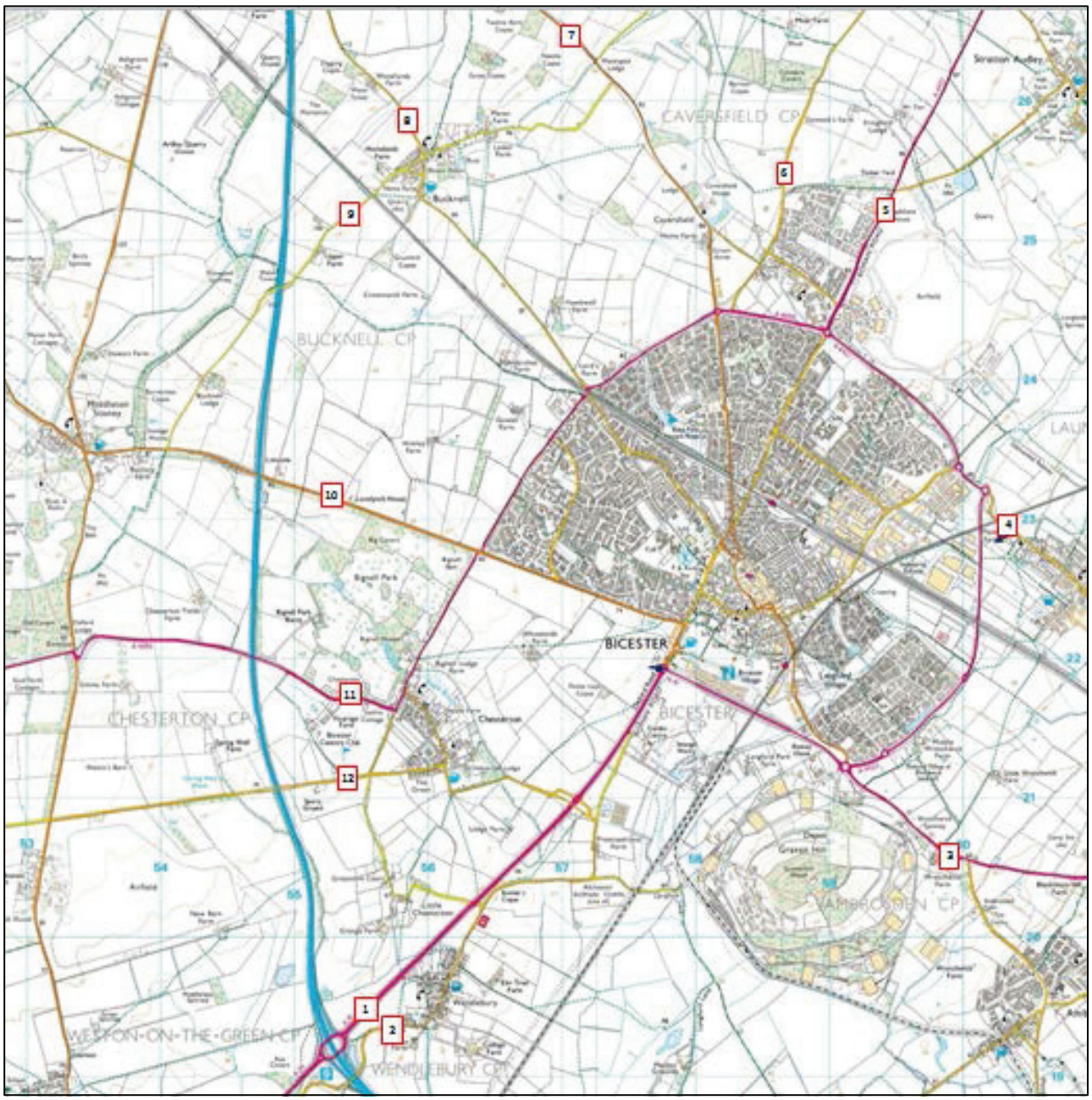
The baseline traffic analysis uses the Saturn Model Flows to provide the evidence of current traffic levels. Baseline AM and PM peak hour flows for links and junctions across the study area have been obtained from the Bicester Saturn Model 2012 Base Year.

### 3.8.2 Cordon Flows

An analysis has been undertaken of total traffic entering and leaving Bicester in the AM and PM peak hours in the Base Year 2012.

Twelve cordon locations have been selected as providing all of the routes in and out of the town, with Bucknell village, Caversfield and Chesterton included within the cordon. The cordon locations are shown on Figure 3.7 below. The analysis also examines which routes are most used in the peak hours.

**Figure 3.7 – Bicester Cordon Locations**




Base Year 2012 traffic movements inbound and outbound through each cordon are shown in Table 3.6 below. These are Base Year movements from the Bicester Saturn Model validated to observed movements.

It can be seen that the A41 from the M40 J9 is the most used route, representing 27% of trips in the PM peak, but the A41 east of the A4421 is similarly used with 25% of PM peak trips. The B4100 Banbury Road and A4421 Buckingham Road (both 12% in PM peak) are also significant routes.

In total there were 9,536 trips in and out of Bicester in the AM peak hour and 9,660 in the PM peak hour. There is not a strong outbound movement in the AM peak and inbound in the PM peak – in fact there are more inbound than outbound trips in both the peak hours.

**Table 3.6: Base Year 2012 Cordon Traffic Movements**

| Reference | Name | AM | | PM | | AM % | PM% |
|---|---|---|---|---|---|---|---|
| | | Inbound | Outbound | Inbound | Outbound | | |
| 1 | A41 E of M40 | 1210 | 1205 | 1493 | 1109 | 25.33% | 26.94% |
| 2 | Wendlebury Road, E of M40 | 238 | 93 | 46 | 161 | 3.47% | 2.14% |
| 3 | A41, E of A4421 junction | 1085 | 1056 | 1185 | 1193 | 22.45% | 24.62% |
| 4 | Bicester Road, E of A4421 junction | 319 | 344 | 330 | 287 | 6.95% | 6.39% |
| 5 | A4421 Buckingham Road, N of Skimmingdish Lane Junction | 673 | 638 | 671 | 461 | 13.75% | 11.72% |
| 6 | Fringford Road, N of Caversfield | 16 | 58 | 46 | 66 | 0.78% | 1.16% |
| 7 | B4100 Banbury Road, N of Bainton Road junction | 632 | 485 | 525 | 661 | 11.71% | 12.28% |
| 8 | Ardley Road, N of Bucknell | 105 | 102 | 107 | 88 | 2.17% | 2.02% |
| 9 | Middleton Road, W of Bucknell | 25 | 2 | 2 | 10 | 0.28% | 0.12% |
| 10 | B4030 Middleton Stoney Road, NW of NWB access | 288 | 268 | 291 | 364 | 5.83% | 6.78% |
| 11 | A4095, W of Chesterton | 70 | 217 | 25 | 179 | 3.01% | 2.11% |
| 12 | Green Lane, W of Chesterton | 301 | 106 | 254 | 106 | 4.27% | 3.73% |
| | TOTAL | **4962** | **4574** | **4975** | **4685** | **100.00%** | **100.00%** |
| | IN AND OUTBOUND TOTAL | **9536** | | **9660** | | | |

## 3.8.3 Link Flows

The AM and PM peak hour flows on links have been factored to give 12 hour and 18 hour flows using a factor of 4.330 and 5.212 respectively on the total of AM plus PM peak hour flows. The factors have been derived from ATC data collected locally to NW Bicester for the Exemplar development Transport Assessment. The flows are set out in Table 3.7. Figure 3.8 at the rear of the document shows the location of links referenced in the table.

**Table 3.7: Base Year 2012 Traffic Flows**

| Link Ref | Link Description | Base Year 2012 | | | |
|---|---|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour | 12 Hour | 18 Hour |
| **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 Road, 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 |
| **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 |

| Link Ref | Link Description | Base Year 2012 | | | |
|---|---|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour | 12 Hour | 18 Hour |
| **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 |

### 3.8.4 Junction Turning Movements

The traffic turning movements at each existing junction across the town network have been provided from the Bicester Saturn Model for the 2012 Base Year and are shown in Table 3.8. The locations of the junctions and the reference numbers are shown in Figure 3.9 at the rear of the document.

**Table 3.8: Base Year 2012 Total Turning Movements at Junctions**

| Junction | Description | AM Peak Hour | PM Peak Hour |
|---|---|---|---|
| J1 - 10005 | M40 Junction 9 | 1228 | 1518 |
| J1 - 10010 | M40 Junction 9 | 3913 | 4069 |
| J1 - 10185 | M40 Junction 9 | 2559 | 2509 |
| J1 - 10190 | M40 Junction 9 | 3869 | 3664 |
| | **Total M40 Junction 9** | **11569** | **11760** |
| J2 | A41/ Vendee Drive | 2804 | 2675 |
| J3 | A41 Oxford Rd/ A41 | 3237 | 3133 |
| J4 | A41 Oxford Rd/ Pingle Drive | 1899 | 2056 |
| J5 | Middleton Stoney Rd/ Kings End | 1888 | 2021 |
| J6 | Field Street/ Bucknell Rd | 1612 | 1709 |
| J6B | Queens Avenue/ St John Street | 1188 | 1734 |
| J7 | Banbury Rd/ Field St | 2154 | 2042 |
| J8 | A41/ A4421/B4100 | 3533 | 3817 |
| J9 | A4421/ Peregrine Way | 1536 | 1959 |
| J10 | Charbridge Lane/ Gavray Drive | 1108 | 1350 |
| J11 | A4421/ Bicester Road | 1668 | 1779 |
| J12 | A4421/ Launton Road | 1969 | 2161 |
| J13 | Skimmingdish Lane/ Buckingham Rd | 2665 | 2748 |
| J14 | B4100 Banbury Road/ A4095 Lord's Lane | 2284 | 2461 |
| J16 | B4100/ Caversfield | 1210 | 1284 |
| J19 | Lord's Lane/ Bucknell Road | 1128 | 1247 |
| J20 | Howes Lane/ Bucknell Road | 1215 | 1215 |

| Junction | Description | AM Peak Hour | PM Peak Hour |
|---|---|---|---|
| J23 | Howes Lane/ Middleton Stoney Rd/ Vendee Drive | 1481 | 1455 |
| J26 | M40 Junction 10, western rbt | 2287 | 1650 |
| J27 | M40 Junction 10, south eastern rbt | 2185 | 2247 |
| J28 | M40 Junction 10, northern rbt | 3185 | 2379 |
| J29 | Middleton Road/ Bainton Road | 265 | 252 |

### 3.8.5 Junction Capacity

Base Year 2012 ARCADY and PICADY models have been produced for the key existing junctions anticipated to be impacted upon by the Application 1 development. The location of these junctions is shown in Figure 3.9.

The results of the base modelling show that the extent of the network assessed is currently operating within capacity. Tables 3-9 to 3-15 provide the results from the modelling of the existing junctions in the 2012 Base Year. The results show the RFC (Ration of Flow to Capacity) and the maximum queue length in vehicles.

**Table 3-9: Field Street/ Bucknell Road Base Year 2012 PICADY Model Results (J6)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| Field Street North | 0.36 | 1.1 | 0.62 | 1.6 |
| Bucknell Road | 0.78 | 3.3 | 0.81 | 6 |
| Field Street South | - | - | - | - |

**Table 3-10: A4421 Skimmingdish Lane/ Buckingham Road Base Year 2012 ARCADY Model Results (J13)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| A4421 Skimmingdish Lane | 0.375 | 0.6 | 0.802 | 4 |
| Buckingham Road | 0.215 | 0.3 | 0.393 | 0.7 |
| A4095 West | 0.764 | 3.2 | 0.341 | 0.5 |
| A4421 North | 0.541 | 1.2 | 0.479 | 0.9 |

**Table 3-11: A4095/ Banbury Road Base Year 2012 ARCADY Model Results (J14)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| A4095 East | 0.571 | 1.3 | 0.479 | 0.9 |
| Banbury Road South | 0.195 | 0.2 | 0.197 | 0.2 |
| A4095 West | 0.65 | 1.8 | 0.519 | 1.1 |
| B4030 North | 0.492 | 1 | 0.556 | 1.2 |

**Table 3-12: B4100 Banbury Road/ Side Road Base Year 2012 PICADY Model Results (J14)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| B4100 North | - | - | - | - |
| Side Road | 0.042 | 0 | 0.092 | 0 |
| B4100 South | 0 | 0 | 0 | 0 |

**Table 3-13: Lord's Lane/ Bucknell Road Base Year 2012 ARCADY Model Results (J19)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| Lord's Lane | 0.292 | 0.4 | 0.196 | 0.2 |
| Bucknell Road South | 0.453 | 0.8 | 0.64 | 1.8 |
| Bucknell Road North | 0.107 | 0.1 | 0.114 | 0.1 |

**Table 3-13: Howes Lane/ Bucknell Road Base Year 2012 PICADY Model Results (J20)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| Bucknell Road South | - | - | - | - |
| Howes Lane | 0.598 | 1.47 | 0.805 | 3.94 |
| Bucknell Road North | 0.675 | 2.27 | 0.711 | 2.56 |

**Table 3-15: B4030/ A4095 Base Year 2012 ARCADY Model Results (J23)**

| | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| B4030 Northwest | 0.251 | 0.3 | 0.241 | 0.3 |
| A4095 Howes Lane | 0.352 | 0.5 | 0.425 | 0.7 |
| Middleton Stoney Road | 0.381 | 0.6 | 0.401 | 0.7 |
| B4030 Vendee Drive | 0.566 | 1.3 | 0.487 | 0.9 |

The base year modelling shows all junctions assessed as operating under capacity. However, a number of junctions and approaches are predicted to operate close to 85% of their capacity. The junction between Field Street and Bucknell Road is operating close to capacity with the Bucknell Road arm of the junction operating with an RFC of 0.78 in the AM peak and 0.81 in the PM peak indicating this junction would not be able to accommodate significant additional traffic without experiencing congestion. It should be noted however that the Base Year layout for this junction has now been superseded by the recent town centre improvements.

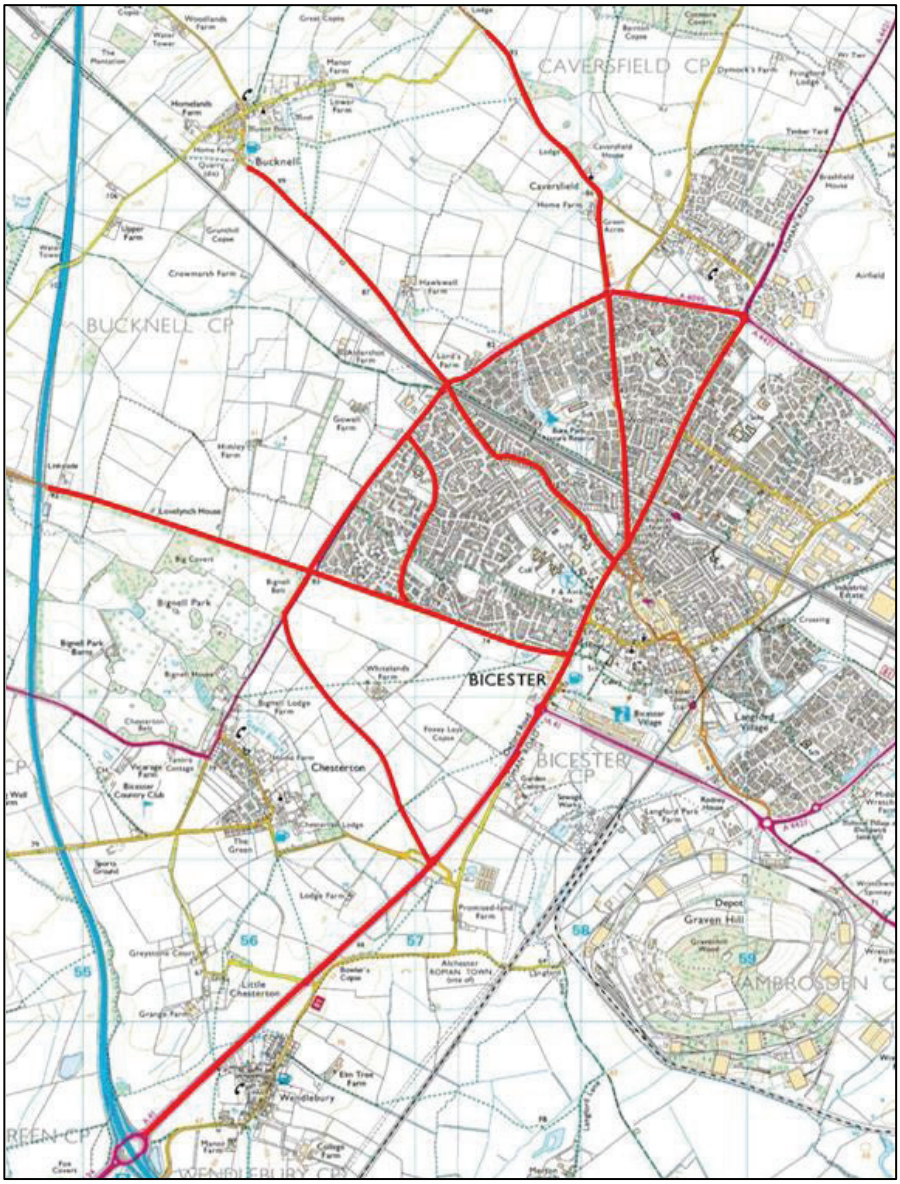
The A4421 Skimmingdish Lane/ A4095 junction and the Howes Lane/ Bucknell Road junction also operate close to capacity during the PM peak period. The A4421 Skimmingdish Lane junction operates with an RFC of 0.802 and the A4095 Howes Lane approach to Bucknell Road operates with an RFC of 0.805.

## 3.9 Personal Injury Accident Analysis

### 3.9.1 Data Analysis

This section analyses personal injury accidents (PIA) that were recorded on the surrounding carriageway of the site and the main transport corridors in Bicester in the period between February 2009 and February 2014. The accident analysis area is shown below as Figure 3.10 and data is provided in Appendix 3.1.

**Figure 3.10 – Accident Analysis Area**




There have been a total of 114 incidents within the study are over the five year period; 98 slight, 14 serious and two fatal in severity. Tables 3.16 and 3.17 provide an overview of casualties and their severity. Of the two fatal accidents; one occurred in 2012 along the B4030 Middleton Stoney road in which a HGV travelling southeast hit a pedestrian who had been jogging east on the footway, who for unknown reasons went into the carriageway. The second fatal accident occurred along Bucknell road when a

vehicle travelling southeast lost control and exited the carriageway, hitting a tree and killing both driver and child passenger.

**Table 3.16 - All Accidents by severity**

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|
| Fatal | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| Serious | 3 | 0 | 3 | 3 | 5 | 0 | 14 |
| Slight | 14 | 10 | 33 | 20 | 18 | 3 | 98 |
| **Total** | **17** | **11** | **36** | **24** | **23** | **3** | **114** |

**Table 3.17 – All Casualties by Severity**

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|
| Fatal | 0 | 2 | 0 | 1 | 0 | 0 | 3 |
| Serious | 3 | 0 | 6 | 3 | 5 | 0 | 17 |
| Slight | 17 | 15 | 43 | 31 | 26 | 4 | 136 |
| **Total** | **20** | **17** | **49** | **35** | **31** | **4** | **156** |

There have been a total of 14 pedestrian accidents over the five year study period. Table 3.18 provides an overview of pedestrian accidents and their severity. The fatal pedestrian accident within this study period is as stated above (Middleton Stoney Road). A total of four serious accidents occurred within the study period, of which two accidents occurred along Buckingham Road.

**Table 3.18 – Pedestrian Casualties by Severity**

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|
| Fatal | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Serious | 2 | 0 | 1 | 1 | 0 | 0 | 4 |
| Slight | 1 | 0 | 5 | 0 | 3 | 0 | 9 |
| **Total** | **3** | **0** | **6** | **2** | **3** | **0** | **14** |

There have been a total of nine cycle accidents recorded over the five year study period. Table 3.19 provides an overview of cycle accidents and their severity. The majority of cycle accidents (8 out of 9) were slight with only one severe accident during the study period.

**Table 3.19: Cycle Accidents by Severity**

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fatal | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Serious | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Slight | 0 | 1 | 3 | 2 | 2 | 0 | 8 |
| **Total** | **0** | **1** | **3** | **2** | **3** | **0** | **9** |

### 3.9.2 Cluster Analysis

Further analysis has been undertaken at key locations within close proximity to the site where clusters of accidents have been identified from the accident data presented in Appendix 3.1 (accident data). This includes the existing key junctions within the vicinity of the site.

#### Bucknell Road near Hawkwell Farm

Four accidents were recorded within a 350m section of the B4100 in the latest five year period. Two of the accidents were slight in severity, with one serious and one fatal. Three of the accidents were a result of drivers losing control of the vehicle. Causes included speeding and being under the influence of alcohol. The incident involving a fatality was due to excessive speeding, travelling too fast for conditions, aggressive driving and being impaired by alcohol. Three of the four accidents involved vehicles travelling southeast-bound along Bucknell Road.

#### B4100 (near Home Farm)

Five accidents in total occurred in a 70m segment of the B4100 near Home Farm, all of which slight in severity. Two of the five accidents occurred as a result of the vehicle losing control rounding a corner along the B4100, travelling north/northwest bound. Two of the accidents occurred at the same junction adjoining Caversfield Road and the B4100. In both cases the vehicles pulling out of the junction failed to see the oncoming vehicle travelling southeast bound along the B4100, rounding a right hand bend. Another incident occurred due to a driver unfamiliar with driving on the left pulled out from a layby onto the wrong side of the road, colliding with an oncoming vehicle.

#### B4100 Banbury Road/A4095 Roundabout

Two incidents have been recorded at the roundabout between the B4100 and A4095 in the last five years, one of which was serious in severity and the other slight. An incident involving a car and a motorcycle occurred due to the car travelling northbound attempting to make a U-turn north of the splitter island north of the roundabout. The car driver failed to give way to a motorcycle overtaking travelling northbound, resulting in a collision and serious injury to the motorcyclist.

#### A4095/Buckingham Road/Skimmingdish Lane

Three accidents have been recorded at the roundabout between the A4095, Buckingham Road and Skimmingdish Lane, all of which were slight in severity. Two of the accidents were a result of vehicles colliding at the roundabout, one due to a driver failing to give way and the other due to an unknown distraction in the car. The remaining incident was a result of a driver being impaired by alcohol and losing control of the car.

### B4030/Vendee Drive/Middleton Stoney Road/A4095

Two accidents have been recorded at the roundabout between the B4030 and A4095 within the last five years, both of which were slight in severity. Both accidents were caused by drivers not stopping at junctions. The cause of one accident was due to a driver speeding and acting recklessly, failing to stop at the junction and exiting the carriageway. The other incident was due to a driver being impaired by drugs failing to stop at the junction and exiting the carriageway.

### Howes Lane/Shakespeare Drive

Three accidents have been recorded at the junction between Howes Lane and Shakespeare Drive, all of which were slight in severity and involving two cars. Two of the accidents were a result of a car jumping a red light, resulting in a collision. The remaining incident was due to a driver failing to give way at the junction.

## 3.9.3 Summary

In summary, the number of incidents on Bucknell Road near Hawkwell Farm, on the B4100 Banbury Road and the junction of Howes Lane/ Shakespeare Drive mean that safety issues need to be considered further in the impact assessment. The number of accidents at the roundabouts does not appear to be unusual given the volume of traffic movements.