

# 4 Baseline Mode Share and Containment

## 4.1 Introduction

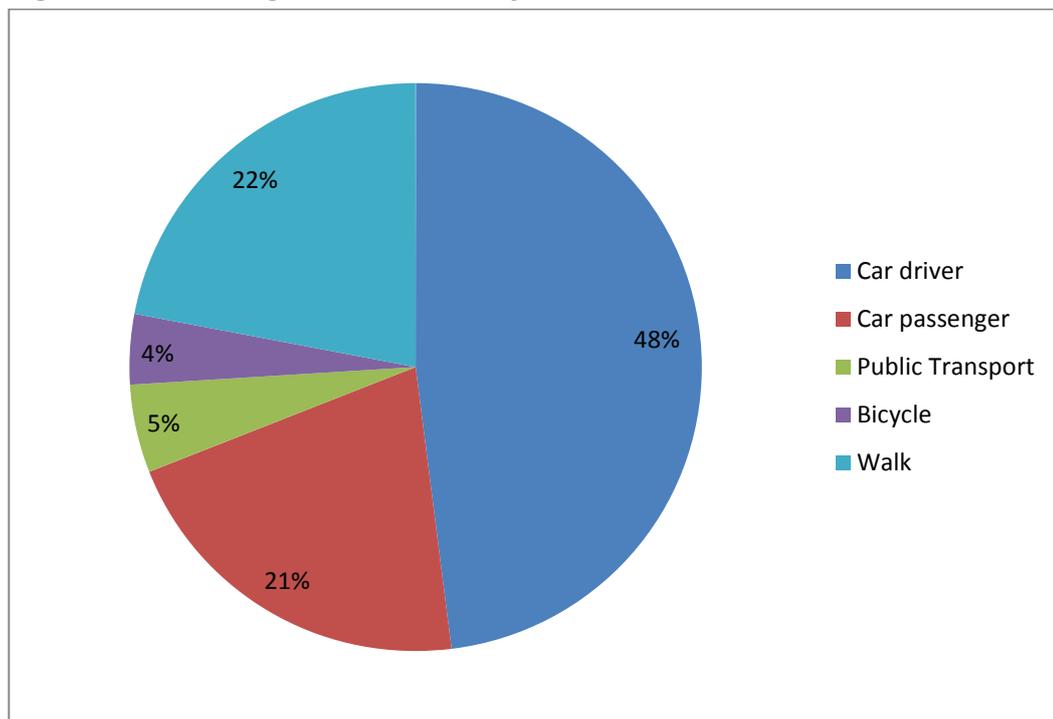
Appendix 5 of the Masterplan Access and Travel Strategy details the baseline mode share and containment of trips and this is summarised in this chapter to inform the Transport Assessment for Application 1.

Baseline information on mode share of trips is available from the Bicester Household Travel Diary Data (2007 and 2010) and the 2011 Census on Method of Travel to Work. The 2010 Household Survey provides some data but is not as comprehensive as the survey undertaken in 2007. The 2010 Household Diary is used as it is most recent, but this has been supplemented by data from 2007 where it has not been available.

## 4.2 Mode Share

The share of trips by various modes for Bicester residents as a whole (2010 survey) is shown in **Figure 4.1**. This is of all trips made by residents across a seven day period.

**Figure 4.1: Percentage of Total Travel by Mode, Bicester Residents, 2010**



Source: Travel Behaviour Survey, Summary of Results, Autumn/Winter 2010/11, OCC 2011

The figures indicate that at present **69% of total trips are made by car modes and 31% by non-car modes**. This is a slight increase in car trips compared to the 2007 survey which recorded 67.5% of all trips by households being made by car or goods vehicle.

The proportion of those currently using sustainable modes<sup>2</sup> is currently 48%, showing the influence of car sharing on overall car use and in achieving modal share targets.

Of non-car modes, walking has the largest share at 22%. The public transport percentage includes both bus and rail trips (it is not broken down in the results into the separate modes).

Table 4.1 sets out modal share for trips within NW Bicester (under 1km), within Bicester (1-3km) and outside of Bicester (more than 3km). In this context trips of under 1km are assumed to be within the NW Bicester Application 1 site, trips of 1-3km are within Bicester and those of more than 3km are assumed to be outside of Bicester.

**Table 4.1: Bicester Household Diary Surveys Mode Share by Distance (2010)**

	2010 Bicester Household Survey		2010 Modal Share Internal Trips (under 1km)		2010 Modal Share External Trips Within Bicester (1-3km)		2010 Modal Share External Trips Outside Bicester (>3km)	
	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car
<b>Car driver</b>	48%	69%	12%	22%	39%	60%	65%	86%
<b>Car passenger</b>	21%		10%		21%		21%	
<b>Bus passenger</b>	5%	31%	1%	78%	2%	40%	6%	14%
<b>Bicycle</b>	4%		5%		8%		3%	
<b>Walk</b>	22%		72%		30%		5%	
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

It can be seen from reference to Table 4.1 that in the baseline, 69% of all trips by households were made by vehicle but this varies from only 22% of internal trips, to 60% within Bicester and 86% of trips outside of Bicester. Furthermore, of non-vehicle modes, walking has the largest share at 22% of all trips but represents 72% of local trips of under 1km.

### Journey to Work Mode Shares: 2011 Census Data

The 2011 Census data provides a modal share of journeys to work in the Bicester North and Caversfield Wards compared to Cherwell District and England as a whole (daytime population). The table includes those who work from home (all the time) within the percentages. The data is shown in Table 4.2.

The Census records approximately 76.9% of work journeys combining Caversfield and Bicester North as being made by car (71.2% drivers, 5.7% passengers). This is higher than the 68% for the Cherwell District and 62% for England as a whole. The percentage working from home is 6% on average in Cherwell District but higher at 8% in Caversfield. The percentage does not include those who work from home on a regular but not full time basis.

<sup>2</sup> Walking, cycling, electric car, rail, bus, taxi, car passenger or motorcycle as defined in Appendix 5 for the Masterplan

**Table 4.2: Summary of Method of Travel to Work – Daytime/Working Population**

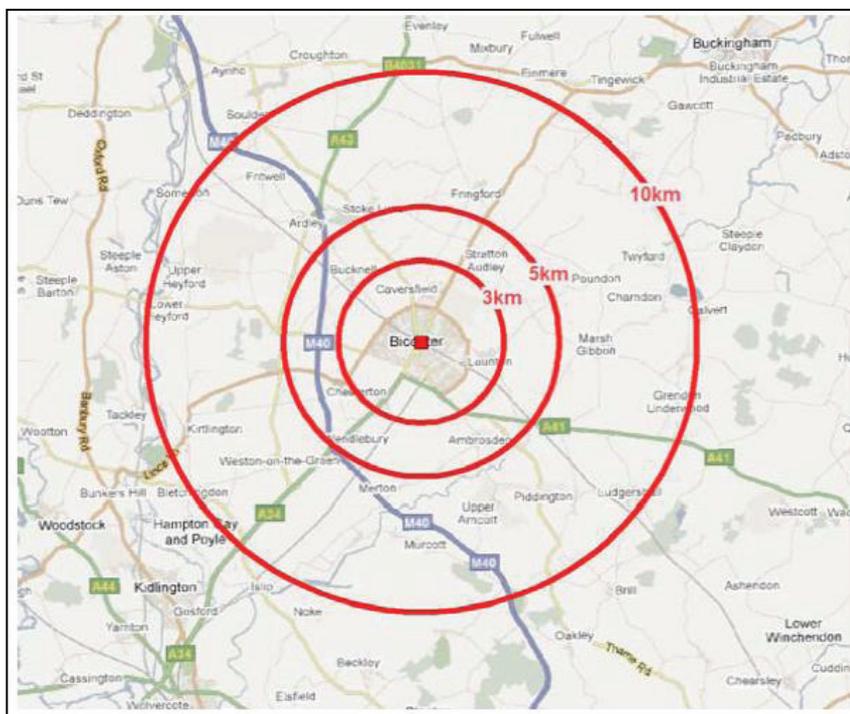
	<b>Caversfield</b>	<b>Bicester North</b>	<b>Cherwell</b>	<b>England</b>
<b>All Usual Residents Aged 16 to 74</b>	<b>1,573</b>	<b>4,223</b>	<b>74,829</b>	<b>25,162,721</b>
Work Mainly at or From Home	8%	5%	6%	5%
Underground, Metro, Light Rail, Tram	0%	0%	0%	4%
Train	2%	4%	3%	5%
Bus, Minibus or Coach	2%	4%	5%	7%
Taxi	0%	0%	0%	1%
Motorcycle, Scooter or Moped	1%	1%	1%	1%
Driving a Car or Van	77%	69%	63%	57%
Passenger in a Car or Van	5%	6%	5%	5%
Bicycle	1%	3%	3%	3%
On Foot	3%	8%	12%	11%
Other Method of Travel to Work	1%	0%	1%	1%

Source: 2011 Census

### 4.3 Containment of Trips

Figure 4.2 shows the extent of the various travel distances from the centre of Bicester. The whole of Bicester and the main development sites (including most of the NW Bicester site) is within the 3km distance. This distance therefore can be used to represent those trips ‘contained’ within Bicester.

**Figure 4.2: Distance from Bicester Town Centre**

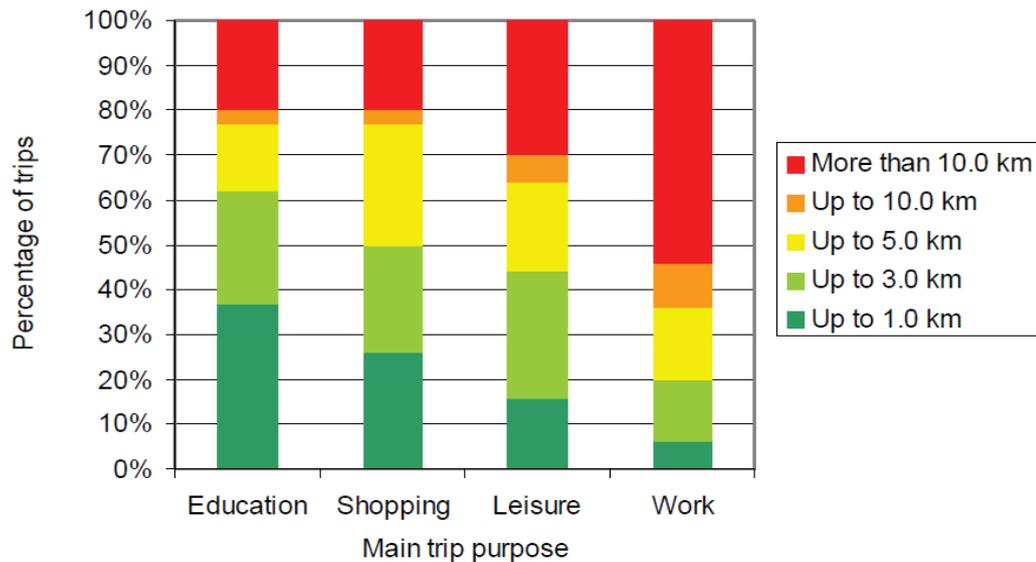


Source: Travel Behaviour Survey, Summary of Results, Autumn/Winter 2010/11, OCC 2011

### 4.3.1 Containment by Trip Purpose

The 2010 survey provides information on the distance versus the trip purpose, as shown in Figure 4.3. The results show that the level of containment of trips within the 3km varies substantially by trip purpose, with 62% of educational trips, 50% of shopping trips and 44% of leisure trips contained compared to only 20% of work trips. The main challenge for achieving a high level of containment for the NW Bicester site will thus be ensuring a high level of containment of jobs within the 3km of residents of the development, whereas other trip purposes tend to have relatively high containment at present in the town.

**Figure 4.3: Trip Purpose vs Distance Travelled**



Source: Travel Behaviour Survey, Summary of Results, Autumn/Winter 2010/11, OCC 2011

### 4.3.2 Destinations

The 2007 Bicester Household Travel Diary survey data has been analysed to establish the destinations of Bicester residents by trip purpose.

Table 4.3 shows the main destinations for work based trips, highlighting that Oxford is a key destination, followed by Kidlington. Trips to the east of Bicester (to the industrial estates) and the town centre are also significant. Work based trips are however the most dispersed out of Bicester of the journey purposes, illustrating that the majority of Bicester residents currently commute out of the town for employment.

**Table 4.3: Employment and Business Trips Main Destinations**

Zone	District/ Ward Name	% of Trips
35	Oxford District (B)	9.8
36	Kidlington Wards	9.5
41	Bicester East Ward	9.5
43	Bicester Town Ward	9.5
37	Wards South and West of Bicester	6.9

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
27	South Oxfordshire District	6.4
38	Wards North and West of Bicester	4.9
24	South Northamptonshire District	4.6
25	West Oxfordshire District	4.1
33	Aylesbury Vale District (South)	3.6
	<b>Total to Main Destinations</b>	<b>68.9</b>

The majority of education related trips made by Bicester households are within Bicester, as shown in Table 4.4, totalling 81%. These trips are generally within walking or cycling distance of homes and thus have a high propensity for sustainable travel.

**Table 4.4: Education Trip Main Destinations**

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
43	Bicester Town Ward	19.6
44	Bicester West Ward	19.0
45	Bicester North Ward	17.9
41	Bicester East Ward	14.7
42	Bicester South Ward	9.8
35	Oxford District (B)	5.4
29	Banbury	3.8
36	Kidlington Wards	2.7
	<b>Total to Main Destinations</b>	<b>92.9</b>

As shown in Table 4.5, shopping trips are concentrated (61%) in the Bicester Town Ward and Bicester South (the town centre, Tesco store and Bicester Village) or are likely to be local centre trips (13% to Bicester North, East and West). The town centre is likely to have increased as a proportion following the opening of the new Sainsbury's store.

**Table 4.5: Shopping Trip Main Destinations**

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
43	Bicester Town Ward	40.9
42	Bicester South Ward	19.7
36	Kidlington Wards	10.2
41	Bicester East Ward	5.1
35	Oxford District (B)	4.4
45	Bicester North Ward	4.4
29	Banbury	3.6
44	Bicester West Ward	3.6

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
37	Wards South and West of Bicester	2.9
	<b>Total to Main Destinations</b>	<b>94.9</b>

Table 4.6 shows the destinations of the majority of leisure trips, with the town centre and other parts of Bicester accounting for 54% of trips. Areas to the south and west of Bicester, and Oxford, are also popular destinations.

**Table 4.6: Leisure Trip Main Destinations**

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
43	Bicester Town Ward	33.3
44	Bicester West Ward	12.5
37	Wards South and West of Bicester	11.1
35	Oxford District (B)	8.3
36	Kidlington Wards	8.3
42	Bicester South Ward	5.6
26	Vale of White Horse District	4.2
39	Fringford Ward	4.2
45	Bicester North Ward	2.8
	<b>Total to Main Destinations</b>	<b>90.3</b>

The data on destinations for people visiting friends and family as shown in Table 4.7 shows strong social linkage to Oxford, with Oxford District accounting for 22% of trips. However, 43% of visits were to people also living in Bicester.

**Table 4.7: Visiting Friends and Family Trip Main Destinations**

<b>Zone</b>	<b>District/ Ward Name</b>	<b>% of Trips</b>
35	Oxford District (B)	22.0
42	Bicester South Ward	13.4
43	Bicester Town Ward	12.2
38	Wards North and West of Bicester	7.3
45	Bicester North Ward	7.3
36	Kidlington Wards	6.1
44	Bicester West Ward	6.1
41	Bicester East Ward	3.7
	<b>Total to Main Destinations</b>	<b>78.0</b>

### 4.3.3 Total Trip Containment

Applying the containment levels for each land use to the proportion of trips made by each purpose (set out in the Appendix 4 to the NW Bicester Masterplan Access and Travel Strategy) gives an overall estimate of 56.4% of trips contained within Bicester.

The current containment of trips within a sector of the town (such as NW Bicester will be) is not known but is assumed to be in the order of 25% given that such areas include educational facilities as well as some jobs and a range of local shops and services and some leisure facilities. The assumption of 25% is half that of Bicester containment as a whole.

### 4.3.4 Containment of Trips by Car

The 2010 survey leads to the estimation that of total car trips made by Bicester residents, 48% are made within Bicester and 52% are to destinations outside of Bicester.

# 5 Planned Transport and Land Use Proposals

## 5.1 Transport Proposals

### 5.1.1 Introduction

The preceding sections of this Transport Assessment report have summarised the strategic and local transport baseline and context for the proposed development. To support growth in the Bicester area and in order to provide better transport services there are a number of schemes, developments and strategies being adopted which will affect all transport modes in the area.

These schemes are being promoted through a number of procedures and organisations including the County Council, District Council, the Highways Agency, rail operators and other private developers. It should be noted that there are no funding responsibility allocations for the schemes on this list and inclusion within this document does not indicate any commitment from the NW Bicester to the schemes. The schemes have been identified by OCC and WYG in conjunction with Hyder.

### 5.1.2 Bicester Proposals included in Saturn Model

Section 2.3.1 sets out the proposals of the Bicester chapter of the Local Transport Plan 3 (produced in May 2014) and this provides a comprehensive list of policy commitments to transport infrastructure in the town by the County Council.

The Bicester Saturn Model has incorporated the following transport proposals in agreement with the County Council in both the Reference Case and with NW Bicester development in 2031.

- 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 will 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.

### 5.1.3 Rail Proposals

The Chiltern Railways' Evergreen<sup>3</sup> proposals will include significant improvements at Bicester Town to cater for the introduction of services to London from Oxford. This requires the construction of a new chord between the two lines as they cross in the town. The East West Rail proposals would also serve Bicester Town and so link Bicester with Oxford and Science Vale to the south and Milton Keynes to the east. The new route will provide a fast and frequent commuter service between Bicester and Oxford, giving a realistic alternative to the congested A34. Chiltern Railways envisages operating two London-Oxford trains each hour in each direction, throughout the day. All trains will call at Bicester Town and Oxford stations, and the new Parkway station in North Oxford.

The East West Rail scheme involves reinstating and upgrading the railway between Cambridge and Oxford, Milton Keynes and Aylesbury to provide a strategic rail route that will link Ipswich, Norwich, Cambridge, Bedford, Milton Keynes, Aylesbury, Bicester and Oxford, with connections to national mainline services. The concept of East West Rail has some parallels with the M25, in that it provides an orbital route around London which both passenger and freight services will use for short, medium and long distances.

### 5.1.4 M40 Improvements

#### A34 M40 Junction 9 Wendlebury Phase 2<sup>3</sup>

The project is located at the A34/M40 Junction 9. The A34 and M40 are key routes for road users travelling in the Midlands. The junction connects both carriageways of the M40, which runs south to the M25 and north to the M42, to the dual carriageway A34 trunk road and dual carriageway A41 county road from Bicester.

The main construction work began in late April 2014 and is expected to take approximately six months to complete. The programme aims to:

- Help to reduce congestion on the A34 northbound carriageway and on the A41 southbound carriageway
- Reduce journey times for road users
- Boost the local economy and support the Bicester Master Plan
- Improve safety for road users using the interchange

#### M40 Junction 10 Improvements

The M40 Junction 10 Improvements are designed to tackle congestion by changing the way traffic on the A43 enters the M40 southbound traffic. The current entry slip lane onto the M40 southbound carriageway from Padbury roundabout will be closed and replaced with a new slip lane directly from Cherwell roundabout.

The work is part of the national Pinch Point Programme. The programme forms part of the UK Government's growth initiative, outlined during the Chancellor's Autumn

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<sup>3</sup> <http://www.highways.gov.uk/roads/road-projects/a34-m40-junction-9-wendlebury-phase-2>

Statement in November 2011. It is estimated that this work will be completed by 23rd May 2014.

## 5.2 Committed and Planned Development

Table 5.1 sets out committed/ planned development that has been considered as part of the 2031 Reference Case together with the level of certainty associated with the development (as at the end of 2013). It should be noted that this is a fully comprehensive list of planned developments as agreed for testing with the County Council to provide a full assessment of development planned for the town. As such the Reference Case is a worst case of 2031 traffic levels.

**Table 5.1: 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

Source: White Young Green February 2014

# 6 Development Proposals

## 6.1 Introduction

This chapter describes the development proposals including the mix of land uses and their location across the site, whilst also outlining the proposed Access and Travel Strategy for the development. A summary of the proposed land uses is provided in Table 6.1.

**Table 6.1: Proposed Land Uses**

	Units	Quantum
Residential – Privately Owned * 70%	Dwellings	1820
Residential – Affordable Housing * 30%	Dwellings	780
		<b>2600</b>
Children’s Nursery	Children	63
Primary School	Pupils	630
B1 Office Business Park / Eco Business Centre	m <sup>2</sup>	3850
B2/B8 Industrial Units/Storage and Distribution	m <sup>2</sup>	974
Local Shops/restaurants/A2 business	m <sup>2</sup>	1771
Community Hall/Multi Faith Centre	m <sup>2</sup>	2220
Energy Centre	m <sup>2</sup>	440

For the purposes of this Transport Assessment it has been assumed that the development would be constructed in phases commencing in 2019, with full occupation anticipated by 2031 (subject to the granting of planning permission). It is recognised that built out may well take longer but this assumption provides a robust basis for assessment.

The provision of a range of non-residential and employment uses presents an opportunity to encourage a high level of containment of trips within the site. Moreover, the relationship of the mix of land uses to the wider Masterplan should be emphasised, with the secondary school included in Application 2 and the proposals by Albion in relation to the business park identified within the master plan at the SE corner of the master plan site, fronting Howes Lane and Middleton Stoney Road (as well as the jobs provided within the Application 1 site).

## 6.2 Site Masterplan

Figure 6.1 indicates the masterplan and access arrangements for the Application 1 development.



*those that do still require cars for longer journeys, we will inspire the use of hybrid or electric vehicles.” (Farrell’s, May 2014)*

Appendix 5 – Mode Share and Containment of the NW Bicester Masterplan Access and Travel Strategy sets out various scenarios considered in relation to modal share and containment.

Consultation with CDC and OCC<sup>4</sup> on the initial scenarios led to the conclusion that the maximum modal share target of no more than 50% by car must be aimed at, given the requirements of PPS1. Scenarios with a lower non-car modal share were therefore dismissed from further consideration.

It was also recognised that achieving a step change in containment of trips is challenging given that trip destinations depend on many factors outside of the control of NW Bicester (even if jobs, facilities and services are provided, people make choices about where they wish to work, spend their leisure time etc.). It was agreed however that some improvement must be achieved for the Masterplan, given that containment of trips is a key factor in achieving the mode share targets (shorter journeys are more likely to be by sustainable modes than longer journeys). The medium containment level was agreed as an appropriate target whereby containment is improved whilst being realistic on the degree to which this can be achieved. The targets for containment and modal share at the point of completion of the Masterplan are set out in Table 6.2.

**Table 6.2: Target Modal Share and Containment**

<i>Containment</i>	At least 35% of trips to be within NW Bicester and 60% to be within Bicester as a whole (i.e. 40% or less travelling outside of Bicester).
<i>Mode Share</i>	No more than 50% of trips by car modes

Table 6.3 sets out target modal share for trips within NW Bicester (under 1km), within Bicester (1-3km) and outside of Bicester (more than 3km). This is based on setting targets for reduction in car use against the baseline for each of the different distances with the aim of achieving an overall modal share of no more than 50% by car.

**Table 6.3: Target Mode Share**

	2031 PPS Target All trips		2031 Internal Trips		2031 External Trips within Bicester		2031 External Trips Outside of Bicester	
	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car	% by mode	Total Car/ Non Car
<b>Car driver</b>	<b>40.00%</b>	<b>50.00%</b>	<b>7.00%</b>	<b>14.00%</b>	<b>35.00%</b>	<b>52.00%</b>	<b>57.00%</b>	<b>77.00%</b>
<b>Car passenger</b>	10.00%		7.00%		17.00%		20.00%	
<b>Bus</b>	10.00%	50.00%	1.00%	86.00%	5.00%	48.00%	11.00%	23.00%

<sup>4</sup> Transport Workstream Meeting - 25<sup>th</sup> September 2013

<b>passenger</b>								
<b>Bicycle</b>	10.00%		10.00%		10.00%		7.00%	
<b>Walk</b>	30.00%		75.00%		33.00%		5.00%	
<b>Total</b>	100%	100%	100%	100%	100%	100%	100%	100%

It is acknowledged that PPS1 seeks to achieve a higher target of 60% non-car modes for Eco towns where they are adjacent to a higher order settlement. The targets set for NW Bicester seek to achieve the 50% non-car as a minimum, but it also needs to be recognised that the town of Bicester currently has high car use given its location close to the strategic motorway network and therefore achieving 50% already represents a substantial shift in travel towards non-car modes. Wider measures such as Evergreen3 and the East-West rail link may assist this but the baseline mode share needs to be taken into account.

The Masterplan assumptions regarding mode share and containment have been applied to the land uses proposed in Application 1. The Application 1 site will have the same access to public transport, walking and cycling and travel planning measures as the overall NW Bicester development and therefore the modal share targets for different distances travelled for each of the land uses will remain unchanged. Moreover, the development forms part of the overall Masterplan and thus the targets for containment of trips within 1km, 1-3km and more than 3km will be in line with the Masterplan.

Whilst the same approach will be used, the mode share and containment expected to be achieved in the land north of the railway will vary slightly from the Masterplan given the particular mix of housing, education, employment, retail and other services. The calculation of mode share and containment arising from the land uses is discussed in the trip generation section.

## 6.4 Walking and Cycling Access

In order to achieve the amount of trips by walking and cycling set out in the targets, the site layout has been developed to ensure a high level of accessibility within the site on foot and cycle and strong connections to off-site destinations. A Walking and Cycling Strategy for the NW Bicester Masterplan has been formulated and is set out in Appendix 1 to the Access and Travel Strategy. The ingredients of the ideal walking and cycling routes are illustrated in Figure 6.2.

**Figure 6.2: Ingredients of High Quality Walking and Cycling Routes**



### 6.4.1 Internal Connections

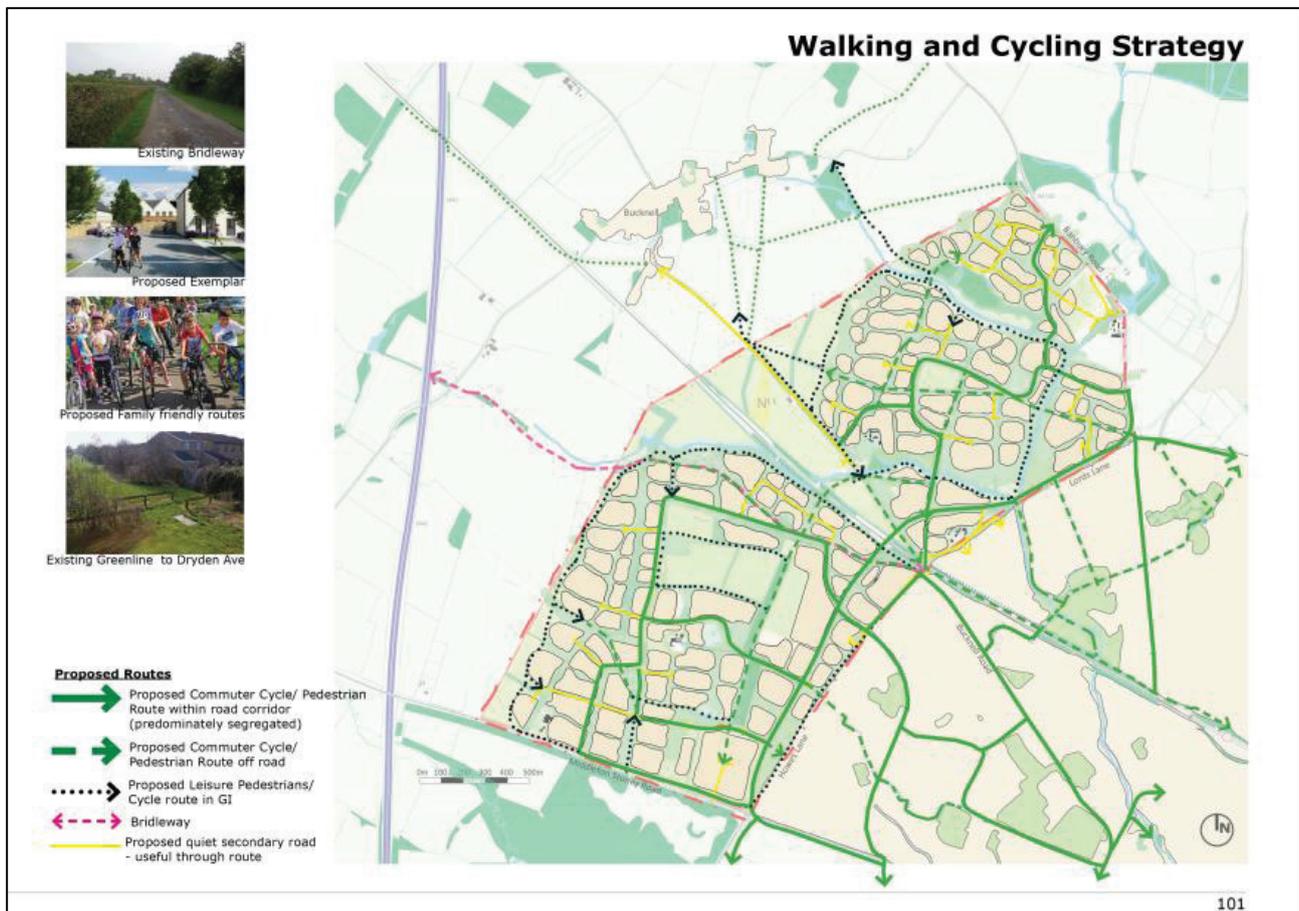
It is proposed that the internal walking and cycling routes will be of a high quality with commuter routes having all-weather surfacing and being well-lit and easily maintained. The layout of home and routes will ensure natural surveillance to increase user safety. Where possible pedestrians and cyclists will be segregated to minimise potential conflicts, and walking and cycling routes will be segregated from vehicular routes. Safety of pedestrians and cyclists will be ensured by providing routes of adequate widths and with numerous crossing points.

To ensure cycle and walking routes are well used and fit for purpose, they will be split into two distinct categories. 'Commuter Routes' will be the most direct routes segregated from traffic but either adjacent to the roads or off-road where this is more direct. They will allow direct and fast access to key local employment areas, schools, local centres and hubs. This allows for the provision of cyclists and walkers travelling to school and to work.

As a contrast, a network of 'leisure routes' will be introduced, which allow more 'weekend' routes, longer meandering paths, these will tend to be more rural and will take in the arable farmland, the Bure stream and the hedgerows.

Figure 6.3 illustrates the proposed walking and cycling strategy within the site layout for the Application 1 development and the connections to wider Bicester.

**Figure 6.3: Walking and Cycling Connections**



## 6.4.2 External Connections

A detailed audit and review was undertaken of walking and cycling routes between the development and the rest of Bicester. From this, a number of primary routes were identified which are likely to be the main routes for residents of NW Bicester as well as secondary connections, also important but less direct. Figure 6.4 shows the primary and secondary route connections for the Masterplan. It is recognised that these connections are not all of the routes which will be used but these provide the best opportunity for direct routes which could be enhanced or upgraded and provide for both walkers and cyclists.

Of the routes identified, the following primary and secondary connections are considered important for the land north of the railway:

### Primary Connections

The primary connections between the Application 1 development and Bicester, and east-west connecting the different parts of the development, in order to encouraging walking and cycling are considered to be:

- Alongside the railway from Lord's Lane to Bicester North Railway Station (Route 3);
- Adjacent to Banbury Road – connecting the east side of the development with the town centre (Route 4); and

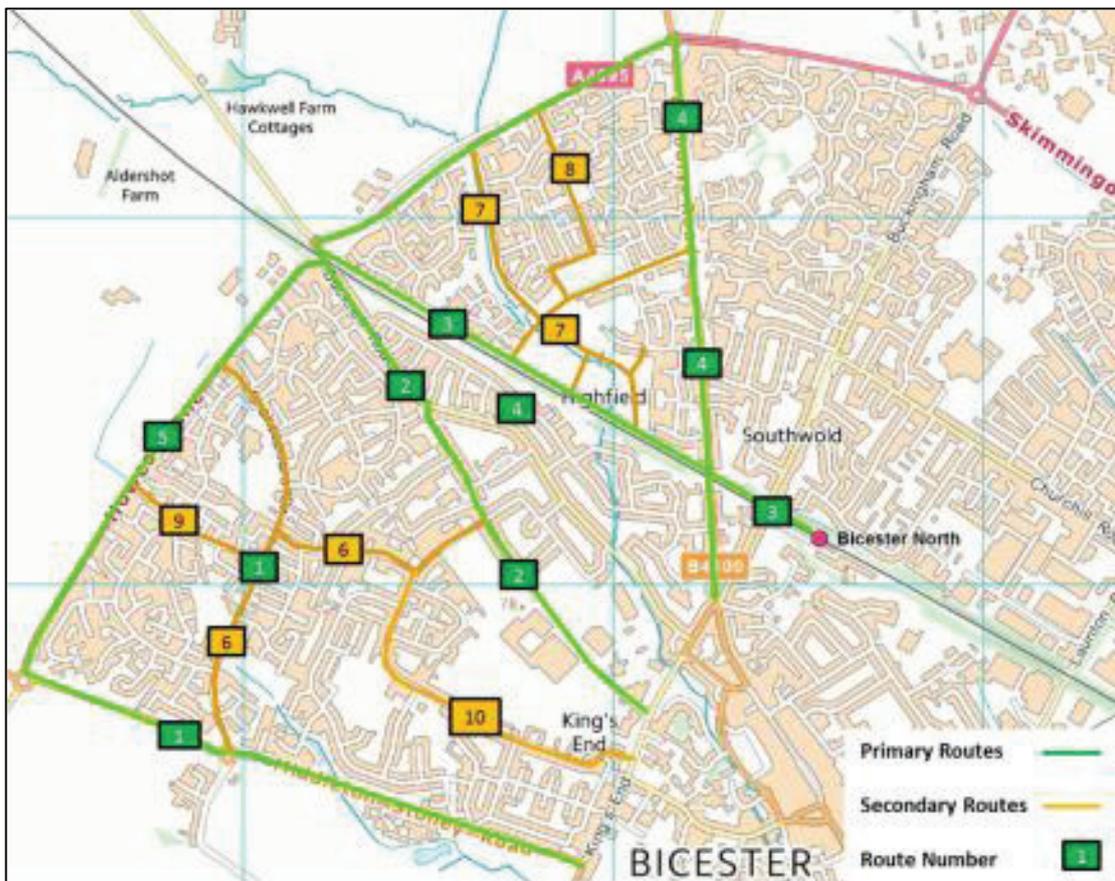
- Alongside Lord's Lane – connecting the different parts of the NW Bicester development (Route 5).

In response to the principles for routes, primary connections should be:

- Segregated from traffic;
- All weather surface;
- Lit;
- The most direct routes.

The east-west route along Howes Lane and Lord's Lane is planned for the southern side of the road as a route with separated walking and cycling provision (4.5m wide). It is also recommended that, subject to feasibility, the route adjacent to the railway line running towards the town centre should also be wider to enable segregation.

Figure 6.4: Primary and Secondary Connections from NW Bicester



## Secondary Connections

The following connections are considered to be of additional significance in linking the land north of the railway into and through the existing residential areas:

- Routes through Bure Park nature reserve connecting to the railway route – connecting the central part of the east side of the development to the town centre (**Route 7**); and
- From Lord's Lane to Lucerne Avenue through the Bure Park housing estate (as above) (**Route 8**).

In response to the principles for routes, secondary connections may be:

- Sharing quiet streets with traffic; and
- On gravelled surfaces and potentially unlit if in environmentally sensitive areas.

## Other Routes

In addition to the primary and secondary connections there are certain routes in the wider town that will also be important for connections from NW Bicester, as well as for residents of the town as a whole. Key routes that may require consideration include:

- From Bicester North Station area to Launton Industrial Estate. This was not surveyed, but it is noted that there is an existing off road walking and cycling route running to the north of the railway line on Town Walk North and connecting via Town Walk East to the industrial estate; and
- From the town centre/ Kings End to Bicester Town Station.

In summary, the following areas for improvement are of particular relevance in providing good connectivity for walkers and cyclists to and from the Application 1 development:

- 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;
- Improvements to the routes through Bure Park to encourage their use as leisure walking and cycling routes.

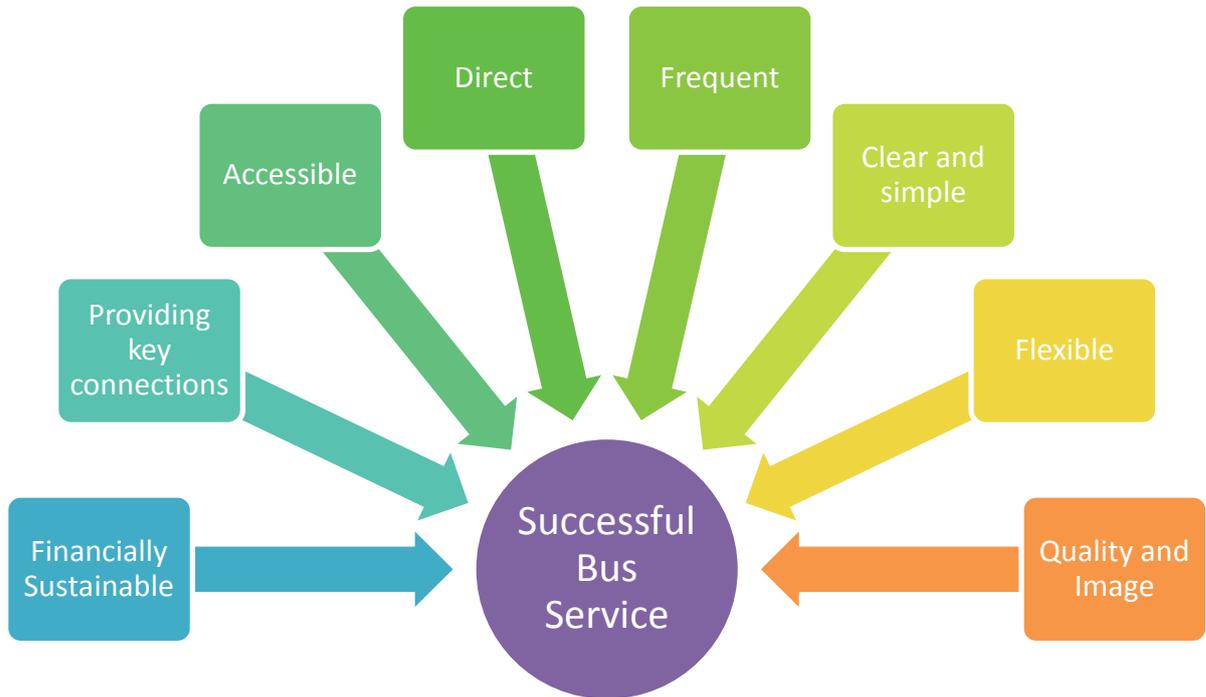
Improvements to routes will be further investigated in conjunction with Oxfordshire County Council and will form part of discussions regarding the s106 for Application 1.

## 6.5 Travel by Public Transport

### 6.5.1 Establishing a Successful Bus Service

PPS1 seeks for a minimum of 50% of travel to and from the site to be via non car means and the bus will have a significant role to play in providing a means of sustainable travel for journeys by residents of the site and those employed/ visiting NW Bicester. Moreover, the bus will provide accessibility to education, jobs, services and facilities for those who do not have a car, which in particular will benefit young people, elderly people and those on lower incomes. A service which does this effectively as part of the long term development of the site will be a 'successful' bus service. The following aims are proposed for a bus service for NW Bicester in order for it to be successful as shown in Figure 6.5.

Figure 6.5: Components of a Successful Bus Service



It is recognised that an effective bus strategy needs to balance the above aims, noting that there can be a conflict between aims, for example in providing a high degree of accessibility with directness and financial sustainability.

## 6.5.2 Proposed Bus Route

The proposed bus routes at the full build out of the development will go to and from Bicester Town Station, through the town centre to Bucknell Road and then loop through the land north of the railway. The proposed routes for both sides of the railway are shown in Figure 6.2 with Route 2 being the proposed route for the land north of the railway.

### Phasing of Bus Routes

The development of the Application 1 site will be phased and built out in different areas. There is therefore a need to phase the bus service to reflect the development phasing.

The route will serve each of the early phases of the development, in order to ensure that there are bus routes within 400 metres of homes as the site builds out. Initially the route will go to Bicester North Station but over time it will directly connect to Bicester Town Station:

- **Early Development (Phase 1)** – this involves a northern loop (the route planned for the Exemplar) which would use Banbury Road to and from the development, giving access to Bicester North Station in the early years of the development.
- **Further Development (Phase 2 onwards)** – involves the establishment of a full loop on the northern side. The bus would travel up Bucknell Road, along Lord's Lane and Banbury Road, then through the development from north to south. This direction would enable those living at the northern end of the site to use a bus to the centre of the site and walk to the secondary school for example. At this stage

it is anticipated that the route through the Exemplar development would alter to continue into the Application 1 development.

## Service Frequencies

It is proposed that there is a frequency of every 15 minutes on the northern loop from the occupation of an agreed number of units. Once a 15 minute service has become commercially viable, frequencies might be increased to every 10 minutes.

## Patronage Assumptions

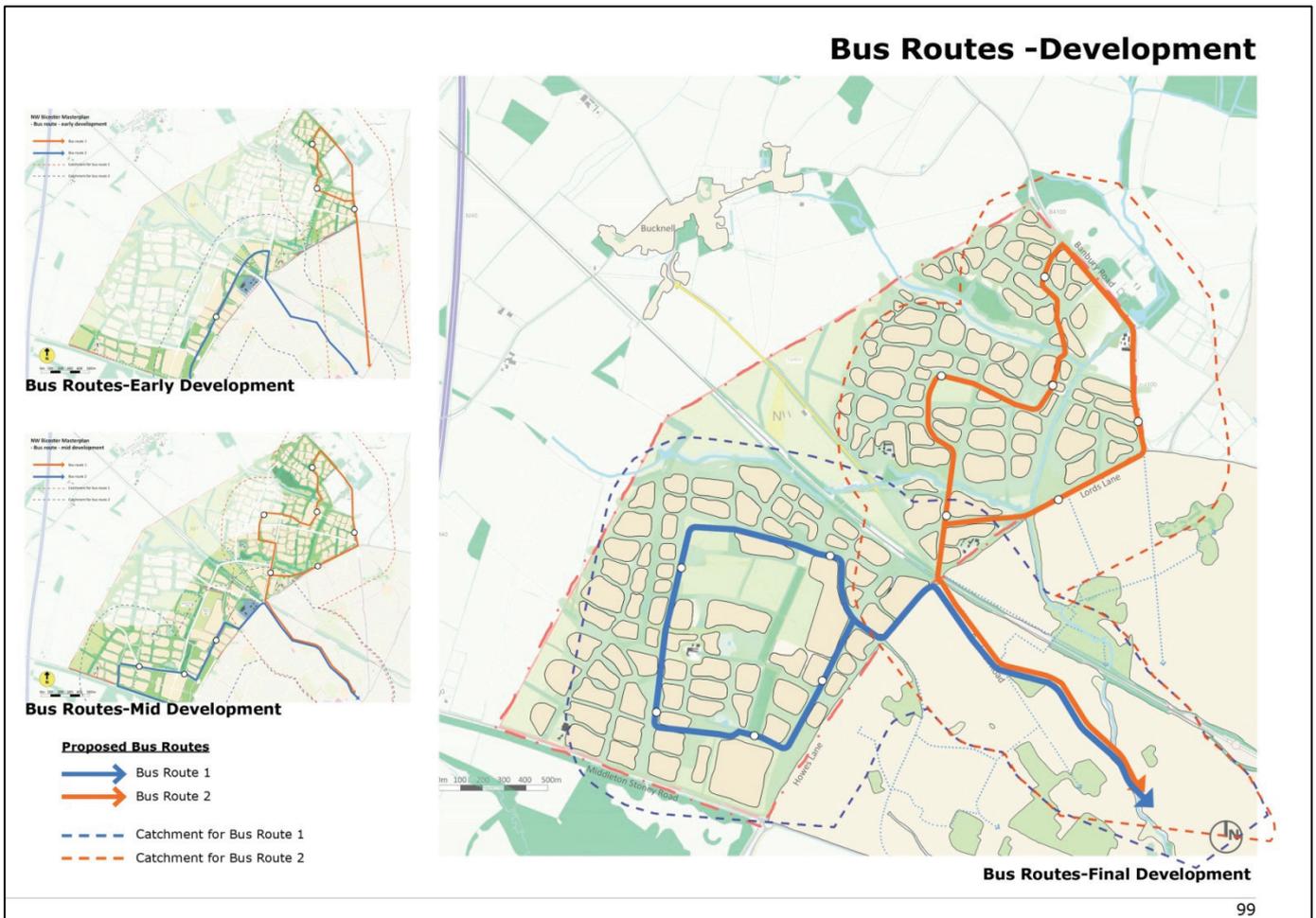
Potential patronage in each phase has been estimated based on the forecast bus use for the development in each phase, assuming a modal share of 6.6% for buses with a service frequency of 4 per hour to all parts of the development. This can be compared to the current modal share for buses of 5% for Bicester Households (2010 survey). It is considered this is realistic given the level of accessibility, frequency and directness of the services and is compatible with the targets set out in this chapter in Table 6.3.

## Bus Priority

The access layout includes the provision of a bus only link from Bucknell Road into the development to provide a priority route for bus services. The means of designing and enforcing the bus links will be determined through agreement with OCC.

There is a need to afford greater priority to buses on Bucknell Road and in the town centre, and this is discussed further in Chapter 11 with respect to alleviating congestion at the town centre junctions. The use of Bucknell Road as the main bus route in the long term gives advantages to buses in that other routes are expected to be more heavily trafficked.

Figure 6.6: Bus Route Development



## Bus Infrastructure

A high standard of infrastructure will be provided on bus routes including shelters with seating, real time information and cycle parking.

## Links to Other Services

The bus route provides links to the town centre and Bicester Town Station. This will also provide the opportunity to extend services to other areas of the town (such as the Launton Road employment area) or to interchange with longer distance bus services.

## Summary

In summary a frequent bus service is proposed between the Application 1 development and the town centre, aiming to provide six services per hour by full occupation of the Application 1 development subject to viability at that point in time, with a minimum of four per hour. In the early phases of the Application 1 development the service would use Banbury Road and travel through the Exemplar development, but as the site builds out there will be a loop from Bucknell Road via a busway into the development and returning on Lord's Lane.

The bus route suggested is an indication of how services may develop. Bus services will however evolve over time to meet passenger needs and there may be demand for additional / alternative services such as east to west on the new link and then westwards to wider destinations.

## 6.6 Promoting Sustainable Travel and Vehicle Choices

A comprehensive range of measures are proposed for the Development which are contained within the accompanying Framework Travel Plan for Application 1 to promote sustainable travel and vehicle choices.

## 6.7 Vehicular Access Strategy

A vehicular access strategy has been developed with the following key considerations:

- Meet OCC policy aspirations to increase the capacity of the Howes Lane/ Lord's Lane junctions and links, recognising the strategic importance of the corridor for movements on the north west of the town;
- The need to integrate NW Bicester into the town and thus to minimise the barrier presented by new road links to the development and ensure they can be easily crossed by walkers and cyclists;
- Addressing the constraints presented by the existing Howes Lane/ Lord's Lane corridor and in particular the rural lane character of Howes Lane and the skewed underpass of the railway with the junctions on either side;
- Minimise impacts of traffic in nearby existing residential areas and communities.

A range of options were assessed to arrive at the best access strategy for the Howes Lane/ Lord's Lane corridor and access for the Masterplan when considering the whole range of factors. Each option assumed a single carriageway of lower speed than the existing route but included the removal of the existing junction constraints near the railway. A route was selected and developed and is incorporated into the Masterplan and will be provided in detail as part of the separate planning application for the A4095 NW Strategic Link Road. The design includes the following:

- a new road to replace Howes Lane and Lord's Lane from the Middleton Stoney Road roundabout to join Lord's Lane east of Purslane Drive;
- a new underpass of the railway north of the existing Avonbury Business Park, passing to the north of Lord's Farm on the east side of the railway;
- keeping part of the old Howes Lane and Lord's Lane to provide access to and from the existing residential areas and Bucknell Road to the south;
- A bus only section south of the new link on the east side of the railway;
- Traffic travelling from Bucknell Road in the town centre will be diverted to the east on the Old Lord's Lane, then north through the Masterplan, thus aiming to reduce the attractiveness of the route for through traffic;
- A one way out of the Shakespeare Drive area towards the new link to avoid as much through traffic as possible.

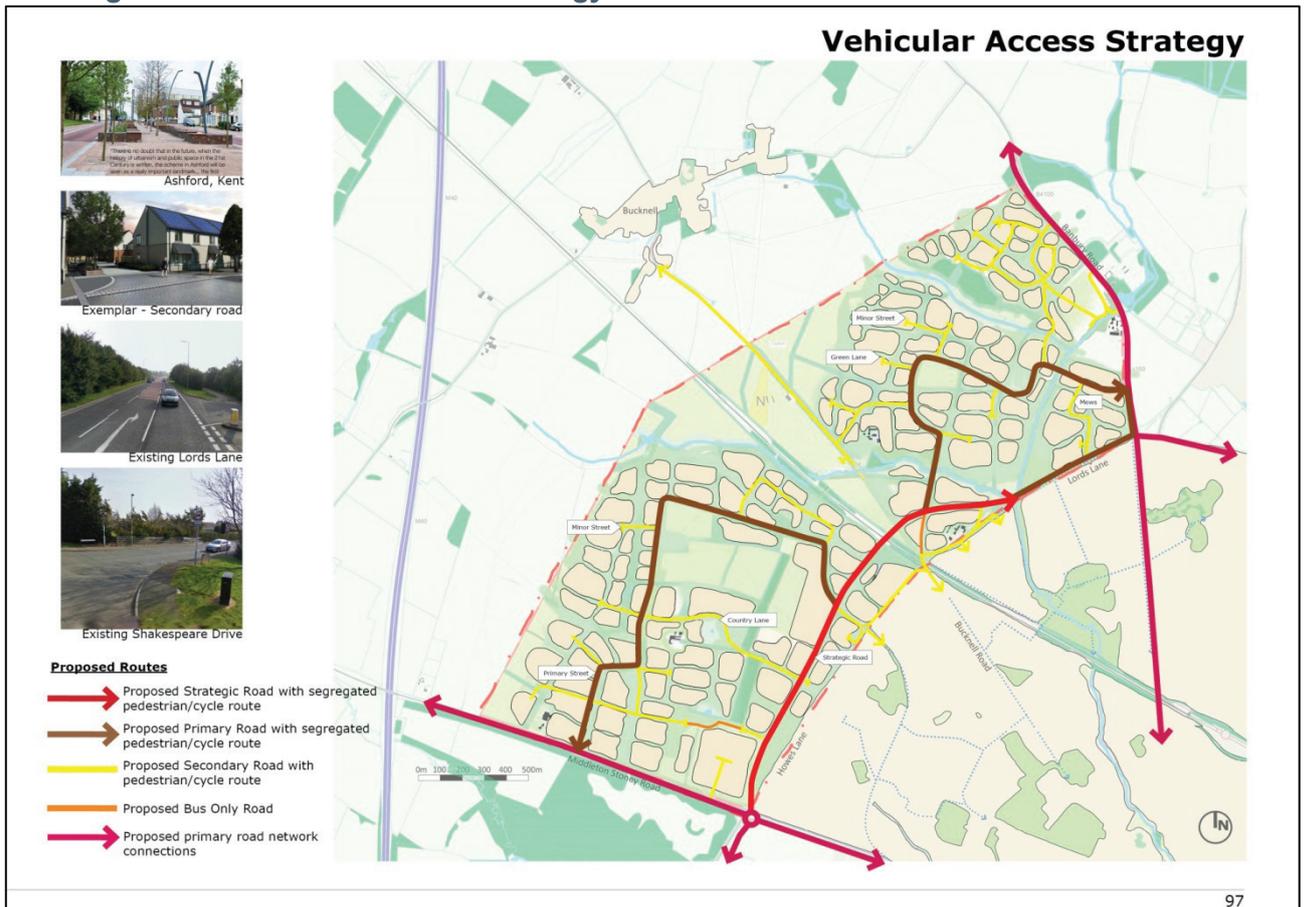
Access into the development of the land north of the railway is proposed from a number of junctions:

- Three traffic signalised junctions on the new Lord's Lane link and existing Lord's Lane on the north side of the development;
- An access onto Bucknell Road on the east side of the railway;
- Two access points onto Banbury Road (from the Exemplar development).

The number and location of junctions aims to spread traffic movements on the road network rather than lead to a concentration in a small number of locations which minimises traffic routeing through other parts of the development as well as adjacent residential areas and communities. Figure 6.7 illustrates the Vehicular Access Strategy for the Masterplan.

Within the development of land north of the railway it is proposed to have a primary route linking the new link at a junction east of the railway line through the development to join the Exemplar spine road. There will be secondary roads connecting to Bucknell Road and to Lord's Lane west of the Banbury Road roundabout as well as to provide access to parts of the development.

**Figure 6.7: Vehicular Access Strategy**



## 6.8 Parking Provision

The approach to parking in each aspect of the development requires a careful balance between meeting the needs of residents/ businesses and not unduly encouraging car use. Whilst Eco Development good practice recommends a much reduced provision of parking over standard developments, it is recognised that the NW Bicester site is in a predominately rural County where car ownership levels are (often by necessity) high.

## 6.8.1 Residential Parking

Parking provision for the development has been developed through the application of Oxfordshire County Councils 'Parking Standards for New Residential Developments'<sup>5</sup>. The guidance sets out the maximum parking standards for allocated and unallocated spaces within new residential areas throughout Oxfordshire, together with guidance on space dimensions and parking layouts.

The parking standards set out in the guidance have been informed by research undertaken in Oxfordshire, which found that the most important factors influencing car ownership are dwelling size and tenure, location and that the overall number of car parking spaces in a development can be reduced if some spaces are provided as unallocated to specific properties.

The guidance provides parking standards for new residential developments for different areas of the County and the specific parking standards for the Cherwell Urban Areas including Bicester are detailed below in Table 6.4.

**Table 6.4: Car Parking Provision in New Development for Urban Area in Cherwell**

Number of bedrooms per dwelling	Maximum number of allocated spaces	Maximum number of spaces when two allocated space per dwelling is provided		Maximum number of spaces when one allocated space per dwelling is provided		Maximum number of unallocated spaces when no allocated spaces
		allocated spaces	unallocated spaces	allocated spaces	unallocated spaces	
1	1	N/A	N/A	1	0.4	1.2
2	2	2	0.3	1	0.6	1.4
2/3	2	2	0.3	1	0.7	1.5
3	2	2	0.3	1	0.8	1.7
3/4	2	2	0.4	1	1.0	1.9
4+	2	2	0.5	1	1.3	2.2

It is proposed that as an average for the Application 1 development parking will be provided for homes following that agreed for the Exemplar development. The provision will be part of a parking strategy which links to the Travel Plan for each part of the development.

Table 6.5 indicates provision by unit type. It can be seen that all dwelling types are lower than the maximum standards with the exception of a small number of 5 bedroom dwellings with more allocated space. As a total, the provision of parking would be less than the standards. Garages are included as allocated spaces and the unallocated spaces includes visitor parking provision.

<sup>5</sup> <http://www.oxfordshire.gov.uk/cms/content/transport-new-developments>

**Table 6.5: Indicative Residential Parking Provision**

Unit Type	Provision	
	Allocated space	Unallocated
1b	1	0
2b	1	1.22
3b	2	0.22
4b	2	0.22
5b	3	0.22

## 6.8.2 Non-Residential Parking

Parking for non-residential uses will be detailed as part of detailed/ reserve matters applications but is expected to be in accordance with the parking provision for the Exemplar development. This sets provision well below the maximum CDC standards but demonstrates how this will be achieved in a parking accumulation.

## 6.8.3 Cycle Parking

The residential units will have cycle storage provided in accordance with the Code for Sustainable Homes (assuming the second option of storage for 1 cycle for 1 bed homes, 2 for 2 and 3 bed and 4 for 4 or more bed homes). The criteria for achieving COSH credits is shown below.

Criteria	Credits
Where either individual or communal cycle storage is provided that is adequate, safe, secure and weather-proof (as defined in <i>Relevant Definitions</i> below) for the following number of cycles:	
Studio or 1 bedroom dwelling - 1 cycle for every two dwellings (only applicable to communal storage)	1
2 and 3 bedroom dwellings - storage for 1 cycle	
4 bedrooms and above - storage for 2 cycles.	
OR	
studios or 1 bedroom dwellings - storage for 1 cycle	
2 and 3 bedroom dwellings - storage for 2 cycles	
4 bedrooms and above - storage for 4 cycles.	2

The non-residential uses will have cycle parking for staff and visitors provided over and above the Cherwell DC standards, which are shown in **Table 6.6**. With regard to the primary school, the CDC standards do not include a standard for cycle parking at schools and it is suggested that an allowance of 1 space per 10 pupils is accommodated. A space allowance should also be made for children's scooter parking.

**Table 6.6: Cycle Parking Standards – Cherwell DC**

	Residential	Food Retail	Non Food Retail	B1 - Offices	D2 Assembly and Leisure	A3 - Restaurant/ pubs
<b>Long stay/ employee/ resident</b>	1 bed - 1 space; 2+ beds - 2 Spaces	1 stand per 12 staff *	1 stand per 6 staff *	1 stand per 150 sqm	1 stand per 12 staff **	1 stand per 12 staff **
<b>Visitor</b>	1 stand per 2 units where more than 4 units	1 stand per 200sqm	1 stand per 200sqm	1 stand per 500 sqm	1 stand per 20 sqm	1 stand per 20 sqm of public space

Stands will be of ‘Sheffield’ type and will be located in well lit, accessible locations. Storage for staff will be provided in covered secure shelters close to building entrances. Cycle stands will also be provided adjacent to each of the bus stops to encourage people to cycle and then transfer to bus.

## 6.9 Construction Traffic

The construction phase of development for the purposes of this assessment is anticipated to commence in 2019 and build out over approximately a 20 year period.

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 routeing agreement to ensure drivers use the peripheral road/A4095 and will be prohibited from passing through the centre of Bicester unless they are transporting locally sourced materials/goods.

It is anticipated that, over the life of the construction period, virtually all construction traffic for the development will use the A41/Vendee Drive from the M40 Junction 9 and the new Howes Lane/ Lord’s Lane to access the development.

## 6.10 Summary

The proposed development comprises a mix of land uses and will provide the physical and service infrastructure to enable a high proportion of trips to be made by walking, cycling and public transport. The following chapter analyses the accessibility of the site and provides an assessment of the relative attractiveness of different modes for journeys to ascertain how likely people will be to take up sustainable modes for travel to and from the development.