

Bicester Local Cycling and Walking Infrastructure Plan (LCWIP)

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Contents

1. Introduction	7
1.1. What is Bicester Local Cycling and Walking Infrastructure Plan (LCWIP)?	7
1.2. Why is it important now for Bicester?	8
1.3. What are the benefits of more walking and cycling?	10
2. Scope	11
3. Travel connections inside and outside Bicester	13
3.1. Overview of existing connections	13
3.2. Main issues for cycling	14
4. New developments	16
4.1. Bicester Sustainable Development	17
5. Bicester Sustainable Transport Policy	18
5.1. Bicester Area Strategy (BAS)	18
5.2. Cherwell Local Plan 2011-2031	19
5.3. Bicester Sustainable Transport Strategy (BSTS)	19
5.4. Bicester Garden Town Masterplan (BGTm) and Baseline Report	19
6. LCWIP Overall Scheme Approach	21
6.1. Overview	21
6.2. Increasing cycling: what works	21
6.3. CAT scale and Bicester targets	21
6.4. CAT scale and Bicester Traffic Priorities	22
6.5. Impact of CAT scale on Bicester trips	23
6.6. CAT scale and transport congestion	24
7. Public support for different category measures	25
7.1. What do Bicester residents see as the solutions?	25
7.2. Prioritising car or cycle at conflict points?	26

8. Overall Scheme Designs for each category	27
8.1. Category D (Do minimum): existing cycle network	27
8.2. Category C: comprehensive cycle network.....	28
8.3. Category B (Bold and Brave).....	32
8.4. Category A (Ambitious and Aspirational).....	33
9. Overview of schemes	37
9.1. Assessing the quality of the network.....	37
9.2. Walking: crossings.....	38
9.3. Walking: town centre	39
10. Bicester LCWIP Policies	41
11. Next actions	44
Annex 1. Policy and Research Background.....	45
Annex 2. Policy backing for LCWIP	47
Annex 3. Commitment to Active Travel Scale (CATS).....	57
Annex 4. Factors affecting travel in Bicester.....	66
Annex 5. Travel behaviour in Bicester	68
Annex 6. Safety and infrastructure.....	77
Annex 7. Cycle network data sources.....	83
Annex 8. Bicester LCWIP cycle network.....	88
Annex 9. New development and new cycle routes	91
Annex 10. AQMA & The Central Corridor	94
Bicester LCWIP map 1 of 2: town	(separate document)
Bicester LCWIP map 2 of 2: town and villages	(separate document)

Figures

Figure 1. Current and predicted internal trips within Bicester by transport mode	9
Figure 2. Bicester lies on a gentle slope ideal for cycling.....	11
Figure 3. Cycling time to town centre.....	11
Figure 4. Walking time to town centre.....	12
Figure 5. Plan showing town centre	15
Figure 6. BAS 2015 plan showing new development proposals around town.....	16
Figure 7. Policy context of Bicester LCWIP	18
Figure 8. Typical modal share of local trips (people trips rather than vehicle trips).....	22
Figure 9. Current (D) and predicted (2031-5) internal Bicester resident trips per day for different levels of Council commitment	23
Figure 10. Current (2014) and predicted (2031-5) road space use (PCUs) for internal Bicester resident trips by mode.....	24
Figure 11. Bicester residents' expectations of future traffic increases	25
Figure 12. Bicester residents' attitudes towards potential solutions to traffic congestion ...	26
Figure 13. Bicester residents' opinions on which mode should be prioritised in traffic planning conflict	26
Figure 14. Bicester existing cycle network	28
Figure 15. LCWIP Bicester cycle (and walking) network.....	29
Figure 16. Bicester map showing typical morning (8am to 9am) traffic congestion	31
Figure 17. Category B schemes: key traffic filters/closures	33
Figure 18. Bicester town centre liveability scheme category A	35
Figure 19. Category A: Comparison of internal journey times by travel mode	36
Figure 20. Cycle network quality.....	37
Figure 21. Bicester crossing points.....	39
Figure 22. Audit of town centre streets quality for walking	40
Figure 23. Bicester Garden Town Masterplan vision	49
Figure 24. Plan showing proposed green corridors	52
Figure 25. Proposed speed limits	55
Figure 26. Design for Market Square	56
Figure 27. Bedford comprehensive cycle network	60
Figure 28. Cycle flows in Bedford (annual counts).....	60
Figure 29. Pedestrian flows in Bedford (annual counts)	61
Figure 30. Central Oxford network from view of cyclist/pedestrian.	62
Figure 31. Central Oxford network from view of car driver.....	62

Figure 32. Oxford town centre traffic (red) and cycling (blue)	62
Figure 33. Plan of Houten: car network.....	63
Figure 34. Plan of Houten: cycle network	63
Figure 35. Percentage breakdown of trips made by Houten residents by mode and purpose.....	64
Figure 36. Plan showing how Bicester can easily be converted to low traffic neighbourhoods	65
Figure 37. Plan showing key destinations.....	66
Figure 38. Plan showing key existing destinations: shopping, green space and schools ..	67
Figure 39. Trips per person per day in Bicester	69
Figure 40. Travel time per person per day in Bicester	69
Figure 41. Distance travelled per person and day in Bicester.....	69
Figure 42. Percentage of total distance travelled by Bicester residents.....	70
Figure 43. Trip distance bands by Bicester residents using different modes	70
Figure 44. Share of all trips by location (in or out of Bicester) compared to distance band	70
Figure 45. Modal share of trips in Bicester compared to trips to/from outside Bicester, by distance	71
Figure 46. Modal share of trips within Bicester by 3 distance bands	71
Figure 47. Number of trips per car per year: potential for change from car trips within Bicester to other sustainable modes	72
Figure 48. Total percentage of all trips within Bicester that could be transferred to sustainable modes.....	72
Figure 49. Trip distance bands for Bicester residents (cycling or walking).....	73
Figure 50. Journey purpose of Bicester residents' trips within Bicester	73
Figure 51. Mode of travel for Bicester residents (trips in and out of Bicester) by journey purpose.....	74
Figure 52. Trip distance by journey purpose.....	74
Figure 53. Detailed breakdown of leisure trips in Bicester	75
Figure 54. Mode choice by employment status.....	76
Figure 55. Mode choice by age.....	76
Figure 56. Bicester residents' perception of risk as pedestrians and cyclists.....	77
Figure 57. Bicester cyclist casualties by kind of road or location in Bicester.....	79
Figure 58. Bicester cyclist casualties by typology of accident.....	80
Figure 59. Bicester pedestrian casualties by location or type of road	80
Figure 60. Bicester pedestrian casualties by typology of accident.....	81
Figure 61. Commuter flows within Bicester	83
Figure 62. Potential cycling flows in Bicester.....	84

Figure 63. Strava heatmap for commuter and leisure cycling in Bicester (2018-2020).....	85
Figure 64. Sustrans Route 51 route	86
Figure 65. Public rights of way map	87
Figure 66. Bicester cycle and walking network LCWIP 2020	88
Figure 67. Location of problem areas for cyclists in Oxfordshire Cycle Survey 2019	90
Figure 68. Plan showing major new development sites in Bicester	91
Figure 69. Plan of NW Bicester showing proposed walking and cycling routes	93
Figure 70. Plan showing limits of Air Quality Action Plan (AQAP)	94
Figure 71. Proposals for Central Corridor in Bicester Masterplan	95
Figure 72. Proposals for Central Corridor in Bicester Garden Town Masterplan	96

Tables

Table 1. Villages around Bicester by population and distance	13
Table 2. Studies and data sources for transport in Banbury	46
Table 3. CAT scale summary	58
Table 4. Share of trips in Bicester by journey purpose and mode	75
Table 5. Trips and accidents per travel mode	78
Table 6. Indicative summary of planned development in Bicester	92

1. Introduction

1.1. What is Bicester Local Cycling and Walking Infrastructure Plan (LCWIP)?

Bicester LCWIP is a 10-year plan (2020 to 2031) to *improve* and *increase* cycling and walking in the town. The year 2031 is in line with the adopted Cherwell Local Plan which sets out the development framework for expansion of Bicester and forms the basis of the LCWIP targets and scheme delivery proposals.

The LCWIP is part of a wider Government initiative to encourage walking and cycling and supports a Government target to double cycling nationally. The overall layout of Bicester LCWIP is as follows:

- Reasons for producing an LCWIP now
- Scope of LCWIP and overview of Bicester travel patterns
- Impact of expansion of Bicester
- Policy context of LCWIP
- CAT scale – choices and consequences
- Public support for walking and cycling
- CAT C Comprehensive cycle and walking network plans
- What next? CAT B and CAT A options
- Cycle and walking networks – main challenges
- Bicester LCWIP cycling and walking network policies
- Next steps
- Annexes

For each cycle and walking route in Bicester, there are also separate documents showing outline scheme designs and options for improvement.

The LCWIP is a policy document of Oxfordshire County Council which is the highway authority and responsible for roads, footways and most cycle paths. Bicester LCWIP will be included in the future Local Transport Plan update – the new Local Transport and Connectivity Plan (LTCP) and guide County highway policy.

It is important that Bicester LCWIP is also supported by Cherwell District Council who, as the planning authority, produce the Local Plan (LP) and manage new development. Another key stakeholder is Bicester Town Council who represent their local population. Bicester LCWIP includes policies, identified as Bicester Cycling and Walking policies (BCW) to achieve these changes which will be adopted. Bicester LCWIP supports many County Council priorities – in particular the focus on the climate emergency and public health.

Note that throughout this LCWIP, the year 2031 may mean any year between 2031 and 2035 depending on the speed at which new development is built.

Bicester LCWIP will set out a programme of measures to improve cycling and walking in support of LTCP and LP policies. The LCWIP will be embedded within the transport and planning policies as these are approved and be used as a material consideration in planning applications for new developments.

1.2. Why is it important now for Bicester?

Bicester is undergoing a rapid expansion from a small market town to a mid-sized town over the next 10 years. It currently has a population of around 30,000 but there are planning agreements for a large expansion in both housing and employment. By 2034, the population is forecast to be around 55,000.

One impact will be an *inevitable* and very *significant* increase in the volume of trips and traffic within Bicester. The number of trips entirely within Bicester is predicted to increase by 90% from around 50,000 to 90,000 per day (Baxter 2015). The critical issue here is to what extent these new trips will be by car *or* by the sustainable modes of cycling, walking and bus use. Bicester road network already suffers from peak time congestion on its key roads. Though there will be some new infrastructure on the periphery roads, the road network within central Bicester will not be expanded. In fact, other factors, such as East-West rail and public realm enhancements, mean that road capacity is likely to be reduced. Managing traffic and promoting sustainable space-efficient alternatives will become a necessity.

Despite its compactness and the short distances involved, current travel behaviour for trips within Bicester is far from sustainable. Until now, it has been assumed to a large extent that Bicester residents can choose to drive to the town centre and within Bicester urban area if they want to. Car ownership is high. 59% of households own at least 2 cars and 38% own 1 car (91% in total) and just 9% are car free. 83% of residents over the age of 16 hold a driving licence.

The larger population and size of Bicester will require a fundamental shift in thinking among planners, politicians and the population. As with all larger towns, traffic restraint and active encouragement for space-efficient modes (mostly cycling and walking) must replace the current policy assumptions of providing for all motorised trips without any traffic restraint. If this is not done, the alternative will be much worse. Towns that do not change track to more sustainable travel suffer from increased severe traffic congestion and air pollution which undermines their attractiveness and eventually their economic competitiveness.

Bicester Sustainable Transport Strategy (Baxter 2015) modelling sets out a target of doubling sustainable transport from around 15,000 to 30,000 trips a day within Bicester (see figure 1). Bicester LCWIP sets out the policies and network plans to achieve, *at a minimum*, this challenging sustainable travel target. Even so, Bicester will suffer from increased traffic congestion and air pollution with motorised traffic within Bicester increasing by 13,000 trips a day. Bicester LCWIP therefore also sets out a range of more ambitious options to achieve an even higher modal share for sustainable travel.

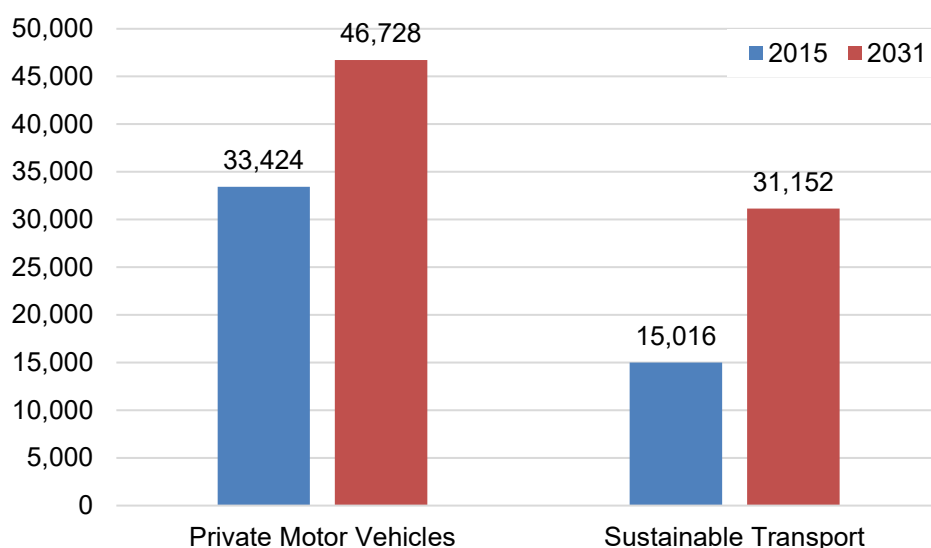


Figure 1. Current and predicted internal trips within Bicester by transport mode

Private motor vehicles include mostly cars and sustainable transport refer to cycling, walking and bus. These figures exclude trips by Bicester residents starting or finishing in Bicester to/from areas outside Bicester as well as trips into or through Bicester by non-Bicester residents. Source: modelling in Bicester Sustainable Transport Strategy (2015).

A greater share by cycling and walking will market Bicester as an innovative go-ahead town in line with its eco-town and garden town aspirations and attract employment and employees in line with its key position in Oxfordshire’s Knowledge Spine. The Oxfordshire Local Enterprise Partnership identifies Bicester as part of the Oxfordshire Knowledge Spine (Science Vale – Oxford – Bicester) and within the Strategic Economic Plan as a key driver for economic growth.

Policy BCW 1: OCC will plan for at least a 200% increase in cycling (tripling) and 50% increase in walking for trips within Bicester from 2020 to 2031

This equates to a daily increase from around 3000 to 9000 cycle trips a day and 18,000 to 24,000 walk trips a day and is based on development and delivery of a comprehensive network of cycle routes across the town by 2031 alongside levels of development allocated within the local plan (and hence population levels). Should additional measures be developed, including re-allocation of road space for cycling, then significantly higher levels of cycling are expected. More details of what this means and how this is to be measured are given in section 6.

Policy BCW 2: OCC in partnership with CDC will plan Bicester’s cycle and road network in line with BCW 1 targets

This means for instance factoring in the increase of cycling in the allocation of road and junction space, when modelling traffic for road improvements, calculating trip generation from new developments, designing widths of cycle paths and calculations of cycle parking numbers at cycling destinations.

1.3. What are the benefits of more walking and cycling?

Increasing walking and cycling has many additional benefits over the alternative of increasing car use and congestion. The benefits of walking and cycling are solidly backed up by a wealth of research, policy and practice. They *give* real life benefits and *prevent* real life costs for the individual, the community and nationally. Many of the benefits have either immediate or longer-term monetary savings. Others are more difficult to measure but are still just as real e.g. quality of life and urban realm benefits. In summary they are:

- **Urban decongestion benefits** – walking and cycling are very space-efficient modes and permit highly efficient urban movement within a town or city
- **Journey time benefits** – typically cycling journeys in urban areas, particularly during the day, are quicker than going by car or bus
- **Health benefits** – regular brisk walking and cycling keep people fit and healthy, helping prevent a wide range of causes of death, disability and ill health
- **Air quality and climate change benefits** – walking and cycling emit no air pollutants nor climate change gases, and their use can have a big impact, particularly when they replace car use and car ownership
- **Safety benefits** – walking and cycling are the safest of all modes in terms of road injuries to other road users; they also have relatively low injury rates compared to many other healthy activities and the health benefits far outweigh any risk
- **Urban realm benefits** – walking and cycling are virtually noise-free and together they fit in easily with a pleasant environment in town centres and residential neighbourhoods

2. Scope

Bicester LCWIP sets out a vision and plan to increase cycling and walking for the town of Bicester including links to its nearby villages.

Bicester is a medium-sized town lying 15 miles north east of Oxford. The town lies in Otmoor and is relatively flat, with a gentle incline upwards from the east to the west (see Figure 2). The town is also very compact and roughly circular (around 3.5 km from edge to edge), making sustainable travel trips to the town centre quick and convenient. Put simply, most people could walk within 20 minutes or cycle within 10 minutes to the town centre (see Figure 4 and Figure 3).

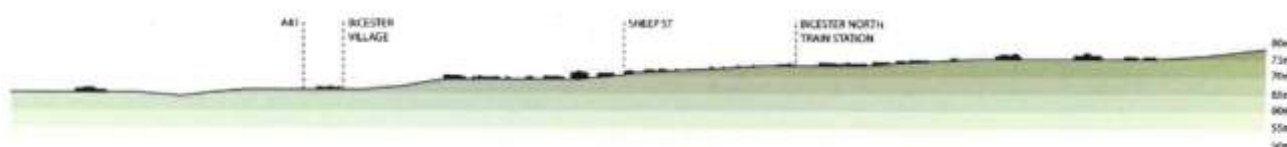


Figure 2. Bicester lies on a gentle slope ideal for cycling
Source: Baxter (2015).

The new developments will expand this distance so that the maximum distance is around 6 km from edge to edge (see Figure 6). This distance from the new developments is ideal for cycling (Figure 3) – under 15 minutes to cycle into the town centre) but is not so attractive for walking (Figure 4) – over 30 minutes.

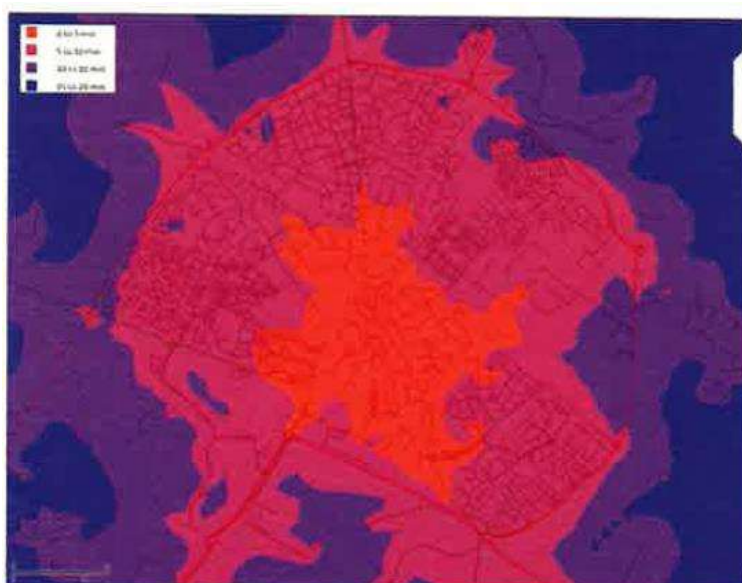


Figure 3. Cycling time to town centre
Orange: 0-5 min; red: 5-10 min; purple: 10-15 min; dark blue: 15-25 min. Source: Baxter (2015)

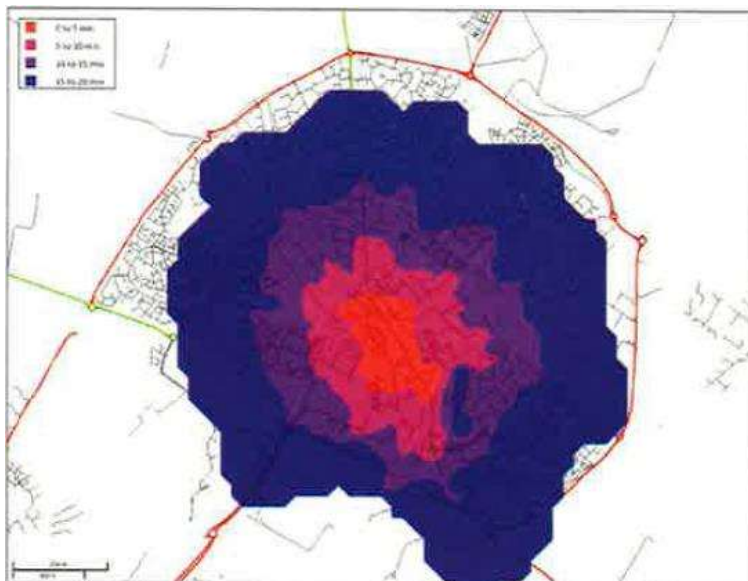


Figure 4. Walking time to town centre

Orange: 0-5 min; red: 5-10 min; purple: 10-15 min; dark blue: 15-25 min. Source: Baxter (2015)

With the right policies and infrastructure, cycling and walking could become the norm and most important mode for local journeys. The expanded footprint of the town will require a *much higher commitment* to sustainable travel, particularly cycling, if the eco-town is to achieve its ambitious target of 50% of all trips by sustainable means.

3. Travel connections inside and outside Bicester

In terms of active travel, the town is self-contained, with just a few villages lying within a reasonable cycling distance (around 3 miles/5 km or under 20-minute cycle ride) to its town centre. Cycle links to these villages vary considerably but are generally very poor. The LCWIP sets out route improvements to these villages. Table 1 shows population and cycle distances by the most direct route to Bicester town centre.

Table 1. Villages around Bicester by population and distance

Village	Population	Distance (km)
Caversfield	1,800	3.6
Launton	1,200	3.6
Ambrosden	2,250	4.1
Chesterton	850	4.4
Bucknell	250	4.4
Wendlebury	400	4.7
Stratton Audley	400	4.8
Middleton Stoney	330	5.0
<i>Total</i>	<i>7,500</i>	<i>-</i>

For active travel, the main priority are trips entirely within Bicester and to the nearby villages. Nearly 60% of trips by Bicester residents are within the town and this split is expected to continue as the town grows. The division between inside Bicester – outside Bicester is summarised below.

- In 2014 there were 86,500 trips of which 48,500 (56%) were inside Bicester and 38,000 (44%) outside Bicester.
- In 2031 it is predicted there will be 153,000 trips, with 93,000 trips (59%) inside Bicester and 60,000 (41%) outside Bicester (Baxter 2015).

All the options, data analysis and schemes in the Bicester LCWIP are based on trips within Bicester including to nearby villages. In some cases, external trips may be affected by the LCWIP policies, such as external trips that travel through Bicester.

3.1. Overview of existing connections

Bicester has very good external strategic connections. On the one hand, there are good road links to the M40, the A34 and A41 encouraging car use. On the other hand, the town has 2 train stations with excellent links to major towns and cities. “Bicester North” is on a

fast line from London to Birmingham and “Bicester Village” lies on the new line from Oxford to London. In the future, the line will also connect to Bletchley, Milton Keynes and Bedford and potentially Cambridge as part of the East-West rail development. If Bicester is to fully realise the potential sustainable benefits of these 2 train stations, providing much better levels of connectivity on foot and by cycle from Bicester residential areas to the two town railway stations is essential.

Bicester has a core historic centre, but most of the housing was built in the 1970s and 1980s. Detached and semi-detached housing with off-road parking are typical. The urban layout is based on self-contained neighbourhoods, in part because the two train lines intersect the town roughly at right angles dividing it into unequal sized quadrants. Most residential roads therefore already have relatively low traffic flows. This existing urban layout could be further enhanced for walking and cycling and urban liveability by the introduction of the ‘low traffic neighbourhoods’ concept.

3.2. Main issues for cycling

The main issues, particularly for cycling, are the main roads (see [Figure 5](#)) which run through the town and are often congested and leave no safe or comfortable space for cyclists. The “central corridor” (Kings End to Buckingham Road - the historic main road SW to NE through the town) bisects the towns and is a major barrier as it is too narrow for cycle lanes and heavily trafficked. A lot of traffic on the central corridor does not need to be there. Bicester is surrounded by a ring road which is designed to take interurban traffic around the town. However, a lot of interurban traffic continues to use the central corridor.

The A41 to the south creates an even greater barrier to cycling and walking. The roads are dominated by cars and lorries with no on-carriageway cycle facilities and very little provision for off-road cycling or even footways in one section. This situation has been exacerbated by the recent shift of new development and retail, including Bicester’s biggest supermarket, to the south west of the town alongside the A41, effectively locking in car use.

Bicester Village is a world-famous designer fashion outlet, located along its southern edge, which attracts around 6 million visitors per year and is amongst the top tourist attractions in the UK. It is aimed almost exclusively at international and national customers arriving almost entirely by car or train. For active travel in Bicester, its major impact is on increasing A41 traffic. Significant changes to the road network of the A41 were implemented to cope with the daily influx of car-borne visitors to Bicester Village. However, the A41 improvements failed to take account of active travel and have worsened access for those walking and cycling.

Bicester Village train station (formerly called Bicester Town) has been expanded to cater for Bicester Village visitors and its new role on the re-opened line from Oxford to London Marylebone. The greater number of trains has created an issue at the London Road level crossing for cycling, walking and car trips with extended downtime of the barriers. What solution is chosen to this issue, whether prioritising sustainable travel or car travel, will fundamentally alter the nature of Bicester town centre.

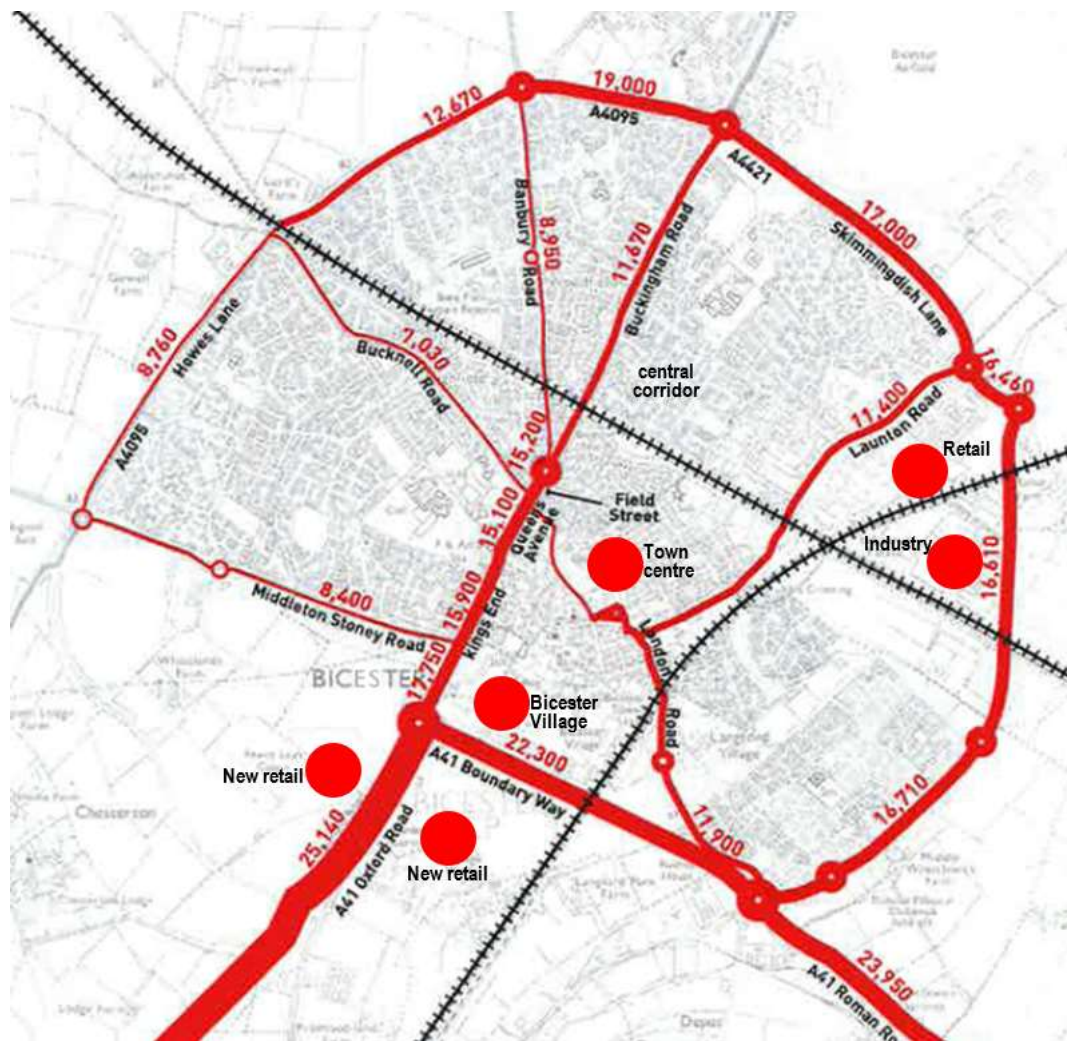


Figure 5. Plan showing town centre Major retail and industry, railway lines and main roads with daily traffic flows. Source: Baxter (2015).

4.1. Bicester Sustainable Development

The proposed development has the aspiration to be based on sustainable principles. In 2009 Department of Communities and Local Government nominated NW Bicester as one of 4 Eco Towns. In 2010, the document Eco-Bicester was produced setting out the aspiration that Bicester development should be carbon neutral and cycling and walking journeys prioritised. In support of this, detailed data was collected (Socialdata 2011) to act as a baseline for future monitoring. This was followed up by an analysis of the planning sites by White Young Green (WYG) in 2012. At the same time, WYG also produced the 'Bicester Movement Study' for Oxfordshire County Council, which set out the planning and transport requirements to 2031, including the need for a new strategic perimeter road around the south east of the town. Cycling plans were drawn up by Sustrans in 2014 for some of the key problem links and junctions inside Bicester.

In December 2014, Bicester was awarded *Garden Town* status by DCLG. Policies for the town were set out in the Bicester Masterplan (BM 2014). Oxfordshire County Council (OCC) set out its transport policies for Bicester – Bicester Area Strategy (BAS 2015) in Local Transport Plan 4 in 2015. Cherwell District Council (CDC) set out the planning policies for the new sites in the Local Plan in the same year (CDC 2015). In 2015, Alan Baxter consultants also set out plans for the cycle network in the Bicester Sustainable Transport Strategy (Baxter 2015). In 2016, Bicester was also awarded *Healthy Town* Status. In 2017, a revised Bicester Masterplan (BGTM 2017) was prepared.

5. Bicester Sustainable Transport Policy

Bicester LCWIP will become a policy document forming part of Oxfordshire’s forthcoming Local Transport and Connectivity Plan (LTCP), which will update the current Local Transport Plan 4. Bicester LCWIP builds on four current policy documents:

- Bicester Area Strategy (BAS 2015)
- Bicester Local Plan (CDC 2015)
- Bicester Sustainable Transport Strategy (2015)
- Bicester Garden Town Masterplan (BGTM 2017)

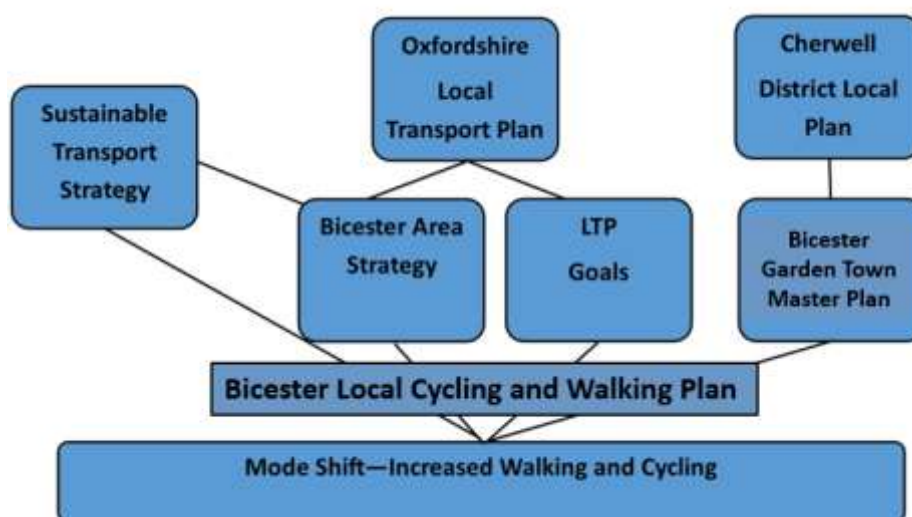


Figure 7. Policy context of Bicester LCWIP

The documents are briefly summarised here, with a much fuller list of policies set out in Annex 2.

5.1. Bicester Area Strategy (BAS)

Bicester Area Strategy (BAS 2015) is part of Oxfordshire County Council’s “Connecting Oxfordshire” Local Transport Plan 4. It sets out adopted transport policies for Bicester to deliver the growth in housing and jobs as set out in *Cherwell Local Plan* and the findings of the *Bicester Movement Study*. Bicester LCWIP will inform the update of the BAS in the new Local Transport and Connectivity Plan (LTCP).

The BAS is based on a balance between increasing road capacity on the peripheral roads (policy BIC 1) offering strategic highway connections, “alongside the introduction of

sustainable transport measures” (policy BIC 2) inside the town. Both elements are essential. As part of the delivery of strategic roads and new development, the BAS states:

“Complementary investment in the town’s bus, walking and cycling network will have an essential role in accommodating growth, encouraging sustainable travel choices, and raising the quality of the environment.”

In terms of cycling and walking, the BAS sets out the “need for a significant increase in the proportion of trips to be made by public transport, cycling and walking if the anticipated level of growth is to be accommodated”.

5.2. Cherwell Local Plan 2011-2031

Cherwell Local Plan (adopted in July 2015) focuses growth in Cherwell on Bicester. It seeks to deliver jobs-led growth, supported by housing, with 138.5 ha of employment land, and 10,000 further new homes planned for Bicester during the plan period. Bicester LP policies embed these principles into each development site, each of which includes a statement similar to Bicester Policy 1:

“A layout that maximises the potential for walkable neighbourhoods, with a legible hierarchy of routes with new footpaths and cycleways provided on site that link to existing networks beyond the site.”

5.3. Bicester Sustainable Transport Strategy (BSTS)

Subsequently, Cherwell District Council commissioned the Bicester Sustainable Transport Strategy (Baxter 2015) and this was used to inform the Bicester Area Strategy. Appendix 3 contains cycle infrastructure proposals. Supporting measures include 20 mph on all residential roads in Bicester and all radial roads where cyclists cannot be segregated.

5.4. Bicester Garden Town Masterplan (BGTM) and Baseline Report

This updates the masterplan for Bicester guiding development as part of Garden Town status. There is a strong theme of providing for walking and cycling and improving the public realm. There is also support for complementary measures to manage car use. Policy outcomes include:

Outcome 3: a Bicester that is 'one place' – where all neighbourhoods are well connected to all others but in particular to the town centre and where there is a shared sense of identity

There is therefore a need to better physically link the town together, in particular for walking and cycling, and especially in tying new areas of development to the town centre.

Outcome 6: Increase Bicester's sustainability, resilience and self sufficiency

There should be a shift away from private car use. Air quality will be improved by reducing traffic and removing through trips from the town centre, with more short trips made by walking and cycling.

6. LCWIP Overall Scheme Approach

6.1. Overview

The schemes in the Bicester LCWIP are set out under 3 different categories according to the Commitment to Active Travel Scale (CAT scale), where category C is considered essential and the current priority, category B is more ambitious and category A the most ambitious. The CAT scale recognises the challenges of political and public commitment, while also recognising that the Bicester LCWIP schemes are programmed over a 10-15-year timescale and that attitudes and priorities are likely to change over that period. Note that the next sections focus on cycling as cycling has the most potential to bring transformative changes to Bicester, but many of the factors apply equally to walking.

6.2. Increasing cycling: what works

Dutch and UK evidence identifies 5 broad factors which are important in promoting and increasing cycling:

1. A **high-density urban realm** with accessible destinations which creates and encourages short journeys
2. A **cycle network** which is identifiable, visible, high quality, comprehensive and town-wide
3. **Traffic management** measures such as road closures, restricted road capacity and the cost of parking which gives comparative advantage to cycling
4. A **cultural norm** among the local population which supports and promotes cycling so that people increasingly build their lives round cycling for local journeys
5. **Council commitment** at all levels to increase cycling as a policy priority

Council commitment (5) impacts on all 4 other factors. Councils guide the placing and design of new development (1), fund and build cycle networks (2), agree on traffic and parking policies (3) and whilst it takes time to build a cultural norm for cycling (4), Councils' actions can over time influence and facilitate this process.

6.3. CAT scale and Bicester targets

Changing travel behaviour is a challenge. Travel behaviour is typically automatic and entrenched. Major changes can make people re-evaluate their travel assumptions, such as moving to a new house, changing town or sudden shocks such as losing a car licence or lockdown in COVID-19.

Nevertheless, many towns have shown that it is possible to change travel behaviour. The primary reason for success is council commitment to create and support that change. The Commitment to Active Travel Scale (CAT scale) is based on a 5-point scale and allows councils to understand the consequences of their choices. The CAT scale is set out in more detail in [Annex 3](#).

The CAT scale recognises that towns start from different bases. Some towns start with relatively high levels of cycling which underpin a cultural norm for cycling. In other towns, there is much stronger cultural norm for car use and cycling levels are low. Where cycling levels are low, it is harder to create the political support for measures higher up the CAT scale.

Bicester LCWIP therefore sets out 3 levels of ambition according to the category chosen by the CAT scale, namely A (Aspirational), B (Brave), C (Comprehensive) compared to the current category D (Do minimum). These levels of ambition depend to a large extent on political acceptability and ambition, both by the population and their political representatives on the District, Town and County Councils. They also depend on delivery of schemes in fitting with these levels of ambition by officers in highways and planning, and the underlying degree of cycling culture.

6.4. CAT scale and Bicester Traffic Priorities

The CAT scale also identifies the consequences of the choices and the kind of urban travel that will eventually result. Fundamentally, this reflects whether the town is based primarily on the car travel or sustainable travel and the balance between them. [Figure 8](#) shows the expected modal share for each category for all urban trips within the town (excluding trips out of the town).

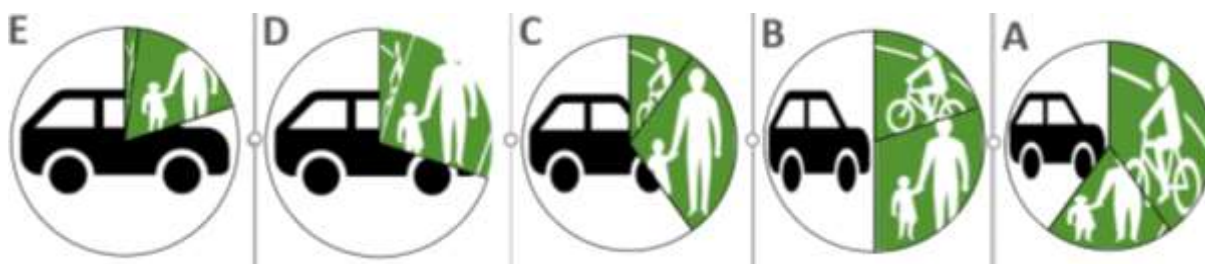


Figure 8. Typical modal share of local trips (people trips rather than vehicle trips) As the consequence of following each CAT scale (Car % includes car passengers, taxi and motorcycle; Cycle % include e-cycles and potentially e-scooters; Walking % includes bus trips).

6.5. Impact of CAT scale on Bicester trips

On the basis of the measures adopted in the CAT scale, different travel outcomes can be expected in Bicester by 2031. Figure 9 shows the total number of Bicester trips over a day by car in the first bar and sustainable modes in second bar for different levels of the CAT scales. The information is set out for 2014 and 2031 for each category A to D.

- **D:** The current (2014 data) numbers and modal breakdown is 42% sustainable vs 58% car for all local trips in Bicester
- **C:** Creating a comprehensive cycle network could see sustainable travel retaining the current overall modal share but with the population growth there will be many more trips. Cycling increases from 3000 to 9000 trips. **This equates to BCW 1 target.**
- **B:** Brave political decisions could see sustainable travel catering for *half* of all local journeys within Bicester. Cycling increases to 15,000 trips a day (5 times or 400% increase)
- **A:** Ambitious and Aspirational planning sees sustainable travel counting for 60% of all local journeys within Bicester. Cycling increases from 3000 to 24,000 trips a day (8 times or 700% increase)

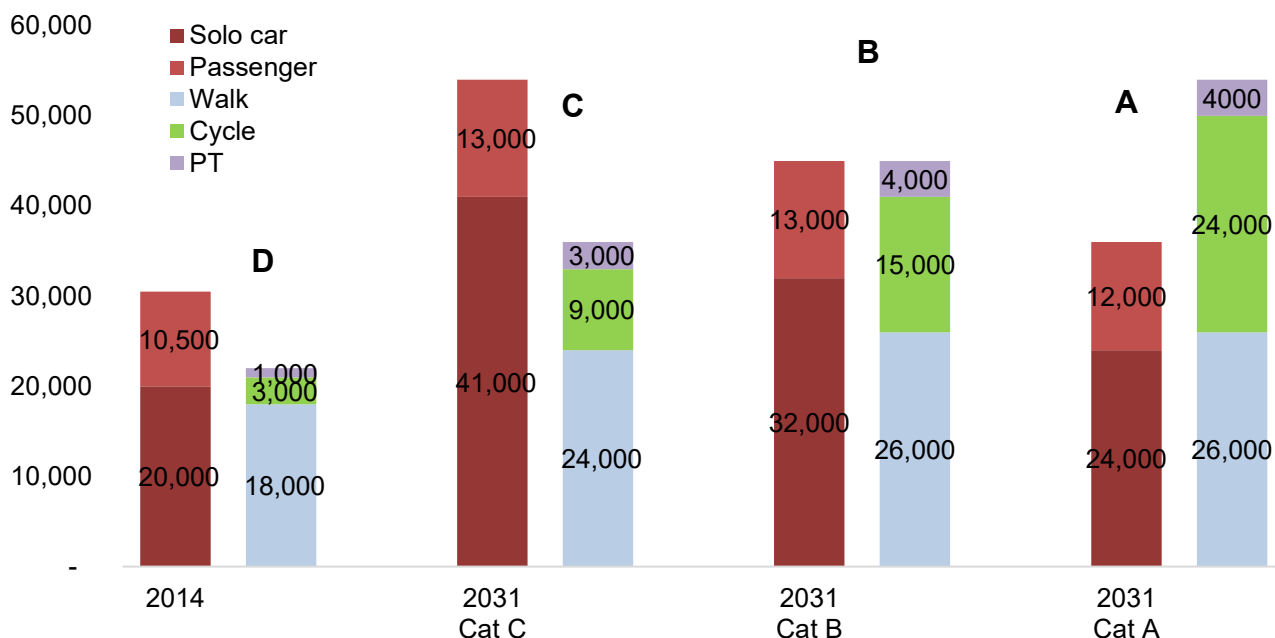


Figure 9. Current (D) and predicted (2031-5) internal Bicester resident trips per day for different levels of Council commitment

Trips to/from outside Bicester are excluded. The left-hand columns show car travel and the right-hand columns show sustainable travel (walking, cycling and bus use) with overall percentages of trips. Source: Baxter (2015) for total trip rates in 2031-5 and category C split.

6.6. CAT scale and transport congestion

Different traffic levels in Figure 9 lead to different levels of internal traffic congestion. Figure 10 shows the impact on road space of the different categories A to C. What this shows is that even with a big increase in cycling and walking with category C measures, internal car trips and congestion will become severe in Bicester.

- C:** The near doubling of internal car trips inside Bicester results in a 90% increase in road space use. This is likely to result in unacceptable traffic congestion on the main roads in Bicester. Increased congestion is likely to affect the attractiveness and economic viability of the town centre. The Central Corridor as the main car route to town centre car parking and shopping is at particular risk.
- B:** Category B results in a 64% increase in road space use. Category B includes proposals for a bus gate along the Central Corridor which would have the benefit of reducing through traffic. This could lessen the congestion impact on this route to 2014 levels as well as encouraging space-efficient active modes.
- A:** Category A foresees an overall 39% increase in road space use. The proposals, however, transfer most traffic to the ring road creating a sustainable, attractive and healthy town. Generally active travel underpins town centre viability in European towns. It is likely that category A proposals would fit in with the new role of town centres as with a quality urban realm and improved space for socialising and support the aspirations and eco-principles of new residents moving into scientific and high-tech industries.

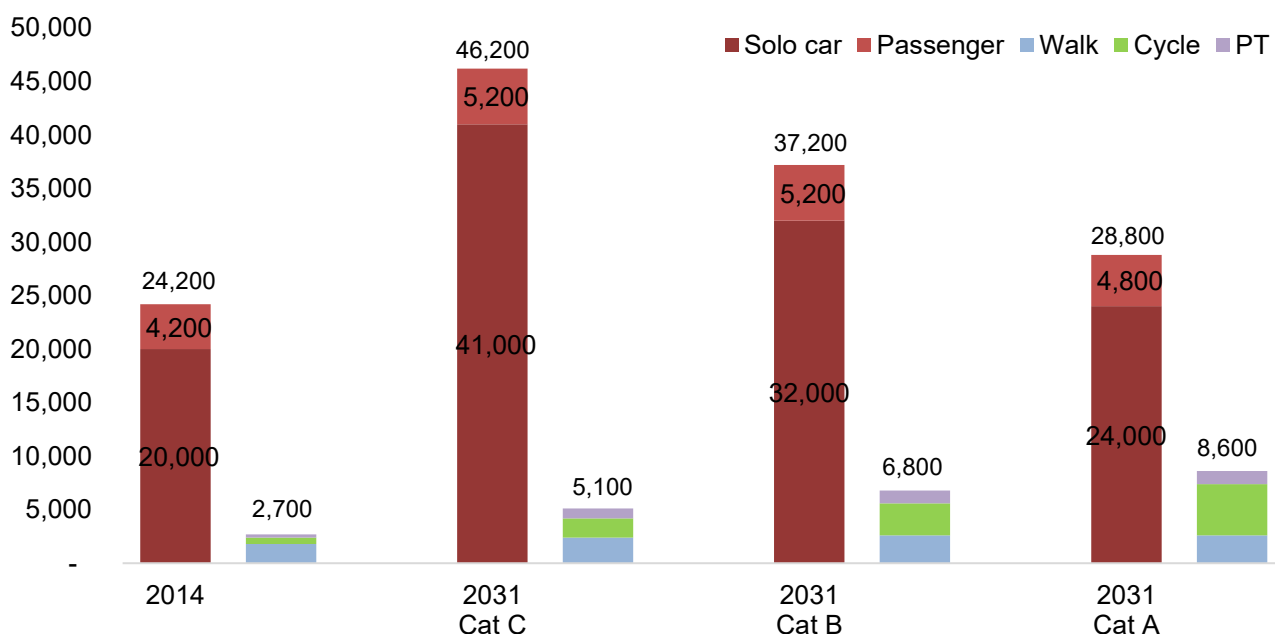


Figure 10. Current (2014) and predicted (2031-5) road space use (PCUs) for internal Bicester resident trips by mode

Daily trips by Bicester residents within Bicester only. Assumptions: car 1, cycle 0.2, pedestrian 0.1, buses 3 with 10 passengers per bus. Pedestrians are not normally included in this scale, but they have been given a score 0.1 to allow their impact on crossings.

7. Public support for different category measures

The expansion of the town will force hard choices on existing and new residents with the inevitable huge increase in movement, whether to suffer increasing severe delays, traffic congestion and pollution *or* to change mode and choose alternative healthy space-efficient travel of walking and cycling. One key element of CAT scale choice is public support for policies. What are the attitudes of Bicester residents?

Fortunately, we have a detailed representative survey of all Bicester residents' attitudes from 2011 (Socialdata 2011). This is now 10 years old, but the importance of promoting sustainable travel is likely to be even more positive now¹.

When asked in 2011, Bicester residents were aware that car traffic congestion had increased and would continue to increase with 99% saying that the increase in traffic in the last few years had been negative and 80% expecting traffic to increase in the next few years with a negative impact (see Figure 11). In contrast, there was a general optimism that cycle use would increase with 58% seeing this as positive. There is a lower expectation that walking would increase (34%) but this was also perceived as positive.

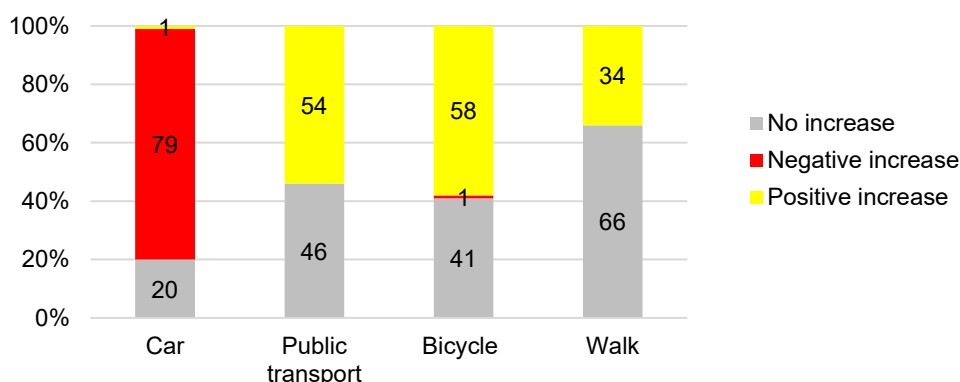


Figure 11. Bicester residents' expectations of future traffic increases
Source: Socialdata (2011) representative survey of Bicester residents.

7.1. What do Bicester residents see as the solutions?

The greatest support was for better cycle routes (52%) along with more pedestrian areas (35%) – see Figure 12. Opposition was low to these solutions, so these are included in category C scale proposals. Parking restrictions and limiting car traffic provoked conflicting views, with 36% and 24% supporting and 42% and 35% opposing. These measures are therefore included in category B scale.

¹ <https://phys.org/news/2020-03-biggest-shift-british-attitude-climate.html> found that climate concern has doubled to 40% of the population since 2016

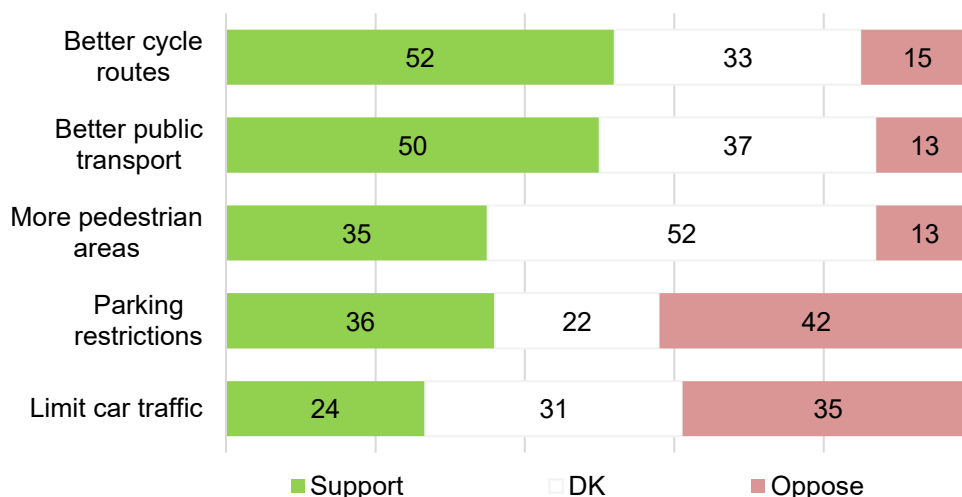


Figure 12. Bicester residents’ attitudes towards potential solutions to traffic congestion
 Source: Socialdata (2011) representative survey of Bicester residents.

7.2. Prioritising car or cycle at conflict points?

When it comes to a conflict, there was a large percentage (80% to 90%) in favour of prioritising cycling, walking or bus use over car use – see Figure 13. This suggests cycling and walking can be prioritised at pinch points at expense of car priority, with just 10-20% in opposition, under CAT C proposals.

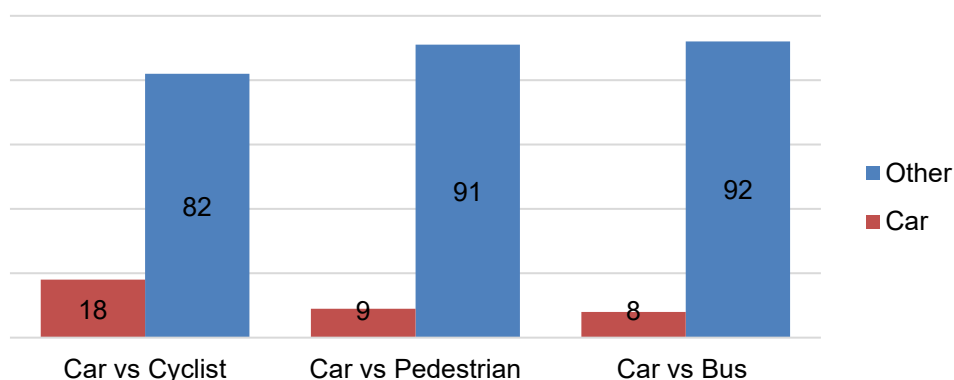


Figure 13. Bicester residents’ opinions on which mode should be prioritised in traffic planning conflict

Source: Socialdata (2011) representative survey of Bicester residents

8. Overall Scheme Designs for each category

Currently levels of cycling in Bicester are relatively low - around 5-6% of all internal journeys according to Socialdata 2011, but higher for commuting. Census 2011 data shows that for internal commuting journeys in Bicester, walking provided for 29% and cycling 11% of journeys to work respectively.

Developing a cycling culture takes time and the challenges are greatest when cycling levels are low. This is because roads are dominated by car traffic and cycling is not very visible and it is difficult to see that travel patterns can be different. This creates a self-reinforcing stasis or inertia where cycling is not provided for with the result that there are few cyclists and there is no recognition of its potential. A virtuous circle can be created where cycling is taken seriously, effective routes are provided, early adopters take up cycling, which puts pressure on solving other cyclists' problems which encourages yet more cyclists.

Bicester LCWIP applies over a 10-year timescale. It is likely that during that period, the impacts of the climate emergency will be taken more seriously, so that attitudes and behaviour will change. Bicester LCWIP therefore sets out different scheme options to adapt for that change. The Bicester schemes, measures and the consequences are based on the experiences of other towns and the measures implemented, which are set out in [Annex 3](#). Category C is based on the experience of Bedford, B on Oxford and A on Houten in the Netherlands.

8.1. Category D (Do minimum): existing cycle network

The existing cycle network ([Figure 14](#)) is disjointed and disconnected and even where there are routes, many are severely sub-standard in width and continuity (e.g. Launton Road cycle path). Routes from new developments and connectivity to the town centre are also very poor. If this approach is continued, cycling will remain marginal and the overall percentage of cycling is very likely to decrease.

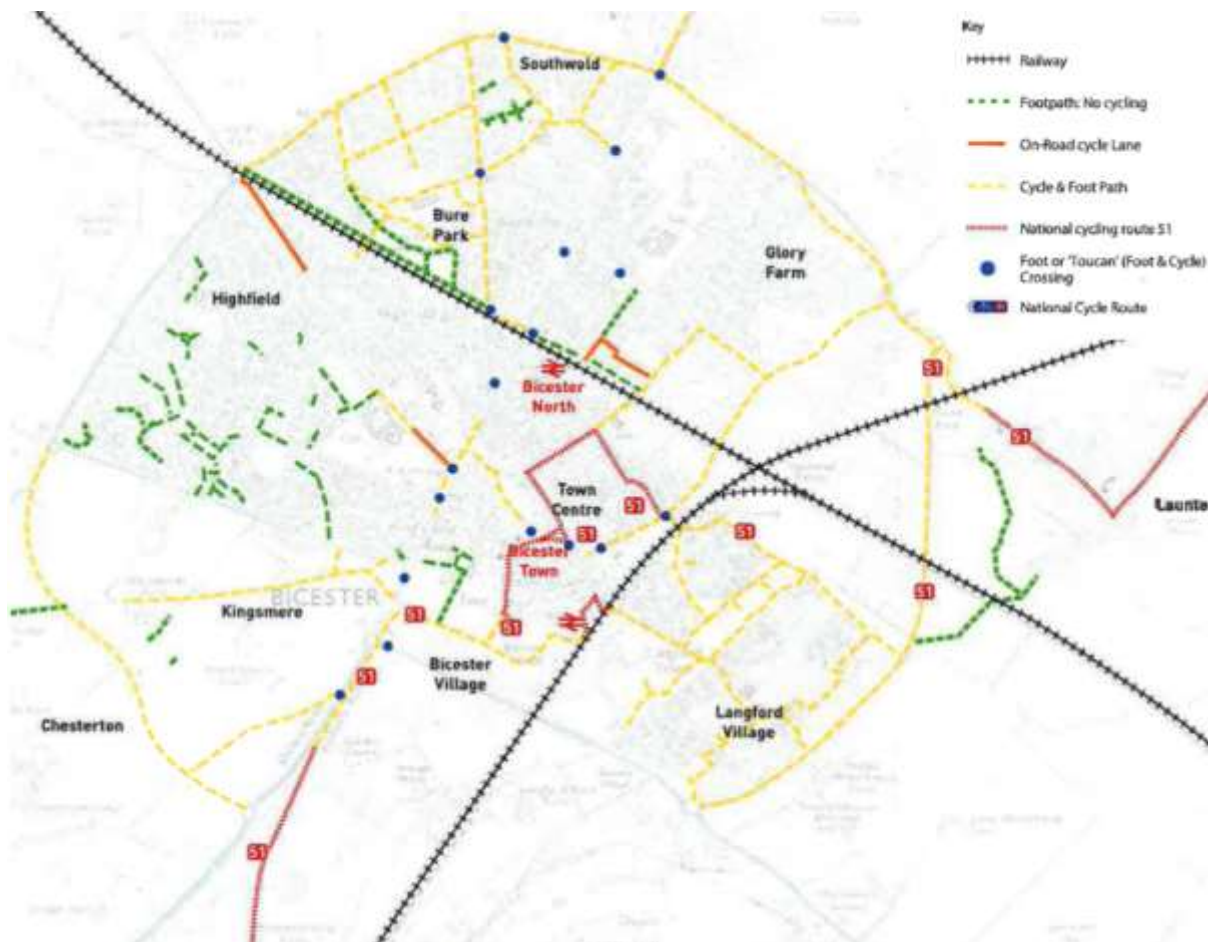


Figure 14. Bicester existing cycle network
 Cycle network in yellow dotted lines. Source: Baxter (2015).

8.2. Category C: comprehensive cycle network

Bicester LCWIP is based on achieving at least category C proposals. Bicester LCWIP sets out plans for a comprehensive and connected cycle network (Figure 15). What does this entail?

The network has been identified using several data sources and consultation (see Annex 7) so that it provides a realistic, comfortable and convenient route for every neighbourhood and nearby village, including future links to the new developments.

The network routes are prioritised according to their importance in line with existing and potential cycle flows. The main radial routes are numbered 1 to 21 focused on the town centre with 2 orbital routes for journeys around the town. Less important but still useful routes are termed “connecting routes” (in light blue).

It is a “dual choice network” with routes aimed at commuters where cycling speed is the main criterion (Quickways in orange) and routes catering for less confident cyclists who

value separation from traffic (Quietways in dark blue). Confident cyclists can use the main roads (but these will still need improvements) and less confident cyclists can use the paths and residential roads. The central corridor is marked in red to emphasise its importance for cycling as it is key to improving cycling and walking.



Figure 15. LCWIP Bicester cycle (and walking) network

Plan also shows some of the more challenging traffic management improvements (category C) including Central Corridor (in red).

Measures to create cycle network

There are many measures to create a cycle network. For each of the main 21 radial routes and 2 orbital routes, there are plans (in separate documents) which identify the measures and costs. The list below gives a basic overview.

Quietway paths

- Fill in gaps in the network with new paths or changing pedestrian only paths by removal of no cycling signs
- Widen shared paths to 3.5m width as far as possible
- Resurface paths to smooth tarmac
- Remove barriers
- Add dropped kerbs at transitions and protect exits from parked vehicles
- Ensure adequate lighting
- Add directional signage
- Give priority where the path crosses a road

Quietway residential roads

- Add cycle logos and signage to create cycle streets
- Traffic calming where necessary
- Road restrictions where necessary to reduce or redirect traffic

Quickways (along main roads)

- Cycle tracks (off-road) if there is adequate space for both cyclists and pedestrians (3.5m minimum)
- Cycle lanes (on-road) where possible (1.5m minimum)
- Other measures to slow or reduce traffic where there is even less road width
- Sort out junctions (advanced stop lines at signalised and Dutch designs for roundabouts)
- Surface signage of route numbers

Challenges

Even with category C, there will be some difficult political decisions to create an effective cycle network. The following measures ideally need to be developed at the same time as the comprehensive cycle network. Otherwise, as in the example of Bedford, progress in promoting cycling and walking will be slow (see [Annex 3](#)). The priorities are:

- Improve safety along and crossing the Central Corridor
- Introduce 20 mph speed limits in all residential areas and along some of the radial roads
- Open Sheep Street to cycling (at a minimum outside of shopping hours)
- Close or create contraflow cycling in the Causeway
- Re-design Market Square to give more space to pedestrians and cyclists
- Identify cycle and pedestrian connections to bypass London Road level crossing
- Reduce or ban heavy good traffic in Launton Road west of Victoria Road
- Introduce 2-way cycle safety and priority under Buckingham Road railway bridge

Congestion and the Central Corridor

The central corridor (B4100 consisting of Kings End, Queens Avenue and Buckingham Road) is an essential element of the walking and cycling network, but is currently heavily trafficked, narrow without cycle facilities, frequently congested with traffic (see

Figure 16) and is probably the major deterrent to cycling and walking. The road is also the only Air Quality Action Plan area in Bicester (see Annex 10). It is essential that the nature of the Central Corridor is changed to benefit sustainable transport. The south half (south of Bicester North railway) is crossed by 9 routes of the proposed Bicester cycle network whilst cycle routes from North Bicester both cross and need to use Buckingham Road.

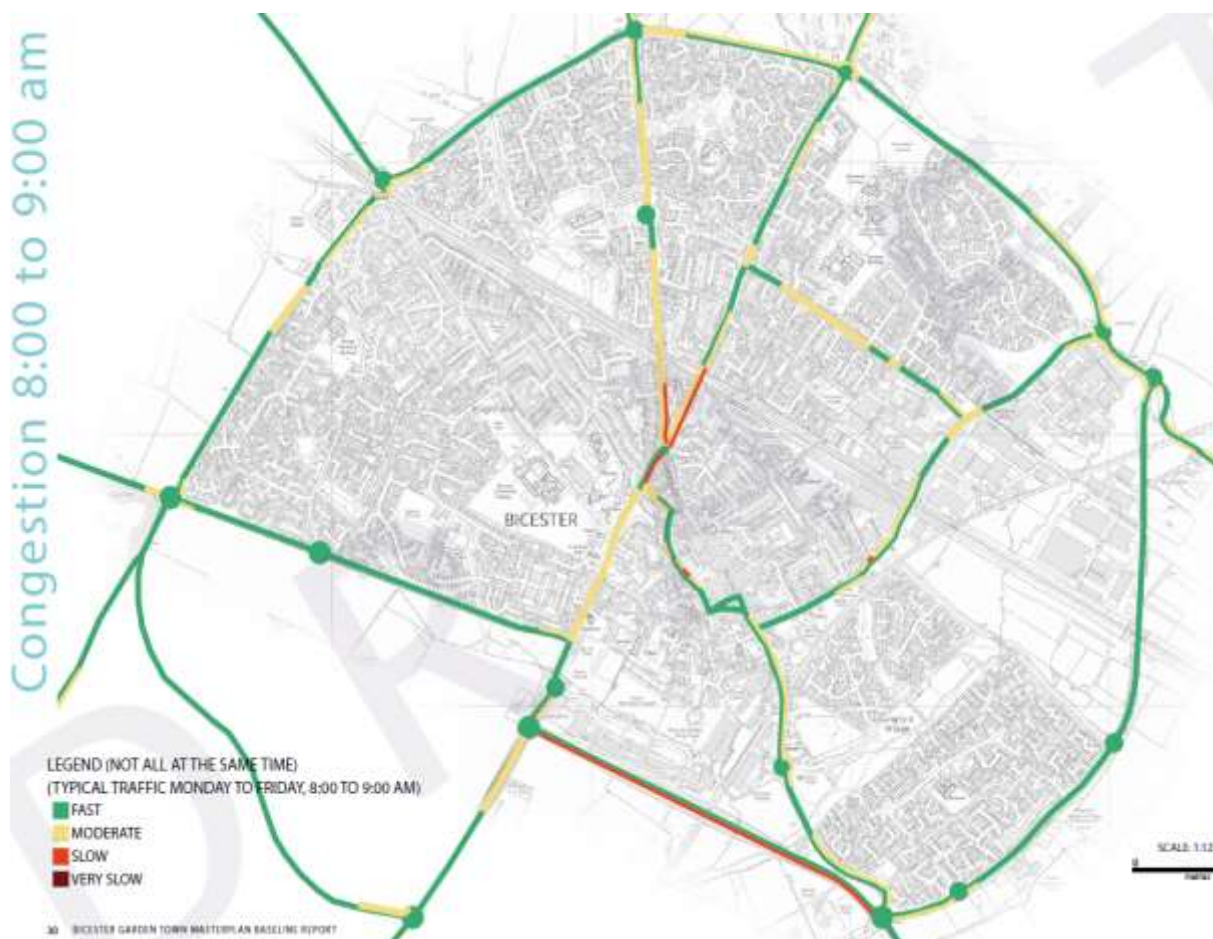


Figure 16. Bicester map showing typical morning (8am to 9am) traffic congestion

The worst congestion (excluding the ring road) is on the Central Corridor particularly at the approach to the Buckingham Rd/Banbury Rd roundabout. Source: Garden Town Master Plan Baseline Report.

Without measures being introduced to encourage traffic to use alternative routes, levels of traffic travelling on the Central Corridor are expected to increase significantly as a result of planned housing and employment growth. This will result in a reduction in air quality, the creation of a less pedestrian and cycle-friendly environment, further severance to east–west movements across the town, a worsening of public transport journey reliability and increased delays for drivers wishing to access the redeveloped town centre.

Google directions suggests that travelling from the A41 south of Bicester to A4421 north of Bicester takes only 6 minutes using the Central Corridor compared to 8 minutes using the eastern bypass route. Even at the peak time, when congestion along the Central Corridor

is greatest, there is little difference in time. This means that through traffic will often choose to use the Central Corridor rather than the bypass. At the northern entrance, through traffic is deterred from entering by lack of priority at a road narrowing. A similar deterrent is needed for the southern entrance. More details of plans and policies are given in [Annex 10](#).

8.3. Category B (Bold and Brave)

Category B schemes are typically the most difficult to implement because they sit at the transition point between providing for the car and prioritising cycling. Category B schemes introduce serious restrictions on car convenience in order to prevent traffic congestion and promote the alternatives of walking, cycling and bus. This was the point Oxford had reached in 1999 when it closed High Street to motorised traffic without providing an alternative. In Oxford the main incentive was to stop the negative impact that traffic congestion was having on the bus services (see [Annex 3](#)).

The equivalent situation in Bicester is likely to be the Central Corridor which acts as a through route as well as the only access to the town centre and Bicester North station. With traffic potentially doubling along the Central Corridor, this implies prolonged delays and congestion. With no ways of realistically providing for bus or cycling along Central Corridor, a similar challenge may develop where the only effective decision is the brave decision of closing the Central Corridor. There are 2 natural locations where this could be implemented:

1. At the central roundabout of Banbury Rd and Buckingham Rd – a greater impact, but may be more difficult to deliver
2. Under the Birmingham-London railway bridge over Buckingham Road – this would however still permit through journeys using Banbury Rd

The category B plan therefore proposes 6 schemes ([Figure 17](#)) on top of the cycle network proposals in category C. Traffic filter here means a closure to motorised traffic, whilst permitting buses and cyclists. These proposals will all be necessary if Bicester is to develop a cycling culture rather than a car culture.

1. Central Corridor filter
2. London Road closure at level crossing
3. The Causeway filter
4. Permitting cycling all day in Sheep Street
5. Public realm improvement in Market Square to create a car-free high-quality public space
6. Launton Road filter at London Road junction (unless Market Square is fully closed)

With the probably inevitable eventual closure of London Road level crossing, Bicester Village station car park is poorly situated. A scheme that would allow the car park to be accessed from Bicester Village and Pingle Drive would be helpful in removing town centre traffic. Alternatively, the Launton Road could remain open if Market Square and London Road level crossing were fully closed.

The advantages of category B schemes are that they would reduce congestion along the Central Corridor and thereby improve accessibility by all modes to the town centre, whilst creating a distinctive much enhanced town centre public realm. It would also lay the essential foundations for the most aspirational category A proposals.

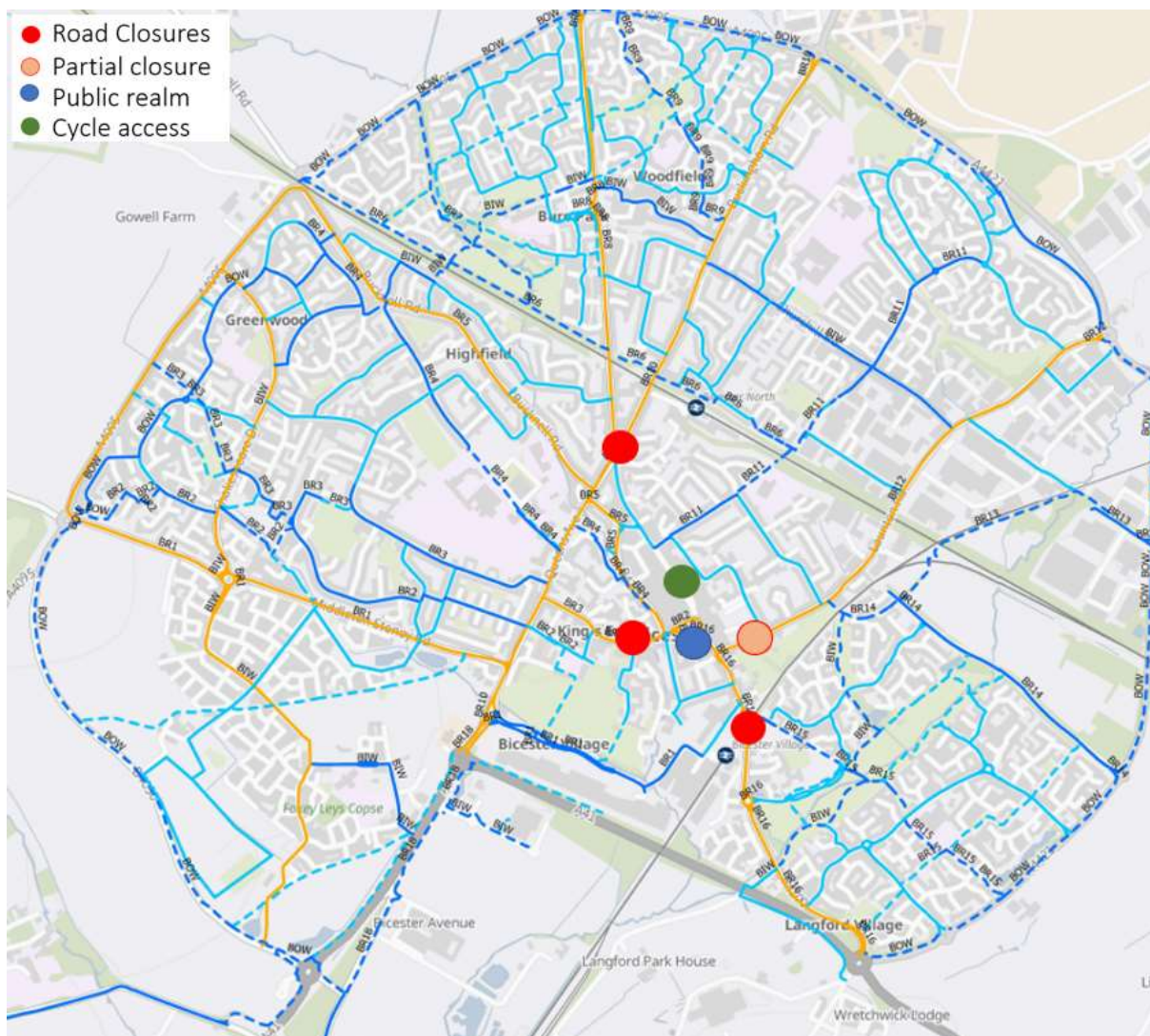


Figure 17. Category B schemes: key traffic filters/closures
Other measures to reduce and restrict car travel and promote urban liveability, walking and cycling also shown.

8.4. Category A (Ambitious and Aspirational)

Curiously, category A proposals are some of the easiest to implement in terms of infrastructure, once the brave decisions of category B have been implemented, because the proposals fit in with the existing layout of Bicester street network. The idea is based on Houten (see Annex 3) where car travel between residential areas is restricted and

replaced by cycling and walking. In Bicester as in Houten, to go from one area to another residential area or to the town centre, cars would return to the ring road and enter the other area from the ring road.

In Bicester, all traffic to the main town centre shopping and employment areas is distributed across 3 main roads: the town centre is accessed along the Central Corridor from the SW, Bicester Town station from Buckingham Road and the industrial area exclusively from Launton Road. These 3 roads are the only core traffic routes in the town. This is achieved by just around 20 modal filters. [Figure 18](#) shows the modal filters, the low traffic neighbourhoods and the entry/exit points.

Category A has the following advantages:

- All commercial traffic would be segregated from residential traffic and restricted to the 3 core roads and ring road
- The health, social and liveability benefits would be maximised as well as climate change and air quality benefits
- All schools would be accessed by cycle paths or low traffic roads
- All the neighbourhood roads would have minimal motorised traffic, making walking and cycling very pleasant, safe and convenient
- Residents would discover that driving to another neighbourhood or the town centre was unnecessary unless there was a need to carry something heavy or bulky – residents would therefore optimise their travel to the most efficient and fastest mode (see [Figure 19](#))
- As a result, the main urban roads would also have low levels of traffic; counter-intuitively, this could make car travel typically faster and more convenient (at least that is the experience of Houten – “good for drivers, and even better for cyclists” – where urban driving times reduced)

In reputational terms, it would also place Bicester at the forefront of transport planning in Europe. Almost inevitably, this reputation would therefore attract innovative businesses with its near unique combination of superb urban liveability along with excellent railway communications to Oxford, London and Birmingham. This would also be likely to revitalise the town centre shopping area where in the European model, town centres become a centre of shopping, culture and socialising, accessed on foot or by bike.

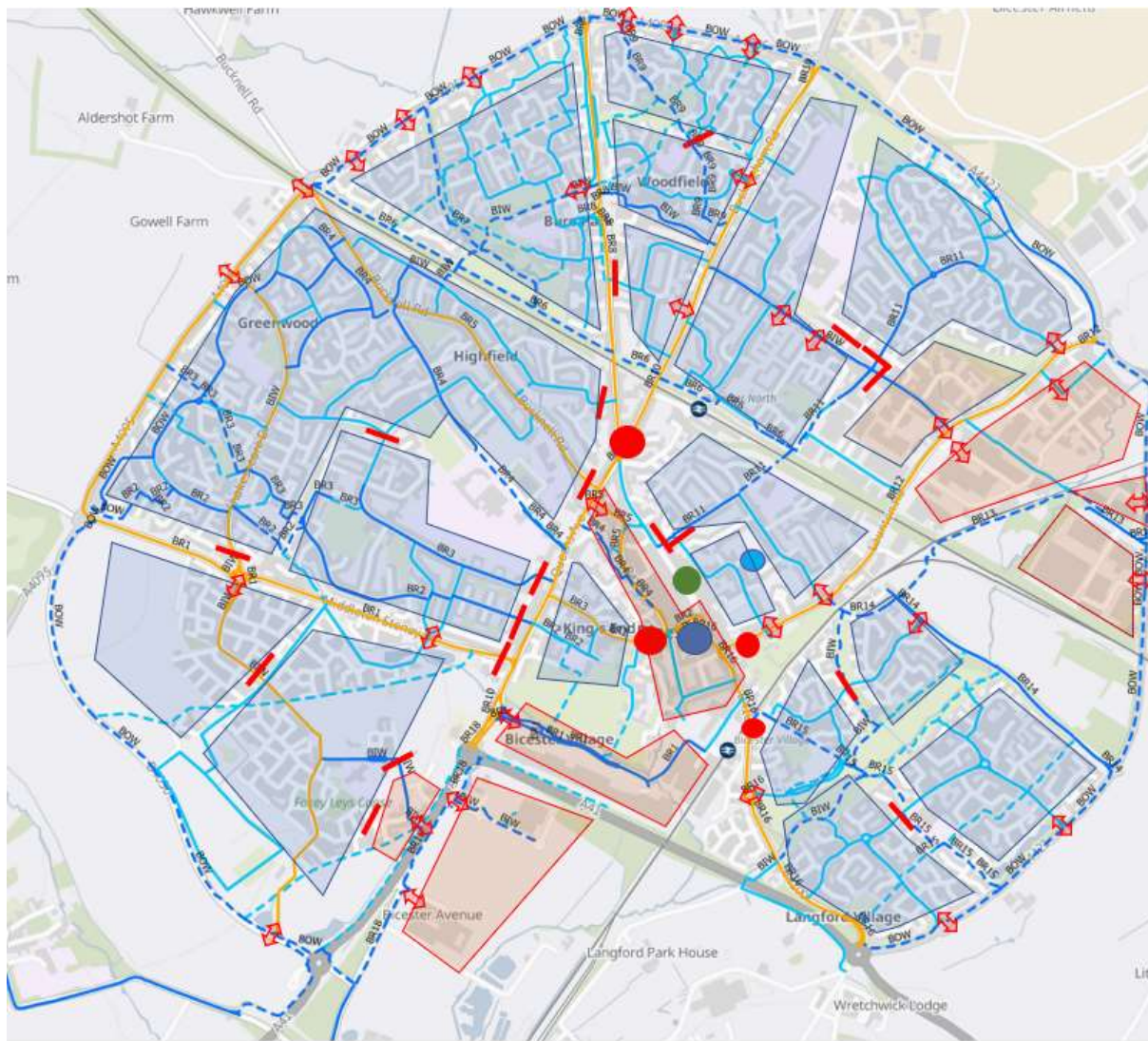


Figure 18. Bicester town centre liveability scheme category A

Map shows placement of traffic filters and entry points to neighbourhoods. Residential neighbourhoods are shown in blue and commercial neighbourhoods in orange.

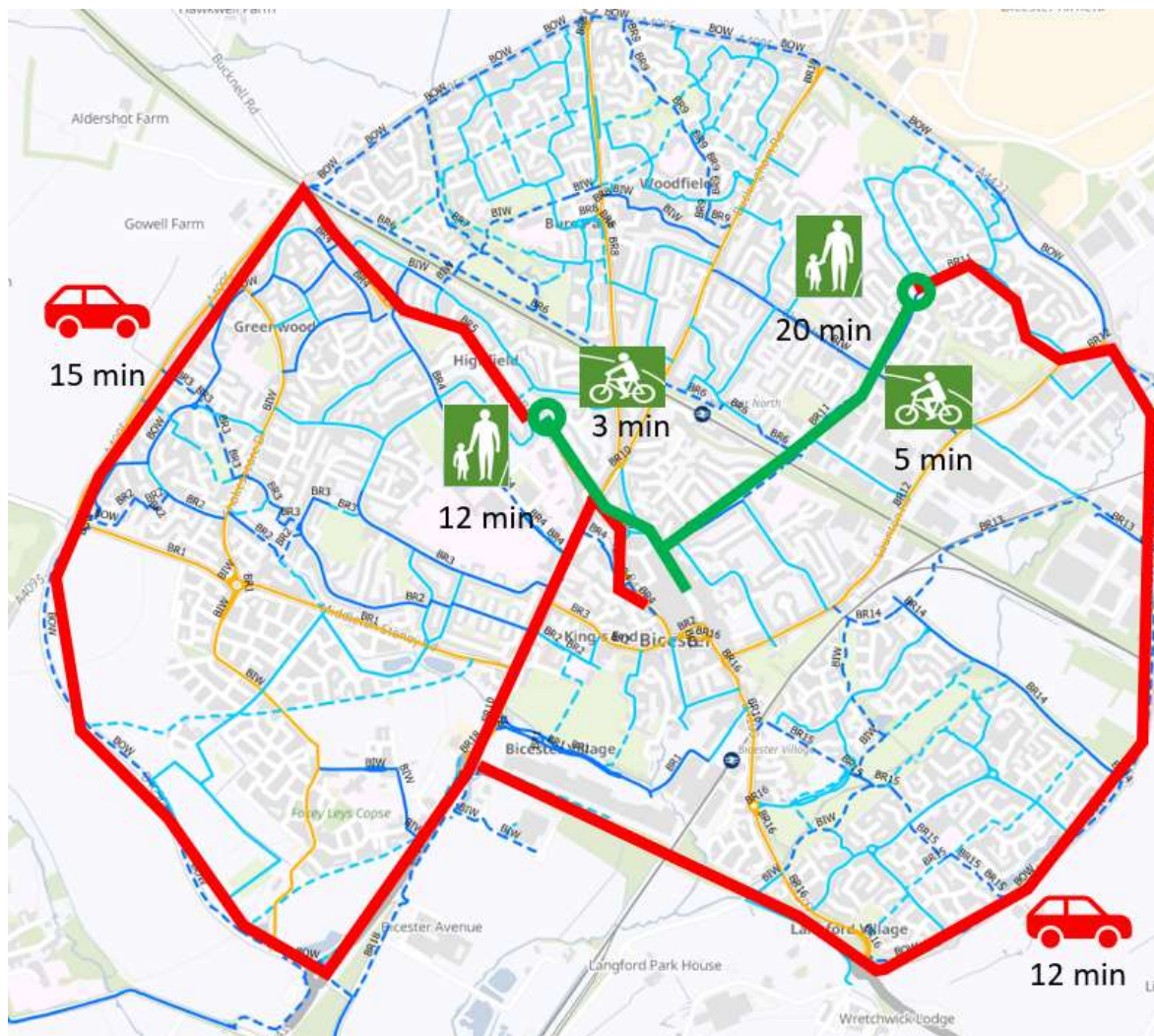


Figure 19. Category A: Comparison of internal journey times by travel mode
 Trips from 2 residential locations in Bicester to the town centre by car, cycle and on foot. Assumptions: 20mph speed limit in urban roads and 30-40mph speed limit on ring road; walking speed 5 km/h (3 mph) and cycle speed 20 km/h (15 mph).

9. Overview of schemes

9.1. Assessing the quality of the network

Having identified the core walking and cycling network, the next task was to audit the quality of the routes to assess the need for improvements. There were 6 sources of information to help inform the audits, from the Bicester Garden Town Masterplan (BGTM) along with an analysis of casualty data and comments in the Oxfordshire Cycle Survey (OCS19). Figure 20 shows how poor much of the potential cycle network is, especially along the central corridor and London Road.

- Bikeability audit of cycle network (BGTM) (Figure 20)
- Comments on cycle network issues (OCS19)
- Analysis of crossings (cyclists and pedestrians) (BGTM)
- Quality of town centre network (BGTM)
- Casualty analysis (cyclists and pedestrians) (See Annex 6)

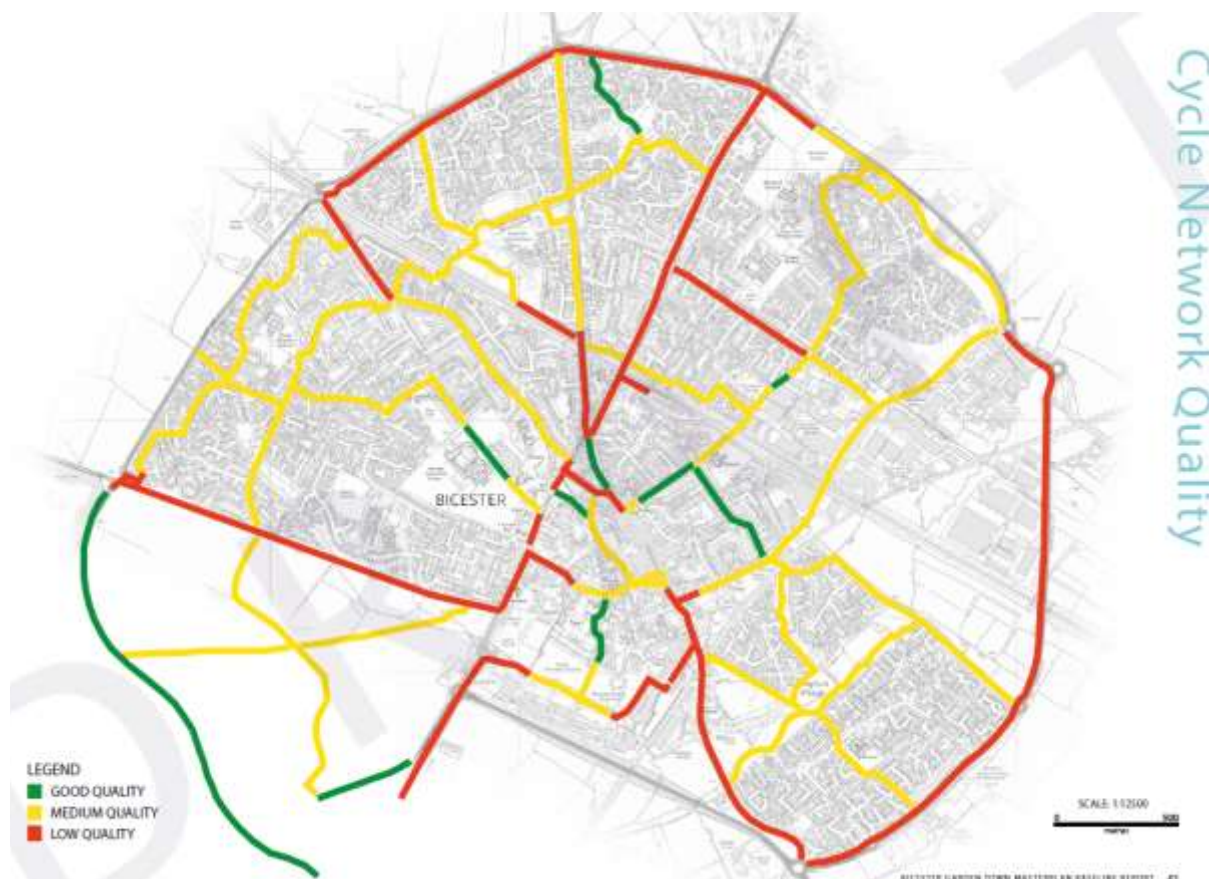


Figure 20. Cycle network quality
Source: Bicester Garden Town Masterplan.

9.2. Walking: crossings

Bicester LCWIP also includes improvements to the walking network. Walking was reviewed along with the cycle network. In contrast to cycling, the walking network is mostly of a reasonable quality with adequate if not generous footways (with some important exceptions: the Causeway and Church Street and St John Street).

For pedestrians, crossings are the main challenges. This can be divided into 3 types:

1. Crossing busy roads
2. Crossing side roads
3. Crossing the barriers of railway lines

Garden Town Master Plan sets the planning policy framework:

“Ensuring streets are safe and easy to cross, with adequate crossing times for vulnerable pedestrians, is essential if the Garden Town ethos is to be delivered... it is important that the underpasses are upgraded where necessary to ensure good sight-lines in and out, and adequate lighting. Maintenance and cleansing of these features needs to be undertaken regularly to ensure lights are working and the underpasses are clean and welcoming. Crossings should be sited with regard to pedestrian and cycle desire lines”.

Figure 21 shows existing crossings. In the future, two of the level crossings will be replaced by bridges (Charbridge Lane and Jarvis Lane) with the East West rail improvements. The third (London Road) is subject to discussion. It is important that a satisfactory alternative is provided for cycling and walking.



Figure 21. Bicester crossing points

Showing type 1 - crossing roads (signalised and Zebra crossings) for pedestrians along with type 3 ways of crossing the railway lines (tunnels, level crossings or bridges). Source: Bicester Garden Town Masterplan (updated)

9.3. Walking: town centre

Walking in the town centre is generally very pleasant. However, there are specific locations that need improving (see Figure 22).

The main challenges are Market Square and the Causeway. In both cases the challenge is removing traffic and car parking. Plans for both locations have been in policy for many years. There is an understandable reluctance on behalf of traders to take risks with car access, so these fall into category B proposals.

The BGTM 2017 outcome 7 sees Market Square as a space for events and community activities. In the medium term, this is a priority. Public realm improvements in these locations along with inevitable restrictions on access from London Road could greatly enhance the attractiveness of Bicester as a shopping and cultural centre and destination for the growing population.

BGTM Outcome 7: Improve Bicester's leisure and cultural offer

“A key underused asset is Market Square. This is at the heart of the Town and should become the central anchoring space that all paths lead to, and where events and activities are regularly held, as was the case historically. At the moment however it is a vehicle dominated space that fails to fulfil the key role it needs to in the town centre.”



Figure 22. Audit of town centre streets quality for walking
Source: Bicester Garden Town Master Plan.

10. Bicester LCWIP Policies

Creating a comprehensive cycle network will require many changes in terms of policies, procedures and implementation. This section sets out Bicester LCWIP policies which will guide the future programme and plans. Together they will establish the essential policy background of creating a viable, popular and convenient walking and cycling network.

Bicester Cycling and Walking Network

Policy BCW 3: The County Council will improve the Bicester cycling and walking network in line with the network proposals in the Bicester LCWIP, Oxfordshire Cycle Design Standards (OCDS) and Oxfordshire Walking Design Guide (OWDG). This includes ensuring that the network is prioritised in other transport and road plans.

Policy BCW 4: The County Council in partnership with Cherwell Council will work with developers to improve the Bicester cycling and walking network including by S106 and S278 works. Bicester LCWIP Cycle and Walking Network will be a material consideration in the approval and network plans of new developments.

Policy BCW 5: The Council will sign the Bicester Cycle and Walking Network, in line with OCDS, by the use of both surface and vertical signage.

Policy BCW 6: Measures will be undertaken to ensure that cyclists and pedestrians can cross the ring road easily, safely and without excessive delay, detour or danger.

Policy BCW 7: The Council will ensure that cycling and walking measures are prioritised in the East-West rail proposals and that they do not create additional barriers to walking and cycling.

Policy BCW 8: The council will review the crossing needs of pedestrians and cyclists on cycle path on main roads to minimise delay or diversion and to satisfy existing or potential flows.

Policy BCW 9: The Council will review all barriers on cycle paths, both those on the Bicester Cycle and Walking Network and local access cycle routes, to ensure that they are convenient and accessible for cycling, taking account of the needs of disabled cyclists and cycle delivery companies.

Policy BCW 10: The Council will set up a maintenance regime for the Bicester Cycle and Walking Network to ensure that the cycle paths are clear of vegetation, surfaces are smooth and safe, which takes into account the extra vulnerability of cyclists to potholes and rough and deformed surfaces.

Complementary measures

Policy BCW 11: The Council will as a priority review the design of the Central Corridor to ensure that it is attractive for pedestrians and cyclists both travelling along and across the road.

Policy BCW 12: The Council will support the implementation of Low Traffic Neighbourhoods in Bicester as a way of improving local public realm and improving conditions for walking and cycling.

Policy BCW 13: The Council will introduce 20 mph speed limits in residential areas. It will also review speed limits along the main roads in Bicester to see if 20 mph is more appropriate, particularly where cyclists share the carriageway or cycle lanes are narrow or large numbers of cyclists or pedestrians need to cross the carriageway.

Town Centre

Policy BCW 14: The Council will with the assistance of CDC and Bicester Town Council review the current TRO banning cycling in Sheep Street.

Policy BCW 15: The Council will with the assistance of CDC and Bicester Town Council ensure that the town centre is attractive for cycling and walking, including reviewing the design of Market Square, The Causeway and London Road.

Policy BCW16: The Council will undertake regular assessments of the town centre to assess whether there is the need and opportunities for more cycle parking. Cycle parking needs to accord with best practice in both design and location.

Cycle parking

Policy BCW 17: The Council will work with Cherwell District Council to ensure that there are comprehensive cycle parking conditions and advice in planning guidance to ensure all new development includes adequate and convenient cycle parking.

Policy BCW 18: The Council will work with Cherwell District Council and Bicester Town Council to encourage retrofitting of secure and convenient cycle parking in existing developments, such as schools, shops, workplaces, places of entertainment, pubs, church and local halls etc. One method may be funding Park that Bike to supply free bike stands.

Walking

Policy BCW19: The Council will assess the feasibility of “Quality Pedestrian Corridors” for all main radials within 2 km of the city centre, but particularly the main pedestrian corridors into the town centre.

Policy BCW 20: The Council will at side roads on the Bicester Walking and Cycling Network, wherever possible and funding is available, for the benefit of all pedestrians but particularly older and disabled pedestrians:

- a) Extend footways across side road entries so there is a raised crossing
- b) Set back the Give Way lines to give priority to the pedestrian crossing
- c) Narrow kerb radii to the minimum possible whilst maintaining access for appropriate vehicles

Policy BCW 21: The Council will set up a monitoring system to assess the baseline walking and cycling flows to help identify the impact and value for money of the Bicester LCWIP schemes.

11. Next actions

Bicester LCWIP is a living document and will evolve as Bicester is developed and future funding opportunities arise.

In particular, the COVID-19 crisis and post-COVID-19 green restart funding has put the LCWIPs and the importance of promoting walking and cycling at the centre of transport planning and implementation.

Priority actions are:

- Continue to develop schemes for all the Bicester LCWIP routes
- Assess the costing of the schemes and overall costing
- Assess value for money of schemes to develop a cost benefit assessment
- Work with COVID-19 Recovery Teams in implementing short term high value schemes
- Ensure that the LCWIP is included within the LTCP consultation
- Ensure that the LCWIP is included in the development of the Bicester Area Strategy of the LTCP

Annex 1. Policy and Research Background

This section highlights the major documents related to transport policy and evidence in Bicester and the impacts of the new development.

Transport in Bicester is probably the most studied of all towns in Oxfordshire with 4 major studies. Altogether over 1000 pages of documentation contributed to preparing Bicester LCWIP.

Similar conclusions and themes are reached throughout all the documents:

- Prioritise walking and cycling in the town
- Ensure that new developments are linked by high quality cycle corridors to the town centre and train stations
- Manage car use in the town, particularly along the Central Corridor
- Improve the public realm of the town centre, by reducing and restricting traffic, particularly in Market Square and the Causeway
- Redirect through traffic around the ring road, particularly the east periphery road

Table 2. Studies and data sources for transport in Banbury

Document	Summary
Eco Bicester: One Shared Vision (2010) (<i>superseded</i>)	This document sets out a “vision [that] is about the whole of Bicester, not just about the 5,000 home eco development at North West Bicester”. The vision is “to create a vibrant Bicester where people choose to live, to work and to spend their leisure time in sustainable ways” by “a town-wide transition to a low carbon community”. Under transport, the goal is to “encourage walking and cycling as the first choice for travel within the town to improve health, reduce carbon emissions and improve the quality of the environment”.
Socialdata (2011)	Research carried out for CDC to provide a baseline for the impacts of the Bicester Eco-town project, involving travel behaviour survey of 2000 Bicester residents (selected to be representative). This represents the most detailed evidence of journey patterns and is used extensively in Bicester LCWIP.
Bicester Masterplan (BM 2012) (<i>superseded</i>)	This draft document set out the vision for the town but was never adopted as policy. However, it collects useful information on the developments and transport proposals relevant to the new developments.
Bicester Movement Study (BMS) (2012)	This study commissioned by OCC supports the 2012 Masterplan. Useful analysis of issues and data.
North West Bicester Masterplan (2014)	A network of new pedestrian and cycle routes will connect to the existing network to create a holistic movement strategy, providing easy, safe and fast access to the railway stations, the town centre and to Bicester Village and Kingsmere.
Bicester Area Strategy (BAS 2015)	Oxfordshire County Council Local Transport Plan policy for Bicester. Dual strategy of managing traffic and promoting walking and cycling inside town whilst providing for traffic around east periphery road – see annex 2
Cherwell Local Plan (LP) (2015)	Cherwell District Council (CDC) planning policies for new developments in Bicester – see annex 2
Bicester Sustainable Transport Strategy (Baxter, 2015)	Commissioned by CDC to update BMS 2012, this long and detailed document reviews routes, travel and includes scheme proposals, particularly for cycling. This data is used extensively in Bicester LCWIP.
Bicester Garden Town Masterplan (BGTM) (2017)	The baseline report includes a detail transport analysis of Bicester, including cycle routes. The main report replaces the Eco-Bicester 2010 document and sets out policy for new development, with a strong emphasis of walking and cycling connections – see annex 2

Annex 2. Policy backing for LCWIP

Bicester Area Strategy (BAS)

BIC2: “We will work to reduce the proportion of journeys made by private car by implementing a Sustainable Transport Strategy”. Measures include:

- **“highway restrictions in Bicester Town Centre on through routes** in order to reduce through traffic in the town centre, constraining it to the peripheral routes and promoting more sustainable travel options in the town”
- **“enhancing pedestrian, cycle and public transport links”** to the two train stations and key employment sites
- **“improving access to Bicester Village by walking and cycling improvements”**
- **“public realm improvements in Bicester Market Square and The Causeway** to enhance the quality of the pedestrian environment by creating a sense of ‘place’”
- **“providing new sections of urban pedestrian and cycle routes** to better connect residential developments with the town centre and key employment destinations”. This is followed by a detailed list of improvements which have been reviewed and included in the LCWIP.

Cherwell Local Plan 2011-2031

The main sites with housing numbers are NW Bicester (Eco-town) 3293, Graven Hill 2100, SE Bicester 1500, SW Bicester 726 and Gavray Drive 300. Employment sites include the Bicester Business Park and South East Bicester that are expected to create up to 9000 jobs. Most relevant policies for walking and cycling are:

Policy SLE 4: “All development where reasonable to do so, should facilitate the use of sustainable modes of transport to make the fullest possible use of public transport, walking and cycling”

For NW Bicester, the national Eco-Towns Planning Policy Statement (PPS) includes a requirement to match the number of homes to jobs within the eco-town and ensure that these are easily reached by walking, cycling and/or public transport (C16). This includes a target of “at least 50% of trips originating from the development to be made by means other than the car”. This is a particularly challenging target as it includes trips external to Bicester. The Technical Note 7 (in BSTS 2014) sets out that 48% inside Bicester (but outside the development) will be by cycle (10%) or on foot (33%).

CDC are seeking to adopt these ‘eco-principles’ in *all* new development (C28) and “act as a catalyst for the transition of the town as a whole towards a more sustainable community”

(C47). CDC are therefore seeking to improve “the connectivity and attractiveness of the pedestrian and cycle network across Bicester” (C17) and “reduce traffic congestion on Kings End/Queens Avenue” (Central Corridor). It is important that “new development integrates and interacts with existing neighbourhoods, is accessible from those neighbourhoods by non-car modes of transport” (C22). “To improve the image of the town to attract new business, visitors and future residents”, highway improvements will “secure substantial gains for the centre of the town by reducing the flow of through traffic” (C25). This includes creating a memorable ‘people place’ in Market Square (C28).

Bicester Sustainable Transport Strategy (BSTS)

This long document (section numbers) sets out Bicester historical urban context (2), transport issues (3), transport policy (4), European best practice (5) and sustainable research (6). Section 7 has a detailed assessment of problems for cycling and walking by the main routes relevant to LCWIP. This is followed by future proposals (8 to 12).

Bicester Garden Town Master Plan

This annex summarises the policies in the 2016 Bicester Garden Town Master Plan (text and images from the document).

The most relevant to the Bicester LCWIP are:

Outcome 1: improve health and well-being by increasing both day-to-day and leisure-based activity, with a focus on increasing walking and cycling and improving access to public transport

Outcome 3: a Bicester that is 'one place' - where all neighbourhoods are well connected to all others but in particular to the town centre and where there is a shared sense of identity

There is therefore a need to better physically link the town together, in particular for walking and cycling, and especially in tying new areas of development to the town centre.

Outcome 5: a place where people of all ages and abilities can move around easily and independently

ensuring that walking and cycling across and through the town is genuinely available for all, including the very young, the more mature and those with different abilities

Outcome 6: Increase Bicester's sustainability, resilience and self sufficiency

There should be a shift away from private car use. Air quality will be improved by reducing traffic and removing through trips from the town centre, with more short trips made by walking and cycling

“Walking and cycling routes provide important linkages between neighbourhoods and green spaces. It is important that these routes are expanded and provide strong links to the new neighbourhoods on the periphery of the town. The creation of a healthy town, where residents, workers and visitors can easily make short trips on foot or by bicycle, through pleasant, safe and green links, is seen as a priority”.

The Vision for Bicester will be delivered by investment and change in the four interconnected layers of the town (see Figure 23). These layers are:

- Main Streets - the important movement corridors within the town, including Bucknell Road, Banbury Road, Buckingham Road and the ring road
- Green & Blue Connections - important car-free pedestrian and cycle routes with a high ecological value that connect neighbourhoods to each other and the town centre
- Neighbourhoods - the residential and employment areas providing local services and community facilities
- The Town Centre - the heart of Bicester and the focal point for shopping, events and civic activities

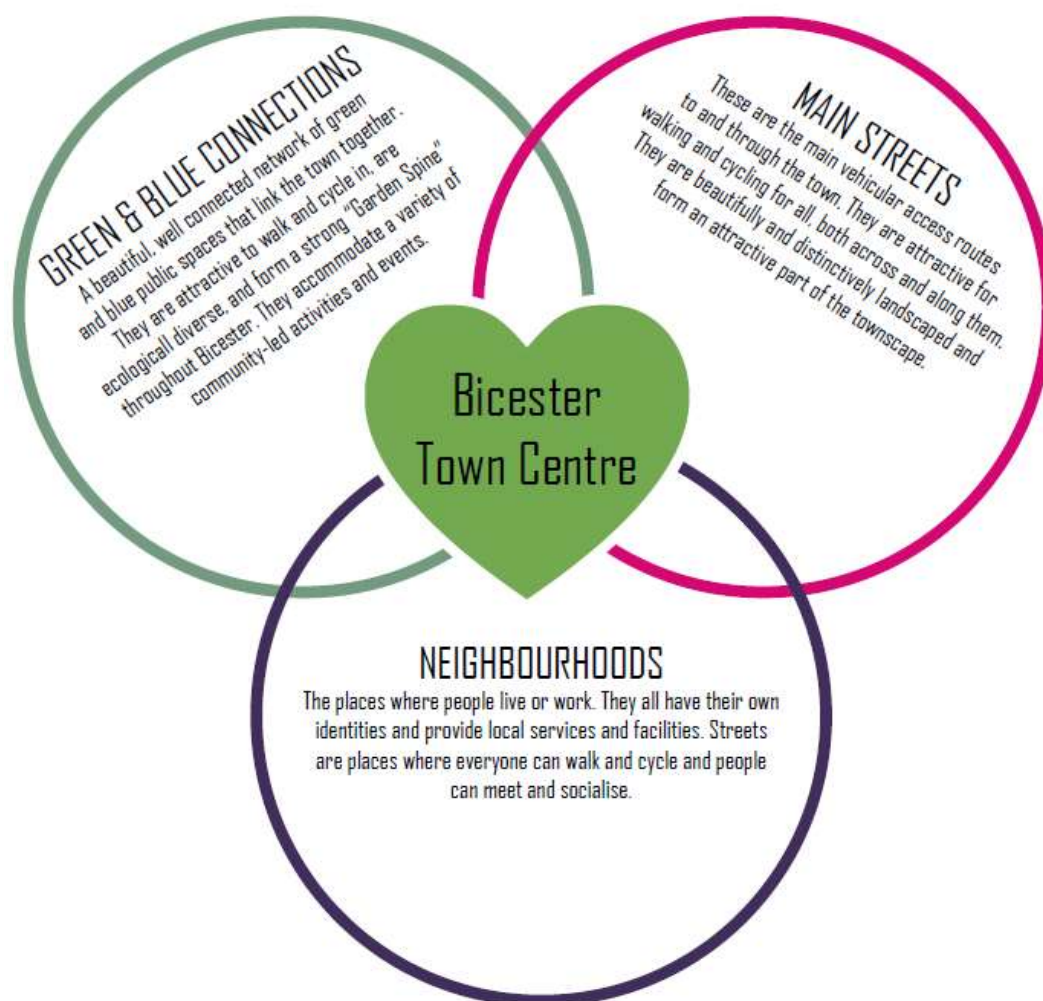


Figure 23. Bicester Garden Town Masterplan vision

Outcome 1: The Cycle Facilities diagram above shows that on and off carriageway provision for cyclists is lacking, resulting in a disjointed cycle network across the town. Delivering the "missing links" and making all streets accessible to cyclists of all abilities will be critical to encouraging healthy lifestyles, and undertake short trips by bike or by foot.

Outcome 2: Land uses and mix, the availability of seating, soft landscape, active frontages, visual interest and generous pavement widths all help encourage walking and hence the number of potential social interactions residents can enjoy. Provision of a choice of routes that provide good permeability and legibility will be key to supporting the sociability of Bicester and enhancing the wellbeing of its residents.

Outcome 3: Bicester is also characterised by a disconnected street network and some areas of significant severance which are caused by transport infrastructure which is wholly impermeable (railways) and partially impermeable (main streets) to crossing by pedestrians and cyclists in particular. There is therefore a need to better physically link the town together, in particular for walking and cycling, and especially in tying new areas of development to the town centre

Outcome 5: One of the hallmarks of a liveable place is ease of movement and access to services and facilities for all. This is about inclusion and choice. The first aim is to make sure that walking and cycling is available to all. This means ensuring that people of all ages and abilities are able to walk and cycle easily and comfortably throughout Bicester. This is about enabling people to lead healthy lives but also critically ensuring that people who don't have access to a car, or can't drive, have the same opportunities as others to access services and facilities. It also includes ensuring that walking and cycling across and through the town is genuinely available for all, including the very young, the more mature and those with different abilities.

Wayfinding

However the quality of walking and cycle routes and the ease of wayfinding and legibility need to be significantly improved to enable people of all ages and abilities to walk and cycle.

Outcome 6: To support Bicester's transition to a low-carbon environment and improved resilience:

- There should be a shift away from private car use
- Pedestrian and cyclists should benefit from safer, more attractive streets and well-linked routes
- Air quality will be improved by reducing traffic and removing through trips from the town centre, with more short trips made by walking and cycling

Main Streets

It is important that despite their important movement function, they are all designed to both allow and encourage short trips to be made by walking and cycling. These main streets also have speed limits which around the perimeter of the town, and also in the heart of the town, are considered too high to accommodate their 'place' role or to be attractive for walking and cycling.

SEVERANCE: Main Streets create varying degrees of severance and there are several areas of concern. The first is access to the town centre. Anyone walking or cycling to the centre needs to cross at least one Main Street to get there. The ease and directness of crossing and the continuity of routes for walking and cycling are a challenge. Secondly, there is a disjointed cycle network, with limited dedicated on-road provision and sporadic shared use facilities. This will act as a deterrent to cycling in particular by less confident cyclists

EASE AND ATTRACTIVENESS FOR WALKING AND CYCLING - FOR ALL: Main Streets are currently designed to move vehicles quickly around the town rather than encourage exploration. Because of this they often present a poor walking and cycling environment, severing routes and desire lines, and creating intimidating environments due to the proximity of heavy and fast traffic flows to vulnerable pedestrians

KEY OPPORTUNITIES

- Significantly improving the environment and provision for cycling and walking
- Reducing severance in particular of the ring road but also for access to the town centre on foot and by bicycle
- Improving the streetscape of these key streets
- Enhancing the town centre significantly by reducing vehicle domination
- Addressing congestion through mode shift and targeted investment in highway capacity

Speed: The implementation of a speed limit strategy for the town that address the anomalies that currently exist and ensures that walking, cycling and placemaking are given appropriate priority and support, and vehicles discouraged from using the town centre as a through route

Crossings: Ensure that at key crossing points for the cross town Garden "Spine" there is good visibility of this spine and that pedestrians and cyclists are prioritised and even the most vulnerable users feel safe and are safe

Town centre: 'De- tune' the route through the centre of town to deter through traffic, reduce severance for those walking into the town centre and improve air quality

'SMALL STEPS'

- Additional tree planting to enhance streetscape, visually narrow carriageways encourage slower vehicle speed, and help mitigate the impact of air pollution and climate change
- Narrow carriageways where possible to slow vehicle speed
- Tighten junction radii at side road junctions to absolute minimum to slow vehicle speeds and give greater priority to pedestrians and cyclists at junctions

- Remove centre-line markings, where appropriate (consider on all 20 mph and 30 mph non ring road streets) to encourage slower vehicle speed and reduce maintenance liability
- Provide segregated cycle lanes in both directions where there room to do so to give greater visibility and prominence to cyclists and encourage cycling by less confident cyclists

Green & Blue Connections

The Green and Blue Connections are a key asset and feature of Bicester and comprise the river, green spaces and "quiet" traffic free routes. They provide opportunities for walking and cycling, play, fun, socialising, food growing, community events and also for encouraging wildlife and biodiversity. This green and blue spine provides an opportunity to connect new communities to existing neighbourhoods, and to the town centre, along high-quality walking and cycling networks including the existing Town Walk.

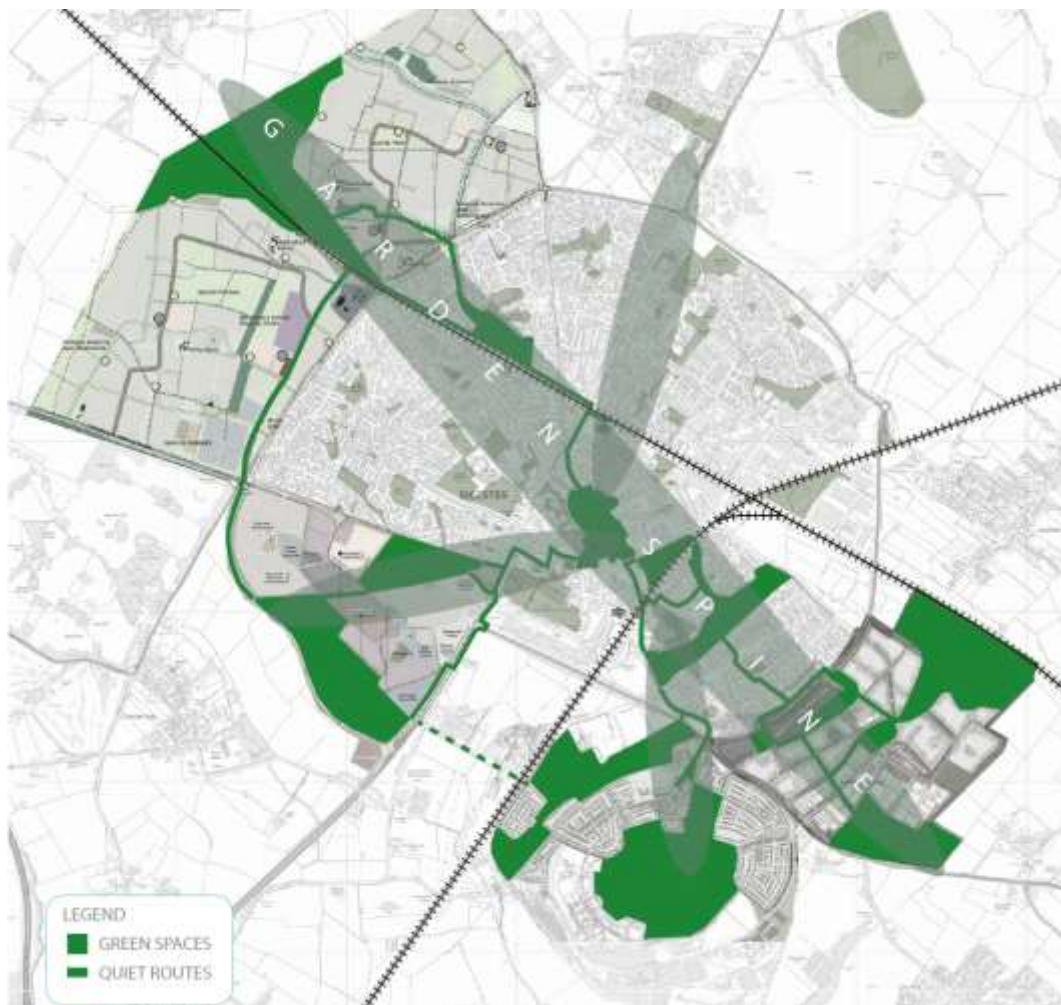


Figure 24. Plan showing proposed green corridors
Source: Bicester Garden Town Masterplan (2017)

KEY OPPORTUNITIES

- Create a fully connected walking and cycling network throughout the town including paced circular routes, outdoor gyms, and links to the proposed urban edge park
- Create a strong cross town "Garden Spine" of linked and very high-quality greenspaces that link new communities to old and enable and encourage walking, cycling, socialising and having fun in and along this 'core'.

NEIGHBOURHOODS

The significant growth planned for Bicester will result in the creation of 13 neighbourhoods, all connected by the Main Streets and Green & Blue Connections identified on the previous pages. It is important that the ring road is suitably treated as opportunities come forward to reduce the severance it causes and provide seamless connections from the town centre out to the new neighbourhoods. Care needs to be taken to ensure that the Main Streets, in particular the routes that currently form the ring road, do not cause severances between communities

Speed: Lowering speed limits on most streets and improving the quality of underpasses beneath the railway will be key to improving the ease and attractiveness of active travel. Within the new neighbourhoods significant opportunity exists to design in from the outset, attractive walking and cycling connections into town.

- Introduce 20 mph speeds limits on neighbourhood streets
- Ensure the 'Garden Spine' is accessible and sign posted from all neighbourhoods by walking and cycling

Congestion The worst congestion occurs in the town centre and this contributes to the air pollution issues. Significant opportunity exists to reduce traffic volumes through the delivery of integrated walking and cycling routes that connect all the neighbourhoods together and create direct links from all homes to the town centre and discouraging through traffic.

Town Centre

The Town Centre is at the heart of Bicester

- Step change in the quality of the public realm, focussed around Market Square.
- Ensuring the town centre is prioritised as the location for an expanded retail and leisure offer within Bicester.
- Significantly improving links to the surrounding neighbourhoods, railway stations and Bicester Village by walking and cycling.

Key assets such as Market Square, within the conservation area, are also dominated by vehicles and highway paraphernalia and therefore do not play the part they could in attracting and retaining people within the town centre.

SEVERANCE

Walking and cycling connections into adjoining neighbourhoods are therefore hampered by the need to cross significant barriers. This physical severance discourages people from

accessing the town centre on foot and by bicycle. It is important that the severance caused by key highways close to the town centre in particular is addressed.

WALKING AND CYCLING - FOR ALL

As noted above the quality of the streetscape and the ease of movement for walking and cycling into and out of the town centre is variable. These factors reduce the ease and attractiveness of walking and cycling in, through and to the town centre. This is important because it encourages car use which itself increases pollution, makes it more likely that people will drive to other centres or out of centre locations, and reduces the opportunities for increasing physical activity levels as part of day-to-day life.

- A step change in the quality of the town centre public realm focussed around Market Square
- The redevelopment of surface car parks and underused assets such as Crown Walk to introduce a wider retail, leisure and employment offer and increased residential density
- Reduce vehicular dominance and severance in the town centre and the area immediately around it through reductions in traffic speed, tightening junction radii and narrowing carriageways where possible
- Improve walking and cycling connections between neighbourhoods and the town centre, and between the town centre and Bicester Village

Central Corridor:

Discourage through traffic routing through the town centre in particular along the Buckingham Road corridor, by introducing a transformational scheme along this corridor which also addresses severance and reduces speeds.

ADDRESS CONGESTION AND HIGHWAY CAPACITY

Develop an approach to increasing highway capacity at key locations to accommodate growth notwithstanding the mode shift towards walking, cycling and public transport. Deliver new capacity sensitively and following the design principles of 'healthy streets'.

Speed strategy

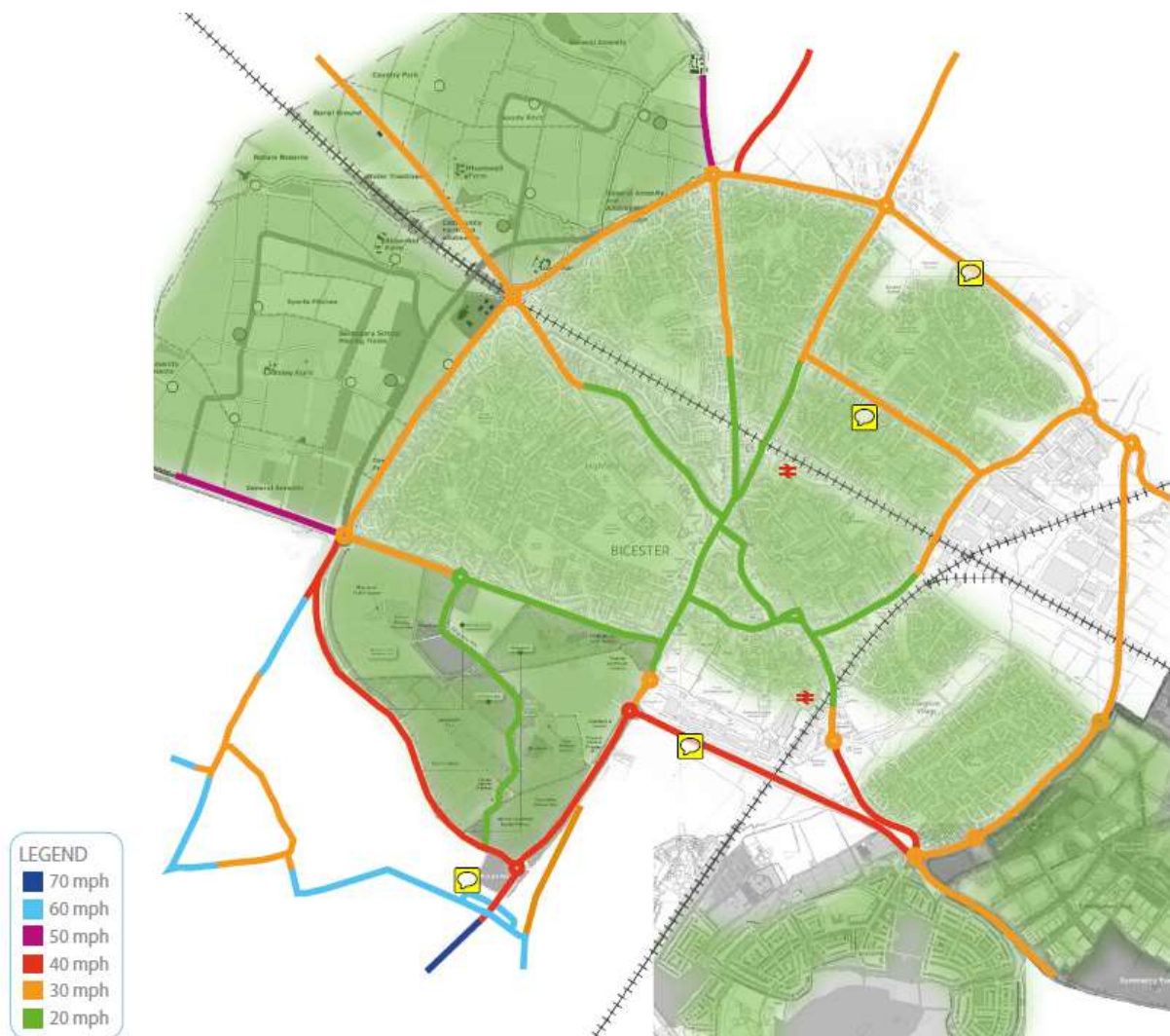


Figure 25. Proposed speed limits
Source: Bicester Garden Town Masterplan (2017)

Market Square

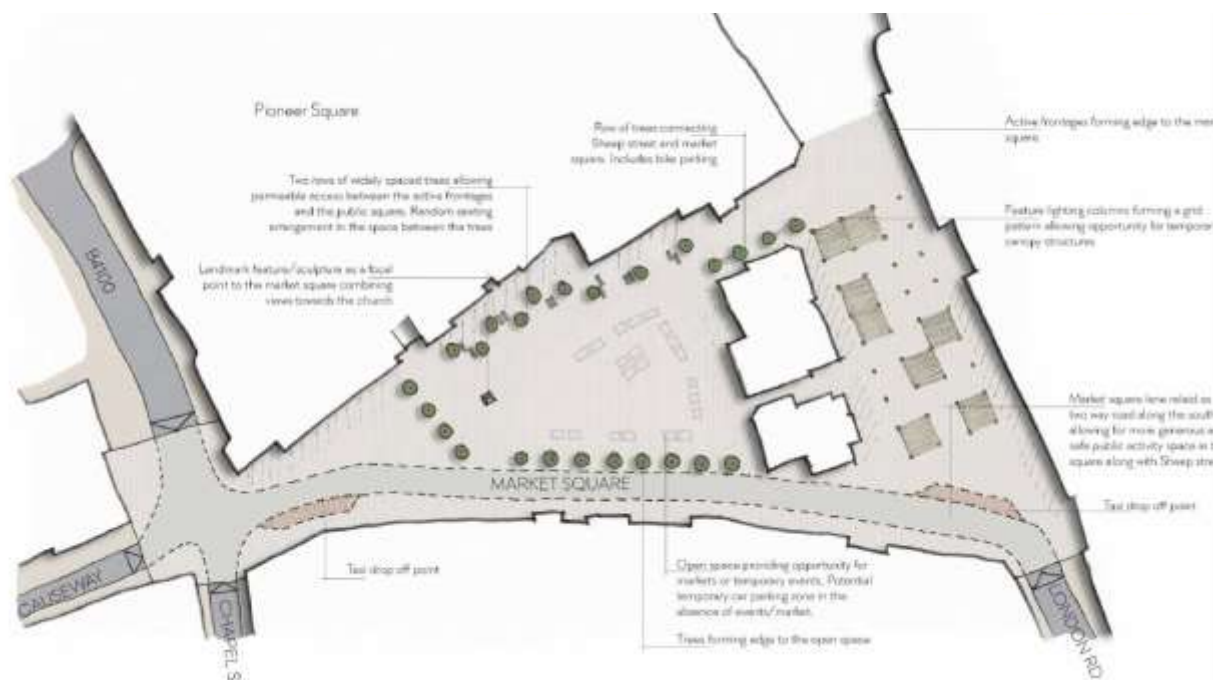


Figure 26. Design for Market Square
Source: Bicester Garden Town Masterplan (2017)

- Parking: “In order to support the delivery of a healthy town where vehicle movements are reduced, a review of parking provision will be undertaken”
- Town centre public realm: “Parking in Market Square in particular will be assessed, to determine if this space could become a civic space, hosting activities more suited to its heritage significance”
- Speed limits: “A number of towns and cities are now actively embracing 20mph limits and zones across their centres and adjoining neighbourhoods. As part of Bicester Garden Town ethos, it is recommended that a similar approach is taken here to encourage walking and cycling”.

Annex 3. Commitment to Active Travel Scale (CATS)

What is it?

CATS is a 5-point scale from A-E for measuring commitment to active travel i.e. improving and increasing active travel according to best practice. By active travel, we mean walking and cycling, but for the moment, the scale concentrates on cycling because generally more needs to be done to improve cycling conditions. Research and the experience of many towns shows how to increase cycling, including ways that will **not** work, ways that will work **a little** and ways that will work **much better** than others. Scale A represents commitment to the most effective ways. At the other end of the scale, E represents the expectation that cycling will wither away to nothing, which was the norm for at least 50 years between 1920 and 1970.

Why is it important?

There are corporate council policies on climate emergency, congestion and public health which identify active travel (AT) as a key and essential way of achieving those wider policy aims.

How is CATS to be used?

The purpose of the CAT scale is to evaluate where the Council (which includes its members, executive and officers in policy, planning and implementation) lies on the scale and thereby evaluate the level of ambition and the likely outcome of their policies over a 10-year timescale. The last row of the chart below shows where cycling levels for Bicester could be in 10 years' time depending on the level of council commitment.

Table 3. CAT scale summary

Level	A	B	C	D	E
Acronyms	Ambitious Aspirational Active	Brave Bold	Committed Comprehensive	Do minimum	Erode
Short Description	Ambition and aspiration to be the best in active travel	Brave decisions in promoting cycle use and managing car use	Committed to making cycling viable and convenient	Providing basic minimum and inadequate paths for cyclists	Ignore cyclists needs as marginal and unimportant
Mindset	Active Travel (cycling) is the future and car is the past. We are re-designing our towns now to make AT first and foremost	Active Travel is the future but we live in a car culture. We will make some brave decisions to restrict the car to create the change	We make a very serious effort to make sure that cycling is a viable alternative to the car by better cycle routes	We think cycling is good but a marginal activity. We will provide for it, but only where it is easy and not at the expense of the car	Cycling is a marginal, unimportant and dying mode. We can ignore it and it will gradually go away
The Town Network	Central streets become Cycle Streets with restricted car access	Comprehensive high-quality wide routes on all routes	Typically, off road cycle routes but priority and good linkages	Cycle routes but with no priority and poorly linked	Not important
Planning	Cycle routes at centre of plans. Car routes intentionally circuitous and inconvenient	Cycle routes at centre of planning. Car routes do not take priority	Cycle routes identified and linked to the cycle network. No long delays or diversions	Cycle routes often ignored or inconvenient. Not linked to whole routes.	Planning for cars – off-road parking and wide junctions
Residential	Cycle streets, cycle parking with car parking restrictions	Low traffic neighbourhoods and traffic calming	Cycle routes identified and made safe and convenient	Minimal or no provision	Lots of car parking
Car parking	Minimal car parking for disabled	Reductions in parking and car parking charges to deter driving	Prioritise shopping and deter commuter parking	Car parking minimum or no charges	Central free car parks
Manage traffic	Central control points to prevent car through-routes creating liveable cells	Major restrictions (rat runs and town centre)	Vehicle lane reduction to create effective cycle routes	Some roads restricted where benefit to cycling	Predict and provide
Examples	Houten	Oxford	Bedford	Bicester now	Pre-1964 policy
Bicester internal % of trips by cycle	50%	20%	10%	5%	2%

Examples are briefly described below to show what other towns have done to increase their levels of cycling and walking at different CAT scales.

CAT C Evidence (Comprehensive and Committed): Bedford

Bedford, though considerably bigger than Bicester now, has a relatively similar level of cycling (around 5% of trips). It was also a focus of new development like Bicester. From 2010, Bedford developed a comprehensive cycle network, as shown below as a tube map (Figure 27). The cycle network, measuring 200 km in total, was made up of quick routes along the main roads and quiet routes along residential roads. Measures included:

Main roads:

- Cycle lanes along many of the main roads and ASLs at many of the signalised junctions
- Innovative redesign of inner ring road with narrow carriageway and cycle lanes
- Cycle logos along narrower roads
- Major junction re-design at key roundabout with cycling Zebras on all arms

Planning:

- All new developments included cycle paths that linked to the wider network
- Bus gate in a major new development forcing cars to use the ring road to get into town
- 3 miles of new cycle path linking the new development to the town centre
- All new housing had both visitor and residential cycle parking
- Inclusion of cycle network in the Local Plan

Other measures

- Many cycle paths and cycle tracks resurfaced and widened to 3.5 m
- Priority over side roads for cycle tracks
- Two new cycle and pedestrian bridges linking directly into the town centre
- Permitting cycling through the pedestrianised town centre out of shopping hours
- Average speed cameras in some residential areas
- Increase of cycle parking at train station from 300 to 500 spaces

Outcomes

Despite the many measures, progress was slow and focused mainly on individual improvements (see Figure 28 and Figure 29). Cycles parked at the train station consistently increased around 5% per year. Flows over the bridges jumped with the opening of the new bridges. Cycle and particularly pedestrian flows significantly increased at the redesigned roundabout. The progress in encouraging cycling and walking more generally were undermined by two factors, namely 1) the low cost and over-provision of central parking for cars and 2) the narrow roads and heavy traffic on High Street and some other central roads.

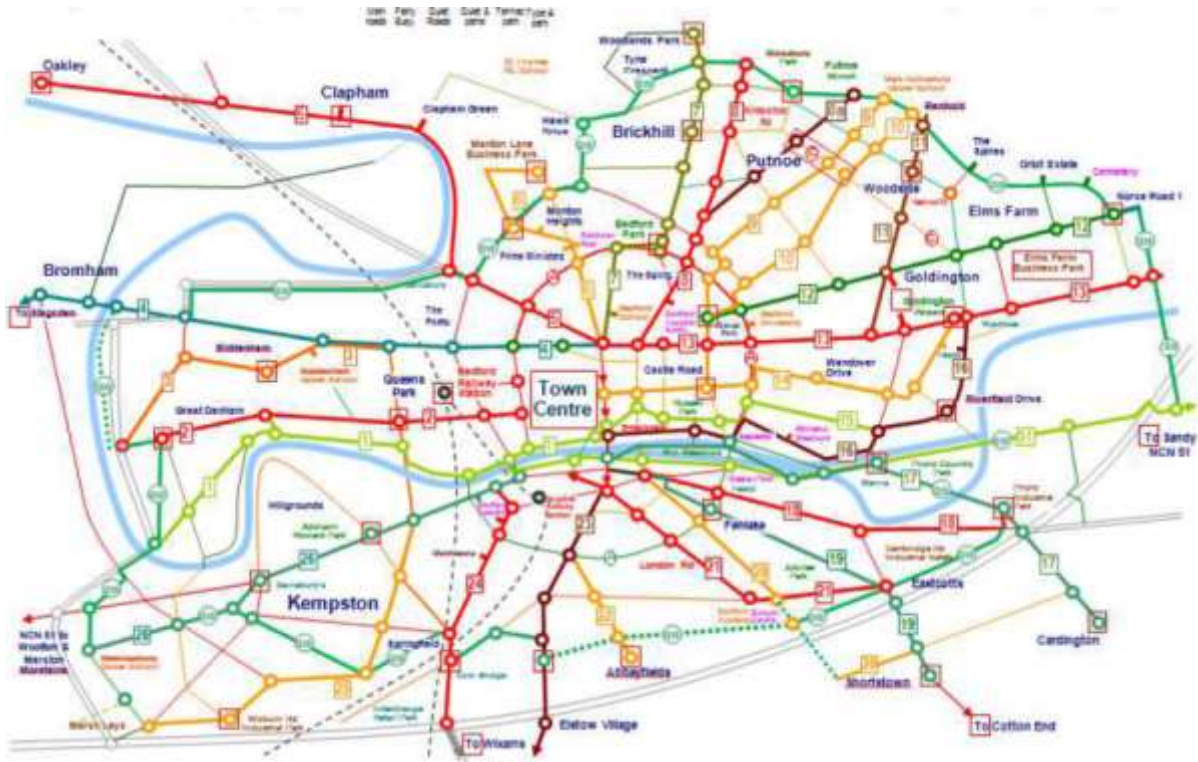


Figure 27. Bedford comprehensive cycle network

Conclusions for Bicester: a comprehensive network will promote cycling and walking, but progress will be local and there will be little transfer from car if car parking is too plentiful and cheap and if cyclists must use roads which are narrow and congested (e.g. Central corridor and Launton Road).

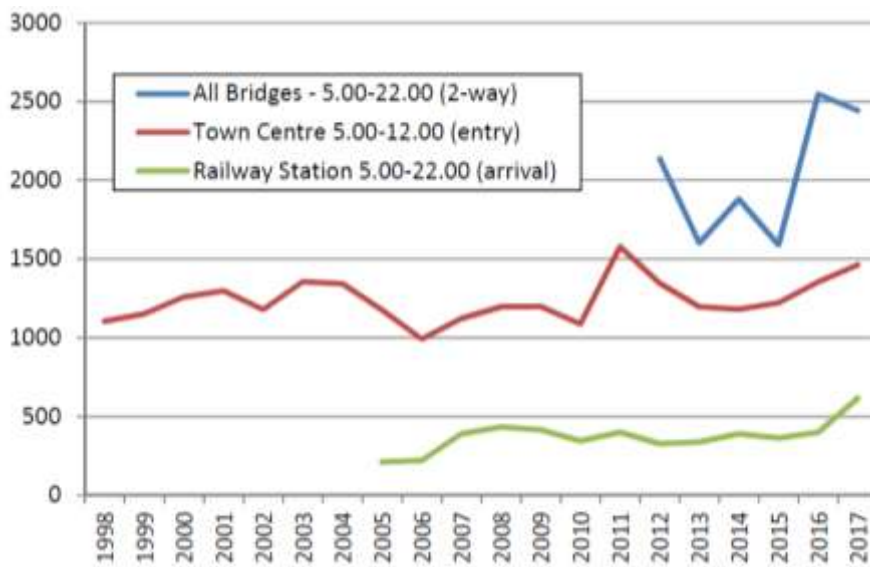


Figure 28. Cycle flows in Bedford (annual counts)

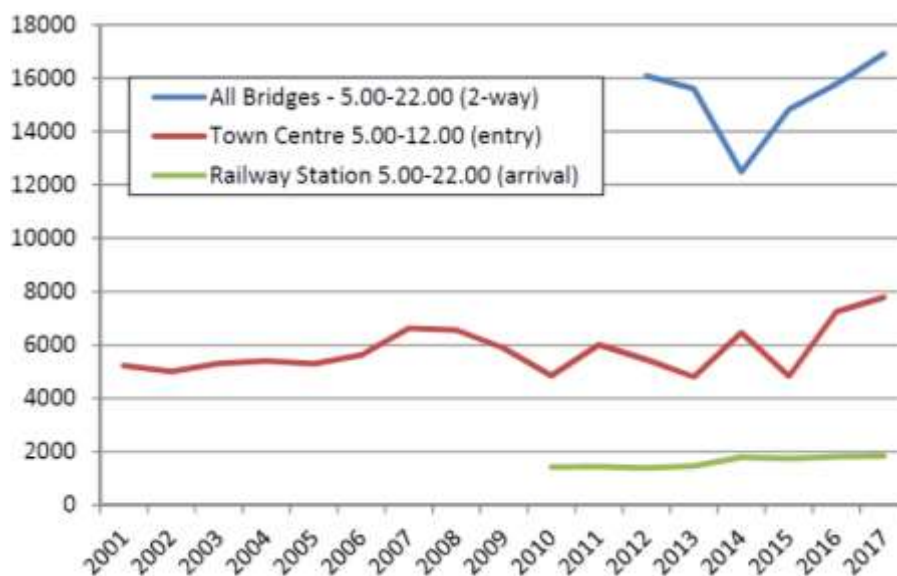


Figure 29. Pedestrian flows in Bedford (annual counts)

CAT B Evidence (Bold and Brave): Oxford

Oxford is near Bicester and familiar to most Bicester residents. Whilst there are many differences in scale and population, its transport policies dating back to 1973 exemplify how to achieve a significant increase in cycling and walking and improvement in urban liveability (category C/B measures). The Balanced Transport Policy (BTP) combined a mixture of measures to promote walking and cycling, increase urban liveability and to manage and reduce car use. In 1999, the Council went much further and closed High Street to through traffic (category B). Policies relevant to Bicester are:

Town Centre

- Expanding the central pedestrian area
- Making it difficult and circuitous to drive across the town (
- Figure 30)
- Restricting some central roads to bicycle only to give cyclists more accessibility (Figure 31)
- Control, increased costs and reduction of on-street and off-street parking
- Variable parking charge to discourage long-term parking

Residential areas

- Creating a comprehensive cycle network including cycle lanes or tracks on most roads
- Opening up new cycle paths
- Closing residential rat runs
- Controlled parking zones in most residential areas
- Provision of Park and Ride



Figure 30. Central Oxford network from view of cyclist/pedestrian.
 (left image) Showing point of view of cyclist or pedestrian (grey cyclists restricted 10-6).
Figure 31. Central Oxford network from view of car driver
 (right image) Showing point of view of car driver.

The impact of the Oxford measures

Council transport policies in Oxford have had an impact on urban liveability, economic vitality and sustainable travel in Oxford. Figure 32 shows the impact on car use (red) and cycle use (blue) into the town centre. Figure 32 also shows how the Council has not stayed at one category but moved onto a more challenging. Category. The Council is now proposing to implement measures in line with category A.

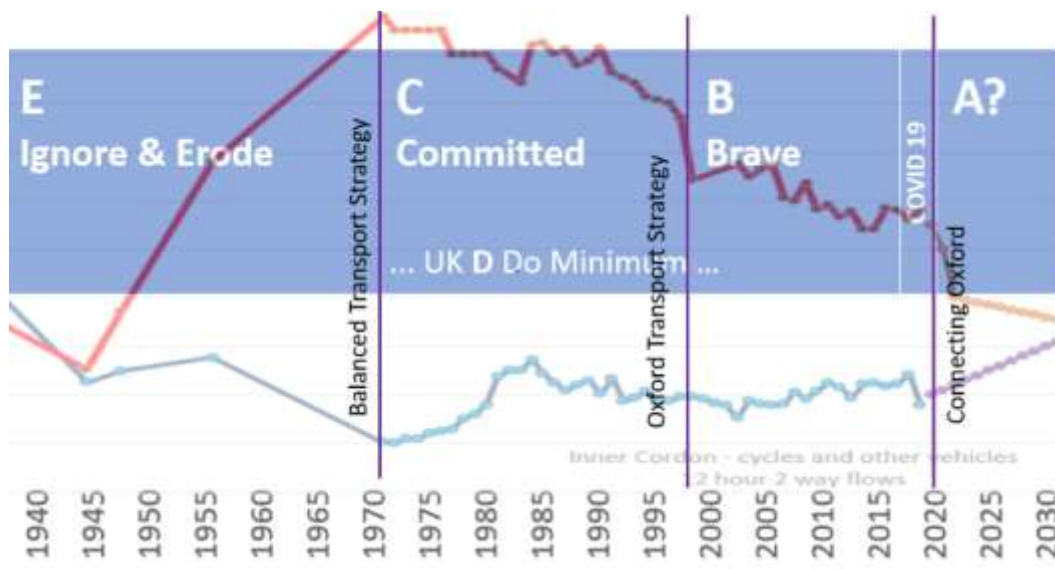


Figure 32. Oxford town centre traffic (red) and cycling (blue)
 Showing the impact of transport policy at different categories.

CAT A Evidence (Ambition and Aspiration): Houten

Houten² in the Netherlands is a good example of CATS A planning. Houten has many parallels with Bicester – a compact town with 2 train stations with a similar population. A summary of its planning principles can be seen at <https://youtu.be/gFEfr7Amn6U>. The town was designed in 1968 around an existing village and built from 1978 to reach a population of 30,000. In 1994 It was expanded again to 50,000 on the same design principles.

The town is divided into 31 residential areas which are only accessible by car from the ring road (Figure 33). Cars cannot pass from one residential area, whilst cyclists can (Figure 34), which exemplifies the concept of filtered permeability. There is 129 km network of bicycle paths which pass by all the schools, shops and town centre. Shared roads inside the ring road are 'cycle streets', where cyclists have priority.



Figure 33. Plan of Houten: car network

(left image) Showing 31 residential areas (red borders) which cars can only enter from the ring road (orange line). Cars cannot cross the red borders.

Figure 34. Plan of Houten: cycle network

(right image) Showing cycle network (red lines).

The result is that walking and cycling are most popular (Figure 35). For all Houten resident trips, the percentage breakdown is 34% car, 28% cycle, 27% walking and 11% by public transit. Walking and cycling is even more popular for trips for other purposes. The design of Houten encourages even those residents not disposed to cycle to start cycling. It contains 2 train station which are no more than 2 km from any residential area. Car ownership is 415 cars per 1000 residents (41%), compared to 98% of households owning a cycle with an average of 3.4 bikes per household. One public health result is that Houten

² Source: Foletta N (nd) Houten, Utrecht, The Netherlands, ITDP Europe, http://www.itdp.org/wp-content/uploads/2014/07/22.-092211_ITDP_NED_Desktop_Houten.pdf

residents are more active (based on 2.5 hours+ per week) than the rest of Netherland – 75% were considered active compared to 55% in Netherland as a whole.

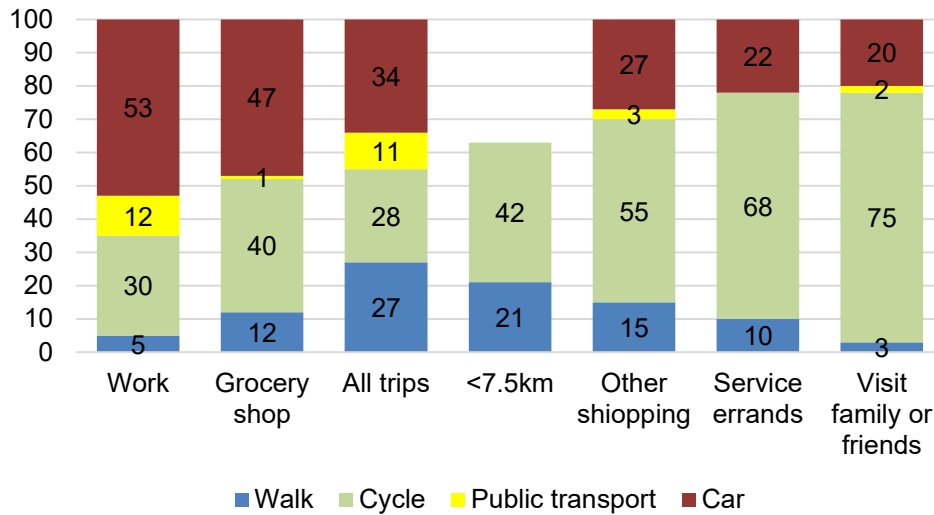


Figure 35. Percentage breakdown of trips made by Houten residents by mode and purpose

Source: ITDP Europe 2010 internet survey of Houten residents

Underlying linkages in Bicester

Bicester is already designed in a way that makes creating low traffic neighbourhoods relatively easy (Figure 36), making it relatively easy to achieve the same effect by a minimum number of traffic filters.

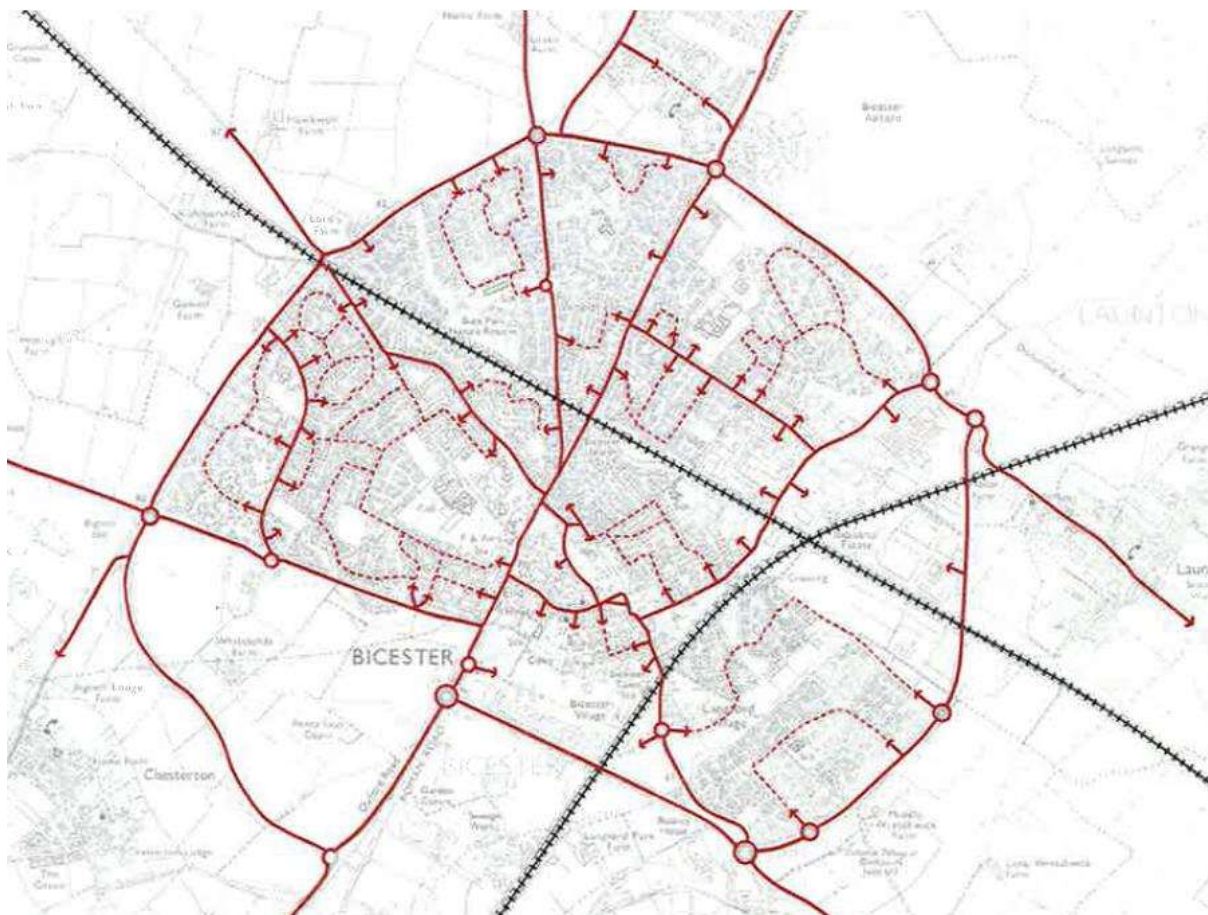


Figure 36. Plan showing how Bicester can easily be converted to low traffic neighbourhoods
Source: Baxter (2015)

Annex 4. Factors affecting travel in Bicester

The main internal flows are to employment and the town centre. The two figures below show how there are many opportunities for local travel by cycling and walking in Bicester.



Figure 37. Plan showing key destinations
Source: Bicester Garden Town Masterplan (2017).

Annex 5. Travel behaviour in Bicester

For walking and cycling in Bicester, national datasets are limited to census 2011 for journeys to work, the propensity to cycling tool (PCT) and Strava data. However, Bicester is fortunate in having a very detailed survey of Bicester residents.

In 2011, Socialdata undertook travel surveys of Bicester residents and 4 adjoining villages to give a representative picture of day-to-day travel patterns of residents of Bicester. In 2009, data was collected from 825 households and 2097 people using a travel behaviour survey and travel diaries to give a representative and detailed picture of day-to-day travel patterns of residents of Bicester.

Socialdata collected the information in 2011 via mail-back surveys to a random sample of households in Bicester and 4 nearby villages to collect data on every member of the household on a sample day with at least 3 call-backs to ensure high response rates. The achieved sample was 2097 people. A sub-sample of 103 people then participated in in-depth follow up surveys. The data provides a representative picture of day to day travel patterns of Bicester residents. This provides a depth of analysis not available for other towns.

Bicester residents basic travel patterns:

- On average, residents made 2.8 trips per day with 41% making 2 trips (i.e. from home and back). In total this equals around 86,000 trips a day (Figure 39).
- On average, residents spent 58 minutes travelling with 15% not making any journeys, 24% making journeys under 30 minutes, 20% between 30 and 60 minutes, 27% between 60 and 120 minutes and 14% over 120 minutes per day (Figure 40).
- On average, 15% of residents made no journeys and 18% travelled under 5 km (Figure 41), but 40% of residents travelled over 30 km doing 88% of all distance (Figure 42).

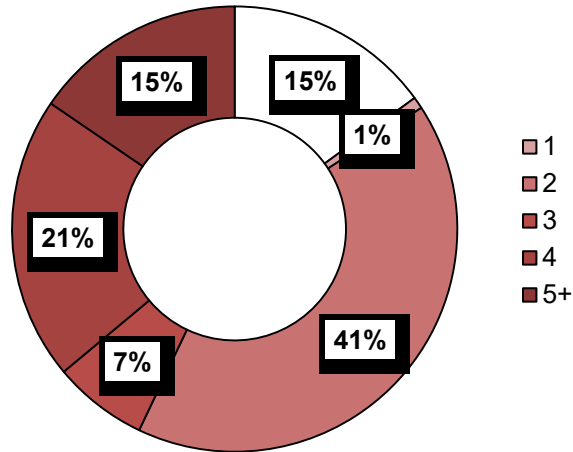


Figure 39. Trips per person per day in Bicester
Source: Socialdata.

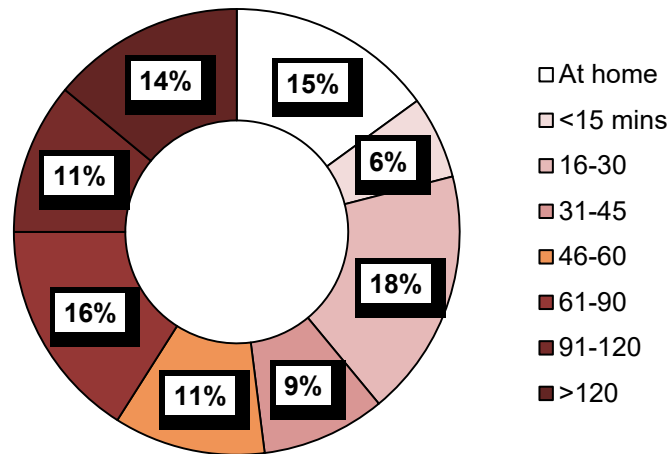


Figure 40. Travel time per person per day in Bicester
Source: Socialdata.

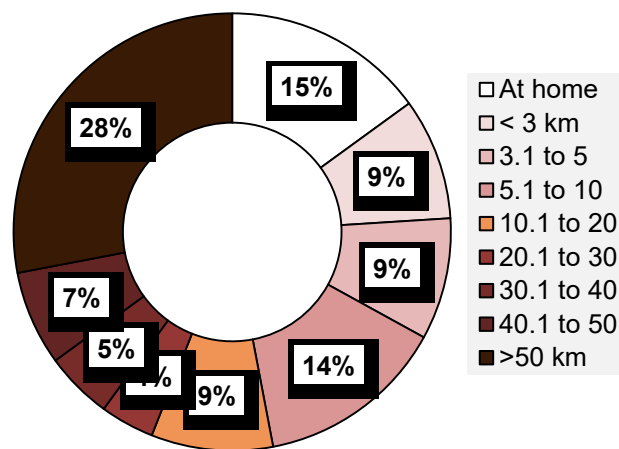


Figure 41. Distance travelled per person and day in Bicester
Source: Socialdata.

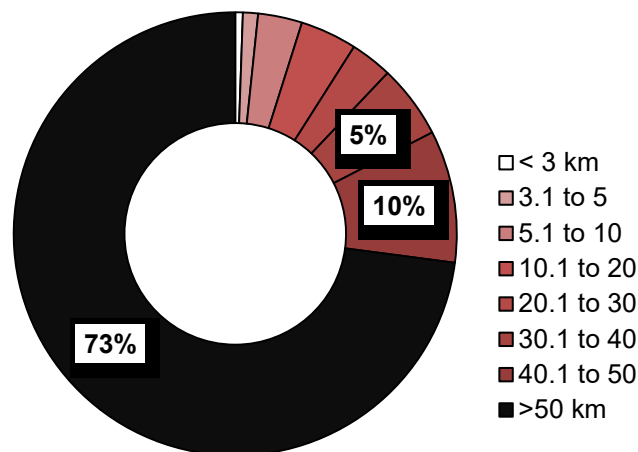


Figure 42. Percentage of total distance travelled by Bicester residents
Source: Socialdata.

The focus of the LCWIP is on trips that can realistically be made on foot or by cycle. Figure 43 shows that all walk journeys and 96% of cycle journeys are under 5 km. Additionally 47% of car trips were under 5 km.

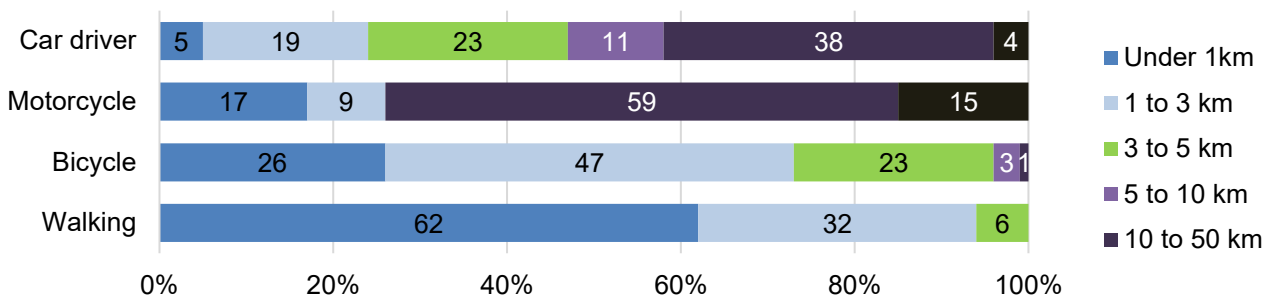


Figure 43. Trip distance bands by Bicester residents using different modes

Figure 44 shows how trips under 5 km by distance (62%) match very closely ‘trips within Bicester’ (61%). In numerical terms, there are around 53,000 daily trips in Bicester, 28,000 trips to/from Bicester and 5000 trips completely outside Bicester by Bicester residents.

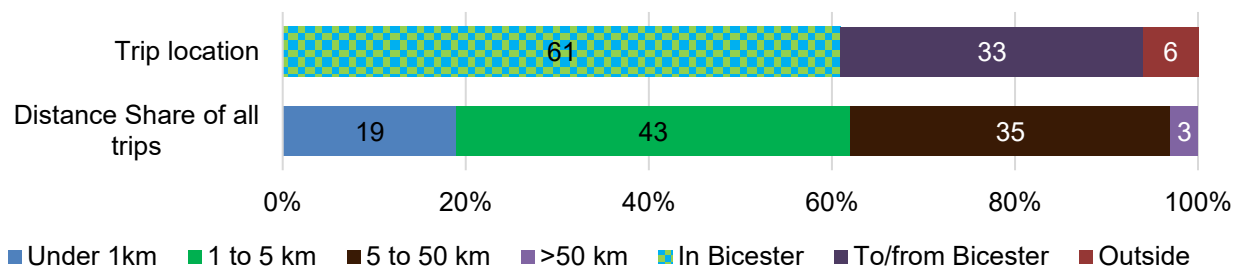


Figure 44. Share of all trips by location (in or out of Bicester) compared to distance band

Figure 45 shows the different modes used for trips outside to/from Bicester and trips within Bicester. Outside Bicester, 89% of trips are by car, with 9% by public transport (probably mostly train to Oxford, London or Birmingham). Walking and cycling account for just 1% each.

Within Bicester, 34% (18,000) of trips are on foot and 6% (3,200) of trips are by cycle (40% together). In spite of the short distances, 58% (31,000) of trips are by car (38% (20,000) as driver and 29% (11,000) as passengers). Bus use within Bicester accounts for a negligible total of around 2% (1000 trips).

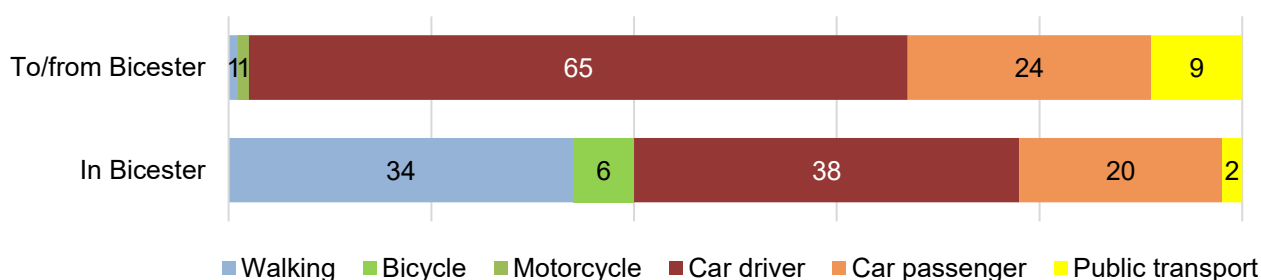


Figure 45. Modal share of trips in Bicester compared to trips to/from outside Bicester, by distance

We can examine the trips under 5 km (within Bicester) in more detail by distance in Figure 46:

- 72% of short journeys under 1 km are on foot and 5% by cycle but car use accounts for 20% of even these very short trips.
- Walking accounts for 30% of trips from 1-3 km and cycling 8% (its peak modal share), but car use accounts 60% of these trips.
- From 3-5 km, walking and cycling are relatively low (11% in total) compared to 85% of trips by car.

This shows that there is a significant potential to detraffick Bicester by changing from car to cycle for journeys from 1-3 km and 3-5 km.

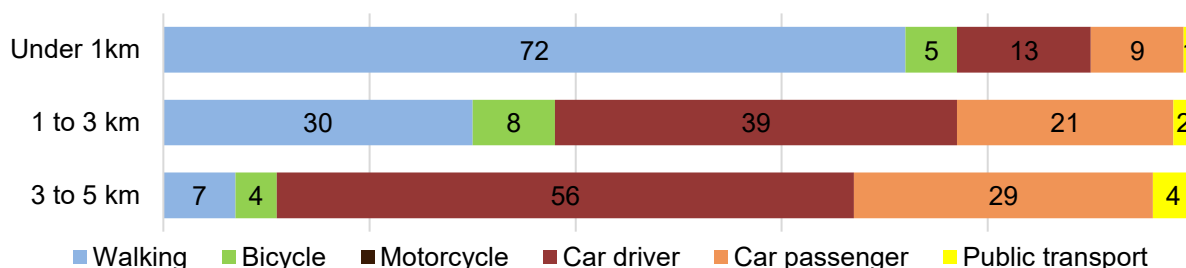


Figure 46. Modal share of trips within Bicester by 3 distance bands

Within Bicester, it is almost certain that cycling will be as fast as car for most trips, so why are people choosing a more expensive and longer mode of travel? The travel survey examined in detail whether there were barriers to replacing car trips by other modes (Figure 47). The survey looked at the number of car trips per car per year *within* Bicester (351 per car per year). It found that:

- 241 (69%) of these car trips were easily replaceable i.e. there were no factors meaning that a car had to be used.
- 175 of all car trips in Bicester (50%) were most easily replaced by cycling and 91 (25% of all car trips in Bicester) by walking.

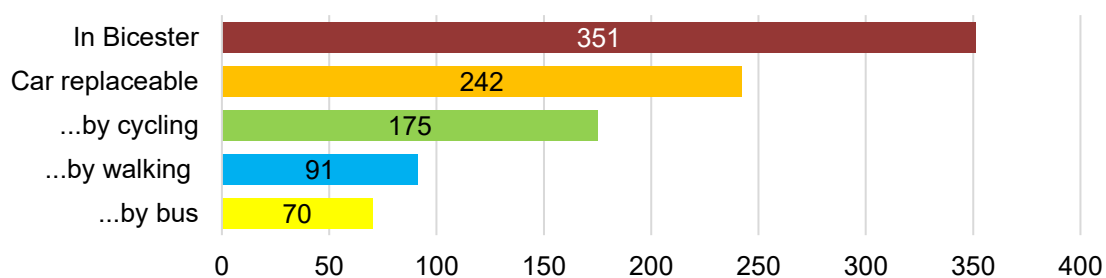


Figure 47. Number of trips per car per year: potential for change from car trips within Bicester to other sustainable modes

What does this mean for trips within Bicester? Figure 48 shows the modal share of all trips inside Bicester if the sustainable potential was realised. What this shows is that whereas 31% of trips are currently by sustainable modes, there are no barriers to another 29% of car trips being made by sustainable modes (60% in total). With a few infrastructure changes, that percentage could increase to 94%.

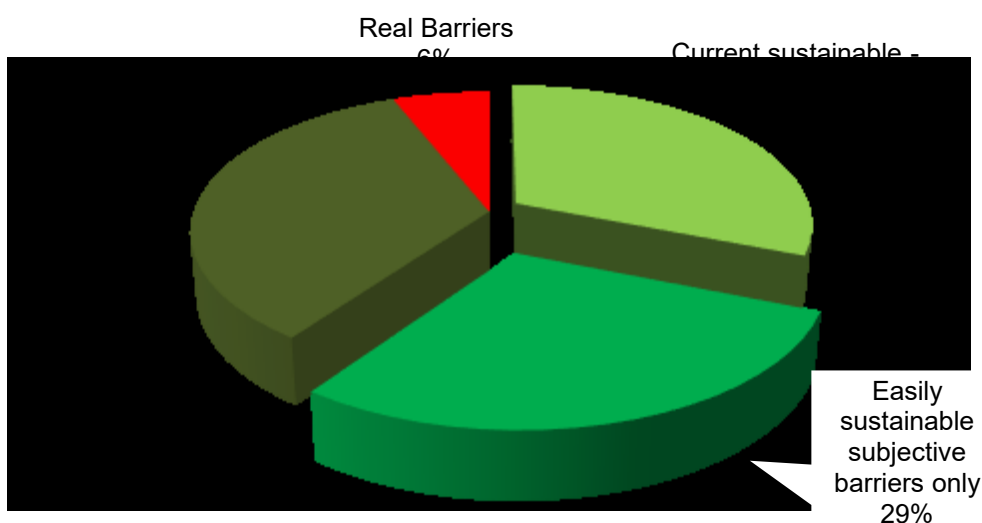


Figure 48. Total percentage of all trips within Bicester that could be transferred to sustainable modes

This means that it makes economic sense to plan for cycling and walking in Bicester. The Bicester data (Figure 49) shows that for walking, the main focus should be planning for trips up to 3 km (especially trips under 1 km) and for cycling up to 5 km (especially trips 1-5 km).

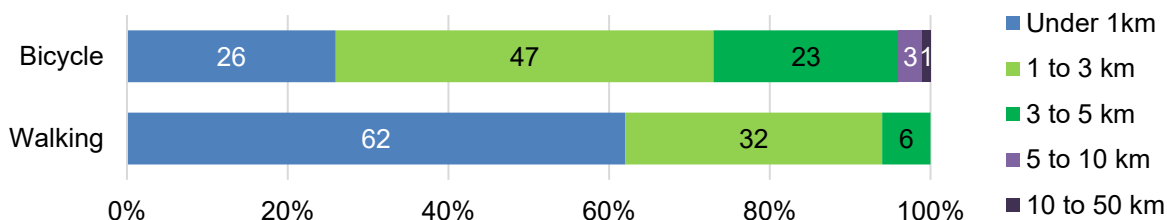


Figure 49. Trip distance bands for Bicester residents (cycling or walking)

How do we achieve such a modal change? The next refinement is journey purpose. This allows improvements to be focused on the route to and the end point (destination) of these journeys. Figure 50 shows the percentage of all trips by Bicester residents by journey purpose. The main journey purposes are leisure (30%), work (24%), shopping (17%), escort (13%) and education (9%).

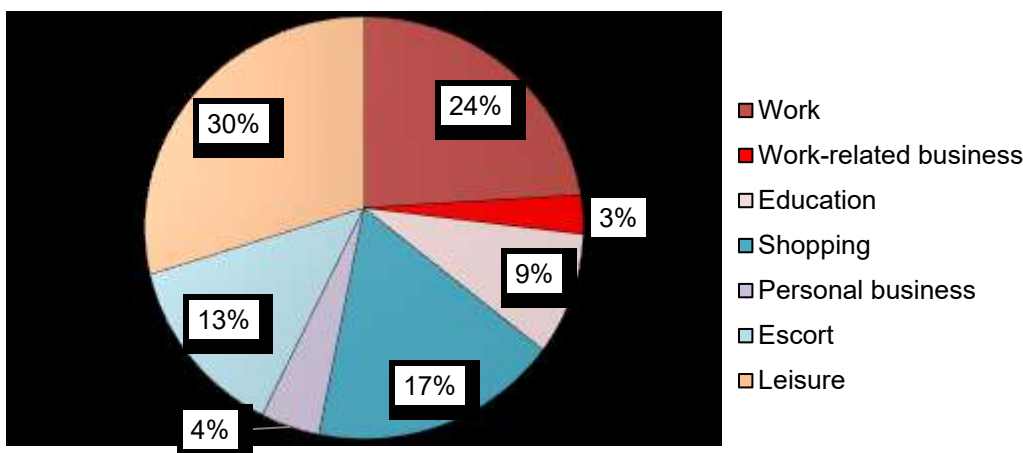


Figure 50. Journey purpose of Bicester residents' trips within Bicester
Source: Socialdata.

Figure 51 shows the current mode choice of Bicester residents arranged in order of percentage of sustainable trips. Whereas 48% of education trips are by sustainable travel, only 11% of work trips are by sustainable travel.

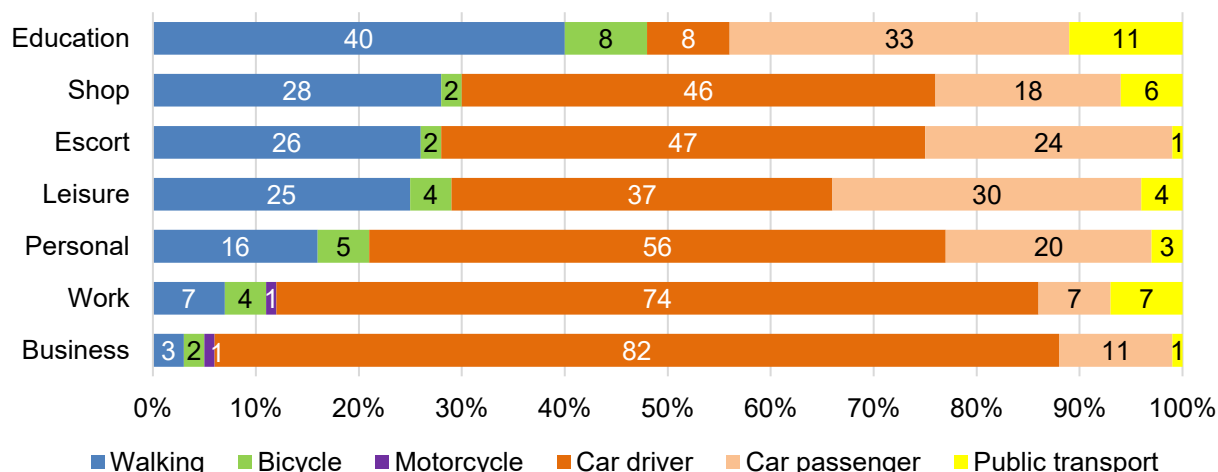


Figure 51. Mode of travel for Bicester residents (trips in and out of Bicester) by journey purpose

However, to understand the potential for change to sustainable travel, it is essential to look at the percentage of these journeys within Bicester. Figure 52 looks at the 4 main journey purposes by journey distance by Bicester residents – ignoring escort – in order to see what percentage are within Bicester and potentially transferable to walking and cycling.

In terms of total journeys, these account for 80% of all journeys by Bicester residents. For journeys under 5 km, 77% of education journeys, 77% of shopping journeys and 64% of leisure journeys, but only 36% of work journeys are under 5 km, i.e. likely to be within Bicester and potentially transferred to walking and cycling.

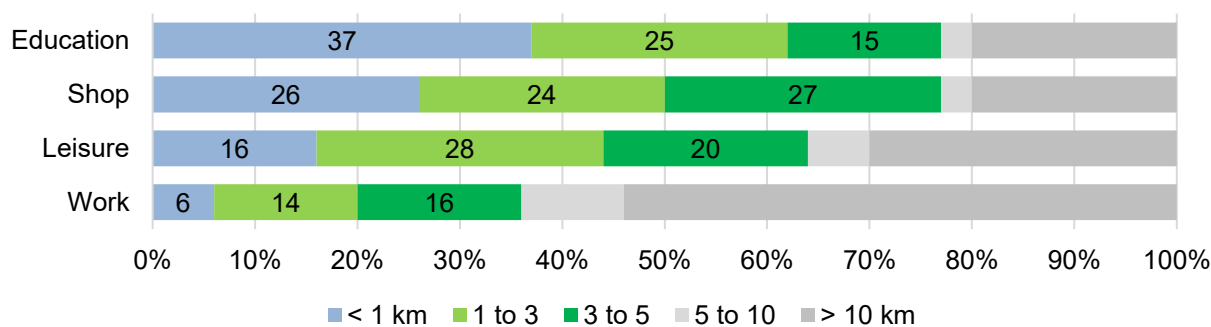


Figure 52. Trip distance by journey purpose

Comparing figures Figure 51 and Figure 52, it is possible to identify the percentage of trips by journey purpose within Bicester that could be converted to walking and cycling. It shows that, 29% of education trips, 47% of all shopping trips, 35% of leisure trips and 25% of all work trips by Bicester residents could be potentially be converted from car to cycling and walking.

Table 4. Share of trips in Bicester by journey purpose and mode

Journey purpose	Current % of trips	Current % of trips by walk/cycle	% trips by car convertible to walk/cycle
Education	77	48	29
Shop	77	30	47
Leisure	64	29	35
Work	36	11	25

To achieve even a fraction of these ‘convertible trips’ calls for a step change in planning, thinking and provision if Bicester is to achieve its aims of becoming a healthy eco-town.

For education, routes to schools should be of an even higher quality and protection to overcome parental concerns, linking seamlessly to the catchment areas and cycle parking should be secure and plentiful. School travel plans should encourage walking and cycling and student or parental parking/stopping severely limited.

- For shopping, the priority should be providing cycle parking suitable for load carrying bikes, such as bikes with baskets and cargo bikes which is more convenient, sheltered and nearer than any other parking provision which should be charged. The routes to the shops should be prioritised for ease and comfort and shops as far as possible located near residential areas to minimise journey length.
- For workplaces, cycle parking, travel plans, incentives and restricted car parking, as well as high quality cycle routes are essential.
- For leisure journeys, the picture is more complex. **Figure 53** shows the breakdown of all leisure journeys in Bicester. Visiting friends and family shows the importance of visitor cycle parking and residential parking schemes. Recreation shows the importance of providing opportunities for recreational cycling. Leisure and sports shows the importance of cycle parking at leisure centres. Restaurants, art centres, churches, cemeteries should all be on cycle routes with adequate cycle parking.

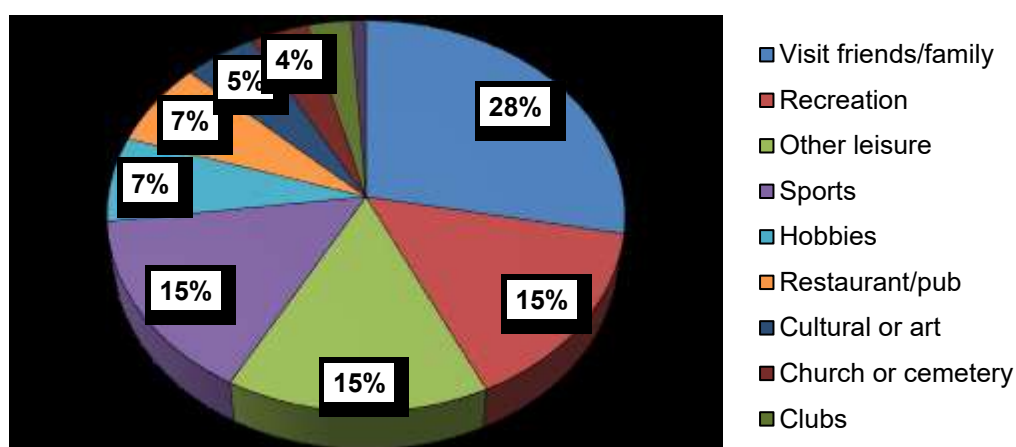


Figure 53. Detailed breakdown of leisure trips in Bicester

The survey examined mode choice by employment status (Figure 54). Employed males had the most car dependent lifestyles, closely followed by employed females with just 16% and 18% of journeys by walking and cycling. In contrast, other groups – those seeking work, staying at home, and children at school made around 40% of their journeys by walking and cycling. There are significant health benefits from all these groups engaging in more active travel, in particular cycling which has the greatest health benefits as well as travel time benefits.

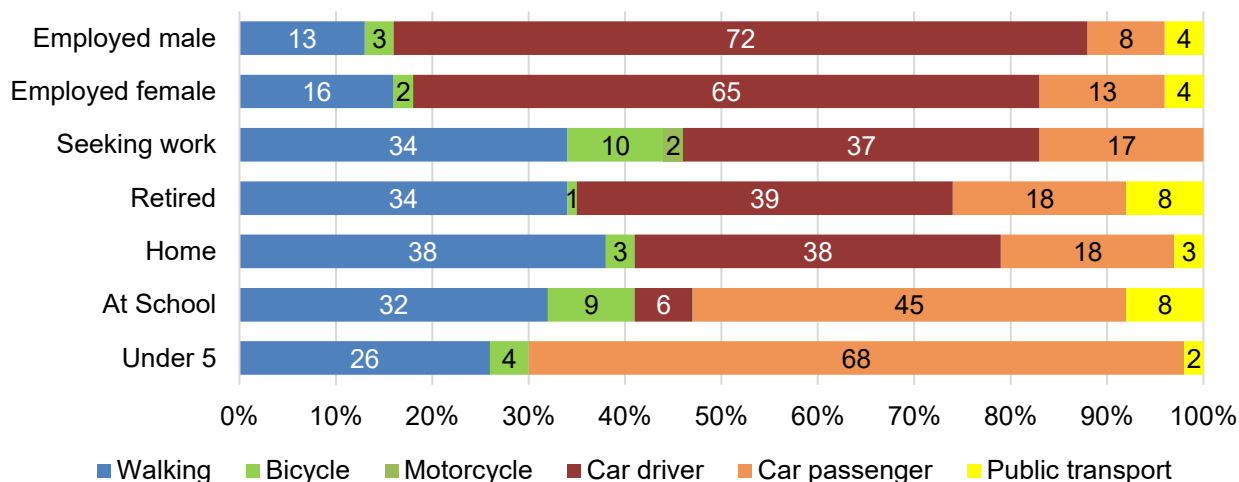


Figure 54. Mode choice by employment status

Figure 55 shows mode choice by age of Bicester residents. This reflects how children under the age of 15 and older people over the age of 61 have the least car dependency, with around 32% of their journeys on foot. However, whereas children make 7% of their journeys by cycle, older people make just 1%. Young adults (16-25) make 18% on foot and 5% by cycle, as well as many journeys as passengers (26%). Both adult age groups are most car dependent with 69% of trips as drivers, but there is a decline in walking and cycling from the 26-45 age group to the 46-60 age group.

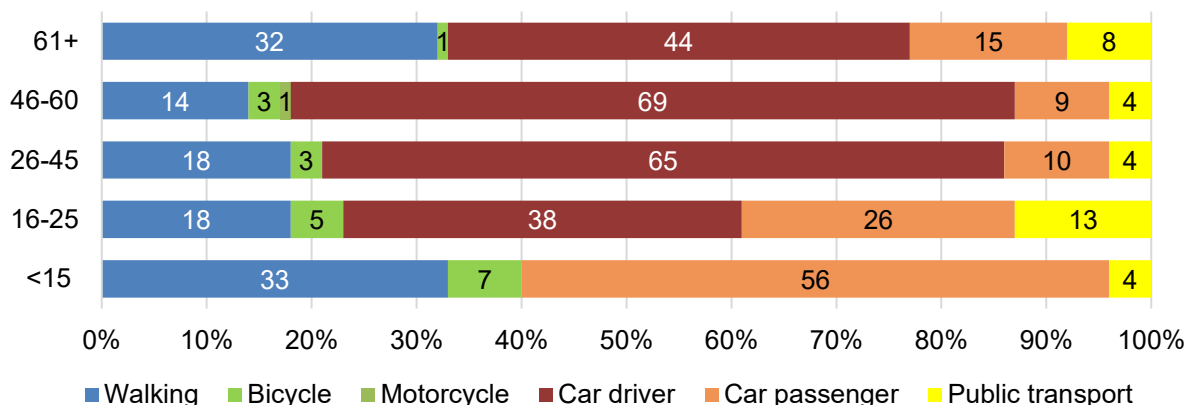


Figure 55. Mode choice by age

Annex 6. Safety and infrastructure

Cycling

There is a common perception that cycling is dangerous. This is untrue. However, many non-cyclists and cyclists perceive safety to be a key issue and barrier to cycling. One element is the perception of risk.

Figure 56 shows that Bicester residents have an unrealistic idea of the risk cycling, with 64% thinking it to be high or rather high, compared to 34% thinking the risk walking to be high or rather high. In summary, it is likely that the main barriers to walking are distance and time taken, whereas for cycling, it is perceived risk, with both balanced by the general ease, convenience and comfort of using a car. Providing high quality walking and cycling routes will at a minimum remove the deterrence of unpleasant and inconvenient routes.

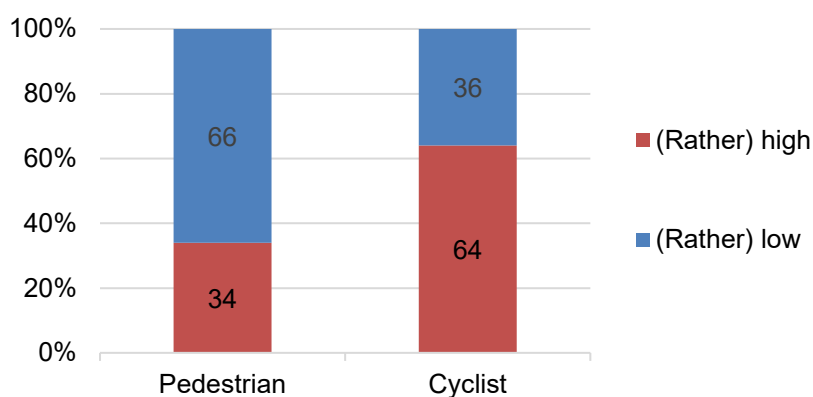


Figure 56. Bicester residents' perception of risk as pedestrians and cyclists
Source: Socialdata (2011)

This section analyses the reported casualty data for cyclists and pedestrians in Bicester. Altogether over the last 5 years, there were 48 *cyclist* casualties (of which 7 were serious and 41 slight) and 37 pedestrian casualties, of which 11 were serious and 26 were slight. There have been no cyclist or pedestrian fatalities in the last 5 years in Bicester.

The definition of serious typically means a visit to hospital with broken bones or severe cuts and lacerations. It is generally accepted that serious casualties are adequately reported, whereas slight casualties are not adequately reported. Serious casualties can have a significant immediate impact on health and well-being, though their long-term effects can vary widely from no impact to lifelong disability. In contrast, slight casualties typically mean only bruises or minor cuts and their impact is generally minimal on health and well-being.

The risk cycling and walking in Bicester is very low indeed. It is possible to calculate this reasonably accurately for reported casualties, because Socialdata research identified

reasonably reliable figures on the number of cycle and pedestrian trips made by Bicester residents and Police stats 19 data record all reported casualties in Bicester for the last 5 years. The chart below sets out the data calculation.

Table 5. Trips and accidents per travel mode

	Trips per day	Trips per year	Fatal accidents per year	Serious accidents per year	Slight accidents per year
Walking	17,100	5,842,500	0	2.2	5.2
Cycling	3,135	1,054,500	0	1.4	8.2

	Fatal risk per trip: 1 in	Serious risk per trip: 1 in	Slight risk per trip: 1 in	Yrs daily commute serious	Yrs daily commute slight
Walking	*Zero	2,655,682	1,123,558	5,311	2,247
Cycling	*Zero	753,214	128,598	1,506	257

What this shows is that:

- a cyclist has roughly **1 in 750,000 chance of a serious accident** for each cycle trip they make; or put another way, a daily commuter making 2 cycle trips each weekday would have to cycle for nearly 1500 years before being involved in a serious accident
- a pedestrian has an even lower risk of roughly **1 in 2,500,000** chance of a serious accident for each walking trip they make – for a daily commuter equivalent to around 5000 years before being involved in a serious accident

Evidence shows that nearly all serious cyclist injuries are reported. Therefore, the risk of serious injury can be trusted. In contrast, slight casualties are significantly under-reported. The risk of a slight injury may be around 10 times higher than Policy Stats 19 suggests, so a more accurate risk might be 1 in 10,000 for a cyclist and 1 in 100,000 for a pedestrian. This still represents a minimal risk of injury of once in 25 years for an everyday commuter cyclist and once in 250 years for an everyday pedestrian.

The health benefits of *brisk* walking and cycling far outweigh any accident risk. Regular physical activity (which gets you slightly out of breath) helps prevent the very real risks of common diseases such as heart disease, stroke and certain cancers, as well as the risk of dementia.

On average, cyclists gain 3-14 months extra life compared to a loss of 5-9 days through traffic accidents. As a comparison, nationally in the UK around 100 cyclists are killed in road accidents, compared to 42,000 people who die prematurely through CVD (heart attacks or strokes).

Additionally, cycling is safer than many other healthy physical activities. For instance, the risk of a serious injury requiring hospital treatment playing football or squash is around 20 times per hour that of cycling.

Location of cyclist casualties (Figure 57)

There are 3 roads which account for 30 or around 60% of the 48 cyclist casualties – the ring road (13 casualties - mostly at the roundabouts), the Central Corridor (9 casualties - from Kings End to Buckingham Road) and Launton Road (8 casualties). An examination of the safety of these 3 roads for cyclists should be an early priority.

The 3 busier commuter routes: London Road (BCR16), Bucknell Rd (BCR5) and Churchill Rd (Q3-BIW) had 2 casualties each. For the rest of the Bicester Active Network, there were just 3 slight cyclist casualties. Also 14 of the radial cycle routes have no casualties.

In summary, the cycle path and quiet road network is safe. Safety measures should be concentrated on the commuter routes and in particular crossing the ring road and crossing or cycling along the Central Corridor.

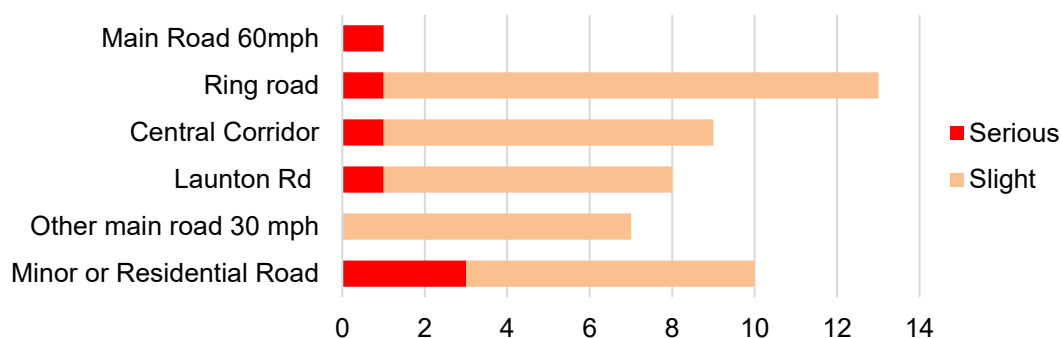


Figure 57. Bicester cyclist casualties by kind of road or location in Bicester

Cyclist casualty types

Figure 58 shows that roundabouts had the highest figure (15, but only 1 serious casualty). The single most common casualty type with 11 casualties was a *car entering failing to see and hitting a circulating cyclist*. Six of these occurred on the ring road and 3 at the Launton Road/London Rd roundabout. This is typical accident showing the poor UK design of roundabouts for cyclists compared to European practice. The redesign of roundabouts is a priority.

Nine casualties happened at Give Way junctions, 5 involving vehicles entering and hitting cyclists on the *carriageway* and 4 involving vehicles hitting or being hit by cyclists crossing the Give Way line from footway to footway.

There were 5 children cyclist casualties (mostly involving crossing bell mouths from footway to footway) which indicate a need for priority crossings across side roads and slower residential speeds.

There were 4 casualties where cyclists cross the road at a Zebra, Toucan or refuge and 4 casualties involving cars overtaking, swiping or shunting cyclists.

45 of the 48 reported casualties involved collision with a car or LGV. In terms of highway fault, cyclists were at fault in 10 cases, the driver at fault in 23 cases and fault unclear in 15 cases.

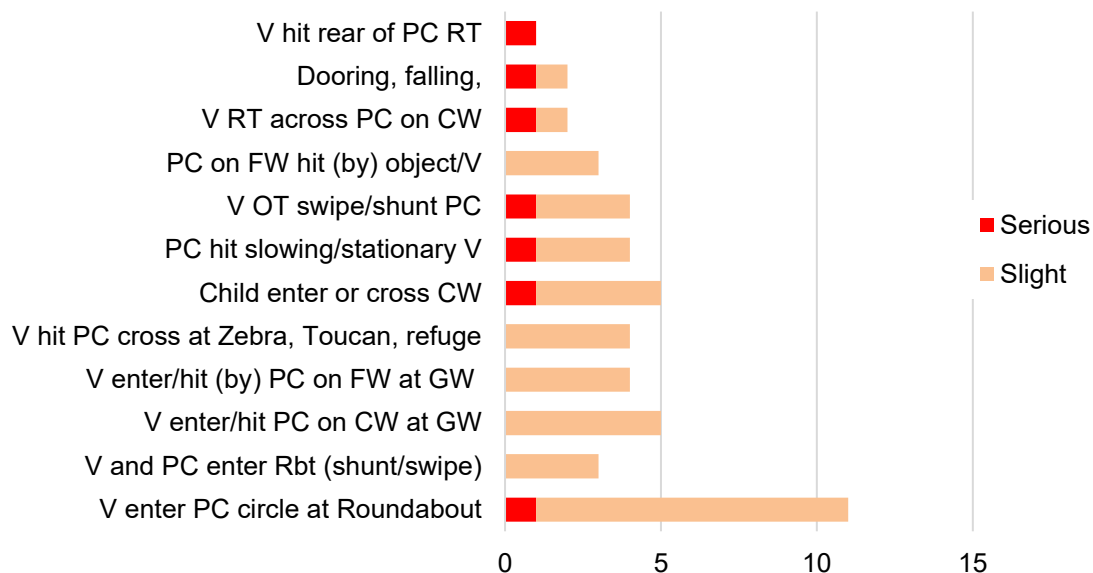


Figure 58. Bicester cyclist casualties by typology of accident

Key: V=motorised vehicle (car, LGV,HGV); PC = pedal cycle; FW = on footway; CW = on carriageway; OT = overtaking; RT turning right; GW = Give Way junction.

Pedestrians

The most common location for pedestrian casualties (Figure 59) was the Central Corridor (with 10 or 32% of all casualties, but with no serious casualties). The other main urban roads – London Rd, Banbury Rd, Bucknell Rd, Launton Rd, Middleton Stoney Rd and Churchill Rd account for another 10 or 32% of pedestrian casualties, with 2 serious casualties). Roads around the town centre account for another 6 casualties included 3 serious. Residential roads account for 7 more casualties include 3 serious.

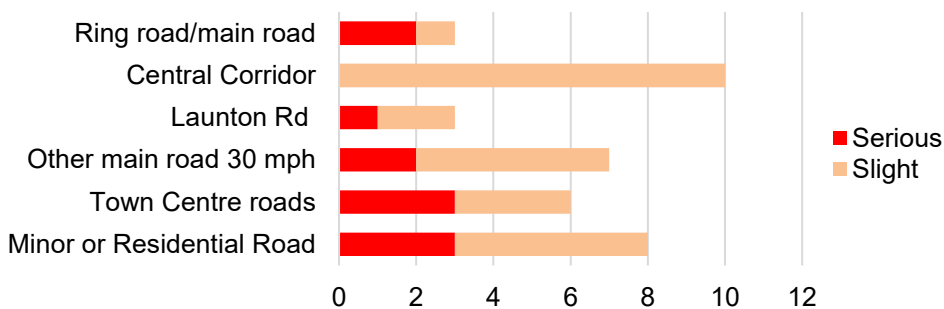


Figure 59. Bicester pedestrian casualties by location or type of road

Pedestrian Casualty types

Most pedestrian casualties (Figure 60) involve being hit by a car whilst crossing a busy road, which account for 21 or 56% of all pedestrian casualties, including 7 serious casualties. In 8 cases, the crossing took place away from any crossing, 7 were at a signal-controlled crossings (Puffin, Pelican or Toucan), 5 at a Zebra and 1 using a central refuge. In 3 cases, these involved a senior citizen (over 65) and in 5 cases a child (under 18). Additionally, there were 2 cases where a car hit a young child either crossing or playing in a residential carriageway. There were also 4 cases of road workers or Police being hit whilst working in the carriageway.

The other cases involved pedestrians on the footway. In 4 cases, pedestrians were hit whilst a vehicle was reversing and 3 cases, a vehicle going forward hit a pedestrian on the footway. In 3 cases, the pedestrian was crossing the bellmouth of a junction.

All reported pedestrian casualties involved a car or LGV. It should be noted, that unlike for cyclists, pedestrian trips, slips and falls are not collected in Police data. Pedestrians were most likely at fault in 7 cases, drivers at fault in 15 cases and fault unclear in 15 cases.

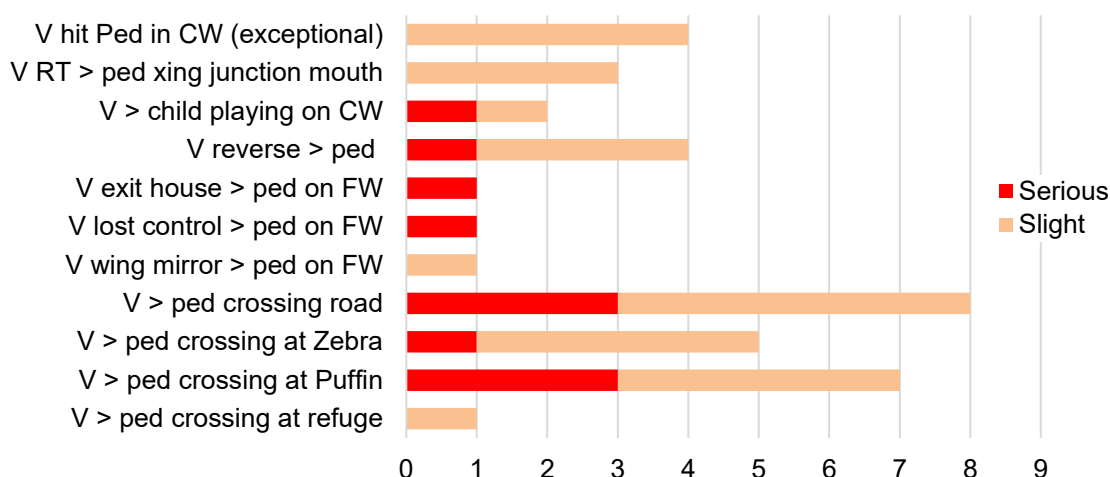


Figure 60. Bicester pedestrian casualties by typology of accident

Key: V = Vehicle; > = hit; ped = pedestrian; CW = carriageway (road); FW = footway (pavement); xing = crossing; RT = making a right turn.

Other mode casualties

Altogether there were 224 casualties by other modes (not cycling or walking) in Bicester over the last 5 years, of which 1 was fatal, 22 were serious and 201 slight.

Powered 2 wheelers (motorcycles) made up 13 (59%) of the serious casualties and 21 (10%) of the slight casualties. Excluding PTWs, there were a very large number of motorised vehicle (mostly car) occupant reported injuries including 1 fatal, 9 serious and 180 slight injuries. It is likely that because of insurance reasons, slight injuries are reported to a higher degree than for walking or cycling. For instance, in comparison if walking and

cyclist slight injuries are under-reported by a factor of 10, there could be around 400 slight cyclist and 250 slight pedestrian casualties.

In terms of location for serious casualties, the bypass saw 8 serious, A41 5 serious, Launton Road 5 serious, other main roads 3 serious and residential 1 serious casualty. The Central Corridor, London Road, the A41 and the bypass were the locations for most slight casualties.

Annex 7. Cycle network data sources

Bicester cycle and walking network was identified using several methods:

- Consultation with Bicester BUG and local members
- Use of Propensity to Cycling Tool (PCT) to identify commuter cycle flows
- Strava heatmap for cycling (commuter and leisure)
- Public rights of way map
- Previous maps of the network

Every route was cycled and audited to ensure that it was viable and assess the need for improvements. The process was iterative. The final Bicester town cycle and walking network is set out below. The network has been designed in line with best practice being comprehensive, town-wide and dense (providing for every neighbourhood).

Census 2011 Total Commuter Flows between MSOAs

There are movements within Bicester being from the residential wards (South, West and North) to those wards containing the most employment opportunity (East and Town).

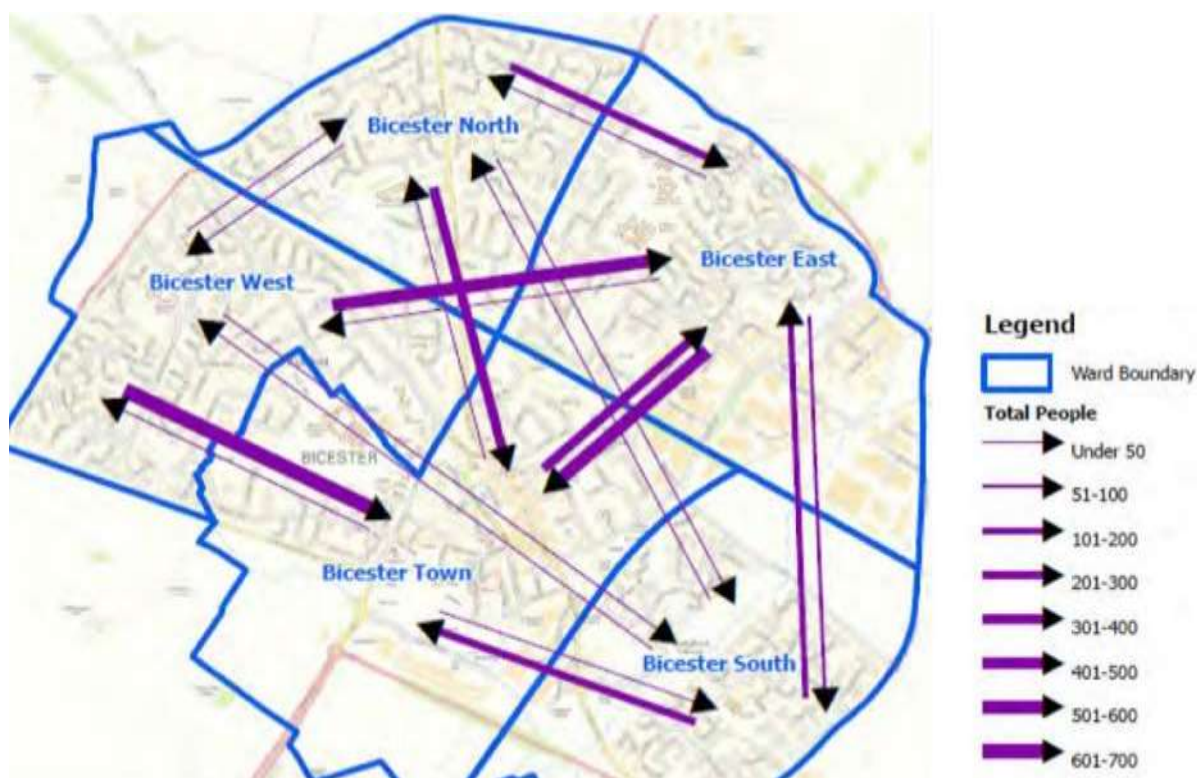


Figure 61. Commuter flows within Bicester
Source: LSOA Census data (2011).

LSOA data (as shown in the Propensity to Cycling Tool)

This data uses Census commuter movements from/to LSOA (lower super output areas) – areas of around 1500 households. The PCT then automatically assigns the flows to existing cycle paths and roads. The plan (for Dutch levels) is given below. The advantage of this dataset is that it is based on real cycle flows and is one of the best data sources.

There are also 3 downsides:

- The data only shows commuter journeys for 2011, so does not include journeys for other purposes or to sites built after 2011.
- Trips to the 2 train stations will not show up, as Census information shows only the longest stage of the journey.
- The PCT assigns cycling to routes and paths but the base map misses out some key cycling routes (for instance the path under the railway from Barry Avenue to Purslane Drive).

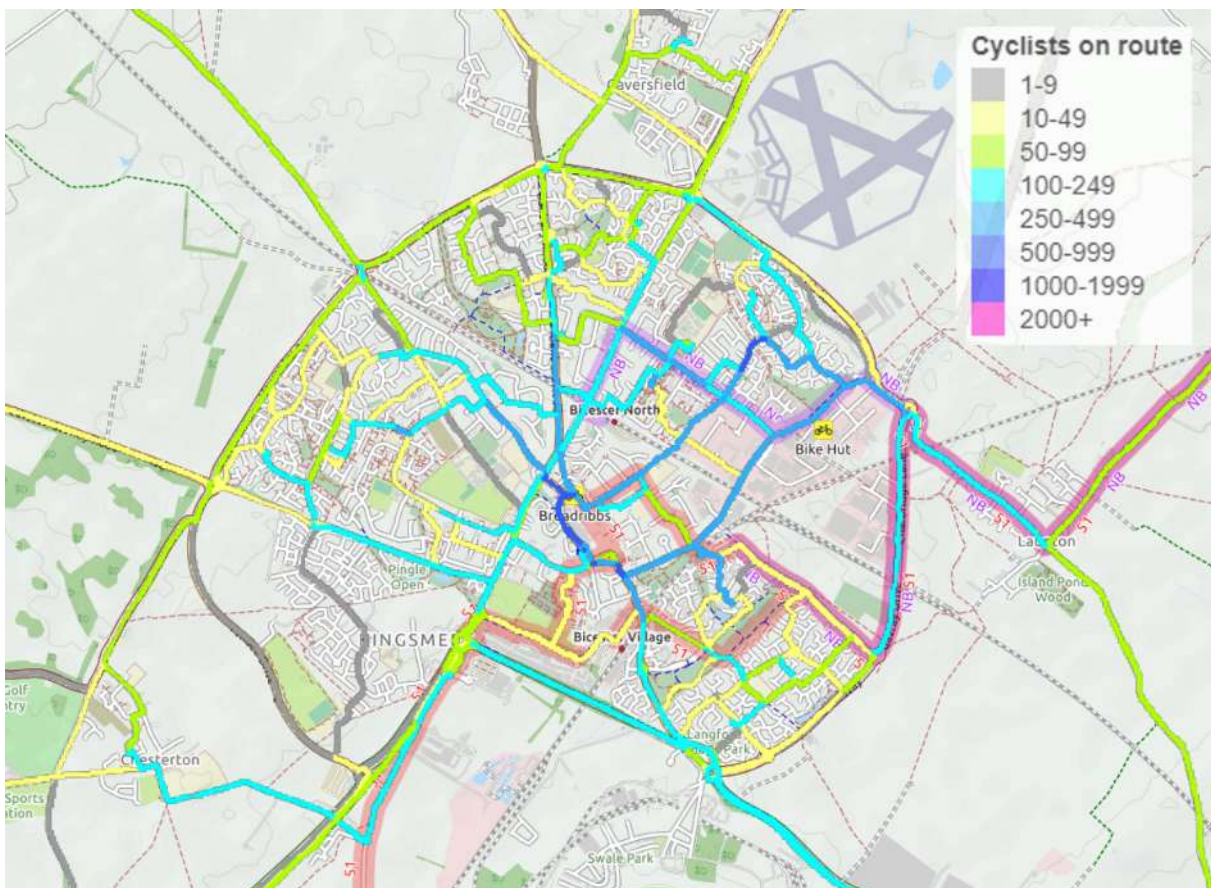


Figure 62. Potential cycling flows in Bicester
Showing LSOA data for Census 2011 from Propensity to Cycling Tool (Dutch levels of cycling).

Strava heatmap

Strava cycling heatmap is based on many actual cycle journeys by cyclists signed up to the Strava website, which tracks their journeys for fitness purposes. Because of this, the data over emphasises long distance fitness journeys, often along busy roads. For instance, note the heavy use of the A41 in the map below, which is not a road that would be attractive to many cyclists or alternatively the velodrome in Kingsmere. However, as it also tracks the journey all the way from/to home, it picks up the routes used by cyclists in the urban area to get to these sportive rides, and thereby gives a fine grain view of the cycle routes within the urban area.



Figure 63. Strava heatmap for commuter and leisure cycling in Bicester (2018-2020)

Sustrans Route 51 through Bicester

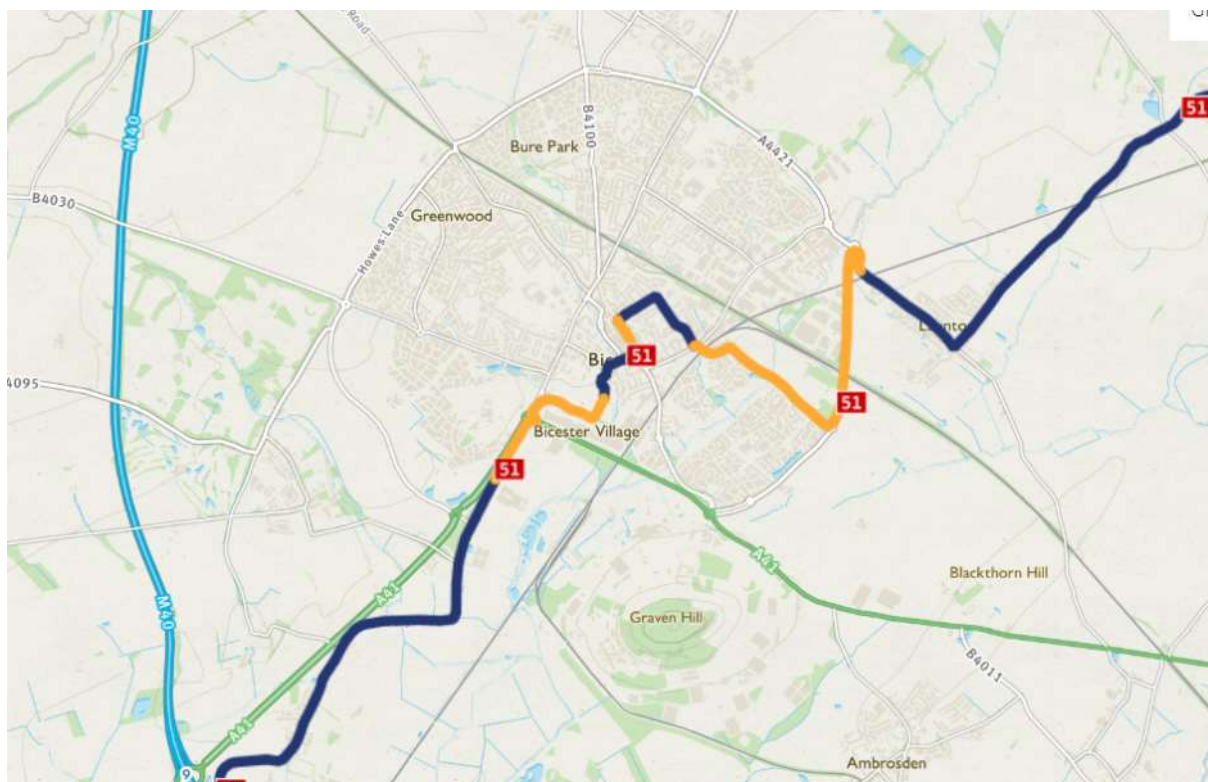


Figure 64. Sustrans Route 51 route

Public Rights of Way

Public rights of way are shown as purple dashes in the map below.

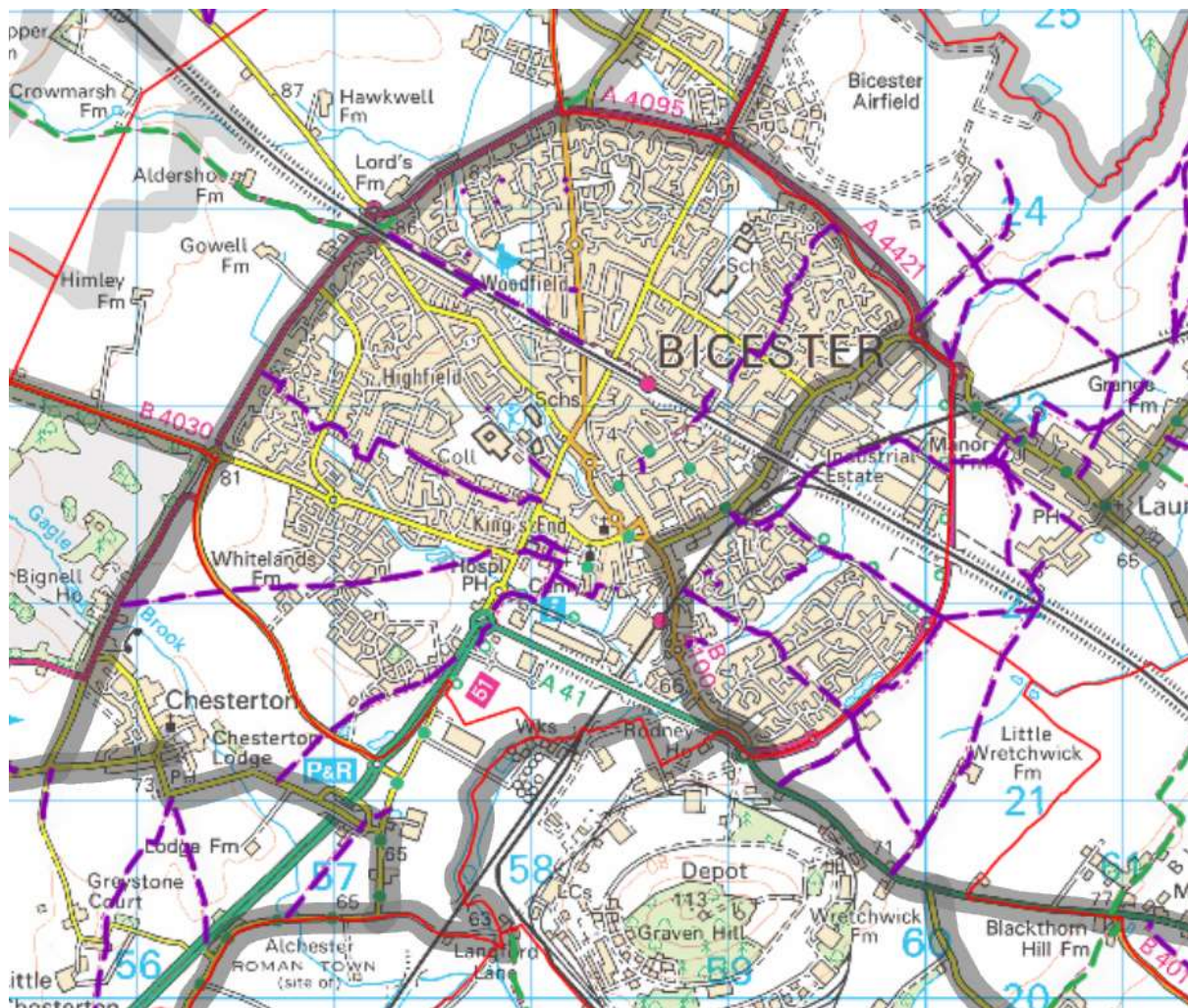


Figure 65. Public rights of way map
Source: Oxfordshire County Council.

Other cycle maps

There have been several cycle maps produced for Bicester before. The LCWIP map has been checked against these maps in case of any significant discrepancies or omissions.

- Primary existing cycle facilities (OCC 15/11/2014)
- Primary and secondary walking and cycling network (BSTS 2015 figure 10.2)
- Bicester cycle network proposal (BGTM 2016)

A number of cycle maps of Bicester have been published by Cherwell District Council (Bronze, Silver, Gold, Langford and Oxygen routes). These recreational routes are based on existing cycle paths, but some cases include footways as part of cycle routes.

Annex 8. Bicester LCWIP cycle network

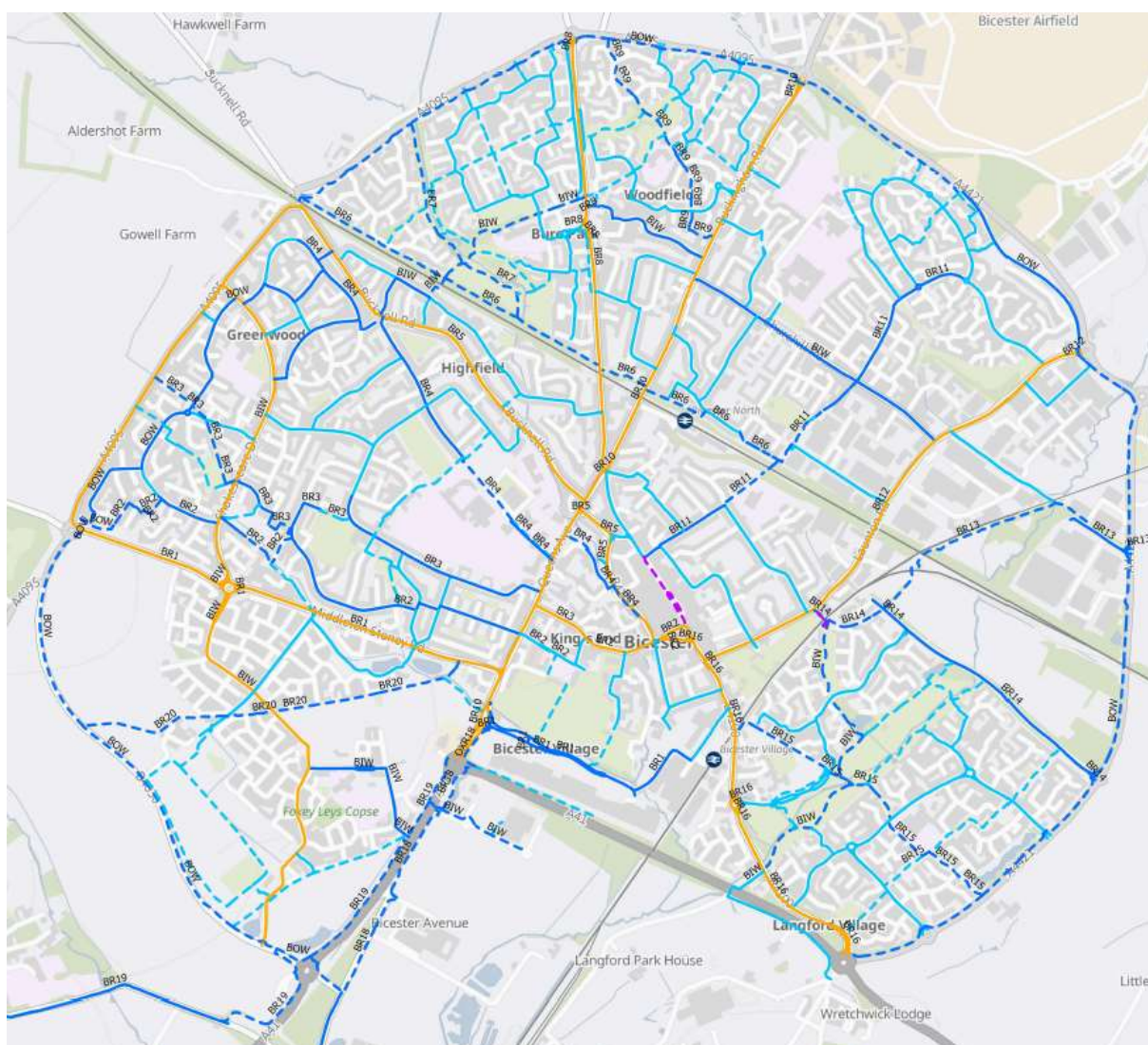


Figure 66. Bicester cycle and walking network LCWIP 2020

In several areas of Bicester, there are a very large number of existing cycle paths and connecting residential roads. In these areas, the challenge has been identifying which paths to include and which to ignore, in order to connect them together to make longer cycle routes. On the other hand, Bicester is divided by the 2 railway lines which sever areas and focus routes onto a small number of tunnels or along the main roads that cross the railways. The ring road usefully has parallel cycle paths except for 2 stretches – the A41 and Howes Lane.

Generally, routes to the town centre at some point have to use or cross one of the 4 main urban roads in Bicester – the central corridor (B4100 consisting of Kings End, Queens

Avenue and Buckingham Road), Launton Road, London Road or Churchill Road. These 4 roads are narrow and busy and only Churchill Road has an adequate parallel cycle track.

To the south, the very busy dual carriageway of the A41 presents a considerable barrier to safe and comfortable cycling, with inadequate and inconvenient crossings and a lack of continuous cycle path to the west of the road. This is particularly significant as it severs Bicester residents off from the only large superstore in the town (Tesco), which is only really accessible by car except to determined cyclists. Equally access to the 2 train stations is difficult from several directions, with cyclists needing to use the Central Corridor to get to Bicester North station and London Road to get to Bicester Village station. The main gaps in the network are related to the “last mile” when accessing key destinations, particularly the town centre and Launton Road employment.

Oxford Cyclist Survey 2019

This internet survey hosted on Oxfordshire County Council website allowed cyclists to locate problem areas on a map (Figure 67). This allows the Council to highlight improvements in the LCWIP schemes focused on what cyclists themselves perceive as the main issues. It is obvious from the plan that the main issue is along the Central Corridor.

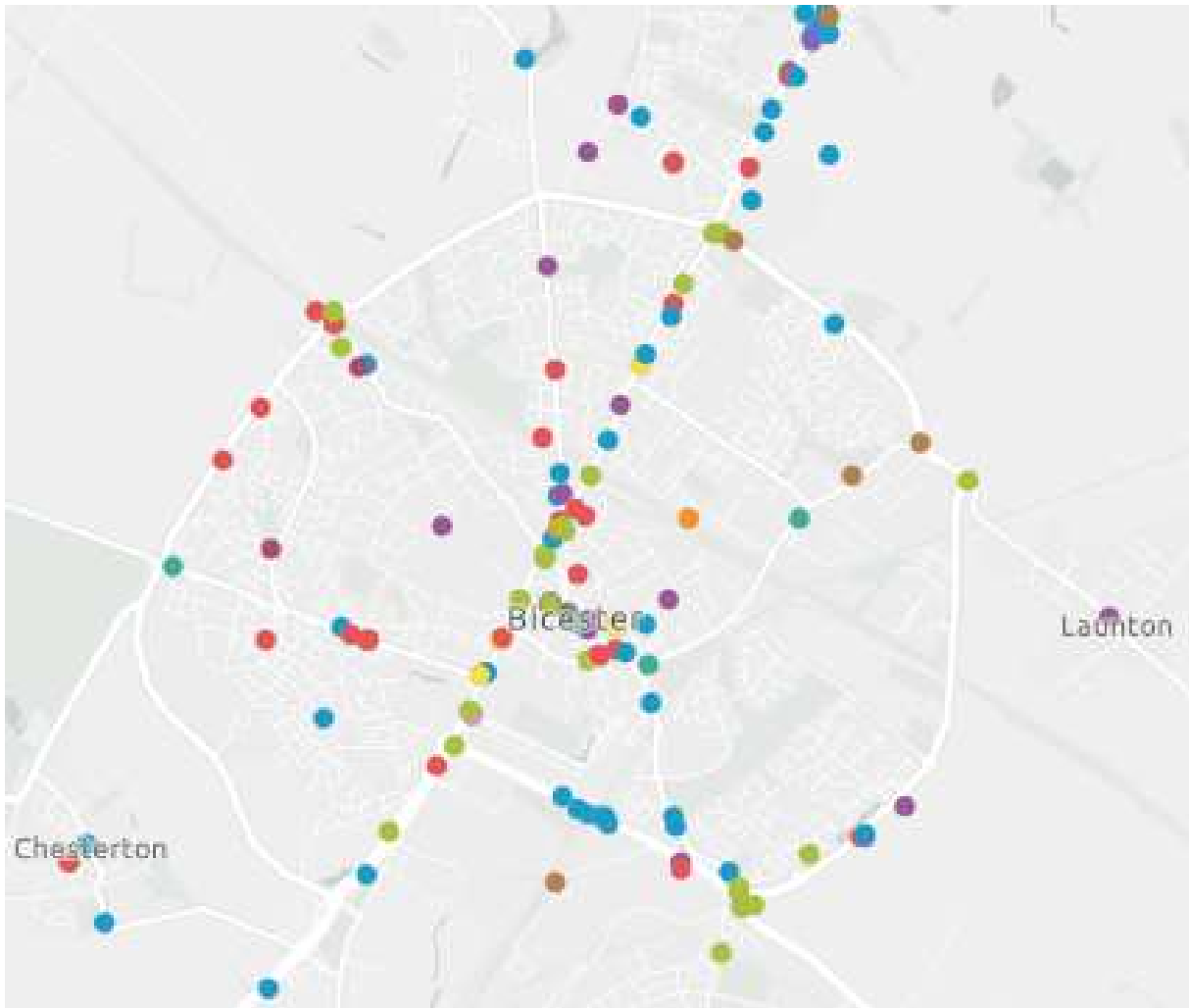


Figure 67. Location of problem areas for cyclists in Oxfordshire Cycle Survey 2019

Annex 9. New development and new cycle routes

The planned new development of Bicester will have a major impact on the flows of people in Bicester. Retail space will increase from 35,000 m² to 45,000 m² with an increase of car parking from 1160 to 1250 spaces (Baxter 2015).

Figure 68 and Table 6 show the major new developments and their approximate size in term of new jobs and new households. There will be roughly 20,000 new jobs and 10,000 new households increasing the population from around 30,000 to 55,000.

There are no plans or possibility of increasing the traffic capacity of the existing roads within Bicester. The only traffic capacity plans are to increase the capacity of the Eastern bypass, which will in part be balanced by a downgrading of the western bypass through the Bicester NW site. Even these capacity increasing plans are dependent on sufficient funding which at this moment has not been secured.

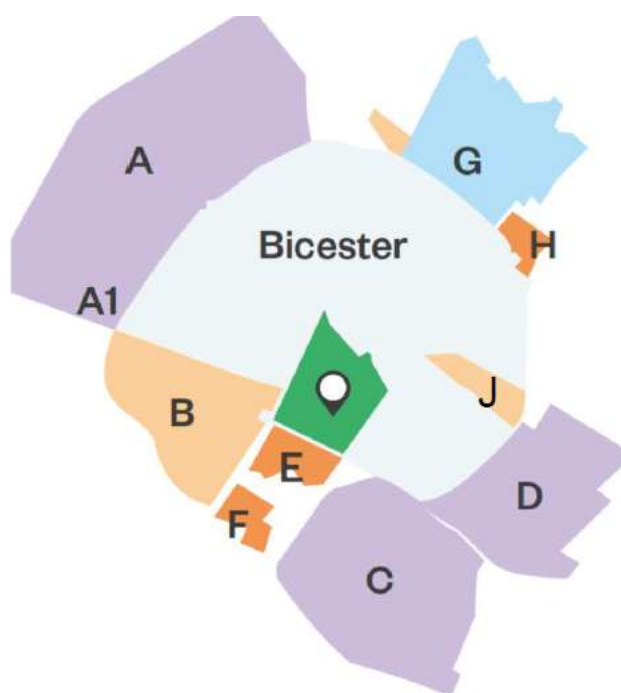


Figure 68. Plan showing major new development sites in Bicester
Source: Bicester Masterplan wyg 2012.

Table 6. Indicative summary of planned development in Bicester

Site	Type	Employ (jobs)	Area (ha)	House units	Area (ha)
A NW Bicester	Mixed use	3366	25.5	5000	321
B Kingsmere	Housing & schools	792	6.0	2235	61
C Graven Hill	Mixed use	1486	26.0	1900	10.5
D Wretchwick Green	Mixed use	3241	24.5	315	10.5
E Office Park	Business	3850	17.5	0	0
F Gateway	Business & hotel	990	7.5	0	0
G Bicester Heritage	Tourism & business	3268	24.8	0	0
H Link 9	Distribution	2244	17.0	0	0
J East Bicester	Housing	0	0.0	500	12.5
<i>Total</i>		<i>19,237</i>	<i>148.8</i>	<i>10,300</i>	<i>470</i>

NW Bicester Masterplan has its goal “a network of new pedestrian and cycle routes will connect to the existing network to create a holistic movement strategy, providing easy, safe and fast access to the railway stations, the town centre and to Bicester Village and Kingsmere”. “Direct routes will act as commuting routes to allow direct and fast access to key local employment areas, schools, local centres and hubs”. The plan includes cycle routes across the railway line within the development. “Pedestrian and cycle access will be provided where the Bure currently crosses underneath the railway”. It also envisages a green leisure loop for cyclists and pedestrians with a 2 m wide walking lane and parallel 3 m wide leisure cycling route.

The commuter primary cycle connections to the development are listed as:

- Middleton Stoney Road (BCR 1)
- Bucknell Road (BCR 5)
- Cycle path alongside Banbury Road (BCR 8)
- A4095 cycle path (Outer ring)

Secondary cycle connections are listed as:

- Shakespeare Drive (Inner ring)
- Routes through Bure Park (BCR 7)
- Lucerne Avenue (connector to BCR 7)
- Dryden Avenue (Outer ring)
- Leach Rd (connector to BCR 3)

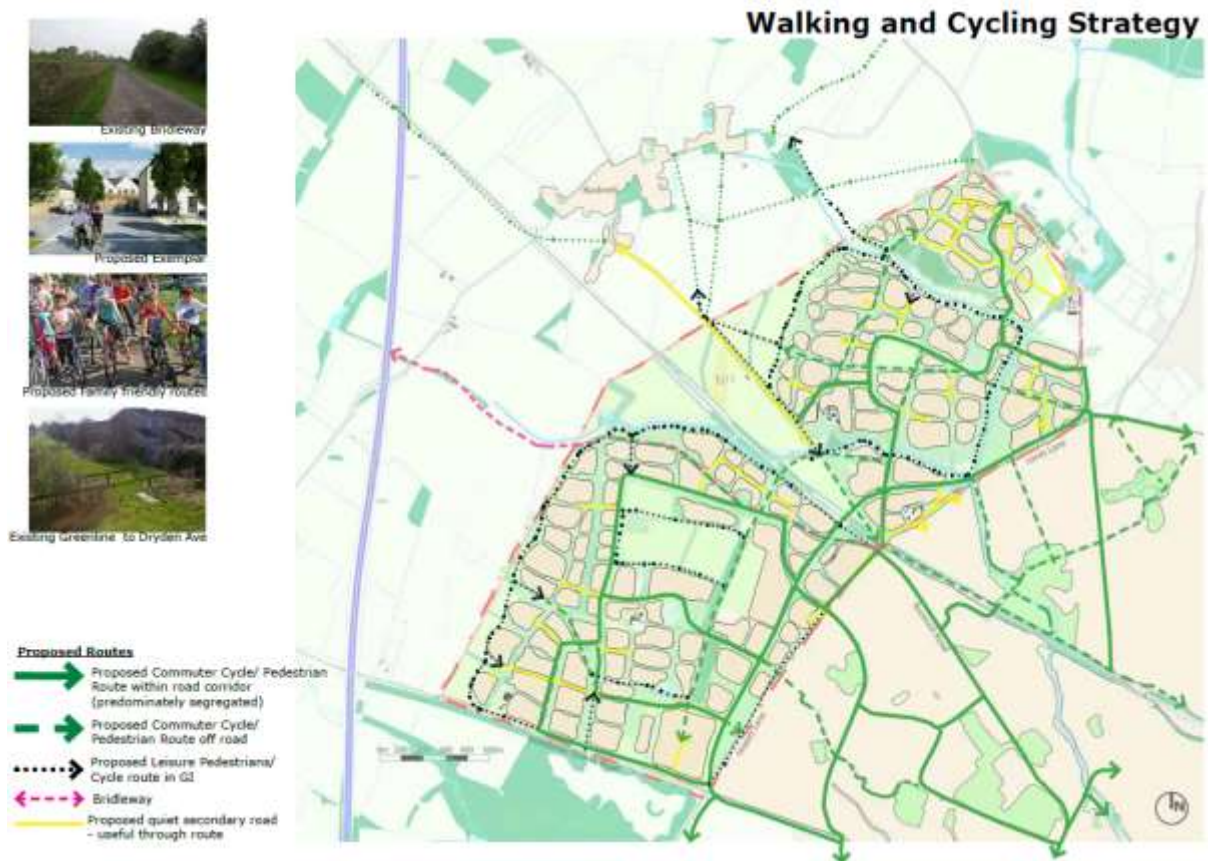


Figure 69. Plan of NW Bicester showing proposed walking and cycling routes
Source: NW Bicester Masterplan.

The northern bypass (Q1-OW)

In order for the development to link successfully with the rest of the town, permeability across the A4095 (Howes Lane) will be an important part of achieving a well-connected and integrated development. As such the nature of the road can be expected to change, with the potential for greater levels of frontage development on the northern side of the road, reduced speeds and at-grade crossings for pedestrians and cyclists. OCC Bicester Movement Study states that it may be appropriate to further discourage use of the route by through traffic or large numbers of heavier vehicles in order to strengthen the lower key, more local access nature of the road.

Upgrading BCR 7

One key development proposal is to upgrade the current public right of way running alongside the rail track from the junction of Howes Lane with Bucknell Road to a full pedestrian / cycle route, providing a direct link from the centre of the Eco-Bicester development to Bicester North Station and onwards to the Launton Road employment area. Currently the path is roughly surfaced with hardcore or unsurfaced and the path is overgrown and muddy in parts. This route would also feed into the current Toucan crossings on Banbury Road and Buckingham Road and connect with the southern end of the Banbury Road Express Way.

Annex 10. AQMA & The Central Corridor

An AQMA (Air Quality Management Area) was declared on 29 October 2014 for the full length of the Central Corridor south of the main roundabout (Figure 70). The NO₂ concentrations are largely related to road traffic emissions with cars contributing 50% of the pollution (of which diesel cars make up 42%) (AQAP 2017). The 2017 AQAP states that a 30% reduction in NO_x is required to meet air quality guidelines. The AQAP among other measures calls for an intensive travel campaign and infrastructure to promote walking and cycling (measure 4.4) – the only measure it accords a high impact on air pollution.

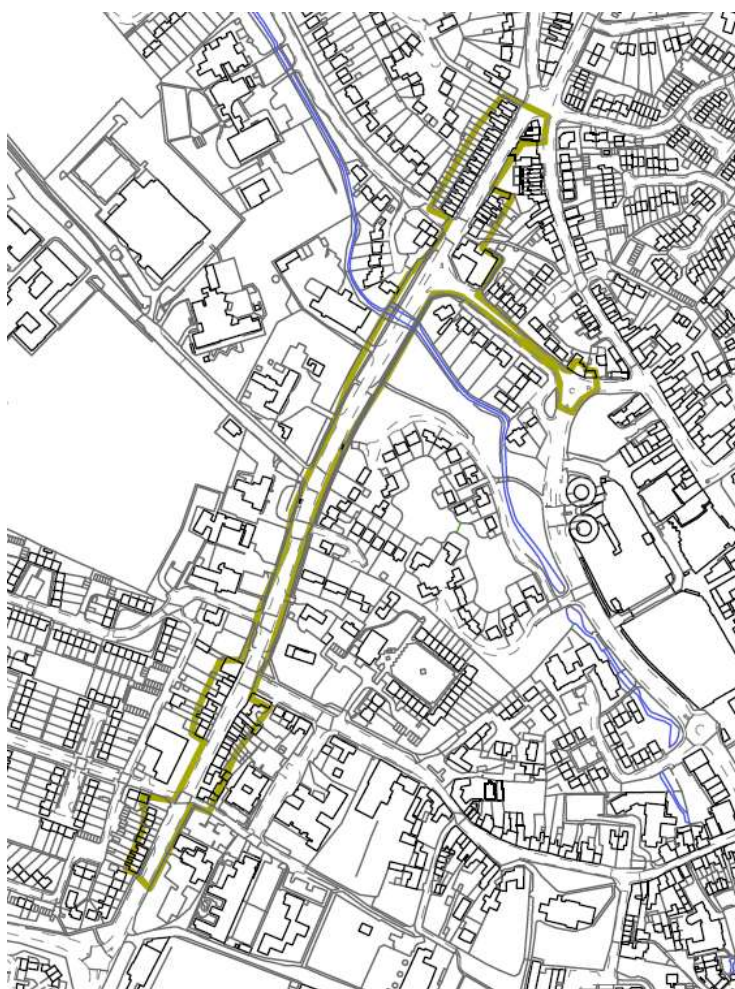


Figure 70. Plan showing limits of Air Quality Action Plan (AQAP)

Bicester Masterplan 2012 document sets out suggested key improvements to the south half, to “improve the environment on the central route through the town and provide a more pedestrian friendly area which encourages greater movements east – west”. The goal of the 2012 Movement Strategy for the town was to provide a balanced solution to

this area, one which allows for necessary journeys (for example trips to and from the town centre itself) to be undertaken easily, whilst discouraging unnecessary through traffic. Speed control measures located approximately 60 - 80m apart can help to maintain traffic speeds of 20mph. The schemes proposed are intended to be mutually supportive, with the enhanced east-west links and a related increase in activity across the central corridor supporting reduced speeds between Queens Avenue and the North Street roundabout without requiring formal traffic calming measures or features.

Potential improvement works to the central corridor include:

- Changes to the Queens Avenue junction with the Community College junction to remove delays associated with queuing traffic and provide a better pedestrian environment
- Improvements to the 5-arm junction at the northern end of Field Street

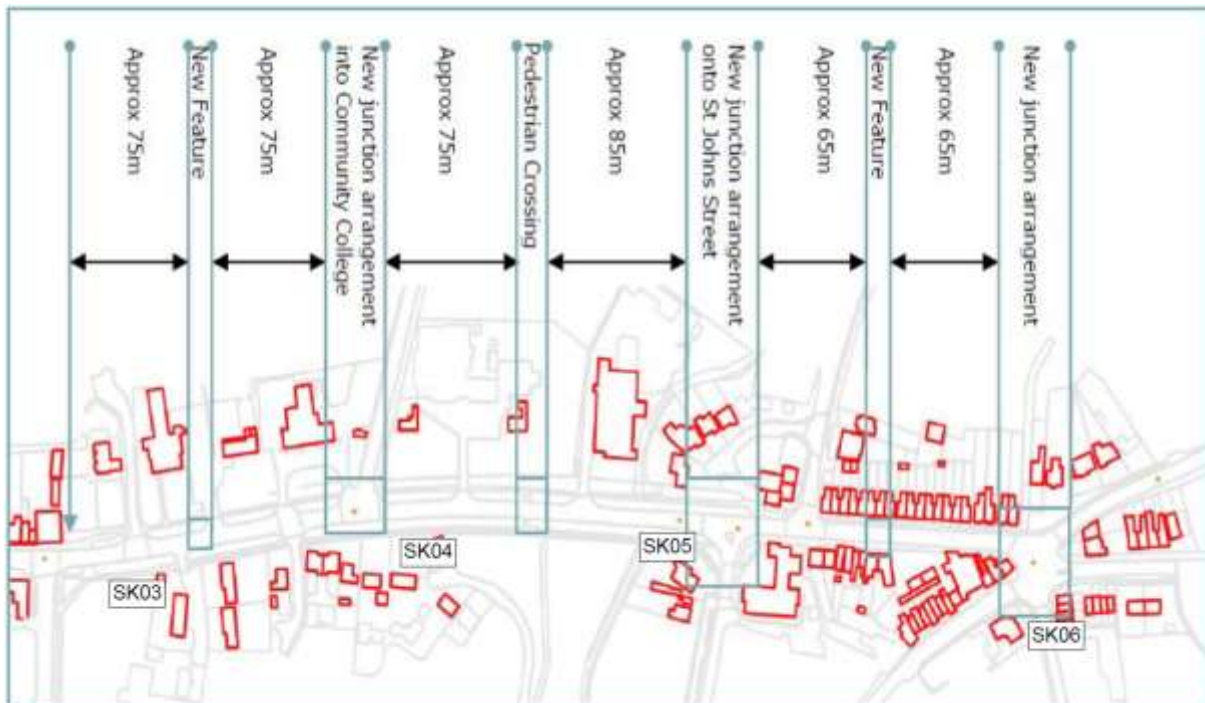


Figure 71. Proposals for Central Corridor in Bicester Masterplan
Source: Bicester Masterplan (2012)

Another set of plans were produced for the updated Bicester Garden Town Masterplan (Figure 72).



Figure 72. Proposals for Central Corridor in Bicester Garden Town Masterplan
Source: Bicester Garden Town Masterplan (2017).