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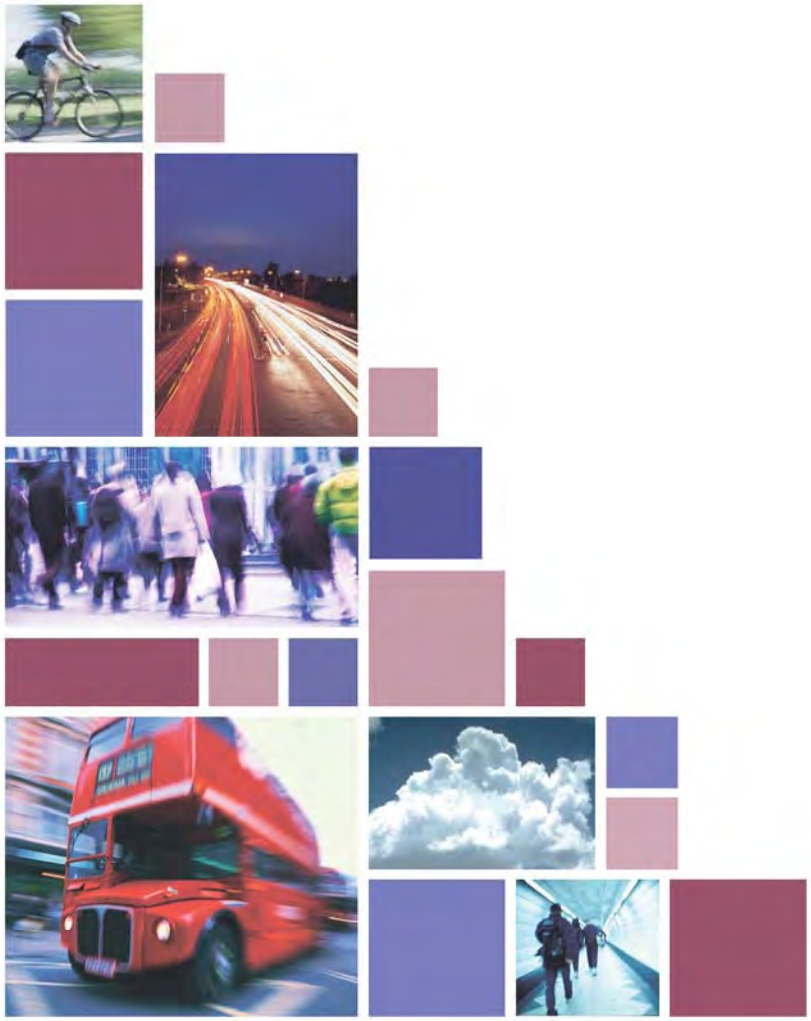
Land West of White Post Road, Banbury

Transport Assessment



Report Prepared for

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Transport Assessment

Land West of White Post Road, Banbury

Client: Gladman Developments Ltd

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Transport Assessment

Land West of White Post Road, Banbury

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1 Introduction

1.1 Ashley Helme Associates Limited (AHA) are appointed by Gladman Developments Ltd to prepare a Transport Assessment (TA) report to support the planning application for the residential development on land off White Post Road, Banbury (henceforth referred to as the Site). The local highway authority is Oxfordshire County Council (OCC). The location of the Site in the context of the local highway network is indicated on Figure 1.

1.2 The proposed development comprises the construction of up to 280 houses. The Site is presently vacant agricultural land.

1.3 The transport policy context for the proposed development is outlined in Chapter 2. The principles of the access strategy adopted for the proposed development are also discussed in Chapter 2, and this provides the means to achieve transport policy objectives. It is fundamental to the approach of the applicant, as represented in this TA, that a holistic view is taken of the consideration of access to the proposed development by all modes of transport.

1.4 The issues addressed within the TA fall broadly into the following areas:

- Accessibility by non-car modes, and
- The vehicular traffic impact on the operational performance of the local highway network, assessed quantitatively for the TA defined study network.

1.5 The local highway network is described in Chapter 3. The proposed Site access arrangements are outlined in Chapter 4.

1.6 The transport sustainability of the proposed development is a key issue, as set out in NPPF. Accessibility issues are identified in Chapter 2, and an accessibility appraisal of the Site by non-car modes is presented in Chapters 5 (Walk & Cycle) and 6 (Public Transport), using an accessibility mapping methodology.

1.7 A Travel Plan forms a key element of the development proposal and the principles of this are outlined in Chapter 7. A summary indication is included in Chapter 7 of the Action Plan for the Travel Plan. This includes measures that are to be implemented prior to first occupation of the development, as well as subsequent and ongoing measures/initiatives. A separate Travel Plan document is submitted as part of the planning application, and is complementary to the TA report.

1.8 The estimation of the development generated traffic and associated With Development traffic flows is presented in Chapter 8. Modelling of the impact of development traffic on the highway network is described in Chapter 9.

1.9 The application Site forms part of a wider allocation for residential development in the Council's Submission Local Plan, which is currently awaiting the outcome of its examination. The application site and other residential schemes along Bloxham Road are known collectively as the Banbury 17 sites. OCC highways officers have requested that the TA considers the traffic implications of the development proposal coming forward in conjunction with the other Banbury 17 residential sites. This is set out in Chapter 10.

1.10 The conclusions of the TA are presented in Chapter 11.

2 Policies & Principles of Access Strategy

2.1 A holistic approach is adopted for the desired access strategy. Due cognisance is taken of a range of relevant policy/guidance documents and considerations that represent national/local policies and good practice. These include:

- National Planning Policy Framework (NPPF), March 2012,
- Planning Practice Guidance (PPG), March 2014,
- Emerging Cherwell Local Plan 2011-2031,
- Cherwell Local Plan, 1996,
- Oxfordshire Local Transport Plan 4 (2015-2031).

2.2 A general thrust of current national and local policies is to promote and deliver sustainable transport objectives, and this is a key factor in defining the access strategy for the proposed development.

2.3 There are a range of documents that provide advice and guidance identifying that the historic approach of adopting rigid highway design standards and considering this in isolation is not appropriate or desirable in today's world. This includes, for example, the Urban Design Compendium (UDC) and Manual for Streets (MfS) and the associated recent Manual for Streets 2 (MfS2).

2.4 **NPPF: CORE LAND-USE PLANNING PRINCIPLE**

The Government's commitment to sustainable development is emphasised in NPPF. In respect of transport related issues, this includes the core land-use planning principle to:

"actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable" (para 17).

The proposed development respects and reflects this NPPF transport sustainability related objective.

2.5 NPPF: PROMOTING SUSTAINABLE TRANSPORT

2.5.1 NPPF sets out that:

"Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel." (para 29)), and identifies that

"…local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport." (para 30).

2.5.2 NPPF further highlights that:

"Plans and decisions should take account of whether:

- *the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
- *safe and suitable access to the site can be achieved for all people; and*
- *improvements can be undertaken within the transport network that cost effectively limits the transport impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe."* (para 32)

2.5.3 National policy guidance is provided about the transport aspect of the location and design of developments:

"Therefore, developments should be located and designed where practical to

- *accommodate the efficient delivery of goods and supplies;*

- *give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;*
- *incorporate facilities for charging plug-in and other low emission vehicles; and*
- *consider the needs of people with disabilities by all modes of transport."* (para 35)

2.5.4 The development proposal reflects and respects as appropriate all of the above.

2.6 **PPG**

2.6.1 The Department for Communities and Local Government (DCLG) launched the new planning practice guidance (PPG) web-based resource on 6 March 2014. The PPG includes advice on when transport assessments and transport statements are required, and what they should contain.

2.6.2 The PPG states that:

"Travel Plans, Transport Assessments and Statements can positively contribute to:

- *encouraging sustainable travel;*
- *lessening traffic generation and its detrimental impacts;*
- *reducing carbon emissions and climate impacts;*
- *creating accessible, connected, inclusive communities;*
- *improving health outcomes and quality of life;*
- *improving road safety; and*
- *reducing the need for new development to increase existing road capacity or provide new roads."*

2.6.3 With respect to Transport Assessments and Statements, PPG sets out that:

''The key issues to consider at the start of preparing a Transport Assessment or Statement may include:

- *the planning context of the development proposal;*
- *appropriate study parameters (i.e. area, scope and duration of study);*
- *assessment of public transport capacity, walking/ cycling capacity and road network capacity;*
- *road trip generation and trip distribution methodologies and/ or assumptions about the development proposal;*
- *measures to promote sustainable travel;*
- *safety implications of development; and*
- *mitigation measures (where applicable) – including scope and implementation strategy.''*

2.6.4 With respect to Travel Plans, PPG sets out that:

''Travel Plans should set explicit outcomes rather than just identify processes to be followed (such as encouraging active travel or supporting the use of low emission vehicles). They should address all journeys resulting from a proposed development by anyone who may need to visit or stay and they should seek to fit in with wider strategies for transport in the area.

They should evaluate and consider:

- *benchmark travel data including trip generation databases;*
- *information concerning the nature of the proposed development and the forecast level of trips by all modes of transport likely to be associated with the development;*
- *relevant information about existing travel habits in the surrounding area;*
- *proposals to reduce the need for travel to and from the site via all modes of transport; and*
- *provision of improved public transport services.''*

2.7 EMERGING CHERWELL LOCAL PLAN 2011-2031

2.7.1 The emerging Cherwell Local Plan was submitted to the Secretary of State for Communities and Local Government for formal examination on January 2014. In June 2014 the Inspector suspended the examination to allow the Council to undertake

main modifications in relation to meeting its objectively assessed housing needs over the plan period. The Council has since undertaken modifications along with further public consultation and has re-submitted these to the Inspector in October 2014. The Inspector's Report on Examination of the modified submission has been published and council officers are considering the report. It is intended that it will be presented to Members at meeting of the Council on 20 July 2015 with a recommendation for adoption.

2.7.2 Relevant policies include the following:

- Draft Policy SLE4: Improved Transport and Connections

2.7.3 Draft Policy SLE 4 sets out the council's aim for improved transport and connections in Cherwell. The draft policy states:

"The Council will support the implementation of the proposals in the Movement Strategies and the Local Transport Plan to deliver key connections, to support modal shift and to support more sustainable locations for employment and housing growth. We will support key transport proposals including:

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

2.7.4 Para C.126 addresses the Council's strategy for Banbury and includes the following statement:

"Provide for new development in accessible locations which will provide good opportunities for improving and accessing public transport services, for delivering and using new cycleways, for travelling on foot and for minimising the impact on the highway network and traffic congestion."

2.8 CHERWELL LOCAL PLAN, 1996

2.8.1 The Cherwell Local Plan was adopted in November 1996. This document contains the most current adopted planning policies for Cherwell. There are a number of 'saved' transportation policies from the Cherwell Local Plan.

2.8.2 Saved policy TR1 sets out the Council's position with regard to accessibility to public transport for new developments. Policy TR1 states that:

"Before proposals for development are permitted the council will require to be satisfied that new highways, highway improvement works, traffic-management measures, additional public transport facilities or other transport measures that would be required as a consequence of allowing the development to proceed will be provided."

2.9 OXFORDSHIRE COUNTY COUNCIL LOCAL TRANSPORT PLAN 4

2.9.1 The Oxfordshire County Council (OCC) Local Transport Plan 4 (LTP4) was adopted in 2015. The OCC LTP4 covers the period 2015 to 2031.

2.9.2 The OCC LTP4 identifies a series of improvements to address the existing transport issues in Banbury, and to manage the increased travel demand that will be generated by development in the town. The Strategy will:

*"**Deliver infrastructure improvements** to increase the overall capacity of the local transport networks whilst also supporting sustainable travel.*

***Facilitate and promote sustainable travel** for trips to, in and around Banbury, including use of the bus, walking and cycling. A step-change in the increased use of sustainable transport modes is essential to support growth in Banbury. The Sustainable Transport element of the Strategy will play a key role in reducing the volume of traffic associated with the town's significant growth and mitigating the traffic impacts on local roads serving Banbury."*

2.9.3 The Banbury Area Strategy of the OCC LTP4 sets out enhancements to the road network to support growth and economic vitality. With respect to the application Site, LTP4 states:

"**A361 Bloxham Road to A4260 Oxford Road Spine Road through the residential development South of Salt Way:** The co-ordinated approach to development to the south of Banbury as proposed in the Local Plan Modifications (August 2014), will enable provision of essential infrastructure including delivery of an east-west link from the A361 Bloxham Road to join White Post Road and the A4260 Oxford Road. This road will support operation of commercially viable bus services through the development, increasing accessibility and long term sustainability of the development. The spine road will be built by the developer."

2.9.4 BAN1 in the OCC LTP4 notes the council will seek improvements to support regeneration and growth. BAN1 refers to the link road connection, stating:

"We will seek opportunities to deliver transport schemes which will support the regeneration and growth of Banbury to 2031 and protect the historically sensitive areas of the town through:

- *Provision of A361 Bloxham Road to A4260 Oxford Road Spine Road."*

2.9.5 BAN2, BAN3 and BAN4 of the OCC LTP4 sets out the policies for promoting bus, rail, walk and cycle travel within Banbury.

2.9.6 Policy BAN5 states:

"Travel Plans, Delivery & Servicing Plans and Construction Logistics Plans will be secured for all new developments that meet OCC's thresholds. Travel Plan/ DSP monitoring contributions will be secured."

2.10 PRINCIPLES OF THE ACCESS STRATEGY

2.10.1 The access strategy for the development provides the means to achieve the identified policy objectives by optimising the opportunity for access to/from the Site by non-car modes. This is in accordance with all local, regional and national policies.

2.10.2 The accessibility of the Site for those travelling on foot and by cycle is reviewed in Chapter 5. The current accessibility of the Site by public transport is outlined in Chapter 6 herein. The proposed development takes account of the needs of the mobility impaired.

2.10.3 The access strategy for the development is cohesive, reflecting the need to appropriately consider and enable provision for the movement of people and goods. This includes considering, inter alia:

- Permeability of the Site from/connection to the surrounding locality, for all modes of transport, motorised and non-motorised, reflecting the principles and good practice set out in the national guidance in Manual for Streets (MfS & MfS2),

- Access/routing: for the external linkage to the Site. The corresponding internal access/routing details are to be addressed by Reserved Matters application(s).

2.11 SUMMARY

In summary, the development proposal respects and promotes the principles of transport sustainability, and is consistent with national, regional and local transport policy objectives.

3 Highway Network

3.1 The location of the Site is indicated on Figure 1 in the context of the local highway network.

3.2 The Site has frontage on White Post Road, which is public highway.

3.3 **Study Network**

3.3.1 Figure 2 identifies the TA network of study junctions, comprising:

REF	JUNCTION	CONTROL
SJ1	Site Access/White Post Road	refer Chapter 4
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	roundabout
SJ2A	Oxford Road/Northbound Slips	priority
SJ3	Oxford Road On & Off Slips/Bankside	priority/r'bout
SJ3A	Oxford Road/Southbound Slips	priority
SJ4	Broad Gap/Oxford Road/Canal Road	priority
SJ5	Weeping Cross/Oxford Road	traffic signals
SJ6	Broad Gap/High Street	priority
SJ7	Wykham Lane/White Post Road/High Street	priority
SJ8	Hightown Road/Oxford Road/Horton View	traffic signals
SJ9	Upper Windsor Street/Oxford Road	traffic signals
SJ10	Bloxham Road/South Bar Street/Oxford Road	traffic signals
SJ11	High Street/South Bar Street/ West Bar Street/Horse Fair	roundabout
SJ12	Castle Street/North Bar Street/Warwick Road/Southam Road	traffic signals
SJ13	Swan Close Road/Upper Windsor Street	traffic signals
SJ14	Bridge Street/Windsor Street/Cherwell Street	traffic signals
SJ15	Cherwell Street/Hennef Way	roundabout
SJ16	Farmfield Road/Oxford Road	traffic signals
SJ17	Bankside/Swan Close/Lamb's Crescent	priority/signals
SJ18	Concorde Avenue/Cherwell Drive	roundabout.

3.3.2 The local highway authority Oxfordshire County Council (OCC) is responsible for TA study junctions SJ1-SJ18.

3.4 Existing Junction Layout Drawings

The layout of the study junctions are presented on the following drawings:

REF	JUNCTION	DRAWING
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	1361/02
SJ2A	Oxford Road/Northbound Slips	1361/03
SJ3	Oxford Road On & Off Slips/Bankside	1361/04
SJ3A	Oxford Road/Southbound Slips	1361/05
SJ4	Broad Gap/Oxford Road/Canal Lane	1361/14
SJ5	Weeping Cross/Oxford Road	1361/15
SJ6	Broad Gap/High Street	1361/16
SJ7	Wykham Lane/White Post Road/High Street	1361/16
SJ8	Hightown Road/Oxford Road/Horton View	Buchanan Fig 54
SJ9	Upper Windsor Street/Oxford Road	Buchanan Fig 53
SJ10	Bloxham Road/South Bar Street/Oxford Road	1361/07
SJ11	High Street/South Bar Street/ West Bar Street/Horse Fair	1361/08
SJ12	Castle Street/North Bar Street/Warwick Road/Southam Road	1361/09
SJ13	Swan Close Road/Upper Windsor Street	1361/18
SJ14	Bridge Street/Windsor Street/Cherwell Street	1361/19
SJ15	Cherwell Street/Hennef Way	1361/20
SJ16	Farmfield Road/Oxford Road	Buchanan Fig 54
SJ17	Bankside/Swan Close/Lamb's Crescent	Buchanan Fig 52.

3.5 White Post Road

3.5.1 White Post Road forms the eastern boundary of the Site. White Post Road is a single carriageway road with footway on both sides. The footway is separated from the carriageway by grass verge. Along the Site frontage, White Post Road is 7.3m wide and is subject to a 30mph speed limit. Street lighting is present and there is an absence of waiting restrictions.

3.5.2 White Post Road provides access to Bishop Loveday C of E Primary School, opposite the Site. It also provides access to Cherwell District Council offices and a playing field, in the vicinity of the Site, and to Banbury Cricket Club, through the Site. There is a pelican crossing on White Post Road at the southern end of the Site frontage. White Post Road provides access to Bodicote village to the south of the Site

3.6 **SJ1: Site Access/White Post Road**

The proposed Site Access/White Post Road junction is described in Chapter 4.

3.7 **SJ2: Bankside/Oxford Road Northbound Slips/White Post Road/Sycamore Drive**

3.7.1 White Post Road forms a four arm roundabout junction with Sycamore Drive, Bankside, and the Oxford Road Northbound Slips.

3.7.2 The existing SJ2 junction arrangements are presented on Drg No 1361/02.

3.7.3 The Oxford Road Northbound Slips (on and off) are referred to as SJ2A. The slips comprise a simple taper diverge and a simple taper merge. Give way markings have been added to the taper merge, which has the effect of turning the merge into a priority controlled junction. There are cycle lanes marked on both sides of Oxford Road in the vicinity of SJ2A. The existing layout of SJ2A is shown on Drg 1361/03.

3.8 **SJ3: Oxford Road Southbound Slips/Bankside**

3.8.1 To the east of SJ2, Bankside forms a 'triangle' of priority controlled junctions with the Oxford Road Southbound Slips.

3.8.2 The existing SJ3 junction arrangements are presented on Drg No 1361/04.

3.8.3 Planning permission has been granted for a mixed use development to the south of Bankside, comprising 1070 dwellings, employment and leisure uses, and a primary school. As part of the permitted development, SJ3 will be converted to a 4-arm roundabout junction providing access to part of the permitted development Site. The proposed roundabout arrangements are presented on Colin Buchanan Figure 59, Appendix F.

3.8.4 The Oxford Road Southbound Slips (on and off) are referred to as SJ3A. The slips comprise a simple taper diverge and a simple taper merge. Give way markings have been added to the taper merge, which has the effect of turning the merge into a

priority controlled junction. There are cycle lanes marked on both sides of Oxford Road in the vicinity of SJ3A. The existing layout of SJ3A is shown on Drg 1361/05.

3.9 **SJ4: Broad Gap/Oxford Road/Canal Lane**

3.9.1 SJ4 is the priority controlled junction of Broad Gap and Oxford Road. Broad Gap forms the minor arm of the junction.

3.9.2 The existing SJ4 arrangements are presented on Drg No 1361/14.

3.10 **SJ5: Weeping Cross/Oxford Road**

3.10.1 To the south of SJ4, Oxford Road forms a traffic signal controlled staggered crossroads junction with Weeping Cross. The fourth arm is the recently introduced access to serve the College Fields residential scheme.

3.10.2 The Weeping Cross/Oxford Road junction includes assisted pedestrian crossings on all approaches. The existing SJ5 arrangements are presented on Drg No 1361/15.

3.11 **SJ6: Broad Gap/High Street**

3.11.1 SJ6 is the priority controlled junction of Broad Gap and High Street. Broad Gap forms the minor arm of the junction.

3.11.2 The existing SJ6 arrangements are presented on Drg No 1361/16.

3.12 **SJ7: Wykham Lane/White Post Road/High Street**

To the north of SJ6, High Street forms a priority controlled 'T' junction with Wykham Lane. This is SJ7 and the existing arrangements are presented on Drg No 1361/16.

3.13 **SJ8: Hightown Road/Oxford Road/Horton View**

3.13.1 SJ8 is the traffic signal controlled staggered crossroads junction of Oxford Road and Hightown Road/Horton View. The junction is to be improved as part of a package of works along the Oxford Road corridor to be implemented as part of the residential

scheme at College Fields (Bankside). The improved junction layout is shown on Buchanan Figure 54.

3.13.2 The improvement scheme will add a third approach lane to Oxford Road in the northbound direction, immediately to the south of Hightown Road. This will mean that there is a dedicated right turn lane (for movements into Hightown Road) and two straight ahead lanes. There are presently 2no lanes on Oxford Road for southbound movements and this will remain the case upon completion of the improvement scheme. Both Hightown Road and Horton View are marked with a single approach lane, which will remain unchanged.

13.3.3 There are assisted pedestrian crossings on Oxford Road, immediately to the north and south of Horton View. There are dropped kerbs and tactile paving which provide unassisted crossing on Hightown Road and Horton View. It is assumed that these features will be retained within the improved junction layout.

3.14 **SJ9: Upper Windsor Street/Oxford Road**

3.14.1 To the north of SJ8, Oxford Road forms a signal controlled T-junction with Upper Windsor Street. There is an assisted pedestrian crossing on the Upper Windsor Street arm of the junction, and dropped kerbs, tactile paving, and pedestrian refuges on the Oxford Road arms.

3.14.2 There is an uphill gradient on Oxford Road, from north to south, in the vicinity of SJ9. There are 'no stopping' restrictions on the Oxford Road (N) and Upper Windsor Street arms of the junction. There are waiting restrictions on all arms of the junction.

3.14.3 The junction is to be improved as part of a package of works along the Oxford Road corridor to be implemented as part of the residential scheme at College Fields (Bankside). The improved junction layout is shown on Buchanan Figure 53. The works include the conversion of the offside Oxford Road (S) lane from a dedicated right turn lane to a shared straight ahead/right turn lane. Other works comprise the introduction of pedestrian refuges on Oxford Road (S) and Upper Windsor Street.

3.15 **SJ10: Bloxham Road/South Bar Street/Oxford Road**

3.15.1 To the north of SJ9, Oxford Road forms a signal controlled T-Junction with Bloxham Road and South Bar Street. There are assisted pedestrian crossing facilities on the South Bar Street arm of the junction, and dropped kerbs, tactile paving and a pedestrian refuge on the Bloxham Road arm of the junction.

3.15.2 There is an uphill gradient towards the junction on the South Bar Street arm, and a downhill gradient towards the junction on the Oxford Road and Bloxham Road arms of the junction. There are waiting restrictions on all arms of the junction and guard rail is present.

3.15.3 The existing SJ10 junction arrangements are presented on Drg No 1361/07.

3.16 **SJ11: High Street/South Bar Street/West Bar Street/Horse Fair**

3.16.1 SJ11 is the roundabout junction at 'Banbury Cross' and is situated to the north of SJ9. There are assisted crossing facilities on all arms of the junction. These comprise zebra crossing facilities on the High Street, South Bar Street and West Bar Street arms, and a pelican crossing on the Horse Fair arm of the junction.

3.16.2 There is guard rail on all arms of the junction, and the Banbury Cross monument is situated in the central roundabout island.

3.16.3 The existing SJ11 junction arrangements are presented on Drg No 1361/08.

3.17 **SJ12: Castle Street/North Bar Street/Warwick Road/Southam Road**

3.17.1 To the north of SJ11 is the signalised crossroads junction of Southam Road, Castle Street, North Bar Street and Warwick Road.

3.17.2 There are assisted crossings and waiting restrictions on all arms of the junction. Guard rail is present on the Castle Street arm of the junction.

3.17.3 The existing SJ12 arrangements are shown on Drg No 1361/09.

3.18 **SJ13: Swan Close Road/Upper Windsor Street**

3.18.1 SJ13 is a 'T' junction operating under traffic signal control. All arms of the junction are located within a 30mph speed limit zone.

13.18.2 There are 2no approach lanes marked on each entry of the junction. The existing lane allocation is shown on Drg No 1361/18. The junction includes pedestrian crossings on Upper Windsor Street (S), which are assisted (ie with push button) and Swan Close Road, which are unassisted.

3.19 **SJ14: Bridge Street/Windsor Street/Cherwell Street**

3.19.1 To the north of SJ13, Windsor Street forms a traffic signal controlled crossroads junction with Bridge Street. The Windsor Street/Cherwell Street approaches are both marked with 3no lanes, comprising:

- Nearside: left turn,
- Middle: straight ahead, and
- Offside: right turn.

3.19.2 Bridge Street (W) is marked with a single approach lane. Bridge Street (E) has 2no lanes.

3.19.3 There are assisted (ie with push button) pedestrian crossings on all approaches with the exception of Bridge Street (W). On this arm, assistance is provided in the form of an island and dropped kerbs/tactile paving.

3.19.4 The existing SJ13 arrangements are presented on Drg No 1361/19.

3.20 **SJ15: Cherwell Street/Hennef Way**

To the north of SJ13, Cherwell Street forms a roundabout junction with Hennef Way. The existing SJ15 roundabout arrangements are presented on Drg No 1361/20.

3.21 **SJ16: Farmfield Road/Oxford Road**

3.21.1 To the south of SJ8, Oxford Road forms a signal controlled crossroads junction with Farmfield Road. The eastern arm of the junction provides access to a Sainsbury's foodstore. This is SJ16.

3.21.2 There are presently assisted pedestrian crossings on the Oxford Road and Sainsbury's approaches to the junction. It is assumed that these will be retained within the improved junction layout.

3.21.3 The junction is to be improved as part of a package of works along the Oxford Road corridor to be implemented as part of the residential scheme at College Fields (Bankside). The improved junction layout is shown on Buchanan Figure 54. The works include the conversion of the offside Oxford Road (S) lane from a dedicated right turn lane to a shared straight ahead/right turn lane. Other works comprise the conversion of the Oxford Road (N) nearside lane from a dedicated left turn lane (to Sainsburys) to a shared straight ahead/left turn lane. Oxford Road is to be widened to provide two lanes in a northbound direction from Farmfield Road to Hightown Road.

3.22 **SJ17: Bankside/Swan Close/Lamb's Crescent**

At the time of preparing this TA report, SJ17 operates under priority control. However, the junction is to be improved as part of a package of works to be implemented as part of the residential scheme at College Fields (Bankside). The improved junction layout is shown on Buchanan Figure 52. The works include the introduction of traffic signal control at the junction. All four approaches are to be marked with a single lane. There are unassisted pedestrian crossings on Swan Close (N) and Bankside.

3.23 **SJ18: Concorde Avenue/Cherwell Drive**

SJ18 is a roundabout junction located to the north of SJ14. The roundabout has three approach arms and all are marked with multiple entry lanes at the junction. There is a dedicated left filter lane from Cherwell Drive to Concorde Avenue (N).

3.24 **ACCIDENT HISTORY**

3.24.1 The three year accident records for the highway network in the vicinity of the Site and the TA study network are purchased from OCC. AHA requested records for the most recent three year period available at the time of purchase. The data provided by OCC cover the periods:

- SJ1-SJ15: 1 January 2012 to 31 April 2015, and
- SJ16-SJ18: 1 January 2012 to 30 September 2015.

The OCC accident records are presented in Appendix A.

3.24.2 A summary of the recorded accidents over the TA study network area is:

TA STUDY JUNCTION	**2012**	**2013**	**2014**	**2015**	**TOTAL**
White Post Road (near Site)	-	-	-	1	1
SJ2	1	-	-	-	1
SJ2A	-	-	-	-	0
SJ3	-	-	-	-	0
SJ3A	-	-	-	-	0
SJ4	-	1	-	-	1
SJ5	1	1	-	-	2
SJ6	-	-	-	-	0
SJ7	-	-	-	-	0
SJ8	-	2	-	1	3
SJ9	1	-	1	-	2
SJ10	2	1	1	-	4
SJ11	2	3	2	-	7
SJ12	-	-	1	-	1
SJ13	-	-	1	-	1
SJ14	2	1	3	-	6
SJ15	2	4	2	4	12
SJ16	2	2	-	-	4
SJ17	-	-	1	2	3
SJ18	-	-	1	1	2
Total	**13**	**15**	**13**	**9**	**50**

3.24.3 At 15 of the study locations there are 3 or fewer recorded accidents. The junctions with the highest number of recorded accidents are SJ11, SJ14 and SJ15.

3.24.4 It is relevant to consider the level of development generated traffic that is predicted to be added to SJ11, SJ14 and SJ15.

REF	2025 BASE (pcu)		GENERATED TRAFFIC (pcu)		IMPACT (%)	
	AM	PM	AM	PM	AM	PM
SJ11	2527	2705	41	44	1.6	1.6
SJ14	3185	3269	62	70	1.9	2.1
SJ15	5807	5714	49	54	0.8	0.9

In all cases the proposed development is estimated to generate only about a 2.0% or less increase in traffic. Consequently, it is highly unlikely that the proposed development will materially alter the occurrence of accidents at the junctions.

3.24.5 **Summary**

It is concluded that the proposed development has **no** material impact on the occurrence of accidents on the study network, subject to the development access arrangements according with usual design standards.

4 Proposed Site Access Arrangements

4.1 A holistic approach to the Site access arrangements is at the core of the development Site access strategy. Thus, there is a cohesive 'package' of development access arrangements for differing modes of travel. Further information about walk and cycle modes is presented in Chapter 5, and about public transport in Chapter 6.

4.2 The proposed access strategy for the Site is:

- Vehicles: Single access on White Post Road,
- Pedestrians/cycles: Access on White Post Road, Salt Way and Wykham Lane.

4.3 The proposed vehicular access arrangements are shown on Drg No 1361/22/C. This shows the realignment of White Post Road to form the Site access road. The residual, southern, section of White Post Road is to form the minor arm of the junction.

4.4 The Site access geometry comprises:

- 6.75m wide Site access road,
- 3.0m wide shared footway/cycle way on the north side of the access
- 2.0 wide footway on the south side of the footway.

4.5 The proposed junction arrangements have been subject to a Stage 1 Road Safety Audit.

4.6 **PARKING SURVEY**

4.6.1 The application Site is located opposite to Bishop Loveday CE Primary School. A parking survey was undertaken on White Post Road to determine the existing on Street parking demand on White Post Road in the vicinity of the proposed Site access. A parking survey was undertaken on 25 September 2013 at the following times:

- 0800 – 0930,

- 1445 – 1545.

The survey periods include the drop-off and pick-up times for the primary school.

4.6.2 The survey area comprises:

- White Post Road between the Sycamore Drive/Bankside roundabout junction (SJ2) and Broad Gap,
- Sycamore Drive between SJ2 and Willow Road.

4.6.3 The survey area is divided into 12 zones, labeled A-L, as shown on Drg 1361/PS/1, Appendix E.

4.6.4 The number of vehicles parked in each zone is recorded at 5 minute intervals. The results of the parking survey are presented in Table 1361/PS/1, Appendix E.

4.6.5 Review of Table 1361/PS/1 confirms that the peak morning parking accumulation occurred during the period 0850-0855. Drg 1361/PS/1, Appendix E, provides a visual summary of the parked vehicles for this period. It is clear that the section of White Post Road in the vicinity of the proposed Site access, (referred to as Zones C & J) is heavily parked on both sides of the road.

4.6.6 Review of Table 1361/PS/1 confirms the peak afternoon parking accumulation occurred during the period 1515-1520. Drg 1361/PS/2, Appendix E, provides a visual summary of the parked vehicles for this period. Zones C & J are heavily parked on both sides of the road, albeit to a lesser extent than in the morning worst case scenario.

4.6.7 Consequently, it is proposed that waiting restrictions are introduced in the vicinity of the proposed Site access to ensure that parked vehicles have no detrimental impact on the operation of the proposed Site access junction. It is also proposed that car parking is provided within the Site to accommodate parking displaced by the proposed waiting restrictions. The proposed parking improvements are presented on AHA Drg 1361/22/C.

4.7 INTERNAL ROADS

4.7.1 The internal road layout for the outline application is to be the subject of reserved matters application(s). However, it is acknowledged that there is an aspiration to provide a 'link road' between Bloxham Road and White Post Road that is aimed primarily at providing access to development that will come forward within the Banbury 17 allocation area. Consequently, the applicant proposes to provide a road through the application Site between White Post Road and the western boundary of the Site comprising the following geometric standards:

- 6.75m wide carriageway,
- 3.0m wide shared footway/cycle way on the north side of the road
- 2.0 wide footway on the south side of the road.

4.7.2 The applicant has been liaising with the promoters of the Wykham Park Farm development. Resulting from this, a road connection location on the Site western boundary has been identified that satisfies both development proposals. Although the internal road network will be subject to reserved matters application(s) the masterplan layout that accompanies the planning application presents an indicative alignment for the 'link road'.

4.7.3 It is relevant to note that the level of geometry proposed for the 'link road' is greater than what would normally be required for a stand-alone residential cul-de-sac scheme of 280 dwellings.

4.8 PEDESTRIANS

4.8.1 Pedestrian connectivity between the proposed residential development and the surrounding area is a key component of the development access strategy. This is converted into practice by a combination of:

- Well designed on-Site development layout that recognises pedestrian desire lines and provides enabling pedestrian facilities (eg footways, roads that discourage high speeds, a sense of place that is safe for pedestrians fostered by the layout of buildings, etc), and

- Pedestrian links between the Site and the surrounding area.

4.8.2 The former (on-Site layout) will be the subject of a reserved matters application, as the planning application is in outline. However, the principles of the pedestrian access strategy are established in this TA report (and the accompanying Travel Plan), and will form the basis of the detailed development Site layout for which reserved matters permission will be sought.

4.8.3 The existing pedestrian infrastructure around the Site and the surrounding area is described in Chapter 5. The development proposals for improvements to the existing pedestrian infrastructure and pedestrian linkages to/from the proposed development are also described in Chapter 5.

4.8.4 The proposed access arrangements shown on Drg No 1361/22/C offer a wide range of measures to assist pedestrians, including:

- Pedestrian refuge (with dropped kerbs and tactile paving) on the Site Access road,
- Zebra Crossing (with pedestrian refuge) on White Post Road (N),
- Pedestrian refuge (with dropped kerbs and tactile paving) on White Post Road (S),
- Shared footway/cycleway on the north side of the Site Access road,
- Footway on the south side of the Site Access road,
- Connection with existing pedestrian infrastructure.

4.9 CYCLE

4.9.1 The existing cycle infrastructure around the Site and the surrounding area is described in Chapter 5. The development proposals for improvements to the existing cycle infrastructure and cycle linkages to/from the proposed development are also described in Chapter 5.

4.9.2 The proposed access arrangements shown on Drg No 1361/22/C offer a wide range of measures to assist cyclists, including:

- Zebra Crossing (with parallel cycle crossing) on White Post Road (N),

- Shared footway/cycleway on the north side of the Site Access road,
- Shared footway/cycleway on the west side of White Post Road (S),
- New cycle lane along the east side of White Post Road,
- Conversion of existing puffin crossing to toucan crossing on White Post Road (S).

4.10 **MOBILITY IMPAIRED**

The needs of those with mobility impairment are an important component of the detailed design of the development. This is advocated in NPPF (eg NPPF para 35, refer para 2.5.3 above). The detailed design of the internal layout of the development, which must be the subject of reserved matters approval, will describe the facilities to be provided on Site to assist the mobility impaired, taking account of guidance and standards together with good practice and local/national policies.

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5 Walk & Cycle

5.1 WALK

5.1.1 It is established and acknowledged that walking is the most important mode of travel at the local level, and offers the greatest potential to replace short car trips, particularly under 2km.

5.1.2 The CIHT provides guidance about journeys on foot. It does not provide a definitive view of distances, but does suggest a preferred maximum distance of 2000m for walk commuting trips. A 400m distance corresponds to a walk time of 5 minutes, based on upon a typical normal walking speed. Figure 3 presents the development 400m, 800m, 1200m and 2000m walk isochrones, (ie reflecting 5, 10, 15 and 25 minute walk journeys), and taking account of the pedestrian infrastructure.

5.1.3 The DfT National Travel Survey confirms that 78% of all trips less than a mile (1.6km) are carried out on foot.

5.1.4 The 'walkable neighbourhood' concept is set out in MfS1 and endorsed in MfS2. MfS1 explains that:

"Walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes' (up to about 800 m) walking distance of residential areas which residents may access comfortably on foot. However, this is ***not an upper limit*** *and .....that walking offers the greatest potential to replace short car trips, particularly those under 2 km."* (MfS para 4.4.1, my emphasis)

5.1.5 Indicated on Figure 3 are examples of local facilities near to the Site. This illustrates that there are a number of amenities within 800m of the Site, including:

- Nursery,
- Primary school,
- Convenience store,
- Community centre,
- Playgrounds/public open space,

- Cricket club,
- Salons,
- Public house,
- Church,
- Employment (Cherwell District Council),
- Allotments,
- Bus stops.

5.1.6 Within about 1200m of the Site (typically a 15 minute walk) there are a number of additional facilities, including:

- Secondary school/sixth form,
- Convenience Store,
- Supermarket,
- Post Office,
- Bank/ATM,
- Dentist, Pharmacy & Optician,
- Restaurants/takeaways.

5.1.7 Figure 3 demonstrates that there is a substantial range of amenities within 2000m of the Site. The edge of Banbury town centre is within 2000m of the Site and Horton Hospital provides a substantial employment destination within 2000m of the Site.

5.1.8 **Public Rights of Way**

5.1.8.1 Figure 4 presents the existing Public Rights of Way (PROW) near to the Site. This shows that there is a restricted byway along the northern boundary of the Site, and a bridleway close to the western Site boundary. There are a number of footpaths connecting the restricted byway to the residential area to the north of the Site.

5.1.8.2 There is an existing footpath within the Site between the restricted byway and Wykham Lane. This will be maintained and improved as part of the proposed development. Improvements may include, for example, a sealed surface, street lighting etc. The on-site layout will be subject of a reserved matters application.

5.1.8.3 Figure 4 shows that there is an extensive network of PROW in the vicinity of the Site providing convenient pedestrian routes to a range of local amenities.

5.2 CYCLE

5.2.1 It is recognised that cycling also has potential to substitute for short car trips, particularly those under 5km, and to form part of a longer journey by public transport.

5.2.2 The CIHT guidance 'Cycle Friendly Infrastructure' (2004) states that:

"Most journeys are short. Three quarters of journeys by all modes are less than five miles (8km) and half under two miles (3.2km) (DOT 1993, table 2a). These are distances that can be cycled comfortably by a reasonably fit person."(para 2.3)

5.2.3 Figure 5 indicates the 2km and 5km cycle isochrones for the Site, reflecting typically 10 minute and 25 minute journeys. Review of Figure 5 highlights that all of the built-up area of Banbury is within 5km of the Site. Additionally, all of Twyford, Adderbury, Broughton, North Newington, and most of Bloxham are accessible to Site residents by cycle.

5.2.4 Figure 6 indicates formally identified cycle routes in the locale of the Site. These include:

- National Cycle Network Route 5 (NCN 5): Reading to Holyhead via Oxford,
- A local signed on-road route linking the Site and NCN 5 to Banbury Rail Station.

5.2.5 In summary, the destination opportunities within a 5km cycle ride of the Site for residents of the development comprise a full range of amenity and employment locations within Banbury itself and beyond.

5.3 SUMMARY

Transport sustainability is a principle underlying the proposed development. Encouraging walk and cycle journeys is recognised as important. The location of the Site, provides a good context for journeys of residents to be undertaken on foot and

by cycle, to a range of local amenities. The development proposals include the package of measures to enhance the pedestrian and public transport accessibility.

6 Public Transport

6.1 The CIHT 'Guidelines for Planning for Public Transport in Developments' (March 1999) set out that, in considering public transport provision for development, three questions need to be addressed:

"• *What is the existing situation with respect to public transport provision in and around the development?*

• *What transport provision is required to ensure that the proposed development meets national and local transport policy objectives?*

• *Are the transport features of the development consistent with the transport policy objectives, and if not, can they be changed to enable the policy objectives to be achieved?"* (para 4.18).

6.2 The CIHT Guidelines conclude that a broad methodology which allows the issues to be identified and debated comprises the following general principles:

- Investigate existing public transport provision,
- Using this information, determine whether the Site is well served by public transport,
- Where the Site is not well served or existing services are fully loaded, suggest measures to rectify this situation,
- Define infrastructure for the proposed development which enables public transport to be operated effectively and make it attractive to potential passengers.

6.3 The proposed development affords opportunity for development generated public transport journeys to be made by bus and rail.

6.4 **BUS**

6.4.1 Figure 7 presents the bus stops within 400m, 800m and 1200m of the Site. The closest bus stop to the Site is on Sycamore Drive, within 400m. There are additional bus stops on Sycamore Drive and White Post Road that are circa 500m from the centre of the Site. The bus stop on the southern side of Sycamore Drive closest to SJ2 has a shelter. All other bus stops on Sycamore Drive and White Post Road comprise a 'flag and pole'.

6.4.2 Table 1 presents the routes and frequencies of bus services calling at stops within 800m of the Site. The routes of services summarised in Table 1 are shown on Figure 8. Table 1 shows that the B1 service calls within 400m of the Site. The B1 operates at a 30 minute frequency, Monday – Saturday. The journey time between Sycamore Drive and Banbury bus station is 12-13 minutes. The earliest weekday departure from Sycamore Drive is 0702, and the latest weekday arrival at Sycamore Drive is at 1822.

6.4.3 The B2 service calls on White Post Road, circa 500m from the Site, and operates on the same frequency as the B1 service. There are additional services calling on A4260 within 800m of the Site. In a typical weekday situation there are circa 8 buses per hour calling within 800m of the Site, taking into account buses travelling in both directions along the road. Destinations include, among others, Banbury town centre, Bodicote, Easington, Oxford, Kings Sutton, Aynho, Evenly, Croughton, and Brackley.

6.4.4 All services calling within 800m of the Site also call at Banbury bus station, which is within 400m of Banbury Rail station. This provides opportunity for onward journeys by public transport to an extensive range of destinations.

6.4.5 **Bus Stop Improvements**

6.4.5.1 Improvements to bus infrastructure are to be provided as part of the proposed development. The aim of this is to promote bus travel to residents of the Site through providing better bus stop facilities. Proposed bus stop improvements are also of benefit to existing public transport users in the vicinity of the Site.

6.4.5.2 As mentioned in para 6.4.1, the bus stop on the southern side of Sycamore Drive closest to SJ2 has a shelter. All other bus stops on Sycamore Drive and White Post Road comprise a 'flag and pole'. The applicant proposes to:

- Upgrade the existing northbound and southbound stops on White Post Road, in the vicinity of the Site, to provide shelters,
- Introduce a bus stop(s) within the Site, with details to be agreed as part of a future reserved matters application.

6.4.5.3 The new/upgraded bus stops are to be to Quality Bus Standard providing a shelter with lighting, seating and timetable/routing information together with low floor access. It is recognised that the proposed bus stop locations will be subject to discussions with the highway authority, as part of a reserved matters application.

6.5 RAIL

6.5.1 Banbury Rail Station is circa 2.5km from the Site (refer Figure 3). This provides opportunity for residents to travel by rail, with the journey between the rail station and the Site by cycle or bus. Cycle storage is provided at the station, and all bus services calling close to the Site call within 400m of the rail station. Additionally, there are 795 car park spaces provided at the station. There are mobility impaired spaces available free of charge for blue badge holders.

6.5.2 The main services calling at Banbury Rail Station comprise:

OPERATOR	PRINCIPAL ROUTE	TYPICAL WEEKDAY FREQUENCY (mins)
Chiltern Railways	London - Birmingham:	30
Cross Country	Manchester - Bournemouth:	60
Cross Country	Newcastle – Reading:	60

Additionally, there are a number of less frequent services calling at Banbury, operated by Chiltern Railways and First Great Western. Typically, there are circa 10-11 services per hour calling at Banbury Station.

6.5.3 Services calling at Banbury provide frequent direct trains to a wide range of destinations including, among others, London, Birmingham, Manchester, Leeds,

Sheffield, Newcastle, Southampton, Bournemouth, Coventry, Stoke-on-Trent, Derby, Doncaster and York.

6.5.4 Banbury rail station provides opportunity for residents undertake regular journeys (eg for work) to a wide range of destinations. Journey times between Banbury and key destinations that may be suitable for daily commuting are:

DESTINATION	APPROXIMATE JOURNEY TIME (mins)
Bicester	14
Leamington Spa	17
Oxford	21
Warwick	22
High Wycombe	32
Reading	45
Birmingham	53
London Marylebone	54 - 64

6.5.5 It is demonstrated that there is excellent opportunity for residents of the proposed development to undertake journeys by rail to an extensive range of destinations.

6.6 **SUMMARY**

It is established that public transport journeys to/from the Site can be made to a range of locations. The development proposals include a package of measures to improve bus accessibility and facilities. This is in accordance with the aims and objectives of current national and local policies.

7 Travel Plan

7.1 The Travel Plan (TP) report is submitted in support of the planning application, and complementary to this TA report. A summary of the key points in the TP are set out below.

7.2 The key objectives of the TP are to:

- Contribute to traffic reduction and other sustainable transport objectives set out in national, regional and local policies,
- Improve accessibility of the Site by sustainable modes of transport and address traffic and parking issues,
- Widen choice of travel mode for all those travelling to/from the Site.

7.3 Specific outcomes sought from the TP are to:

- Achieve the minimum number of additional single occupancy car traffic movements to/from the development,
- Address the access needs of site users, by supporting walking, cycling and public transport,
- Reduce the need for travel to/from the Site.

7.4 The TP explicitly considers accessibility by the sustainable travel modes of pedestrian, cycle, public transport and car share.

7.5 The TP target is set as: **maximum peak hour 2-way vehicle trip rate of 0.537 vehicles/hour/dwelling**, to be achieved within 5 years of first occupation of the development.

7.6 The residential developer will appoint a Travel Plan Coordinator (TPC), to introduce, manage, operate and monitor the TP. As part of the on-going management of the TP, the TPC will maintain a dialogue with the Council, and monitor emerging best practice information, to provide the most efficient platform for maximising the effectiveness of the TP.

7.7 The residential developer is required to finance the TP. A sufficient revenue budget will be identified to employ the TPC for a period of 5 years of first occupation of the development, on a sufficient basis to introduce and manage the TP initiatives, and thereafter as required to:

- Manage the initiatives,
- Finance the measures identified in this and subsequent TP Monitoring and Review reports and as agreed with the Council, and
- Enable the TPC postholder to carry out the duties identified above.

7.8 The TP Action Plan is set out in Chapter 10 of the TP. The TP Table 3 summarises identified measures that are proposed, and indicates the timing for the measures and funding information. This illustrates the holistic approach adopted for the TP, aimed at encouraging from the outset a positive sustainable transport awareness and culture for the development. The TP measures will be reviewed and amended as appropriate, in consultation with and requiring the agreement of the local authority, as part of the on-going dynamic monitoring and review process for the TP.

8 Traffic Flows

8.1 STUDY NETWORK

The study network of junctions for the TA comprises:

REF	JUNCTION	CONTROL
SJ1	Site Access/White Post Road	priority
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	roundabout
SJ2A	Oxford Road/Northbound Slips	priority
SJ3	Oxford Road On & Off Slips/Bankside	priority/r'bout
SJ3A	Oxford Road/Southbound Slips	priority
SJ4	Broad Gap/Oxford Road/Canal Road	priority
SJ5	Weeping Cross/Oxford Road	traffic signals
SJ6	Broad Gap/High Street	priority
SJ7	Wykham Lane/White Post Road/High Street	priority
SJ8	Hightown Road/Oxford Road/Horton View	traffic signals
SJ9	Upper Windsor Street/Oxford Road	traffic signals
SJ10	Bloxham Road/South Bar Street/Oxford Road	traffic signals
SJ11	High Street/South Bar Street/ West Bar Street/Horse Fair	roundabout
SJ12	Castle Street/North Bar Street/Warwick Road/Southam Road	traffic signals
SJ13	Swan Close Road/Upper Windsor Street	traffic signals
SJ14	Bridge Street/Windsor Street/Cherwell Street	traffic signals
SJ15	Cherwell Street/Hennef Way	roundabout
SJ16	Farmfield Road/Oxford Road	traffic signals
SJ17	Bankside/Swan Close/Lamb's Crescent	priority/signals
SJ18	Concorde Avenue/Cherwell Drive	roundabout.

8.2 PEAK PERIODS

The times when the combination is greatest, of traffic generated by the proposed residential development and the existing highway network traffic, are the weekday AM & PM peak hours. The TA includes quantitative analysis of the traffic impact of the proposed development for these periods.

8.3 TRAFFIC COUNTS

8.3.1 Traffic count surveys at the TA Study Junctions were undertaken as follows:

- SJ2 & SJ3 11 September 2013,
- SJ4-8 & SJ13-15 21 May 2015,
- SJ9 – SJ12 11 July 2013.
- SJ16 2014 (from PBA TA)
- SJ17 & SJ18 8 December 2015.

8.3.2 Analysis of the traffic count data identifies the peak hours for traffic flows at the study junctions as:

- AM 0800-0900,
- PM 1645-1745.

Quantative analysis is undertaken for these peak hours.

8.3.3 Figure B1/A, Appendix B, presents the 2013, 2014 & 2015 AM & PM peak hour traffic count flows at the study junctions. The flows are presented in pcus.

8.4 ANALYSIS YEARS

8.4.1 The proposed development comprises 280 dwellings. The assumed development Year of Opening (ie completion) is 2024.

8.4.2 For the purposes of this TA report, modelling of the TA study network of junctions is undertaken for year **2025**, this being 10 years after application submission.

8.4.3 Growth Factors

8.4.3.1 The National Transport Model (NTM) TEMPRO Version 6.2 (AF09 dataset) is used as a basis for deriving local growth factors. The model assumes that new houses will be built in the Banbury area between 2013/2014/2015 and 2025. However, the TA also includes estimates of traffic generated by a number of residential schemes near to the application Site. The permitted schemes will deliver nearly 2000 new homes.

Without adjustment to TEMPRO assumptions on household growth, there would be a double counting effect and the estimates of future traffic flows on the local highway network are likely to be significantly overestimated. Consequently, local adjustments are made to TEMPRO assumptions on household growth and the resultant traffic growth factors are set out in Technical Filenote 1C, Appendix C.

8.4.3.2 The combination of background growth (estimated using NTM/TEMPRO) and traffic generated by committed developments at each of the study junctions is summarised below:

REF	COUNT (pcu)		2025 BASE (pcu)		TOTAL GROWTH (%)	
	AM	PM	AM	PM	AM	PM
SJ2	1033	921	1332	1169	28.9	26.9
SJ2A	993	969	1351	1283	36.1	32.4
SJ3	1002	888	1471	1336	46.8	50.0
SJ3A	961	1024	1301	1414	35.4	38.1
SJ4	1900	1940	2448	2524	28.8	30.1
SJ5	1882	2000	2483	2642	31.9	32.1
SJ6	350	289	423	357	20.9	23.5
SJ7	540	400	632	480	17.0	20.0
SJ8	2238	2153	2789	2709	24.6	25.8
SJ9	1845	1938	2357	2457	27.8	26.8
SJ10	1855	1954	2193	2373	18.2	21.4
SJ11	2165	2257	2527	2705	16.7	19.8
SJ12	2109	2447	2528	2959	19.9	20.1
SJ13	1881	1870	2404	2412	27.8	29.0
SJ14	2612	2678	3185	3269	21.9	22.1
SJ15	4770	4684	5807	5714	21.7	22.0.
SJ16	2044	2459	2595	3075	27.0	25.1
SJ17	1027	951	1310	1248	27.6	31.2
SJ18	2189	2508	2570	2930	17.4	16.8.

Review of the Count-2025 total growth figures set out above shows that virtually all of the TA study junctions are estimated to receive an increase in traffic of in excess of 20%. At a number of the TA study junctions the estimated increase in traffic is more than 30%. It is demonstrated that the TA adopts extremely robust future traffic flows assumptions.

8.4.5 **Factored Counts**

The factored AM & PM peak hour traffic flows at the TA study network junctions are presented on Figure B2/A, Appendix B.

8.6 **COMMITTED DEVELOPMENT**

8.6.1 AHA is aware of the following consented developments within Banbury and the surrounding area:

- 05/01337/OUT Land at College Fields: 1070 dwellings, employment, local centre and primary school,
- 10/01575/OUT Former Sapa Profiles: B1, B2 and B8 employment,
- 11/01755/OUT Bourne Lane, Hook Norton: 70 dwellings,
- 11/00617/OUT Land South of Blackwood Place: 82 dwellings,
- 11/01870/F Banbury Gateway: Retail, restaurants and cafes,
- 11/01878/OUT Land South of Overthorpe Road: 115,197sm B2/B8 Employment,
- 12/00080/OUT Crouch Farm: 145 dwellings,
- 12/00926/OUT Barford Road, Bloxham: 75 dwellings,
- 12/01139/OUT Milton Road, Bloxham: 85 dwellings,
- 13/00456/OUT Milton Road, Adderbury: 65 dwellings,
- 13/00444/OUT Land West of Bretch Hill: 400 dwellings, 60 extra care units,
- 13/00656/OUT Land West of Warwick Road: 300 dwellings,
- 13/01768/F Aynho Road, Adderbury: 59 dwellings.

8.6.2 AHA has reviewed TAs and related information submitted as part of the planning applications. From the information submitted as part of the successful planning applications/appeals it is concluded that the following do not have a material impact on traffic flows at the AHA TA Study Junction Network:

- 11/01878/OUT Land South of Overthorpe Road,
- 11/01755/OUT Bourne Lane, Hook Norton,
- 12/00926/OUT Barford Road, Bloxham,

- 12/01139/OUT Milton Road, Bloxham,
- 13/00456/OUT Milton Road, Adderbury,
- 13/01768/F Aynho Road, Adderbury.

Therefore the following developments are included as committed development:

- 05/01337/OUT Land at College Fields,
- 10/01575/OUT Former Sapa Profiles: B1, B2 and B8 employment,
- 11/00617/OUT Land South of Blackwood Place,
- 11/01870/F Banbury Gateway,
- 12/00080/OUT Crouch Farm,
- 13/00444/OUT Land West of Bretch Hill,
- 13/00656/OUT Land West of Warwick Road.

8.6.3 AHA Committed Development Report (ref 1361/10) considers the traffic generated by the committed developments at the TA study network of junctions.

8.6.4 **Total Committed Development**

The consequent total committed development traffic is presented on Figure B3/A, Appendix B.

8.7 **BASE**

8.7.1 The 'Base' situation represents the traffic flows on the TA study network with the full implementation (and occupation) of the consented developments. This provides the proper context in which to assess the traffic impact of the proposed development.

8.7.2 The estimated 2025 Base peak hour traffic flows at the TA study junctions are presented on Figure B4/A, Appendix B.

8.8 **DISTRIBUTION OF GENERATED TRAFFIC: PROPOSED DEVELOPMENT**

8.8.1 It is necessary to estimate the % distribution of the proposed development generated traffic. A common methodology is to use Journey to Work data from the

2011 Census as a basis for estimating the % distribution of development generated traffic on the study network junctions. This methodology is adopted for the purposes of the TA quantative analysis.

8.8.2 Table 2 provides a summary of the information derived from the 2011 Census Journey to Work data.

8.8.3 Deriving from this, the % distribution of traffic generated at the study junctions by the proposed residential development that is adopted for the purpose of the TA quantative analysis is presented on Figure B5/A, Appendix F.

8.9 GENERATED TRAFFIC: PROPOSED DEVELOPMENT

8.9.1 The TRICS database is interrogated to identify suitable trip generation rates to adopt for estimating the AM and PM peak hour traffic generated by the proposed residential development.

8.9.2 TRICS is interrogated for information about trip generation rates for Houses. Criteria adopted for this interrogation include:

- Houses privately owned,
- Sites between 125-525 units,
- All surveys 2005 or more recent,
- Sites in Greater London, Northern Ireland and the Republic of Ireland excluded on the basis that they may have significantly different travel characteristics,
- Sites near neighbourhood centres excluded,
- If a site has multiple survey date entries, include only the most recent survey used within the identified TRICS sample, (to avoid statistical bias in the trip rates identified for use in the analysis).

8.9.3 On this basis, 12 sites are identified. TRICS explicitly states that the 85%le statistic is not reliable for a database with less than 20 entries. Thus, average trip rates are adopted to estimate the traffic generated by the proposed residential development.

8.9.4 The AM and PM peak hour house trip rates adopted for the quantative analysis are presented in Table 3. The consequent estimate of development generated traffic is presented in Table 4.

8.9.5 Figure B6/A, Appendix B presents the traffic generated by the proposed development in the AM and PM peak hours at the study junctions, based on the % distribution on Figure B5/A, Appendix B.

8.10 TRAFFIC IMPACT

8.10.1 The March 2007 GTA has recently been withdrawn. However, at the time of preparing this TA report, there is no alternative document that provides clear guidance on traffic impact.

8.10.2 In the absence of alternative guidance, the tests adopted to determine if a more detailed junction assessment is required is if the proposed development is predicted to generate an increase in traffic at a study junction of:

(i) Test 1: **30** vehicles or more, **and**
(ii) Test 2: **2.5%** of the total 2025 Base junction flow.

8.10.3 The net change in peak hour traffic flows at the TA study junctions as a result of implementing the proposed residential development is presented on Figure B6/A, Appendix B herein.

8.10.4 A review of Figure B4/A (2025 Base) and Figure B6 (development generated traffic) is summarised below.

REF	2025 BASE (pcu)		GENERATED TRAFFIC (pcu)		IMPACT (%)		TEST MET (Y/N)
	AM	PM	AM	PM	AM	PM	
SJ2	1332	1169	154	160	11.6	13.7	Y
SJ2A	1351	1283	23	58	1.7	4.5	Y
SJ3	1471	1336	66	100	4.5	7.5	Y
SJ3A	1301	1414	67	46	5.1	3.3	Y
SJ4	2448	2524	16	18	0.7	0.7	N

SJ5	2483	2642	32	36	1.3	1.4	N
SJ6	423	357	16	18	3.8	5.0	N
SJ7	632	480	22	24	3.5	5.0	N
SJ8	2789	2709	86	93	3.1	3.4	Y
SJ9	2357	2457	77	84	3.3	3.4	Y
SJ10	2193	2373	46	49	2.1	2.1	N
SJ11	2527	2705	41	44	1.6	1.6	N
SJ12	2528	2959	25	27	1.0	0.9	N
SJ13	2404	2412	62	70	2.6	2.9	Y
SJ14	3185	3269	62	70	1.9	2.1	N
SJ15	5807	5714	49	54	0.8	0.9	N
SJ16	2595	3075	86	93	3.3	3.0	Y
SJ17	1310	1248	31	35	2.4	2.8	Y
SJ18	2570	2930	49	54	1.9	1.8	N

8.10.5 Consequently, modelling of the traffic impact of the proposed development is undertaken for:

REF	JUNCTION	CONTROL
SJ1	Site Access/White Post Road	priority
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	roundabout
SJ2A	Oxford Road/Northbound Slips	priority
SJ3	Oxford Road On & Off Slips/Bankside	roundabout
SJ3A	Oxford Road/Southbound Slips	priority
SJ8	Hightown Road/Oxford Road/Horton View	traffic signals
SJ9	Upper Windsor Street/Oxford Road	traffic signals
SJ13	Swan Close Road/Upper Windsor Street	traffic signals
SJ16	Farmfield Road/Oxford Road	traffic signals
SJ17	Bankside/Swan Close/Lamb's Crescent	priority/signals.

The results of this TA junction modelling are reported in Chapter 9.

8.11 WITH DEVELOPMENT

The estimated 2025 AM and PM peak hour With Development traffic flows are presented on Figure B7/A, Appendix B.

9 Operational Performance of Highway Network

9.1 The computer program PICADY is used to model the performance of a priority (give-way) control junction. PICADY predicts the ratio of flow to capacity (RFC) and associated queue for the minor (give-way) entry to the junction and for the major road. PICADY is used to model the operational performance of:

REF	JUNCTION
SJ1	Site Access/White Post Road
SJ2A	Oxford Road/Northbound Slips
SJ3A	Oxford Road/Southbound Slips.

9.2 The computer program ARCADY is used to model the performance of a roundabout junction. ARCADY predicts the ratio of flow to capacity (RFC) and associated queue for each entry to the roundabout. ARCADY is used to model the operational performance of:

REF	JUNCTION
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive
SJ3	Oxford Road On & Off Slips/Bankside

9.3 The computer program LINSIG is used to analyse and predict the performance of a traffic signal control junction. This predicts the degree of saturation (%) and associated queues and delay for the junction entry arms. LINSIG is used to model the performance of:

REF	JUNCTION
SJ8	Hightown Road/Oxford Road/Horton View
SJ9	Upper Windsor Street/Oxford Road
SJ13	Swan Close Road/Upper Windsor Street
SJ16	Farmfield Road/Oxford Road
SJ17	Bankside/Swan Close/Lamb's Crescent.

9.4 **SJ1: SITE ACCESS/WHITE POST ROAD (Drg No 1361/22/C)**

Table 5 presents the results of the PICADY modelling for SJ1. A review of Table 5 shows that SJ1 is predicted to operate with a high level of spare capacity and negligible queues/delays in the 2025 AM & PM peak hour With Development situations.

9.5 **SJ2: BANKSIDE/OXFORD ROAD N'BOUND SLIPS/WHITE POST ROAD/SYCAMORE DRIVE**

Table 6 presents the results of the ARCADY modelling for SJ2. A review of Table 6 shows that SJ2 is predicted to operate with a high level of spare capacity and negligible queues/delays in the 2025 AM & PM peak hour Base situations and continues to do so if the proposed development is implemented.

9.6 **SJ2A: OXFORD ROAD/NORTHBOUND SLIPS**

Table 7 presents the results of the PICADY modelling for SJ2A. A review of Table 7 shows that SJ2A is predicted to operate with spare capacity the 2025 AM & PM peak hour Base situations and continues to do so if the proposed development is implemented.

9.7 **SJ3: COLLEGE FIELDS ACCESS/OXFORD ROAD SOUTHBOUND SLIPS/BANKSIDE**

9.7.1 SJ3 is presently a 'triangle' of priority controlled junctions. SJ3 will be converted to a 4-arm roundabout junction to provide access to part of the College Fields development. A drawing of the College Fields access junction included as part of the College Fields TA is shown on Colin Buchanan Figure 59, Appendix F.

9.7.2 Table 8 presents the results of the ARCADY modelling for the SJ3 College Fields Access/Bankside roundabout junction. A review of Table 8 shows that the roundabout junction is predicted to operate with spare capacity and negligible queues/delays in the 2025 AM & PM peak hour Base situations, and continues to do so if the proposed development is implemented.

9.8 **SJ3A OXFORD ROAD/SOUTHBOUND SLIPS**

Table 9 presents the results of the PICADY modelling for SJ3A. A review of Table 9 shows that SJ2A is predicted to operate with spare capacity the 2025 AM & PM peak hour Base situations and continues to do so if the proposed development is implemented.

9.9 **SJ8 HIGHTOWN ROAD/OXFORD ROAD/HORTON VIEW &**
SJ9 UPPER WINDSOR STREET/OXFORD ROAD &
SJ16 FARMFIELD ROAD/OXFORD ROAD

9.9.1 SJ8, SJ9 and SJ16 are all located in close proximity along Oxford Road. OCC highway officers have confirmed that they are all linked in operation and should be assessed using as a linked LINSIG model.

9.9.2 SJ8, SJ9 and SJ16 are to be improved as part of a package of works along the Oxford Road corridor to be implemented as part of the residential scheme at College Fields (Bankside). The improved junction layouts are shown on Buchanan Figures 53 & 54. As the year 2025 Base traffic flows include traffic generated by the College Fields development it follows that modelling should be undertaken of the situation in which the proposed improvement works have been implemented.

9.9.3 Table 10 presents the results of the LINSIG modelling for SJ8, SJ9 and SJ16. The LINSIG modelling shows that the network of junctions is predicted to work with spare capacity and modest queues/delays in the 2025 Base AM peak hour situation. The corresponding modelling for the 2025 With Development AM peak hour shows negligible change to the Base situation. It is concluded that the proposed development does not materially affect the operation of SJ8, SJ9 and SJ16 in the AM peak hour.

9.9.4 The LINSIG analysis confirms that all approaches to SJ8 (Hightown Road/Oxford Road/Horton View) are predicted to work with spare capacity in the 2025 Base PM peak hour situation and continue to do so if the proposed development is implemented.

9.9.5 A review of Table 10 shows that some approaches to SJ9 and SJ16 are predicted to operate above capacity in the 2025 PM peak hour Base situation. The links with a predicted RFC in excess of 100% are:

- SJ9: Oxford Road (N) left/straight ahead lane,
- SJ16: Farmfield Road (E)
- SJ16: Oxford Road (S) straight ahead/right turn lane.

All other approaches to SJ9 and SJ16 are predicted to operate with spare capacity in the 2025 Base PM peak hour situation.

9.9.6 A review of the corresponding 2025 With Development PM peak hour LINSIG analysis shows that the proposed development does not materially alter the performance of the junctions. Consequently, it is reasonable to conclude that the proposed development does not lead to a material traffic impact at SJ8, SJ9 and SJ16 in the PM peak hour.

9.10 SJ13 SWAN CLOSE ROAD/UPPER WINDSOR STREET

9.10.1 AHA commissioned queue surveys to provide insight into how the existing junction layout operates with 2015 traffic. In order to achieve more meaningful and robust model results, the approach adopted was to:

- Undertake AM & PM peak period queue surveys at SJ13,
- Construct LINSIG model for the 2015 Count situation,
- Compare the model outputs to the queue survey results, and where necessary calibrate LINSIG model so that model output results provide as good a 'match' as possible to the recorded queue surveys by making adjustments to model junction geometry.

9.10.2 Table 11 presents the results of the 2015 Count LINSIG modelling for SJ13. The LINSIG model queue results for the 2015 Count situation compare reasonably well to those recorded by the queue surveys. Consequently, the validated LINSIG model is used test junction performance in the 2025 Base and With Development situations and these results are presented in Table 12.

9.10.3 Table 12 presents the results of the LINSIG modelling for SJ13.

9.10.4 A review of Table 12 shows that SJ13 is predicted to operate in an acceptable manner in both the 2025 AM & PM peak hour Base situations and continues to do so in the corresponding With Development situations.

9.11 SJ17 SWAN CLOSE/BANKSIDE/LAMB'S CRESCENT

9.11.1 SJ17 is to be improved as part of a package of works to be implemented as part of the residential scheme at College Fields (Bankside). The improved junction layout is shown on Buchanan Figure 52. As the year 2025 Base traffic flows include traffic generated by the College Fields development it follows that modelling should be undertaken of the situation in which the proposed improvement works have been implemented.

9.11.2 Table 13 presents the results of the LINSIG modelling for SJ17. A review of Table 13 shows that SJ17 is predicted to operate with spare capacity the 2025 AM & PM peak hour Base situations and continues to do so if the proposed development is implemented.

9.12 SUMMARY

Comprehensive testing of the TA study network of junctions has been undertaken. It is demonstrated that the proposed development will have **no severe** impact on the performance of the TA study junctions.

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10 Banbury 17 Allocation

10.1 INTRODUCTION

10.1.1 The application Site forms part of wider area that is allocated for residential development in the Council's Submission Local Plan. The application Site, together with other sites to the west, are known collectively as the Banbury 17 Allocation sites. There are 3no sites within the Banbury 17 allocation that are centred on Bloxham Road. These are:

- Wykham Park Farm,
- Land to the east of Bloxham Road, and
- Land to the west of Bloxham Road.

10.1.2 Wykham Park Farm

10.1.2.1 The main site within the Banbury 17 area is known as Wykham Park Farm (WPF). A planning application for a predominantly residential scheme was submitted to CDC. The scheme comprises:

- Circa 1000 dwellings,
- Primary School,
- Local centre.

10.1.2.2 AHA has obtained a copy of the TA report (ref W14129 TAR01_A) prepared by Jubb that accompanied the WPF application.

10.1.3 Land to the East of Bloxham Road (12/00080/OUT)

10.1.3.1 Planning permission has been granted for a residential scheme on land to the east of Bloxham Road. This scheme, known as Crouch Farm Phase 1, comprises 145 dwellings.

10.1.3.2 AHA has obtained a copy of the TA report (ref 25936/006) prepared by Peter Brett Associates that accompanied the application.

10.1.4.1 **Land to the West of Bloxham Road**

This scheme, referred to as Crouch Farm Phase 2, comprises 400 dwellings. A Screening Opinion was submitted to CDC in May 2014. AHA has available the TA report (ref 30369) prepared by Peter Brett Associates that accompanied the application.

10.2 **WALK & CYCLE**

The adjacent WPF scheme includes a primary school and local centre. If there is a link road connection between the proposed development and the WPF scheme then the primary school and local centre will be within a convenient walk or cycle ride for residents of the proposed development.

10.3 **PUBLIC TRANSPORT**

10.3.1 OCC in their 1 April 2015 pre-application consultation response set out that:

"It's envisaged that a new bus route will be introduced along the new spine road, and this is currently conceived as a two-way loop from the Town centre to the Town Centre via Bloxham Road, the Spine Road, Bankside and a new link along Tramway Road to the Rail Station and thence to the Town Centre. It is possible that this route could be cross-linked with other bus services, to provide direct access to workplaces to the north or east of the Town Centre. This new bus service would be procured on a pump-priming basis, to ensure that it became fully commercially viable after a few years. Bus stop infrastructure will be required and it is recommended the location of the stops is identified at an early stage.

It is imperative the spine road is provided in a manner able to accommodate the bus service efficiently. Therefore due consideration must be given to its width and alignment."

10.3.2 The internal road network within the proposed development and the adjoining WPF scheme is to be subject to reserved matters applications. However, it is proposed that the main access road serving the proposed development comprises a 6.75m wide carriageway. This would satisfy bus operator requirements. The access arrangements shown on Drg No 1361/22/C show a Site access road with a width of 6.75m.

10.4 **TRAFFIC FLOWS**

10.4.1 Oxfordshire County Council (OCC) highways officers have requested that testing be undertaken for the situation in which there is a link road connection between White Post Road and Bloxham Road and all of the Banbury 17 allocation sites come forward. This test is referred to herein as the OCC Sensitivity Test.

10.4.2 **Proposed Development**

10.4.2.1 The proposed development is predicted to generate limited traffic movements to/from Bloxham Road. Figure B6/A, Appendix B shows that these movements are assigned to Wykham Lane.

10.4.2.2 In the event of a vehicular connection between the proposed development and WPF scheme then these movements would more than likely take place along the link road. Figure D1, Appendix D shows the effect of the link road and the removal of Site generated traffic movements to/from Wykham Lane.

10.4.3 **Wykham Park Farm**

10.4.3.1 AHA has reviewed the TA for the Wykham Park Farm (WPF) development, prepared by Jubb, dated October 2014.

10.4.3.2 The distribution of development generated traffic in the WPF TA is based on a combination of turning movements at junctions, and a 'zonal approach'. However, the details of how the distribution is derived are not set out in the WPF TA.

10.4.3.3 AHA has analysed the WPF TA estimated distribution of generated traffic. The WPF TA assumes the AM and PM peak hour trips are assigned via:

	AM PEAK HOUR	PM PEAK HOUR
Bloxham Road South	19.7%	16.1%
Wykham Lane	4.2%	2.6%
Queens Way	25.7%	24.8%
South Bar Street	22.3%	29.1%
Upper Windsor Street	12.8%	14.0%
Hightown Road	1.2%	1.0%
Sainsbury	2.5%	3.1%
Hospital	0.8%	0.1%
Oxford Road South	5.1%	4.8%.

10.4.3.4 AHA has considered how much of the traffic generated by the WPF site would use a link road through the proposed development. It is estimated that the traffic assigned to the following routes would use the link road through the application Site.

	AM PEAK HOUR	PM PEAK HOUR
Wykham Lane	4.2%	2.6%
Hightown Road	1.2%	1.0%
Sainsbury	2.5%	3.1%
Hospital	0.8%	0.1%
Oxford Road South	5.1%	4.8%
TOTAL	**13.8%**	**11.6%.**

10.4.3.5 In addition to the above, it is considered that some of the WPF traffic assigned to South Bar Street and Upper Windsor Street may divert through the proposed development, if a link road is provided. It is assumed, for the purposes of this TA, that 50% of traffic assigned to these routes in the WPF distribution would be diverted through the Site. The percentage of WPF traffic diverting through the proposed development may comprise:

	AM PEAK HOUR	PM PEAK HOUR
South Bar Street	11.2%	14.6%
Upper Windsor Street	6.4%	7.0%
TOTAL	**17.6%**	**21.6%.**

10.4.3.6 Based on a combination of the above, it is estimated that circa **one third** of traffic generated by the WPF Site may pass through the proposed development, if a link road is provided.

10.4.3.7 Figure D2, Appendix D shows the effect of the link road on WPF generated traffic movements.

10.4.4 **Land to the East of Bloxham Road (Crouch Farm Phase 1)**

10.4.4.1 For the purposes of the OCC Sensitivity Test, it is assumed that traffic generated by the permitted Crouch Farm Phase 1 development of 145 dwellings uses the link road in an identical manner to that assumed for the WPF scheme. Thus, it is it is assumed that **one third** of traffic generated by the Crouch Farm Phase 1 Site may pass through the proposed development, if a link road is provided.

10.4.4.2 Figure D3, Appendix D shows the effect of the link road on Crouch Farm Phase 1 generated traffic movements.

10.4.5 **Land to the West of Bloxham Road (Crouch Farm Phase 2)**

10.4.5.1 For the purposes of the OCC Sensitivity Test, it is assumed that traffic generated by the proposed Crouch Farm Phase 2 development of 400 dwellings uses the link road in an identical manner to that assumed for the WPF scheme. Thus, it is it is assumed that **one third** of traffic generated by the Crouch Farm Phase 2 Site may pass through the proposed development, if a link road is provided.

10.4.5.2 Figure D4, Appendix D shows the effect of the link road on Crouch Farm Phase 2 generated traffic movements.

10.4.6 **Wykham Lane**

10.4.6.1 OCC in their 1 April 2015 pre-application consultation response set out that:

"The spine road will i) help with the management of traffic across the network (including deterring use of Wykham Lane as a though route)..."

Thus, it is clear that an aspiration of the highway authority is to reduce traffic movements along Wykham Lane and a new link road between White Post Road and Bloxham Road can facilitate that change.

10.4.6.2 For the purposes of the OCC Sensitivity Test, it is assumed that **all** 'Base' traffic movements between White Post Road/High Street and Wykham Lane are reassigned to the Site/White Post Road junction. This is a robust assumption. In effect, this would represent the situation in Wykham Lane is closed to traffic.

10.4.6.3 Figure D5, Appendix D shows the effect of the link road on Wykham Lane traffic movements.

10.4.7 **Total Effect of Link Road**

Figure D6, Appendix D shows the total effect of the link road on existing and development generated traffic movements.

10.4.8 **With Development: OCC Sensitivity Test**

Figure D7, Appendix D presents the 2025 AM & PM peak hour OCC Sensitivity Test flows for the study network.

10.5 **JUNCTION MODELLING**

At the request of OCC highway officers, AHA has undertaken additional modelling of TA study junctions using the OCC Sensitivity Test flows presented in Figure D7, Appendix D. Modelling is undertaken for the junctions in the immediate vicinity of the application Site. These are:

REF	JUNCTION	CONTROL
SJ1	Site Access/White Post Road	priority
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	roundabout
SJ2A	Oxford Road/Northbound Slips	priority
SJ3	College Fields Access/Oxford Road On & Off Slips/Bankside	roundabout
SJ3A	Oxford Road/Southbound Slips	priority.

10.5.1 **SJ1: Site Access/White Post Road (AHA Drg No 1361/22/C)**

10.5.1.1 If the Site access road eventually forms a connection with the internal road network within the Wykham Park Farm scheme then this will have the effect of creating a 'link' road between White Post Road and Bloxham Road.

10.5.1.2 Table 14 presents the results of the PICADY modelling of the Site/White Post Road junction (Drg 1361/22/C). A review of Table 14 shows that the junction is predicted to operate with spare capacity and with small queues/delays in the 2025 AM & PM peak hour OCC Sensitivity Test situation.

10.5.2 **SJ2: Bankside/Oxford Road N'Bound Slips/White Post Road/Sycamore Drive**

10.5.2.1 Review of Figure D6, Appendix D shows that the formation of the link road and traffic generated by the proposed Western Banbury 17 sites are estimated to increase traffic at SJ2 by:

- AM: 211 pcu,
- PM: 198 pcu.

10.5.2.2 Table 15 presents the results of the ARCADY modelling of SJ2 for the OCC Sensitivity Test situation. Review of Table 15 shows that the existing roundabout junction is predicted to operate with a high degree of spare capacity and with small queues/delays in the 2025 AM & PM peak hour OCC Sensitivity Test situations.

10.5.3 **SJ2A: Oxford Road/Northbound Slips**

10.5.3.1 Review of Figure D6, Appendix D shows that the formation of the link road and traffic generated by the proposed Western Banbury 17 sites are estimated to increase traffic at SJ2A by:

- AM: 138 pcu,
- PM: 59 pcu.

10.5.3.2 Table 16 presents the results of the PICADY modelling of SJ2A for the OCC Sensitivity Test situation. Review of Table 16 shows that the priority controlled junction is

predicted to operate within capacity and with modest queues in the 2025 AM & PM peak hour OCC Sensitivity Test situations.

10.5.4 **SJ3: Oxford Road Southbound Slips/Bankside**

10.5.4.1 SJ3 will be converted to a 4-arm roundabout junction to provide access to part of the College Fields development. A drawing of the College Fields access junction included as part of the College Fields TA is shown on Colin Buchanan Figure 59, Appendix F. For the purposes of the OCC Sensitivity Test, it is assumed that the proposed roundabout scheme has been implemented.

10.5.4.2 Review of Figure D6, Appendix D shows that the formation of the link road and traffic generated by the proposed Western Banbury 17 sites are estimated to increase traffic at SJ3 by:

- AM: 73 pcu,
- PM: 139 pcu.

10.5.4.3 Table 17 presents the results of the ARCADY modelling of SJ3 for the OCC Sensitivity Test situation. Review of Table 17 shows that the permitted roundabout junction is predicted to operate with a high degree of spare capacity and with small queues/delays in the 2025 AM & PM peak hour OCC Sensitivity Test situations.

10.5.5 **SJ3A Oxford Road/Southbound Slips**

10.5.5.1 Review of Figure D6, Appendix D shows that the formation of the link road and traffic generated by the proposed Western Banbury 17 sites are estimated to increase traffic at SJ3A by:

- AM: 73 pcu,
- PM: 139 pcu.

10.5.5.2 Table 18 presents the results of the PICADY modelling of SJ3A for the OCC Sensitivity Test situation. Review of Table 18 shows that the priority controlled junction is predicted to operate within capacity and with modest queues in the 2025 AM & PM peak hour OCC Sensitivity Test situations.

10.5.6 **Summary**

It is demonstrated that the existing/proposed geometry of junctions near to the application Site can accommodate the predicted traffic flows of the Western Banbury 17 sites.

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11 Summary & Conclusions

11.1 Ashley Helme Associates Limited (AHA) are appointed by Gladman Developments Ltd to prepare a Transport Assessment (TA) report to support the planning application for the residential development on land off White Post Road, Banbury. The proposed development comprises the construction of up to 280 houses.

11.2 **Site Access Arrangements**

The proposed Site access is a priority controlled junction on White Post Road. The proposed access arrangements are presented on Drg No 1361/22/C.

11.3 **Walk & Cycle**

An accessibility appraisal of the Site is undertaken, to assess the transport sustainability of the development proposal. Encouraging walk and cycle journeys is an essential component of the development access strategy. The location of the Site provides a good context for journeys of residents to be undertaken on foot and by cycle, for a variety of purposes, including employment, leisure, shopping, school, etc.

11.4 **Public Transport**

11.4.1 There are existing bus services that operate near to the Site. These are identified on Figure 7.

11.4.2 The applicant proposes to upgrade/introduce the following bus stop infrastructure:

- Upgrade the existing northbound and southbound stops on White Post Road, in the vicinity of the Site, to provide shelters,
- Introduce a bus stop(s) within the Site, with details to be agreed as part of a future reserved matters application.

11.4.3 Banbury Rail Station is circa 2.5km from the Site. This provides opportunity for residents to travel by rail, with the journey between the rail station and the Site on foot or by cycle or bus.

11.4.4 Typically, there are circa 10-11 services per hour calling at Banbury Station. Services calling at Banbury provide frequent direct trains to a wide range of destinations including, among others, London, Birmingham, Manchester, Leeds, Sheffield, Newcastle, Southampton, Bournemouth, Coventry, Stoke-on-Trent, Derby, Doncaster and York.

11.5 Travel Plan

The AHA Travel Plan is submitted in support of the outline application, and is complementary to this TA report. The TP target is set as: **maximum peak hour 2-way vehicle trip rate of 0.537 vehicles/hour/dwelling**, to be achieved within 5 years of first occupation of the fully consented development.

11.6 Traffic Flows

Traffic generated by the Site will pass through the following junctions that comprise the TA study network of junctions:

REF	JUNCTION	CONTROL
SJ1	Site Access/White Post Road	priority
SJ2	Bankside/ Oxford Rd N'bound Slips/White Post Rd/Sycamore Drive	roundabout
SJ2A	Oxford Road/Northbound Slips	priority
SJ3	Oxford Road On & Off Slips/Bankside	priority/r'bout
SJ3A	Oxford Road/Southbound Slips	priority
SJ4	Broad Gap/Oxford Road/Canal Road	priority
SJ5	Weeping Cross/Oxford Road	traffic signals
SJ6	Broad Gap/High Street	priority
SJ7	Wykham Lane/White Post Road/High Street	priority
SJ8	Hightown Road/Oxford Road/Horton View	traffic signals
SJ9	Upper Windsor Street/Oxford Road	traffic signals
SJ10	Bloxham Road/South Bar Street/Oxford Road	traffic signals
SJ11	High Street/South Bar Street/ West Bar Street/Horse Fair	roundabout
SJ12	Castle Street/North Bar Street/Warwick Road/Southam Road	traffic signals

SJ13	Swan Close Road/Upper Windsor Street	traffic signals
SJ14	Bridge Street/Windsor Street/Cherwell Street	traffic signals
SJ15	Cherwell Street/Hennef Way	roundabout
SJ16	Farmfield Road/Oxford Road	traffic signals
SJ17	Bankside/Swan Close/Lamb's Crescent	priority/signals
SJ18	Concorde Avenue/Cherwell Drive	roundabout.

11.7 **Traffic Impact**

Comprehensive testing of the TA study network of junctions has been undertaken. It is demonstrated that the proposed development will have **no severe** impact on the performance of the TA study junctions.

11.8 **Western Banbury 17 Sites**

11.8.1 The application Site forms part of a wider allocation for residential development in the Council's Submission Local Plan, which is currently awaiting the outcome of its examination. The application site and other residential schemes along Bloxham Road are known collectively as the Banbury 17 sites. OCC highways officers have requested that the TA considers the traffic implications of the development proposal coming forward in conjunction with the other Banbury 17 residential sites. This is set out in Chapter 10.

11.8.2 It is demonstrated that the existing/proposed geometry of junctions near to the application Site can accommodate the predicted traffic flows of the Western Banbury 17 sites.

11.9 **Conclusions**

It is concluded that the proposed residential development is in accordance with national and local transport policies, and that there are no transport/highways reasons for refusal of planning permission.

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Figures

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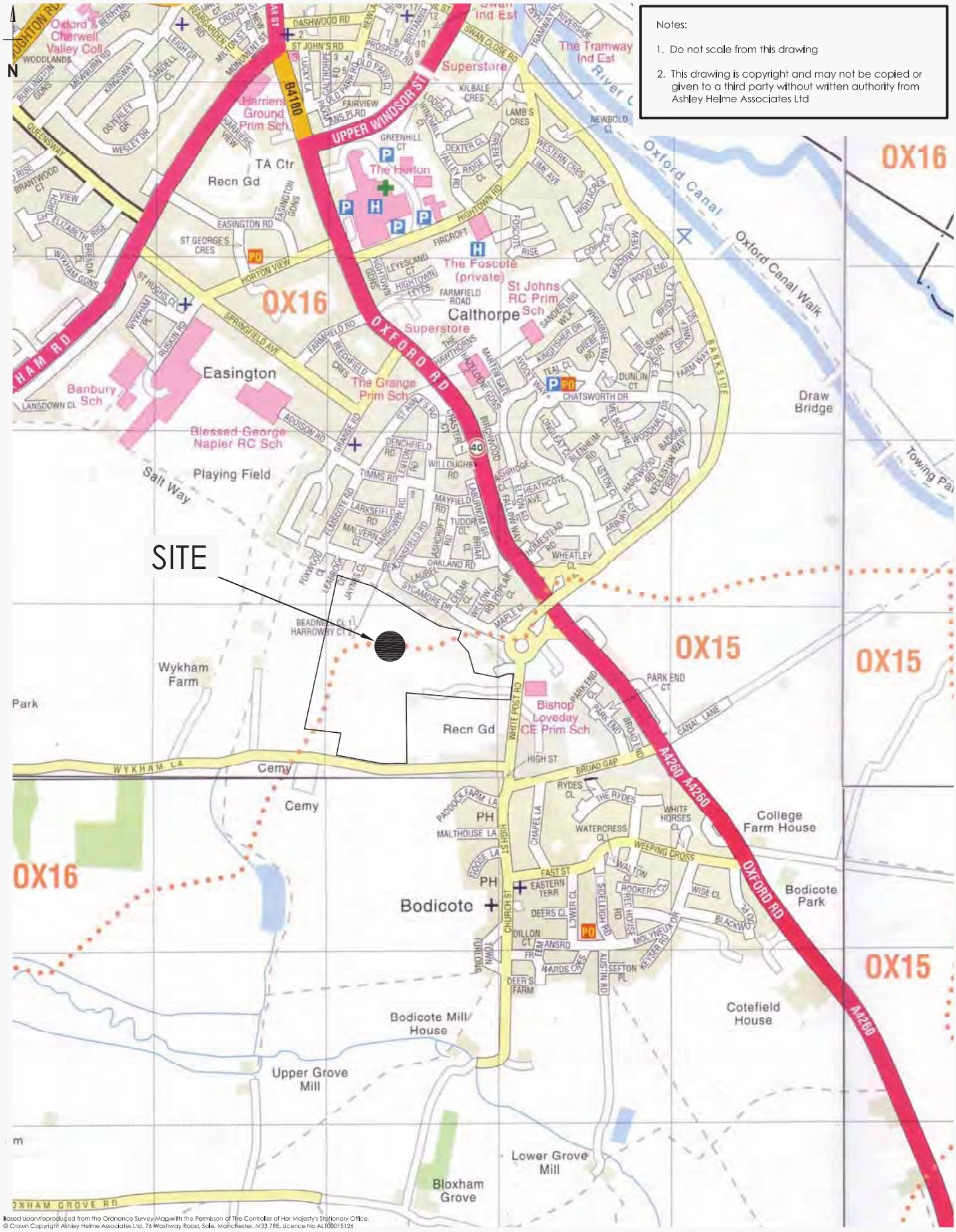

LOCATION PLAN

FIGURE 1

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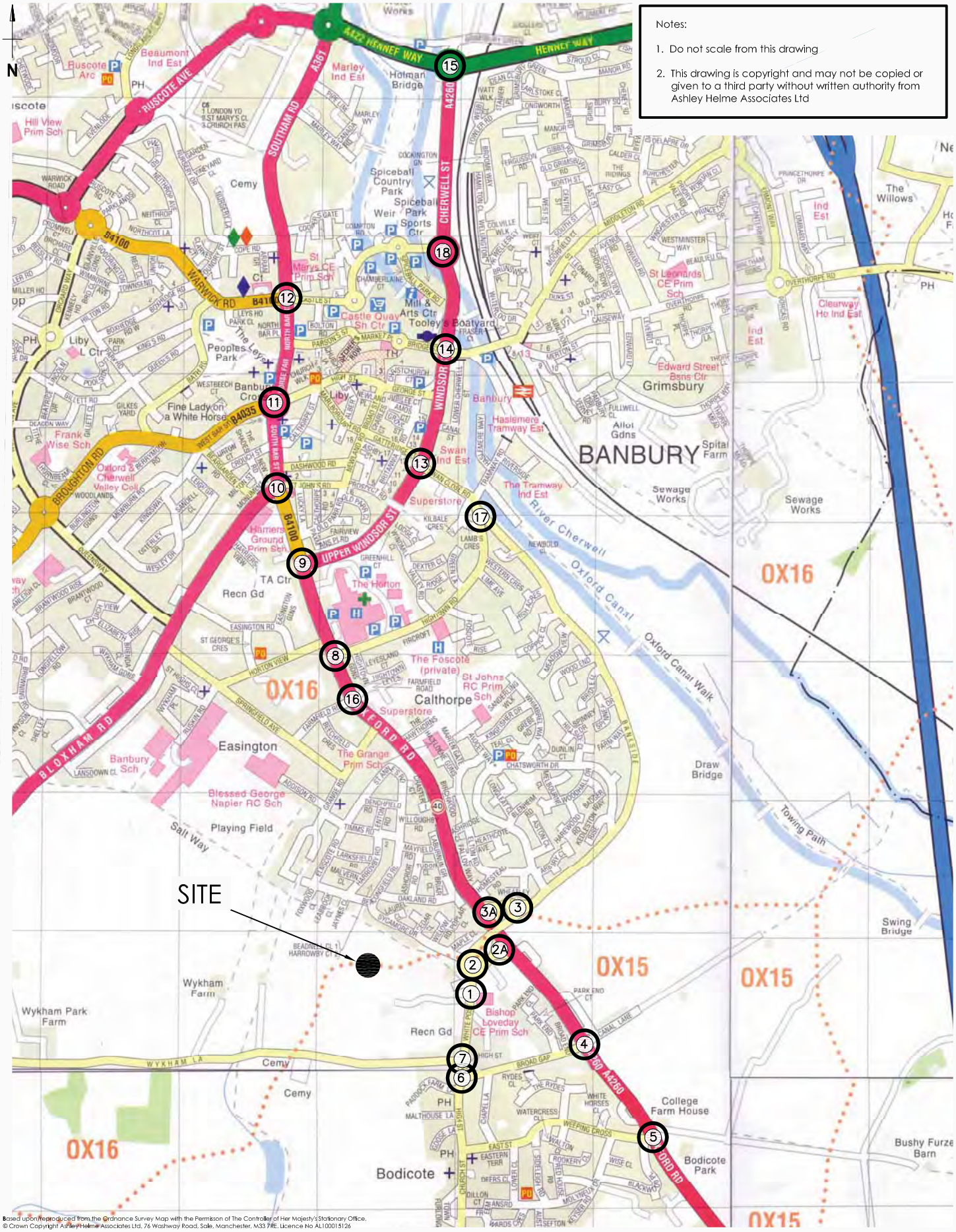

Notes:

1. Do not scale from this drawing
2. This drawing is copyright and may not be copied or given to a third party without written authority from Ashley Helme Associates Ltd

STUDY JUNCTIONS

FIGURE 2

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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Notes:

1. Only bus stop within 400m of site shown
2. Do not scale from this drawing
3. This drawing is copyright and may not be copied or given to a third party without written authority from Ashley Helme Associates Ltd

Key:

TRAVEL
- 1 Bus Stop [1]
- 2 Rail Station

EDUCATION
- 1 Nursery/Creche/ Surestart Centre
- 2 Primary School
- 3 Secondary School/ Sixth Form

COMMUNITY
- 1 Place of worship
- 2 Community Centre
- 3 Library

SHOPPING
- 1 Convenience Store/ Newsagent
- 2 Supermarket
- 3 Post Office
- 4 Bank/ATM
- 5 Specialist Shop

HEALTH
- 1 Health Centre
- 2 Pharmacy
- 3 Dentist
- 4 Opticians
- 5 Hospital

LEISURE
- 1 Restaurant/takeaway
- 2 Public House
- 3 Salon
- 4 Sports Ground/Club
- 5 Public Open Space
- 6 Playground
- 7 Leisure Centre
- 8 Allotments

Employment Locations

400m Isochrone (5 minute walk)

800m isochrone (10 minute walk)

1200m isochrone (15 minute walk)

2000m isochrone (25 minute walk)

SITE

WALK ISOCHRONES & LOCAL AMENITIES

FIGURE 3

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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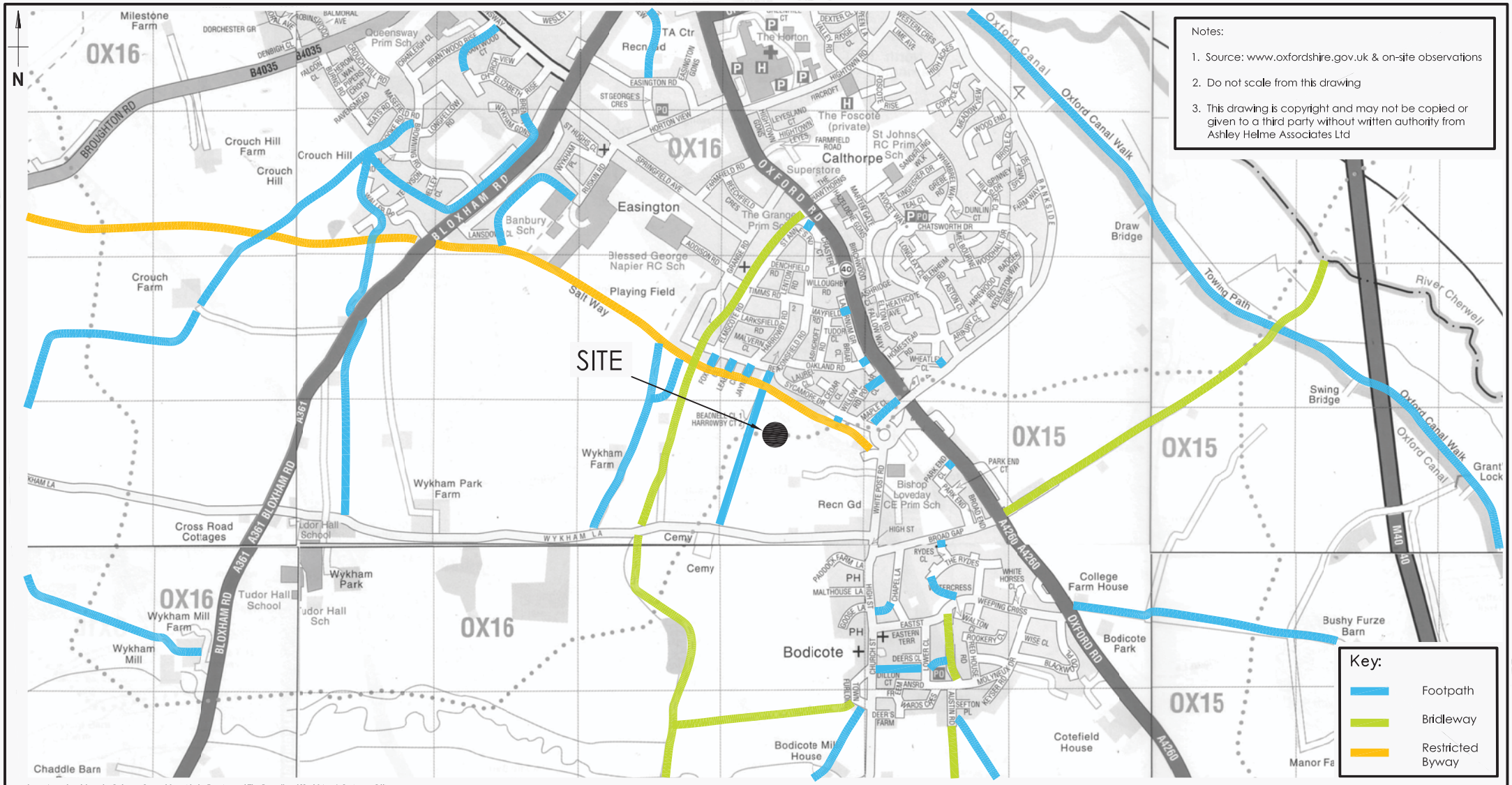

FIGURE 4 PUBLIC RIGHTS OF WAY (PROW)

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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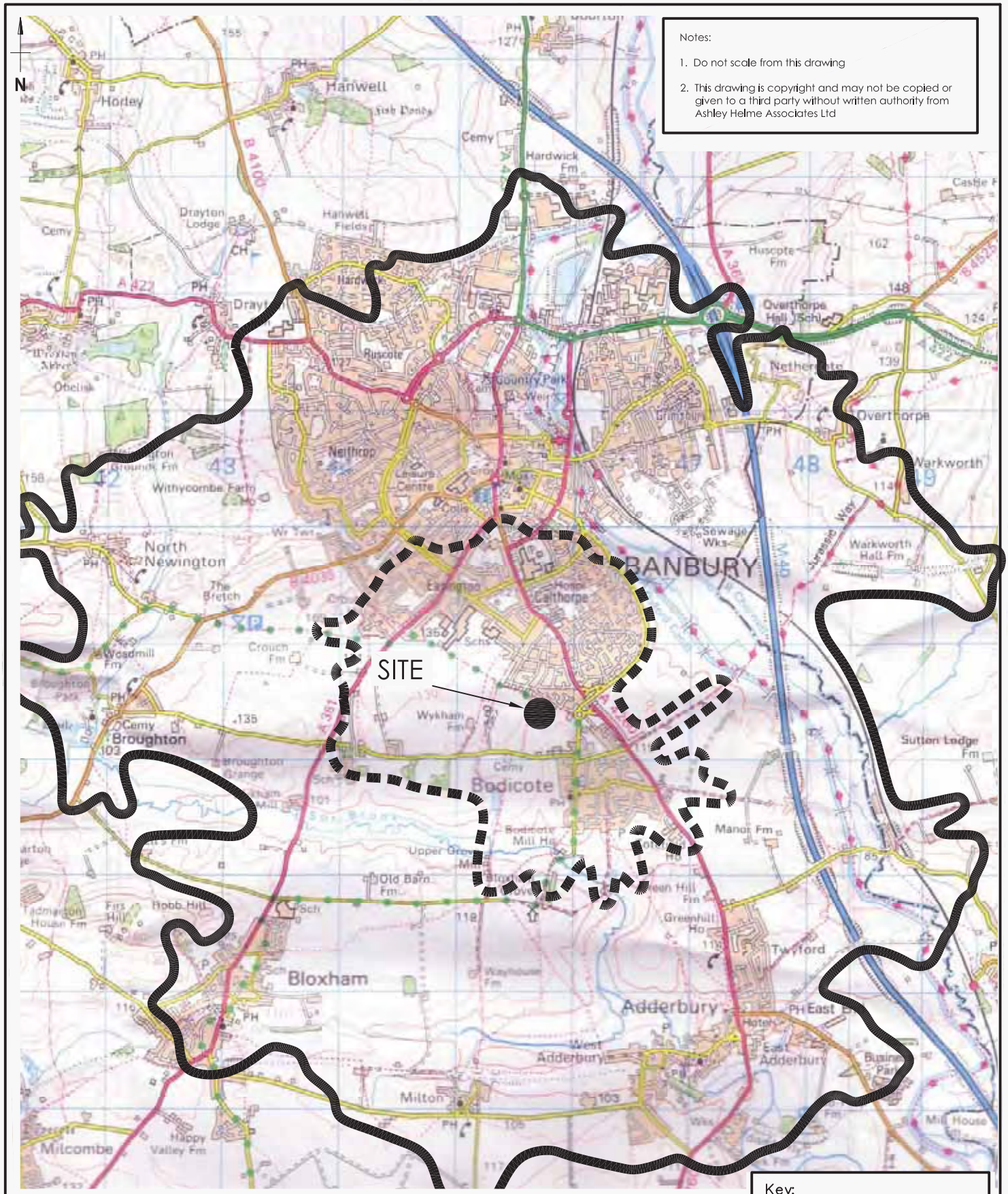

CYCLE ISOCHRONES

FIGURE 5

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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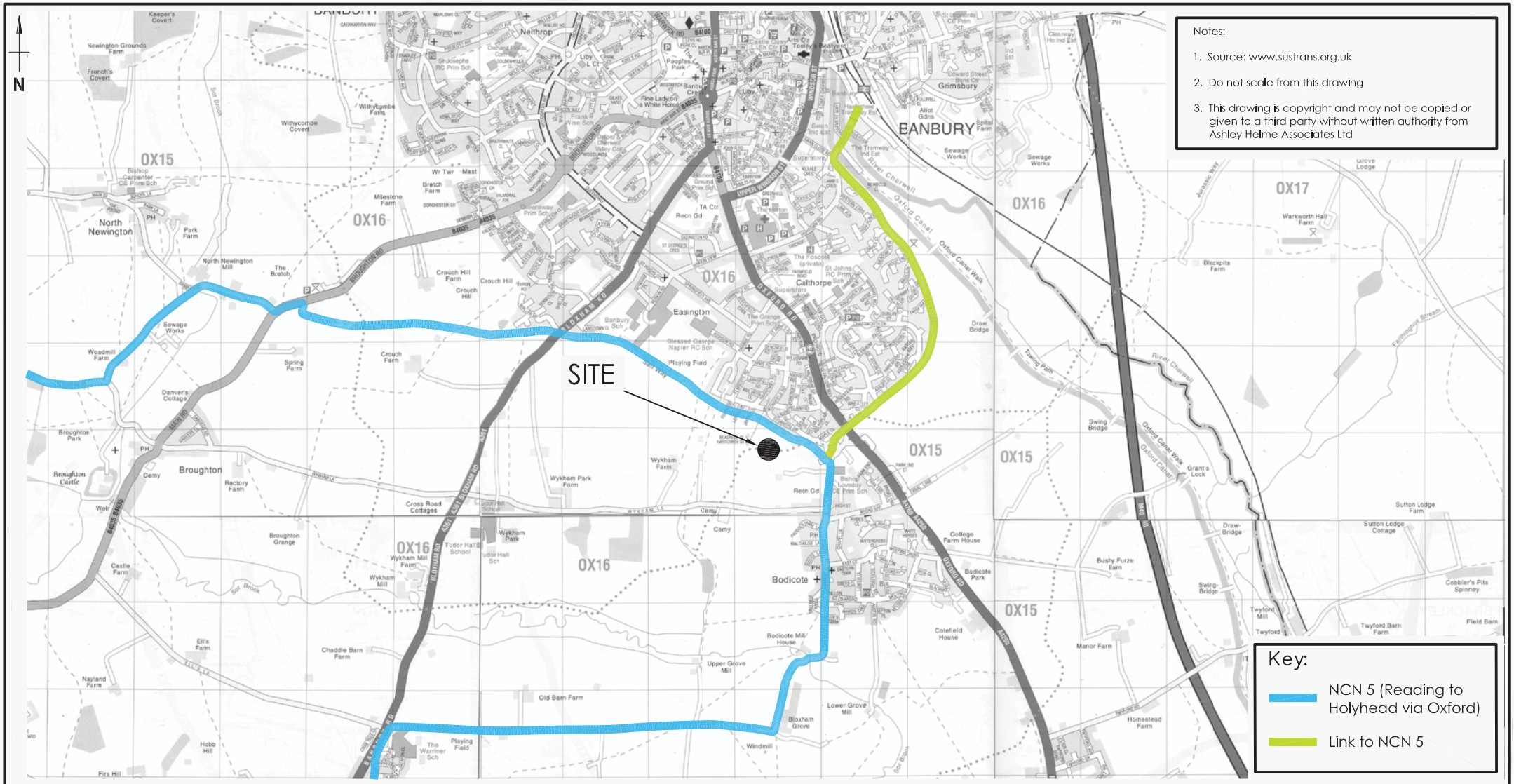

FIGURE 6 CYCLE ROUTES

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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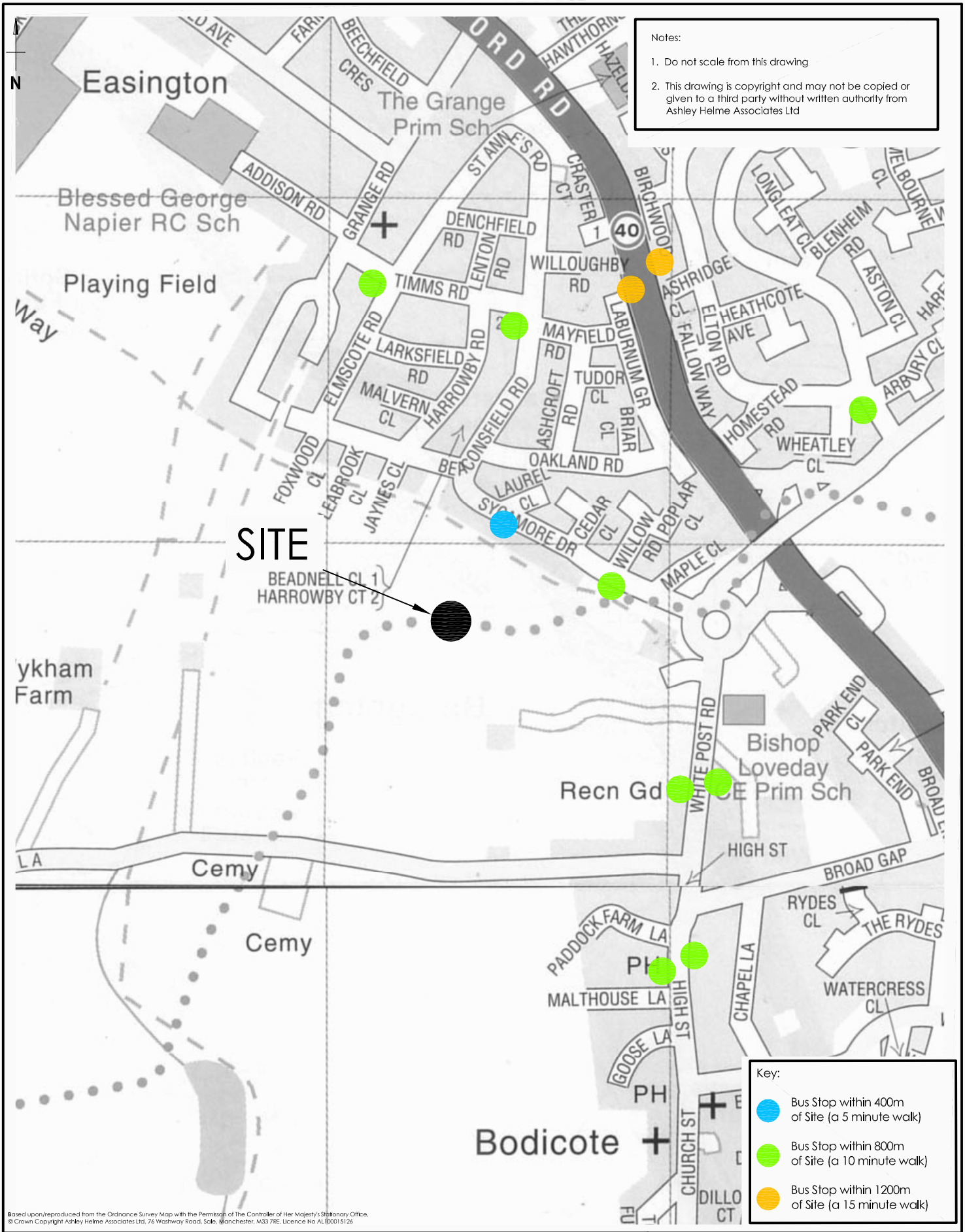

BUS STOPS

FIGURE 7

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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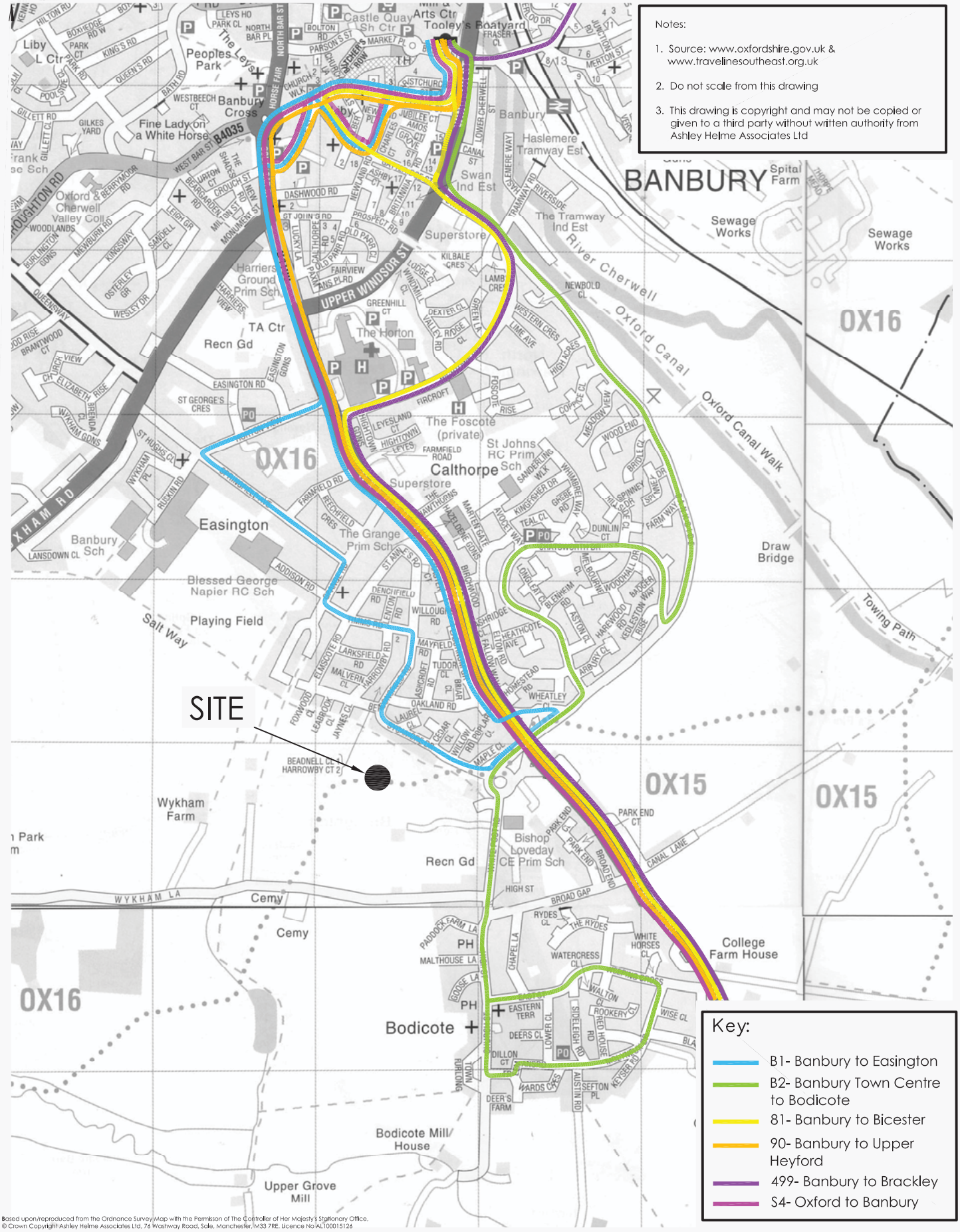

BUS ROUTES

FIGURE 8

ashleyhelme associates
76 washway road, sale, manchester, m33 7re
e: aha@ashleyhelme.co.uk t: 0161 972 0552 f: 0161 972 0553

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Tables

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BUS No	Route	FREQUENCY			OPERATOR
		Mon- Sat		Sun	
		Day	Eve		
Services calling within 400m of site					
B1	Banbury-Easington	30mins(1)	-	-	SIO
Services calling on White Post Road					
B2	Banbury Town Centre- Bodicote	30mins(1)	-	-	SIO
Services calling on A4260 Oxford Road					
81	Bicester-Fritwell-Souldern-Banbury	6 trips(2)	-	-	HT
90	Banbury-Deddington-Upper Heyford	2 trips(3)	-	-	OCC
499	Banbury-Kings Sutton-Aynho-Evenly-Brackley	12 trips(4)	-	-	HT
S4	Oxford-Banbury	30mins	4 trips(5)	8 trips(5)	SIO

Source: www.oxfordshire.gov.uk & www.travelinesoutheast.org.uk

Notes

1. Journey frequency is circa every 30 minutes, some trips vary,
2. During week on Thursday and Friday only, there is 1 trip to Banbury in AM and 1 trip to Bicester in PM. On Saturdays, there are 2 trips to Banbury and 2 return trips to Bicester,
3. 1 trip to Banbury in AM and 1 return trip to Upper Heyford in PM on Thursdays only,
4. 6 trips in each direction. In direction of Brackley, 1 trip terminates at Croughton and in direction of Banbury, 1 trip originates at Charlton,
5. There are 3 trips in direction of Banbury and 1 trip in direction of Deddington in evenings, Monday to Saturday. On Sundays, there are 4 trips in each direction.

Key:

SIO Stagecoach In Oxfordshire
OCC Oxfordshire County Council (Integrated Transport Unit)
HT Heyfordian Travel

TABLE 1 BUS SERVICES AND FREQUENCIES

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AREA OF WORKPLACE - RESIDENT POPULATION

LOCAL AUTHORITY/COUNTY/REGION

PLACE OF RESIDENCE / ROUTE ASSIGNMENT	LEICESTER	BLABY	DAVENTRY	NORTHAMPTON	SOUTH NORTHAMPTONSHIRE	WELLINGBOROUGH	EAST STAFFORDSHIRE	RUGBY	STRATFORD-UPON-AVON	WARWICK	BIRMINGHAM	COVENTRY	SOLIHULL	BEDFORD	CENTRAL BEDFORDSHIRE	LUTON	HERTSMERE	HUNTINGDONSHIRE	WATFORD	WESTMINSTER	EALING
A361 N			31																		
A423 N	3	6						12				28									
M40 N							2			48	8		8								
A4260 S														2	6	2					
A4260 N																					
WYKHAM LANE									52												
B4035 (W)																					
M40 S																	2		2	2	2
A422 E				11	238	3												3			
A361 S																					
SYCAMORE DRIVE																					
HIGHTOWN ROAD																					
B4100 (W)																					
TOTAL No.	3	6	31	11	238	3	2	12	52	48	8	28	8	2	6	2	2	3	2	2	2
TOTAL %	0.1	0.2	0.9	0.3	7.1	0.1	0.1	0.4	1.5	1.4	0.2	0.8	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1

PLACE OF RESIDENCE / ROUTE ASSIGNMENT	HILLINGDON	HOUNSLOW	MILTON KEYNES	SLOUGH	WEST BERKSHIRE	WINDSOR AND MAIDENHEAD	AYLESBURY VALE	WYCOMBE	OXFORD	SOUTH OXFORDSHIRE	VALE OF WHITE HORSE	WEST OXFORDSHIRE	RUNNYMEDE	SURREY HEATH	SOUTH GLOUCESTERSHIRE	SWINDON	CHELTENHAM	COTSWOLD	GLOUCESTER	TEWKESBURY
A361 N																				
A423 N																				
M40 N																				
A4260 S			14				23		95	13	19	76								
A4260 N																				
WYKHAM LANE																				
B4035 (W)																				
M40 S	3	3		3	10	7	24	18	94	14	18		2	2						
A422 E			15																	
A361 S												76			2	7	2	5	3	3
SYCAMORE DRIVE																				
HIGHTOWN ROAD																				
B4100 (W)																				
TOTAL No.	3	3	29	3	10	7	47	18	189	27	37	152	2	2	2	8	2	9	3	3
TOTAL %	0.1	0.1	0.9	0.1	0.3	0.2	1.4	0.5	5.6	0.8	1.1	4.5	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1

MIDDLE LAYER OUTPUT AREAS WITHIN CHERWELL

PLACE OF RESIDENCE / ROUTE ASSIGNMENT	CHERWELL 001	CHERWELL 002	CHERWELL 003	CHERWELL 004	CHERWELL 005	CHERWELL 006	CHERWELL 007	CHERWELL 008	CHERWELL 009	CHERWELL 010	CHERWELL 011	CHERWELL 013	CHERWELL 014	CHERWELL 015	CHERWELL 016	CHERWELL 017	CHERWELL 018	CHERWELL 019	TOTAL %
A361 N			321																10.5
A423 N	35																		2.5
M40 N																			2.0
A4260 S								258		61						9	1	66	19.2
A4260 N				858															25.5
WYKHAM LANE									63										3.4
B4035 (W)					25														0.7
M40 S											12	54	8	30	31				10.1
A422 E																			8.0
A361 S																			2.9
SYCAMORE DRIVE						256													7.6
HIGHTOWN ROAD							169												5.0
B4100 (W)	35	51																	2.6
TOTAL No.	70	51	321	858	25	256	169	258	63	61	12	54	8	30	31	9	1	66	100
TOTAL %	2.1	1.5	9.5	25.5	0.7	7.6	5.0	7.7	1.9	1.8	0.4	1.6	0.2	0.9	0.9	0.3	0.0	2.0	

Source: Origin-Destination data for Middle Layer Super Output (SO) Area, extract of table WU03EW 'Location of usual residence and place of work by method of travel to work'

Notes:

1. Car drivers only,
2. Destinations with 1 trip not included.

TABLE 2 2011 CENSUS DISTRIBUTION
PLACE OF WORK
RESIDENTS IN CHERWELL 006 & 007 MIDDLE LAYER SO AREAS

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PEAK HOUR	ARR	DEP	2-WAY
AM	0.156	0.441	0.597
PM	0.413	0.245	0.658

Notes:
1. Source: TRICS 2013(b).
2. Units = vehicles/hour/dwelling.

TABLE 3 TRIP GENERATION RATES
RESIDENTIAL
AM & PM PEAK HOURS

PEAK HOUR	ARR	DEP	2-WAY
AM	44	123	167
PM	115	69	184

Notes:

1. Trip rates as Table 3 trip rates
2. Assumes 280 houses.

TABLE 4 GENERATED TRAFFIC
PROPOSED DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	SITE ACCESS			WHITE POST ROAD (N)			WHITE POST ROAD (S) RIGHT			WHITE POST ROAD (S) LEFT		
	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)
AM	0.032	0.03	0.11	0.282	0.39	0.05	0.651	1.80	0.36	0.013	0.01	0.12
PM	0.017	0.02	0.10	0.207	0.26	0.04	0.745	2.76	0.47	0.034	0.03	0.13

Notes:
1. Refer Figure B7A, Appendix B, for traffic flows,
2. Refer Drg No 1361/22/C for junction geometry,
3. Q = Queue (pcu),
4. Delay = Average vehicle delay (minutes).

TABLE 5 **PICADY ANALYSIS RESULTS**
SJ1: SITE ACCESS/WHITE POST ROAD
2025 WITH DEVELOPMENT
AM & PM PEAK HOURS

PEAK HOUR	DEVT	OXFORD ROAD NORTHBOUND SLIP			WHITE POST ROAD			SYCAMORE DRIVE			BANKSIDE		
		RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)
AM	Base[1]	0.179	0.22	2.629	0.223	0.29	3.365	0.192	0.24	3.186	0.363	0.57	3.453
	With[2]	0.185	0.23	2.691	0.308	0.44	3.781	0.204	0.26	3.407	0.396	0.65	3.750
PM	Base[1]	0.214	0.27	2.553	0.271	0.37	3.790	0.146	0.17	3.148	0.215	0.27	2.781
	With[2]	0.230	0.30	2.712	0.322	0.47	4.074	0.158	0.19	3.290	0.274	0.38	3.066

Notes:
1. Refer Figure B4A, Appendix B, for traffic flows,
2. Refer Figure B7A, Appendix B, for traffic flows,
3. Refer Drg No 1361/02 for existing junction geometry,
4. Q = Queue (pcu),
5. Delay= Average vehicle delay (seconds)

TABLE 6 **ARCADY ANALYSIS RESULTS**
SJ2: OXFORD ROAD SLIP/WHITE POST ROAD/SYCAMORE DRIVE/BANKSIDE
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	DEVT	NORTHBOUND ON-SLIP		
		RFC	Q	DELAY (min)
AM	Base(1)	0.444	0.79	0.22
	With(2)	0.583	1.37	0.29
PM	Base(1)	0.264	0.36	0.16
	With(2)	0.338	0.51	0.17

Notes:
1. Refer Figure B9/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Drg No 1361/03 for existing junction geometry,
4. Q = Queue (pcu),
5. Delay = Average vehicle delay (minutes)

TABLE 7 PICADY ANALYSIS RESULTS
SJ2A: OXFORD ROAD/NORTHBOUND SLIPS
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	DEVT	BANKSIDE (E)			COLLEGE FIELDS SITE ACCESS			BANKSIDE (W)			OXFORD ROAD SOUTHBOUND SLIPS		
		RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)
AM	Base(1)	0.458	0.84	4.731	0.209	0.26	5.352	0.517	1.06	6.605	0.150	0.18	2.950
	With(2)	0.469	0.88	4.886	0.213	0.27	5.507	0.551	1.22	7.108	0.170	0.20	3.055
PM	Base(1)	0.364	0.57	4.150	0.122	0.14	4.335	0.518	1.07	6.669	0.202	0.25	3.251
	With(2)	0.392	0.64	4.474	0.129	0.15	4.605	0.538	1.15	6.952	0.249	0.33	3.482

Notes:
1. Refer Figure B4/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Colin Buchanan TA report, Figure 59, Appendix F,
4. Q = Queue (pcu),
5. Delay= Average vehicle delay (seconds).

TABLE 8 ARCADY ANALYSIS RESULTS
SJ3: COLLEGE FIELDS ACCESS/OXFORD ROAD SOUTHBOUND SLIPS/BANKSIDE
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	DEVT	SOUTHBOUND ON-SLIP		
		RFC	Q	DELAY (min)
AM	Base[1]	0.751	2.86	0.44
	With[2]	0.775	3.23	0.48
PM	Base[1]	0.681	2.06	0.37
	With[2]	0.696	2.20	0.38

Notes:
1. Refer Figure B4/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Drg No 1361/05 for junction geometry,
4. Q = Queue (pcu),
5. Delay = Average vehicle delay (minutes)

TABLE 9 PICADY ANALYSIS RESULTS
SJ3A: OXFORD ROAD/SOUTHBOUND SLIPS
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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SJ	LINK	AM						PM					
		BASE			WITH			BASE			WITH		
		DS	Q	DELAY	DS	Q	DELAY	DS	Q	DELAY	DS	Q	DELAY
SJ8	Oxford Road (S) Ahead	57.0	13.6	24.8	59.9	13.7	12.0	60.9	16.3	26.8	58.8	15.1	26.7
	Oxford Road (S) Right/Ahead	69.9	9.0	32.3	75.2	5.1	22.1	66.9	8.0	19.9	79.2	10.0	29.9
	Hightown Road Left/Right	66.9	9.3	42.1	67.4	8.4	41.7	84.6	15.2	65.2	85.8	13.6	58.9
	Horton View Right/Left	80.2	11.6	51.7	80.2	10.6	51.1	60.0	7.3	41.5	59.8	7.3	41.4
	Oxford Road (N) Ahead/Right	62.6	11.4	18.4	64.0	10.9	18.5	77.6	14.9	22.1	79.4	17.4	20.9
	Oxford Road (S Link) Ahead/Left	60.1	3.8	8.4	62.8	2.5	6.4	61.5	3.1	7.3	63.0	3.1	6.7
	Oxford Road (S Link) Ahead	40.8	3.0	6.2	43.1	3.2	6.9	40.3	3.5	6.0	41.8	3.1	6.2
	Oxford Road (N Link) Left/Ahead	62.5	5.5	9.8	63.6	5.5	9.9	70.7	5.3	9.7	74.6	5.8	11.1
	Oxford Road (N Link) Ahead	34.9	3.3	7.3	35.6	3.3	7.3	35.3	2.7	6.1	38.3	2.9	6.8
SJ9	Oxford Road (N) Left/Ahead	81.6	15.7	36.4	85.9	17.3	40.7	104.1	48.6	137.7	96.6	28.7	59.9
	Oxford Road (S) Ahead	36.8	4.1	4.5	38.9	4.5	4.6	35.1	4.2	5.7	35.1	4.0	5.0
	Oxford Road (S) Ahead/Right	82.8	15.0	40.2	84.5	15.9	40.9	86.3	15.1	48.4	95.5	20.0	76.4
	Upper Windsor Street Left	35.1	5.1	16.7	35.2	5.1	16.1	35.4	5.1	16.7	41.5	6.1	20.2
	Upper Windsor Street Right	82.9	5.6	93.3	82.9	5.6	93.3	77.1	6.4	66.3	92.5	9.1	113.3
SJ16	Oxford Road (N) Left/Ahead	72.4	9.8	18.4	72.1	16.1	32.7	93.8	25.8	46.3	98.5	38.3	78.6
	Oxford Road (N) Ahead/Right	54.0	6.0	14.0	53.6	11.7	28.2	55.8	11.5	18.8	59.3	14.5	17.5
	Farmfield Road (E) Right/Left/Ahead	68.4	4.2	57.7	68.4	4.1	57.5	102.2	24.9	146.9	102.5	25.4	151.7
	Oxford Road (S) Ahead/Left	61.8	14.1	25.8	63.9	13.5	24.5	61.6	13.4	24.7	63.4	14.0	25.2
	Oxford Road (S) Ahead/Right	64.0	13.9	28.7	64.7	13.2	26.8	103.5	33.7	151.2	103.5	33.3	146.6
	Farmfield Road (W) Left/Ahead/Right	75.6	6.7	62.6	81.0	7.6	72.6	96.1	9.0	156.2	96.1	8.7	153.8

Notes:
1. Refer Figure B4/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Buchanan Figures S3 and S4 for proposed junction geometry,
4. Q = Queue (pcu),
5. Delay= Average vehicle delay (seconds/pcu)

TABLE 10 LINSIG ANALYSIS RESULTS
SJ8, 9 & 16
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	UPPER WINDSOR STREET (N)		SWAN CLOSE ROAD		UPPER WINDSOR STREET (S)	
	O(1)	M(2)	O(1)	M(2)	O(1)	M(2)
AM	18.58	8.8	17.83	11.9	14.25	10.3
PM	16.67	8.1	15.58	12.1	9.58	8.1

Notes:
1. Average observed queue during peak hour.
2. Modelled queue,
3. Refer Drg No 1361/18 for junction geometry,
4. Refer Figure B1/A, Appendix B for traffic flows.

TABLE 11 LINSIG VALDIATION RESULTS: SJ13
AM & PM PEAK HOURS

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PEAK HOUR	DEVT	UPPER WINDSOR STREET (N)			SWAN CLOSE ROAD			UPPER WINDSOR STREET (N)		
		DS[4]	Q[5]	DELAY[6]	DS[4]	Q[5]	DELAY[6]	DS[4]	Q[5]	DELAY[6]
AM	Base[1]	82.7	17.6	41.6	84.6	18.9	37.2	80.4	12.6	22.2
	With[2]	85.8	19.2	44.5	87.5	20.5	40.6	81.9	13.0	23.0
PM	Base[1]	66.3	11.6	34.6	89.0	21.6	40.0	87.7	14.9	27.0
	With[2]	68.0	12.1	35.1	90.6	22.7	42.8	92.1	17.5	32.8

Notes:
1. Refer Figure B4/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Drg No 1361/18 for junction geometry,
4. DS = Degree of Saturation (%),
5. Delay = Average vehicle delay (seconds)

TABLE 12 LINSIG ANALYSIS RESULTS
SJ13: SWAN CLOSE ROAD/UPPER WINDSOR STREET
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	DEVT	BANKSIDE			SWAN CLOSE ROAD (S)			LAMBS CRESCENT			SWAN CLOSE ROAD (N)		
		DS	Q	DELAY (sec)	DS	Q	DELAY (sec)	DS	Q	DELAY (sec)	DS	Q	DELAY (sec)
AM	Base[1]	84.8	14.2	46.2	63.7	5.2	36.1	4.1	0.2	50.5	86.6	15.9	45.8
	With[2]	88.7	15.8	52.2	66.5	5.3	37.8	4.1	0.2	50.5	87.9	16.6	47.8
PM	Base[1]	76.1	8.0	53.4	47.1	4.5	20.8	4.1	0.2	50.8	79.2	15.9	28.5
	With[2]	79.7	8.7	57.0	50.4	4.6	21.7	4.1	0.2	50.8	81.9	17.1	30.2

Notes:
1. Refer Figure B4/A, Appendix B, for traffic flows,
2. Refer Figure B7/A, Appendix B, for traffic flows,
3. Refer Buchanan Figure S2 for proposed junction geometry,
4. Q = Queue (pcu),
5. Delay= Average vehicle delay (seconds/pcu)

TABLE 13 LINSIG ANALYSIS RESULTS
SJ17: BANKSIDE/SWAN CLOSE ROAD/LAMBS CRESCENT
2025 BASE & WITH DEVELOPMENT
AM & PM PEAK HOURS

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PEAK HOUR	SITE ACCESS			WHITE POST ROAD (N)			WHITE POST ROAD (S) RIGHT			WHITE POST ROAD (S) LEFT		
	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)	RFC	Q	DELAY (min)
AM	0.205	0.26	0.14	0.313	0.46	0.05	0.492	0.95	0.32	0.307	0.44	0.17
PM	0.139	0.16	0.13	0.297	0.42	0.05	0.675	1.99	0.46	0.200	0.25	0.16

Notes:
1. Refer Figure D7, Appendix D, for traffic flows,
2. Refer Drg No 1361/22/B for junction geometry,
3. Q = Queue (pcu),
4. Delay = Average vehicle delay (mins).

TABLE 14 PICADY ANALYSIS RESULTS
SJ1: SITE ACCESS/WHITE POST ROAD
2025 WITH DEVELOPMENT: OCC SENSITIVITY TEST
AM & PM PEAK HOURS

PEAK HOUR	OXFORD ROAD NORTHBOUND SLIP			WHITE POST ROAD			SYCAMORE DRIVE			BANKSIDE		
	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)
AM	0.196	0.24	2.785	0.435	0.77	4.628	0.223	0.29	3.815	0.451	0.82	4.386
PM	0.258	0.35	2.995	0.363	0.57	4.333	0.163	0.19	3.396	0.369	0.58	3.592

Notes:
1. Refer Figure D7, Appendix D, for traffic flows,
2. Refer Drg No 1361/02 for junction geometry,
3. Q = Queue (pcu),
4. Delay = Average vehicle delay (seconds).

TABLE 15 ARCADY ANALYSIS RESULTS
SJ2: OXFORD ROAD SLIP/WHITE POST ROAD/SYCAMORE DRIVE/BANKSIDE
2025 WITH DEVELOPMENT: OCC SENSITIVITY TEST
AM & PM PEAK HOURS

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PEAK HOUR	NORTHBOUND ON-SLIP		
	RFC	Q	DELAY (min)
AM	0.864	5.37	0.80
PM	0.421	0.72	0.20

Notes:
1. Refer Figure D7, Appendix D, for traffic flows,
2. Refer Drg No 1361/03 for existing junction geometry,
3. Q = Queue (pcu),
4. Delay = Average vehicle delay (minutes)

TABLE 16 PICADY ANALYSIS RESULTS
SJ2A: OXFORD ROAD/NORTHBOUND SLIPS
2025 WITH DEVELOPMENT: OCC SENSITIVITY TEST
AM & PM PEAK HOURS

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PEAK HOUR	BANKSIDE (E)			COLLEGE FIELDS SITE ACCESS			BANKSIDE (W)			OXFORD ROAD SOUTHBOUND SLIPS		
	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)	RFC	Q	DELAY (sec)
AM	0.479	0.91	5.077	0.220	0.28	5.731	0.582	1.38	7.619	0.203	0.25	3.180
PM	0.420	0.72	5.011	0.141	0.16	5.124	0.547	1.20	7.088	0.353	0.54	4.043

Notes:
1. Refer Figure D7, Appendix D, for traffic flows,
2. Refer Colin Buchanan TA report, Figure 59, Appendix H,
3. Q = Queue (pcu),
4. Delay= Average vehicle delay (seconds).

TABLE 17 ARCADY ANALYSIS RESULTS
SJ3: COLLEGE FIELDS ACCESS/OXFORD ROAD SOUTHBOUND SLIPS/BANKSIDE
2025 WITH DEVELOPMENT: OCC SENSITIVITY TEST
AM & PM PEAK HOURS

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PEAK HOUR	SOUTHBOUND ON-SLIP		
	RFC	Q	DELAY (min)
AM	0.838	4.60	0.64
PM	0.716	2.41	0.41

Notes:
1. Refer Figure D7, Appendix D, for traffic flows,
2. Refer Drg No 1361/05 for existing junction geometry,
3. Q = Queue (pcu),
4. Delay = Average vehicle delay (minutes)

TABLE 18 PICADY ANALYSIS RESULTS
SJ3A: OXFORD ROAD/SOUTHBOUND SLIPS
2025 WITH DEVELOPMENT: OCC SENSITIVITY TEST
AM & PM PEAK HOURS

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