Woodstock East, Oxfordshire

Transport Assessment

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1 INTRODUCTION

1.1 David Tucker Associates has been commissioned by Pye Homes Ltd and Vanbrugh Unit Trust to provide highways and transport advice, and to prepare a Transport Assessment (TA) and Framework Travel Plan to support a planning application for a mixed use development on land off the A44 Oxford Road, to the south east of Woodstock. An indicative site masterplan is attached at **Appendix A**.

1.2 The description of development is as follows:

Outline planning application, with all matters reserved, for mixed use development comprising:-

- *up to 1,500 houses, including a 150 unit care village with associated publicly accessible ancillary facilities;*
- *Primary school (2 form entry);*
- *Up to 930sqm of retail space;*
- *Up to 7,500sqm of locally led employment (B1, B2 and B8);*
- *Site for a Football Association step 5 football facility;*
- *Public open space;*
- *Public Transport Interchange with 300 car parking spaces; and*
- *Associated infrastructure, engineering and ancillary works, with vehicular access*

1.3 The site is located within West Oxfordshire District Council and Cherwell District Council. To support the development, within the context of the wider developments proposed within the County, a transport strategy for the site has been developed in line with the published transport policies of local and national Government. This transport strategy sets out the infrastructure and transport service provision required to secure that a high standard of access to key employment centres including Oxford City will be achievable in an efficient and sustainable manner. This will be achieved by securing additional junction capacity and reallocation of road space in favour of enhanced bus services. As such the proposed strategy will provide the needs of the development whilst also providing a foundation for wider development.

1.4 The methodology used for the Transport Assessment (TA) in support of the application takes account of 'Guidance on Transport Assessment' (GTA) issued by the Department for Transport (DfT) and Department for Communities and Local Government (DCLG) in March 2007 and other relevant Government guidance including DfT Circular 02/2013. Detailed discussions have been had with both highway authorities, Oxfordshire County Council (OCC) and the Highways Agency (HA). Discussions have also been held with all local stakeholders including residents and public transport operators including Stagecoach which have informed the assessments contained within the TA.

1.5 A detailed analysis has been carried out to assess the likely traffic generation from the proposals, the distribution of trips and the assignment of traffic onto the road network. In this way the traffic impact has been assessed, along with consideration of measures required to mitigate the impact of the traffic generated by the development.

1.6 The assessment considers the potential transport and highways impacts of the proposals including the impact of construction traffic and development generated traffic on the capacity and safety of the surrounding road network and the implications for public transport and pedestrian and cycling movements.

1.7 In addition to assessing the full development, the Transport Assessment considers the phasing of the proposed development both in terms of the construction of the development and the infrastructure and transport measures required to support it.

1.8 A Framework Travel Plan has been prepared to set out how the development will be managed from a sustainable travel perspective and this includes consideration of trigger points and infrastructure requirements.

2 POLICY

2.1 National Guidance

Transport White Paper: 'Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen', DfT 2011

2.1.1 In January 2011 the Government set out in its Local Transport White Paper its approach for creating growth in the economy and to tackle climate change by cutting carbon emissions.

2.1.2 The White Paper sets the Government's approach to shorter local journeys (so, trips of five miles or less) with the intention to support its wider goals of promoting economic growth and reducing carbon.

2.1.3 It emphasises the key role of developing sustainable travel in delivering the Government's key objectives for Local Transport.

National Planning Policy Framework, DCLG 2012

2.1.4 In March 2012, the DCLG published the National Planning Policy Framework (NPPF). The NPPF confirms that the Government will continue to encourage sustainable development and in relation to the transport issues it notes 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. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas*."
>
> Para 29

2.1.5 It confirms that:

> "*All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. 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 limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe".*

Para 31

2.1.6 The policy test in terms of new development in the NPPF relate to the need to ensure traffic impacts are not severe whilst cost effectively limiting new infrastructure. To ensure high quality development the NPPF confirms that:

"*Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. 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 ultra-low emission vehicles; and*
- *consider the needs of people with disabilities by all modes of transport.*

A key tool to facilitate this will be a Travel Plan. All developments which generate significant amounts of movement should be required to provide a Travel Plan.

Planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities.

For larger scale residential developments in particular, planning policies should promote a mix of uses in order to provide opportunities to undertake day-to-day activities including work on site. Where practical, particularly within large-scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties".

Para 35

Guidance on Transport Assessment, DfT 2007

2.1.7 The GTA document was issued by the DfT and DCLG in March 2007. It is intended to assist stakeholders in determining if an Assessment is required for a particular development and provides guidance on the content. As with the NPPF, this document should be reviewed in conjunction with other relevant statements of national planning policy.

2.1.8 In preparing a Transport Assessment (TA) the GTA identifies three key areas and advises the following considerations for each:

Encouraging environmental sustainability

- ***Reducing the need to travel, especially by car*** *– reducing the need for travel, reducing the length of trips, and promoting multi-purpose or linked trips by promoting more sustainable patterns of development and more sustainable communities that reduce the physical separation of key land uses.*
- ***Tackling the environmental impact of travel*** *– by improving sustainable transport choices, and by making it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking, and cycling.*
- ***The accessibility of the location*** *– the extent to which a site is, or is capable of becoming, accessible by non car modes, particularly for large developments that involve major generators of travel demand.*

- ***Other measures which may assist in influencing travel behaviour (ITB)*** *– achieving reductions in car usage (particularly single occupancy vehicles), by measures such as car sharing/pooling, High Occupancy Vehicle (HOV) lanes and parking control*

Managing the existing network

- ***Making best possible use of existing transport infrastructure –*** *for instance by low-cost improvements to the local public transport network and using advanced signal control systems, public transport priority measures (bus lanes), or other forms of Intelligent Transport Systems (ITS) to improve operations on the highway network. It should be noted that the capacity of the existing public transport infrastructure and footpaths is finite, and in some areas overcrowding already exists.*
- ***Managing access to the highway network*** *– taking steps to maximise the extent to which the development can be made to 'fit' within the available capacity by managing access from developments onto the highway network.*

Mitigating residual impacts

- ***Through demand management*** *– using traffic control measures across a wide network to regulate flows.*
- ***Through improvements to the local public transport network, and walking and cycling facilities*** *– for example, by extending bus routes and increasing bus frequencies, and designing sites to facilitate walking and cycling.*
- ***Through minor physical improvements to existing roads*** *– it may be possible in some circumstances to improve the capacity of existing roads by relatively minor physical adjustments such as improving the geometry of junctions etc. within the existing highway boundary.*
- ***Through provision of new or expanded roads*** *– it is considered good transport planning practice to demonstrate that the other opportunities above have been fully explored before considering the provision of additional road space such as new roads or major junction upgrades.*

2.1.9 The methodology used for the TA is in accordance with the guidelines outlined above.

DfT Circular 02/2013, The Strategic Link Road Network and the Delivery of Sustainable Development

2.1.10 The document sets out the way in which the Highways Agency will engage with communities and the development industry to deliver sustainable development, and thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network.

2.1.11 In determining its contribution to the development of Local Plans, the Highways Agency's aim will be to ensure that the scale and patterns of development are planned in a manner which will not compromise the fulfilment of the primary purpose of the strategic road network. To this end, the Agency will assess the cumulative and individual impacts of Local Plan proposals on the ability of the various road links and junctions to accommodate the forecast traffic flows in terms of capacity and safety.

2.1.12 The Highways Agency will work with local authorities and developers in identifying potential development sites and can provide information and expertise in helping to understand the transport implications of proposals.

DfT, Building Sustainable Transport into New Developments: A Menu of Options for Growth Points and Eco-Towns, 2008

2.1.13 The document published in 2008 sets out its plans to increase housing growth. This document, which forms part of the Government's advice on transport within Ecotowns and New Growth Points, is aimed at all those involved in the planning, design and construction of new housing developments. It sets out advice on how to build an effective sustainable transport system in new developments, from the planning to the implementation stage. It recommends a variety of transport options to integrate and adopt according to the location and needs of the individual development.

2.1.14 Section 1 of the document emphasises how the layout of a development can have a significant impact on how people choose to travel. Good design is key to maximising sustainable transport usage and reducing the need to travel. Streets should be primarily designed to accommodate the needs of pedestrians, cyclists and public transport to make sustainable modes of travel attractive, convenient and accessible.

2.1.15 Design features that encourage sustainable transport usage include:

- Comprehensive direct networks for walking, cycling and public transport, with routes for private motor traffic taking a lower priority;
- Limited private vehicle access to homes and services;
- Situating key services such as health centres and schools in central locations within the town;
- Inclusive street environments that aim to integrate the activities of pedestrians, cyclists and motorists;
- Car-free areas within a development;
- Pedestrianised shopping areas (preferably with cycling access if this can be safely accommodated) which are served by direct cycle routes and public transport;
- A 'legible' development design i.e. it should be easy for people to work out where they are and where they are going in order to navigate easily around the community;
- Joined-up transport networks, with good interchanges.

2.1.16 Decisions regarding transport will inevitably depend upon location, the scale and type of development and what (if any) capacity is available on the existing network.

2.1.17 The following headings highlight the ways in which sustainable transport can be provided in and around Growth Points and Eco-towns:

- promoting cycling and walking;
- reducing car usage;
- providing access to public transport;
- goods and emergency vehicles.

DfT, Smarter Choices – Changing the Way We Travel, 2005

2.1.18 The report, published in June 2005 examines the impact of soft measures, using evidence from the UK and abroad, case study interviews and the experiences of stakeholders.

2.1.19 'Soft' measures typically include workplace and school travel plans, personalised travel planning, travel awareness campaigns, public transport information and marketing, car clubs and car sharing schemes, teleworking, teleconferencing, and home shopping.

2.1.20 The report concluded that sufficient evidence now exists to have some confidence that soft factor interventions can have a significant effect on individual travel choices.

DfT and DCLG, Manual for Streets (2007) and Manual for Streets 2 (2010)

2.1.21 Manual for Streets was published in 2007 and provides guidance on residential street design. Manual for Streets recognises that there is a need to transform the quality of residential streets, and this requires a new approach to their provision. The Manual is aimed at any organisation or discipline with an interest in residential streets, ranging from access officers to the emergency services. The importance of joint working among practitioners is a key feature of the Manual.

2.1.22 Manual for Streets 2 published in 2010 builds on the guidance contained within Manual for Streets, exploring in greater detail they can be extended beyond residential streets to encompass both urban and rural situations. It fills the perceived gap in design advice that lies between Manual for Streets and the design standards for trunk roads set out in the Design Manual for Roads and Bridges.

DMRB TD16/07, Geometric Design of Roundabouts, 2007

2.1.23 This document sets out the design standards and advice for the geometric design of roundabouts.

DMRB TD41/95, Vehicle Access to all Purpose Trunk Roads, 1995

2.1.24 This document sets out the design requirements for accesses on to an all-purpose trunk road, including geometric and visibility standards.

National Road Transport Forecasts (2009)

2.1.25 Department for Transport's National Transport Model (NTM) produces forecasts of road traffic growth, vehicle tailpipe emissions, congestion and journey times up to 2035.

2.2 Local Guidance

West Oxfordshire Local Plan – 2011

2.2.1 The Local Plan sets out a comprehensive list of policies relating to all aspects of social and economic development and environmental protection in the district. In terms of transport the Local Plan identifies the following policies:

Policy T1 – Traffic Generation

Proposals which would generate significant levels of traffic will not be permitted in locations where travel by means other than a private car is not a realistic alternative.

Policy T2 – Pedestrian and Cycle Facilities

Measures will be sought to protect, improve and extend facilities for cyclists and pedestrians, and particularly to extend the cycle and pedestrian route network within and between settlements, within and through new development areas and through the countryside generally.

2.2.2 The proposed development has been designed with precisely these issues in mind and the accessibility of the site to all users and modes other than the private car are given specific emphasis in this report. Woodstock has good transport links including public transport, both bus and rail, foot and cycle links to adjacent communities and good road links to the principle road network.

2.2.3 The site is also well located with respect to accessing education, retail, health and leisure with a convenient supermarket, doctors and dentist surgeries which are a short distance from the proposed development.

Emerging West Oxfordshire Local Plan

2.2.4 West Oxfordshire District Council are in the process of replacing the adopted Local Plan with a number of documents known collectively as the Local Development Framework. It will include the Local Plan (Part 1) which deals with strategic issues and sites and Local Plan (Part 2) which deals with more local issues and smaller sites.

2.2.5 The new Local Plan (Part 1) will set out an overall strategy to guide development across the District in the period up to 2029 and will focus on strategically important

issues and sites. A draft version of the plan was published in November 2012 with a further round of consultation on housing issues recently closing in September 2014.

2.2.6 The key transport objectives of the emerging Local Plan include:

- Providing new development, services and facilities of an appropriate scale and type in locations which will help improve the quality of life of local communities and where the need to travel, particularly by car, can be minimised;
- Ensure that land is not released for new development until the supporting infrastructure and facilities are secured;
- Maximised the opportunity for walking, cycling and use of public transport;
- Improve access to services and facilities without unacceptably impacting upon the character and resources of West Oxfordshire;
- Reduce the causes and adverse impacts of climate change, especially flood risk;
- Achieve improvements in water and air quality; and
- Minimise use of non-renewable natural resources and promote more widespread use of renewable energy solutions.

2.2.7 Core Policy 24 – Transport and Movement states that:

2.2.8 "*Priority will be given to locating new development in areas with convenient access to a reasonable range of services and facilities and where the need to travel by private car can be minimised, particularly where this would help to reduce traffic congestion around Oxford and the Air Quality Management Area at Witney and Chipping Norton.*

2.2.9 *All new development will be designed to maximise opportunities for walking, cycling and the use of public transport, ensure the safe movement of vehicles and minimise the impact of parked and moving vehicles on local residents, business and the environment*".

Cherwell Local Plan Policies

Cherwell Local Plan – Submission

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

2.2.11 The plan addresses a number of broad parameters, such as:

- A strategy for Cherwell;
- Policies for development in the district;
- Policies for Cherwell's places;
- Infrastructure, and
- Delivery.

2.2.12 This Supplementary Planning Document (SPD) offers guidance on how the Council, as Local Planning Authority (LPA) will decide what new infrastructure and facilities need to be provided as a consequence of development and to assess requirements for "in kind" provision and / or financial contributions towards provision.

2.2.13 The SPD is split into two sections. Section 1 includes items relating to the provision of facilities on the development site that will be required as a direct result of the impact of the proposed scheme. Section 2 includes items that are considered to be general community infrastructure or service items where the LPA seeks a partial financial contribution towards enhancing provision to meet the needs of the development.

2.2.14 The charges within Section 2 are calculated against a tariff system based on a contribution figure per dwelling type. The SPD states at Para 1.10 that the tariff items detailed in Section 2 will not normally be applied to the affordable housing element of the residential development.

2.2.15 Sustainable transport, general transport and access impacts form part of both Section 1 and Section 2 of the SPD. The implications of the SPD requirements will be addressed in the subsequent sections of the TA.

2.2.16 During the Examination in Public of the Submission Draft Local Plan, the Inspector requested that Cherwell District Council (CDC) objectively assesses its housing needs against the Oxfordshire Strategic Housing Market Assessment (2014). Accordingly,

the Examination in Public was suspended whilst the Council explores options to increase the housing delivery within the plan period. Accordingly the Council is reviewing its evidence base. It is understood that the Examination in Public will take place in December 2014. Subject to the Examination reconvening and concluding in accordance with the defined timescales, it is understood that the Local Plan is likely to be adopted in spring 2015.

Oxfordshire Local Transport Plan 3 (2011 – 2030)

2.2.17 The County Council adopted the third LTP in April 2011 and focuses on attracting and supporting economic investment and growth, delivering transport infrastructure, tackling congestion and improving quality of life. Oxfordshire has significant plans for future economic and housing growth, with a focus on the Local Enterprise Partnership hubs – the Science Vale UK area, Bicester and Oxford City.

2.2.18 In terms of supporting development in Oxfordshire, the Local Transport Plan sets out the following transport policies:

Policy SD1

i. the location and layout of new developments minimise the need for travel and can be served by high quality public transport, cycling and walking facilities;
ii. developers promote sustainable travel for all journeys associated with new development, especially those to work and education, and;
iii. the traffic from new development can be accommodated safely and efficiently on the transport network.

Policy SD2

i. secure contributions from new developments towards improvements for all modes of transport. This can be financial contributions or direct works for the mitigation of adverse transport impacts in the immediate locality and/or wider area improvements;
ii. ensure that all infrastructure associated with the developments is provided to appropriate design standards;
iii. set local routeing agreements to protect environmentally sensitive locations from traffic generated by new developments, and;

iv. normally seek commuted sums towards the long term operation and maintenance of facilities, services and infrastructure.

2.2.19 In terms of specific transport policies Policy PT3 states that Oxfordshire County Council will support and promote the development of high quality public transport interchanges and infrastructure in appropriate locations. Policy CW5 states that Oxfordshire County Council will seek opportunities for network improvements and initiatives to better meet the needs of walkers, cyclists, and horse riders, including people with disabilities, for local journeys, recreation, and health.

2.2.20 Within the Local Transport Plan, Woodstock lies within the rural Oxfordshire area. Particular transport objectives for rural Oxfordshire are:

- supporting access to work, education and services for the residents of rural Oxfordshire;
- supporting the rural economy through access to rural Oxfordshire for all (local residents and non-residents); and
- maintaining and improving the condition of local roads, bridleways, footpaths and cycleways, supporting access by all modes.

2.2.21 The proposed development has been designed to ensure the accessibility of the site to all users and modes other than the private car are given specific emphasis.

2.2.22 Within the Local Transport Plan 3, there are five primary inter-urban corridors identified. The A44 Oxford – Woodstock – Chipping Norton is identified as a secondary corridor. The Plan sets out an overall strategy for these corridors together with corridor specific strategies.

> *'The strategy broadly consists of supporting 'modal shift' (change from car travel to more efficient alternatives for all or part of the journey), using demand management techniques (reducing the need to travel) and managing the use of the network to maximise efficiency of vehicle flows' (LTP3, para 27.19)*

2.2.23 Details of the specific issues on the A44 Oxford – Woodstock – Chipping Norton Corridor are set out in Appendix A.

Challenges/Problems

A1.124 Congestion is a problem in the following locations:

- *the A44 approaching Wolvercote roundabout is severely congested due to the traffic volumes exceeding the capacity of the roundabout and traffic often backs up to Pear Tree and Loop Farm roundabouts in the morning peak;*
- *Loop Farm roundabout can itself also be a source of congestion even when traffic ahead of it is free flowing;*
- *the A44 approaching the Bladon roundabout south of Woodstock is often slow moving due to the volume of traffic; and,*
- *the A44 passes through Woodstock, Enstone and Chipping Norton, leading to severance and air quality issues, particularly due to the relatively high number of lorries.*

A1.125 There is no bus priority between Chipping Norton and Oxford or Charlbury and Oxford until services reach Pear Tree roundabout. An inbound bus lane is then provided, although there are gaps in provision across the entrance to Pear Tree Park and Ride and on the immediate approach to Wolvercote roundabout. Buses are delayed in the morning peak by congestion approaching Pear Tree and Loop Farm roundabouts (caused by capacity constraints at Wolvercote). There is no northbound bus priority approaching Wolvercote Roundabout, leading to delays in the evening peak.

A1.126 Destinations in the south and east of Oxford are not accessible without a change of bus in the city centre.

Strategy

A1.127 Although not all local trips along this corridor are between the major settlements of Chipping Norton, Woodstock and Oxford, most originate from these settlements. Optimising management of the network and alternatives to car travel serving these settlements will be the key to reducing congestion on the A44.

A1.128 Bus stops in this corridor will be upgraded to premium route standard at appropriate locations. Improved public transport provision as part of Oxford's Eastern Arc could also have an important impact upon the A44, as well as upon the A40 and A34. Proposed improvements to the A44/A40 Wolvercote Roundabout should provide a way to reduce traffic and improve traffic flow.

A1.129 A small park and ride site to serve this corridor may be pursued during the course of this Plan if congestion continues to worsen and a way can be found to give buses a travel time advantage on the route.

Emerging Oxfordshire Local Transport Plan 4

2.2.24 Since LTP3 was adopted in 2011, much has changed, especially the way in which transport improvements can be funded, with less money coming directly to the council. To ensure that the county's transport systems are fit to support population and economic growth, in 2014/15 the Council will be developing a new Local Transport Plan, that will give Oxfordshire the best chance of success when bidding for projects and securing new infrastructure to support new development.

2.2.25 The key objectives include:

- Minimising the need to travel;
- Make more efficient use of available transport capacity through more innovative management of the network and encouraging the use of public transport, walking and cycling;
- Improve transport connections to support economic growth: between housing and jobs/ education/ services, and in networks of businesses and their supply chains;
- Influence the location of development to maximise the use and value of existing and planned strategic transport investment;
- Minimise overall journey times and increase journey time reliability on strategically important routes;
- Develop a high quality, resilient integrated transport system that is attractive to customers and generates inward investment;

- Manage the impacts of transport on human health and safety, and the environment, including reducing carbon emissions;
- Encourage and facilitate physically active travel to support health.

3 EXISTING CONDITIONS

3.1 Introduction

3.1.1 The transport patterns arising from a development are defined by the location of the site in relation to existing developments, i.e. how far people must travel to or from the location to access employment, education, services etc., and the structure of the transport system, i.e. how people can travel. This section describes the site and the surrounding transport networks to establish the level of accessibility to the area.

3.2 Site Location

3.2.1 The site is located to the south east of Woodstock and is approximately 12km northwest of Oxford in West Oxfordshire / Cherwell Districts.

3.2.2 The site is bounded by Shipton Road to the north, the A4095 Upper Campsfield Road to the east, the A44 Oxford Road to the south and the existing residential settlement of Woodstock to the west.

3.3 Local and Wider Road Network

3.3.1 The main strategic access from Woodstock is via the A44 Oxford Road. This provides access to Oxford, around 13 miles (21km) to the South. The A34(T) lies around 5 miles (8km) to the south, which provides strategic Trunk Road access to the M40 and M4.

3.3.2 A44 Oxford Road runs in a northwest-southeast direction providing connections to Oxford to the southeast and Chipping Norton to the northwest. The road varies in width from a single carriageway to a dual carriageway. In the vicinity of the site the road is a single lane carriageway and is subject to a 50mph speed limit. This reduces to 30mph when entering the built up area of Woodstock. There is a shared foot/ cycle route along the northbound side of the carriageway but no footway provision on the southbound side of the carriageway.

3.3.3 The A44 Oxford Road connects to the A4095 Upper Campsfield Road/ A44 Woodstock Road/ A4095 Bladon Road at a large priority roundabout. The A4095 routes through the village of Long Hanborough to Witney.

3.3.4 The A4095 Upper Campsfield Road runs between the A44 Oxford Road / A44 Woodstock Road/ A4095 Bladon Road roundabout to the A4260 Banbury Road and is approximately 2km long. The road is a single lane carriageway and subject to a national speed limit which reduces to 50mph through Upper Campsfield village. There is no footway provision on either side of the carriageway.

3.3.5 Shipton Road runs east to west and is approximately 1.8km long. At its eastern end it links to Upper Campsfield Road. The initial eastern section is rural in character with agricultural land both sides of the road. The alignment of the road on this section is relatively straight except for two ninety degree bends, a right hand bend followed by a left hand bend at which point the road becomes more urban in character. Within Woodstock, Shipton Road provides access to existing residential areas and to Marlborough School. To the west it links via a mini-roundabout to Hensington Road, which in turn links to the A44 Oxford Road.

3.3.6 Shipton Road is a single carriageway approximately 6.5m wide. There is a footpath (approx. 1.8m wide) running along the frontage of the Marlborough Church of England School and to the new Marlborough Place residential area. The road is well marked and maintained between the mini-roundabout and the school.

3.3.7 Shipton Road itself is heavily traffic managed, subject to a 20mph speed limit and is well lit up to the Marlborough Church of England School. From here to the A4095 Upper Campsfield Road, the road is typically rural in nature with a national speed limit and no footway provision and no street lighting.

3.3.8 There is a zebra crossing within close proximity to the site, providing a linkage from the school to cricket ground/ playing fields.

3.3.9 The stretch of Shipton Road between the entrance to the school and Randolph Avenue has been upgraded as part of the consent for the Marlborough Place residential development to include a give-way build out restricting traffic to one-way flow and improved footway links.

3.4 Existing Traffic Flows

3.4.1 To quantify the existing traffic flows on the local road network surveys were undertaken at key junctions on the local road network by a specialist independent traffic survey company. These traffic surveys were undertaken in July 2014 during school term time. The surveys included manual classified counts (MCC) with queue lengths and automatic traffic counts (ATC). The MCC's were undertaken on Tuesday 15th July 2014 for the following junctions:

- A44 - A4095 Bladon Roundabout
- A4095 Main Road / Lower Road;
- A4260 Banbury Road / A4095 Bunkers Hill / A0495 Upper Campsfield Road;
- A44 Woodstock Road / Spring Hill Road;
- A44 Woodstock Road / Sandy Lane / Rutten Lane;
- A44 Woodstock Road / The Turnpike / Cassington Road;
- Loop Farm Roundabout; and
- A34 / Services / A44 Woodstock Road.

3.4.2 The ATC's were undertaken between 10/07/2014 to 16/07/2014 for the following links:

- A44 Oxford Road;
- A44 Woodstock Road;
- A4095 Upper Campsfield Road;
- A44 Manor Road;
- A4095 Grove Road;
- Hensington Road; and
- Shipton Road.

3.4.3 The location of the ATC's and MCC's are attached at **Appendix B** along with the survey results.

3.4.4 The five day average ATC results for the A44 Oxford Road, A4095 Upper Campsfield Road and Shipton Road are summarised in the **Table 1** below.

Table 1 Existing Traffic Flows

Link	0800-0900			1700-1800		
	N/B	S/B	Two-way	N/B	S/B	Two-way
A44 Oxford Road	448	869	1317	842	631	1473
	N/B	S/B	Two-way	N/B	S/B	Two-way
A4095 Upper Campsfield Road	510	448	958	521	486	1007
	W/B	E/B	Two-way	W/B	E/B	Two-way
Shipton Road	145	132	277	102	53	155

3.5 Personal Injury Collision Data

3.5.1 Personal Injury Collision (PIC) data has been obtained by Oxfordshire County Council for the most recent five and a half year period from 01/01/2009 to 30/06/2014. The study area for the road safety review includes all roads within around 2km of the Bladon Roundabout. This area encompasses the local road network within Woodstock, A44 from Woodstock down to Begbrook, A4095 through Bladon across to the A4260, Langford Locks and A4260 through Thrupp.

3.5.2 The PIC output data and a plan area covered is attached at **Appendix C**. A breakdown of the recorded collisions is set out in **Table 2** below.

Table 2 Personal Injury Accident Data (2009 - mid-2014)

	Fatal	Serious	Slight	Total
Number of collisions	3	20	64	87
% of collisions	3%	23%	74%	100%

3.5.3 There were 87 recorded collisions in the last five year period, three of which were recorded as fatal in severity, 20 recorded as serious in severity and 64 recorded as slight in severity.

3.5.4 There were 24 collisions involving motorcycles and pedal cycles, of which one was fatal in severity, 8 were “serious” in severity and 15 were “slight” in severity.

3.5.5 The review of PIC can identify clusters in collisions. The following cluster junctions are:

- Bladon Roundabout (A4095 – A44)

- Upper Campsfield Road/Banbury Road Crossroads (A4095 – A4260);
- A44 Woodstock Road/Langford Lane;
- A44 Woodstock Road/ Spring Hill Road; and
- A4095 Main Road/ Lower Road.

3.5.6 At Bladon Roundabout there were around 14 incidents (including incidents on the immediate approaches). This is equivalent to an accident rate of 2.55 incidents per year. TD16/07 reports that on average a large four arm roundabout will have 2.65 incidents per year of which 7.1% would be KSI (Killed or Seriously Injured). The frequency of incidents at this location is therefore broadly in line with the national average although the severity (%KSI) is higher at 28.6%. The majority of collisions were recorded as rear shunts, vehicle lost control, or failing to give way. The four serious incidents were all on the southern approach to the roundabout. One involved a collision between a car and a pedal cyclist. The other three incidents were all single vehicle loss of control, two of which involved car drivers where the drivers were impaired and the third involved a motor-cyclist. Overall there is a downward trend in incidents at this location from 2010 when there were 5 incidents.

3.5.7 In the vicinity of the A4095 Upper Campsfield Road/A4260 Banbury Road junction there were 9 incidents. This is equivalent to an accident rate of 1.64 incidents per year of which 44% were classified as KSI. The frequency of incidents at this location does not appear to be high although the severity is higher than expected. Of the four incidents that were classified serious, two were single vehicle loss of control incidents on a bend on the approach to the junction rather than the junction itself. Of the other two serious incidents, both involve collisions between entering or exiting Upper Campsfield Road. One of these involved a motorcyclist. There is no clear trend in terms of accidents at this location over time although over half of the incidents occurred at the weekend. A third of incidents involved motorcyclists.

3.5.8 There are traffic signals at the junction of A44 Woodstock Road and Langford Lane. Here there were six reported incidents from the start of 2012 including a serious and a fatal incident. Four incidents were classified as slight and these were generally shunts or lane change manoeuvres. The fatal and serious incidents both involved

collisions between a southbound vehicle on the A44 and a right turn movements out of Langford Lane.

3.5.9 In the vicinity of the A44 Woodstock Road/ Spring Hill Road junction the majority of collisions were recorded as failure to negotiate the roundabout, braking hard resulting in losing control and hitting the sign.

3.5.10 In the vicinity of the A4095 Main Road/Lower Road junction the majority of collisions were recorded as a vehicle overtaking motorcyclist failed to give enough distance and hit wheel of motorcycle, failure to give way, driving on the wrong side of the road (foreign driver) and rear shunts.

3.6 Walking

3.6.1 There is a shared pedestrian and cycle path along the south-western side of the A44 on the southern boundary of the site. There is no footway on the north-eastern side of the A44 Oxford Road. There are also no footways on the A4095 Upper Campsfield Road at present.

3.6.2 The existing residential areas to the north west of the site are typically residential access roads with footways either side of the roadway. These are not uniformly lit rather there is some provision at the potential conflict points e.g. junctions. The area is subject to a 30mph speed limit. There is a public right of way footpath skirting along a section of the site boundary from the A44 Oxford Road to the existing residential area on Crecy Walk. In addition there are possible connections through onto Hedge End and Flemmings Road.

3.7 Cycling

3.7.1 The site is very well located to the National Cycle Network which forms a nationwide network of paths and onto which a number of local routes link. National Cycle Network (NCN) Route 5 runs along the A44 to the south of the site. Within Oxfordshire the route is largely off-road, i.e. along segregated paths.

3.7.2 To the north NCN5 runs along the A44 into Woodstock, where it runs on-road through the town centre before re-joining an off-road path northwards up towards Banbury. The route ultimately continues on from Banbury up into Warwickshire. To the south NCN5 runs along the A44 towards Oxford. A short distance before the Frieze Way

roundabout the route turns off the A44 across to the A40 and then southwards through Wolvercote and onto the Woodstock Road to the City Centre. Beyond the City Centre the route continues south through Oxfordshire linking to Abingdon, Didcot and then onwards to Reading.

3.7.3 Linking into NCN5 are local cycle paths and routes which are deemed to be preferable for cyclists. At Begbroke for example, there is a spur from NCN5 across to Kidlington where it joins NCN51 which runs from Oxford City Centre to the South, through Kidlington, and northwards up to Bicester and onwards to Milton Keynes and beyond.

3.7.4 The existing cycle routes are shown on **Figure 1**.

3.8 Access to Local Services and Facilities

3.8.1 The centre of Woodstock has a range of local facilities and services including independent stores, churches, post office, pubs, museums, health services. All of these facilities and services are located approximately 1.2km from the centre of the site and hence within a 10 – 15 minute walk.

3.8.2 The nearest convenience store to the site is Premier Stores located on Shipton Road. The store is located approximately 870m from the centre of the site which equates to a 9-10 minute walk.

3.8.3 Blenheim Palace located adjacent to the site on the A44 Oxford Road is a designated World Heritage Site. The building and grounds attract visitors from all over the world with various events taking place all year round. Access into the grounds is taken from the A44 Oxford Road.

3.8.4 Leisure facilities are within walking distance of the site, in particular, the Woodstock heated outdoor swimming pool is located to the north of the site.

3.8.5 A summary of the local facilities is shown in **Figure 1**.

Education

3.8.6 The proposed residential development will increase the demand for education however the site is well located with respect to existing schools and the proposals provide a primary school on site.

3.8.7 Given the timing for educational trips, these will overlap with the network AM peak hour, indeed according to the national travel survey (2008) around 43% of trips in progress during the AM peak (08:00 – 09:00) are school related. Education trips are therefore, one of the most significant factors influencing the 'garden gate' vehicle trip generation of a residential site particularly given the apparent sensitivity to distance.

3.8.8 As shown by the 2008 national travel survey, for primary school trips, pupils are over three times more likely to travel to school by private car if their journey to school is 1.6 to 3.2 km compared to those whose journey is under 1.6 km. Nationally, the average journey length is 2.6 km. A similar relationship is also apparent for secondary school pupils although they are more likely to take the bus rather than be driven for long journey lengths. Nationally the average journey length is 5.4 km.

Table 3 Primary school trips by mode and length (2007-08 data)

Percentage	Under 1.6km	1.6km to 3.2km	3.2km to 8.0km	8.0km and over	Total
Walk	80	31	3	0	49
Bicycle	1	2	1	0	1
Car/van	18	61	76	70	42
Bus	1	6	18	28	7
Other	0	0	2	2	1
Total	100	100	100	100	100

Table 4 Secondary school trips by mode and length (2007 - 08 data)

Percentage	Under 1.6km	1.6km to 3.2km	3.2km to 8.0km	8.0km and over	Total
Walk	91	65	10	0	41
Bicycle	1	4	3	0	2
Car/van	6	21	34	22	22
Bus	2	11	50	68	32
Other	0	1	3	10	3
Total	100	100	100	100	100

3.8.9 The nearest primary school to the site is Woodstock Church of England Primary School located on Shipton Road approximately 750m from the centre of the site. As can be seen from the above table the door to door walk distances are likely to be well within the national average and within the under 1.6km category and therefore the propensity to walk should be high.

3.8.10 It is proposed to build a new primary school on the site. It is therefore likely that the majority of trips will be internal to the site and therefore not interact with traffic on the wider road network.

3.8.11 The nearest secondary school is Marlborough Church of England School located on Shipton Road, approximately 700m from the centre of the site. Distance to secondary school is therefore closer, and accordingly accessibility much higher than the national average. The majority of pupils are likely to travel independently and therefore walk or cycle. Improvements to connectivity to the school from the site are discussed below.

Employment

3.8.12 Journey to work Origin-Destination statistics as reported by the 2011 Census have been obtained from the Office of National Statistics for the Super Output Area Mid Layer - West Oxfordshire 001 which includes Woodstock. This data provides the broad distribution of workplaces for residents within the study area and their main mode of transport.

3.8.13 The main workplace and study-place destinations for the population of this ward are shown below in **Table 5**. The data does not include those that work at or mainly from home and therefore the statistics relate to those who must commute. It shows that the majority work 34.3% of the West Oxfordshire 004 population travel to work within the local District. As set out above, however, the site does straddle both West Oxfordshire and Cherwell and therefore it is unsurprising that 15.9% actually travel into nearby Cherwell. A further 30% travel to work to Oxford. The data therefore describes a fairly tight distribution of work trip ends with 87.5% within Oxfordshire as a whole.

Table 5 Workplace destinations from West Oxfordshire 004 (2011 Census)

Workplace Destination	West Oxfordshire 004
West Oxfordshire	34.3%
Oxford	30.0%
Cherwell	15.9%
Vale of White Horse	5.3%
South Oxfordshire	2.0%

Other	12.5%
Total	100.0%

3.8.14 The 2011 Census 'Journey to Work' statistics provides modal share data for current residents of West Oxfordshire 004. These are summarised in **Table 6** together with data on national modal shares.

Table 6 Journey to work mode share for West Oxfordshire 004 (2011 Census)

Mode	Woodstock and Bladon	England and Wales
Work mainly from home	9.7%	9%
Underground	0.2%	3%
Train	2.8%	4%
Bus/mini-bus	8.2%	7%
Motorcycle	1.1%	1%
Driving a car	55.4%	55%
Passenger in a car	6.8%	6%
Taxi/minicab	0.0%	1%
Bicycle	4.1%	3%
On foot	11.4%	10%
Other	0.4%	0%
Total	100%	100%

3.8.15 It can be seen from the above data that notwithstanding the relatively small size of Woodstock, that bus use, walking and cycling are higher than the national average that includes the large conurbations including Greater London, Greater Manchester and the West Midlands Conurbation. Clearly, for new residential development, the main demand for travel to work is in and around the local area itself.

3.8.16 In addition a good frequency of bus services and access is available along the A44 to provide for longer distance journey to work trips to Oxford and Witney. There is therefore scope to significantly enhance overall modal share for walking, cycling and public transport within the area as a result of development of the site.

3.9 Public Transport Provision

Current Bus Services

3.9.1 The scoping response from OCC confirms that the site is very well located from the transport perspective, adjacent to the A44 strategic Premium Bus Route from

Chipping Norton and Woodstock to Oxford. It is also located on the secondary strategic bus route from Burford and Witney to Woodstock.

3.9.2 At present, the nearest bus stops are located on the A44 Oxford Road adjacent to Blenheim Palace approximately 900m north of the proposed site access. The northbound bus stop has a layby with bus stop flag and timetable information. The southbound bus stop has a layby with bus stop flag, timetable information and bus shelter.

3.9.3 Bus service S3 connects Woodstock and Oxford city centre, serving George Street and Gloucester Green bus station and the railway station. This provides connections with Oxford's extensive and frequent bus network, and with national and regional train and coach services. North of Woodstock service S3 branches, with routes to Chipping Norton and to Charlbury.

3.9.4 S3 is a Stagecoach 'Gold' standard service. The buses have leather-trimmed seats, free WiFi and Euro5 low-emission engines. Drivers are trained to provide a high standard of customer care in addition to professional driving standards. Real-time information on bus departure times is available online and by SMS text.

3.9.5 S3 operates seven days a week. On weekdays, the first departure to Oxford leaves Woodstock at 0620 and arrives in the George Street at 0645, continuing to the railway station at 0650; the last departure from Oxford's Gloucester Green bus station is at 2345, arriving in Woodstock at 0010. A summary of first and last departures by day of week is presented in **Table 7**.

Table 7 Service S3 first and last departures to/from Oxford City Centre

Direction of Travel	Weekday	Saturday	Sunday
From Woodstock to City Centre – first departure	Depart: 0620 Arrive: 0645 [0650 at railway station]	Depart: 0647 Arrive: 0720 [0725 at railway station]	Depart: 0835 Arrive: 0900 [0905 at railway station]
From City Centre to Woodstock – last departure	Depart: 2345 Arrive: 0010	Depart: 2345 Arrive: 0010	Depart: 1945 [1940 from railway station] Arrive: 2019

3.9.6 S3 is a frequent service, with departures every 10 minutes towards Oxford at the busiest time in the morning peak; every 15 minutes from Oxford in the afternoon

peak; and every 20 minutes during the weekday and Saturday inter-peak. Sunday departures are at 30 minute intervals during the daytime. Evening departures are once per hour. A summary of service frequencies is presented in **Table 8**.

Table 8 Service S3 departure intervals to/from Oxford

Direction of Travel	Weekday Peaks	Weekday and Saturday Inter-Peak	Sunday Daytime	Evenings
From Woodstock to City Centre	AM [0630-0930]: - from 0732 to 0802 – every 10 minutes - other times – every 15 to 20 minutes	Every 20 minutes	Every 30 minutes	Once per hour [mostly regular interval of 60 minutes]
From City Centre to Woodstock	PM [1630-1830]: - from 1615 to 1815 – every 15 minutes - other times – every 20 minutes	Every 20 minutes	Every 30 minutes	Once per hour [mostly regular interval of 60 minutes]

3.9.7 Journey times on service S3 between Woodstock and Oxford city centre vary between 43 minutes in the morning peak and 24 minutes in the off-peak; see **Table 9**. These journey times are in a range that it is considered car drivers would find bus an acceptable travel option. Peak period punctuality is supported by bus lanes on the Woodstock Road within the Oxford ring road.

Table 9 Service S3 running times to/from Oxford City Centre

Direction of Travel	Weekday Peaks	Weekday and Saturday Inter-Peak	Sunday Daytime	Evenings
From Woodstock to City Centre	AM [0630-0930]: between 38 and 43 minutes	33 minutes	25 minutes	23 minutes
From City Centre to Woodstock	PM [1630-1830]: between 33 and 35 minutes	28 minutes	24 minutes	24 minutes

3.9.8 Stagecoach's service 233 provides a connection between Woodstock, Long Hanborough, Witney and Burford on weekdays and Saturday. The weekday service operates between approximately 6.30am and 6.30pm, the precise times depending on the location and the direction of travel.

3.9.9 Morning and afternoon departures between Woodstock, Long Hanborough and Witney are at intervals tailored to school travel, with a regular 60-minute interval service during the middle of the day. The Saturday service starts at approximately 8am.

3.9.10 OCC have confirmed that strategic plans exist to improve the bus service between Witney, Hanborough and Woodstock, to operate two times per hour. Furthermore, there is an aspiration to extend this service to Water Eaton (and possibly Headington) via Langford Lane and Kidlington. OCC are currently collecting Section 106 contributions from other development sites to assist in achieving this desired improved bus service and extended route towards Kidlington and beyond.

3.9.11 Services W10, W11 and W12 provide connectivity to Woodstock and Kidlington from the smaller villages in the vicinity. These services provide limited travel-to-work commuter services in Woodstock.

Bus Ticketing

3.9.12 Stagecoach's Megarider Gold ticket provides unlimited travel on their services in Oxfordshire. It is available in periods from weekly to annual, plus a monthly direct-debit option; see **Table 10** for prices. Tickets valid for up to one month are delivered on a smartcard platform.

3.9.13 The Oxford SmartZone is a ticketing scheme that enables travel on the services of Stagecoach, Oxford Bus Company and Thames Travel. Woodstock lies outside the Oxford SmartZone core area; Stagecoach offers a SmartZone add on to their Megarider Gold ticket for one-third of the price of a stand-alone SmartZone ticket.

Table 10 Stagecoach Megarider ticketing

Service Coverage	1-Week	4-Week and Monthly	13-Week	Annual
Oxfordshire Megarider – Stagecoach only	£26.00	£78.00	£232.00	£812.00
Delivery method:	Smart	Smart	Paper	Paper
Oxfordshire Megarider plus Oxford SmartZone multi-operator	£31.20	£95.20	£276.10	£956.80
Delivery method:	Smart	Smart	Smart	Smart

Coach Services

3.9.14 Stagecoach's 'Oxford Tube' and Oxford Bus Company's 'Espress X90' operate between Oxford and London at frequent intervals on weekdays and at weekends. The Oxford Tube service operates throughout the night. Both these services can be accessed at Gloucester Green bus station which bus service S3 from Woodstock serves, at Thornhill Park & Ride site round 10 miles south-east of the development site, and at M40 Junction 6.

3.9.15 National Express provides direct coach services in Oxford to/from 65 locations across Britain. Stagecoach's X5 service to Cambridge via Milton Keynes provides an additional coach link. These services all call at Gloucester Green bus station.

3.9.16 Oxford Bus Company's 'Airline' services to Heathrow and Gatwick airport operate at intervals of between every 30 minutes and every two hours, including overnight. These services run from Gloucester Green bus station and the Thornhill Park & Ride site.

Rail

3.9.17 The regional and national rail network can be accessed at Oxford railway station. This provides frequent train services, typically one or two trains per hour, on weekdays and at weekends to destinations including: the Great Western line to Reading and London; the Cotswold Line to Moreton-in-Marsh, Evesham, Worcester and Hereford; and the CrossCountry network to Surrey and the south coast, e.g. Basingstoke and Bournemouth, to the Midlands including Birmingham and to the north-east, e.g. Leeds and Newcastle, and to the north-west, e.g. Manchester.

3.9.18 Train services on the Cotswold line can also be accessed at Hanborough station, roughly 2 miles from the development site. On weekdays this station offers 19 departures to London via Reading, and 20 departures to Moreton-in-Marsh, 17 of which extend to Worcester. Bus service 242 also routes pass the station with a bus

stop situated outside of the station entrance. The bus service provides an average journey time of 3 minutes. A summary of the rail services is provided in **Table 11**.

Table 11 Rail services and frequencies

Route	Monday to Saturday Frequency	Sunday Service	Journey times
Oxford	20-60 minutes	60-120 minutes	8-17 minutes
London Paddington	20-60 minutes	60-120 minutes	1hr 15 minutes
Worcester Shrub Hill	45-120 minutes	60-120 minutes	1hr-1hr 15 mins

3.9.19 The 55 space station car park at Harborough station was expanded in 2013 to create a new 191 space car park to accommodate the increase in commuters. In terms of facilities on site, there are 10 Sheffield stands for cycle storage, self-service ticket machines, customer help points and access for the mobility impaired.

3.9.20 From 2015 a new Chiltern Railways service will be available from a new Oxford Parkway station adjacent to Water Eaton Park & Ride site (approximately 6km from the development site). The station will have access to over 800 car parking spaces and parking for over 100 bikes. The new train service will provide two trains per hour to London via Bicester and High Wycombe. This will provide a step-change in access to train services from towns and villages to the north of Oxford including Woodstock, obviating the need to travel into the city centre to reach London by train.

3.9.21 The East-West rail scheme will provide services to Milton Keynes and Bedford by 2019, and will increase the frequency of service between Oxford and Bicester. Services will call at Oxford Parkway station and thus be accessible from Woodstock without the need to travel into the city centre.

3.10 Accessibility

3.10.1 Woodstock benefits from excellent transport links including public transport, foot and cycle links to adjacent communities and good road links to the principle road network. The need to travel however is significantly reduced by the facilities already available within Woodstock.

3.10.2 Overall given the good locational benefits of the site, it is concluded that the development of the site is in full accordance with the transport policy objectives as discussed above in **Section 2.** As part of the development proposals, a Travel Plan has been prepared to promote sustainable travel and therefore secure the benefits of the accessible nature of the site.

4 TRANSPORT STRATEGY

4.1 Introduction

4.1.1 A Transport Strategy for the site has been developed to encourage the development of efficient and sustainable transport patterns to and from the site. On this basis it is fundamental that the Transport Strategy for the site focuses on the following key criteria:

- Reducing the need to travel, especially by car, and managing traffic growth and congestion;
- Significantly improving opportunities for walking and cycling;
- Improving the reliability, capacity, quality accessibility and coverage of the public transport network;
- Making better use of the existing transport network through better management; and
- Only developing additional highway capacity when all other measures have been considered.

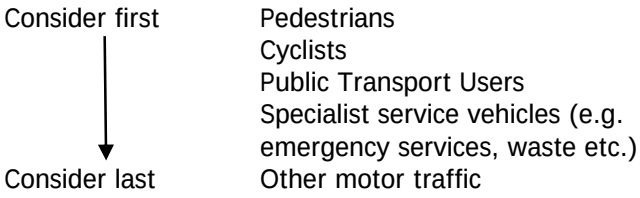
4.1.2 This largely mirrors the strategy set out by OCC in LTPs (see Section 2.7).

4.1.3 Following a detailed review of travel demand for employees, residents and other users of the site by trip mode and purpose, the Transport Strategy below sets out how these criteria will be met. In accordance with the wider Transport Policy requirement, a conscious decision has been made in formulating the Transport Strategy to provide a balanced package of measures which seek to deliver a sustainable development.

4.2 Access Strategy

4.2.1 A number of vehicular access options have been identified in respect of landscape and land-ownership constraints and the potential impact on the operation of the adjacent highway network. For vehicular access to the site, the site is bounded on three sides by publically adopted highways onto which access could be taken. These are A4095 Upper Campsfield Road to the south-east; the A44 Oxford Road to the south-west, and Shipton Road to the North. To the West of the site is existing residential development and there are a number of pedestrian paths onto Hedge End, Flemings Road and Crecy Walk that are available for non-motorised trips.

4.2.2 The options for access have been considered in the context of the likely key destinations within the area and the need to maintain a hierarchy of sustainable road users with reference to guidance provided within the Manual for Streets:



4.3 Pedestrians

4.3.1 Pedestrian desire lines between the site and local facilities have been reviewed previously. Principal destinations from the site include the following:

- Woodstock Town Centre;
- Leisure facilities;
- Places of education
- Medical practices; and
- Places of employment.

4.3.2 There will as part of the redevelopment of the site be a number of improvements to the pedestrian accessibility and permeability of the site to provide a coherent pedestrian access strategy within the site to the surrounding areas.

4.3.3 The aforementioned pedestrian links will all be fully integrated into the proposed internal road layout and residential scheme. This will significantly increase the permeability of the site and provide a coherent pedestrian route between the site and the local area. This will afford pedestrians more direct routes to local facilities and integrate the site to the local pedestrian network.

4.3.4 The footpath connections to the site therefore include:

1) Direct Access to Shipton Road / Marlborough School via a new 3m wide combined walking and cycling route;
2) Connections to Hedge End to the west. There is an existing elbow in the alignment of the road where the highway directly abuts the application site. The proposed footpath link will be designed to prevent use by motor vehicles;
3) A44 connection to serve new bus stops;
4) A44 connection to provide a further link to Bladon via the Bladon Roundabout;
5) A44 connection towards Woodstock via a new/extended footway on the northern side of the road; and,
6) Connections via Upper Campsfield Road to Bladon Roundabout.

4.3.5 The proposed footpath connections are shown on **DTA Drawing 15291-19**.

4.4 Cyclists

4.4.1 There is an established 'cycle culture' within Oxford itself where cycling is a significant part of the overall transport mix as opposed to a niche mode or hobby. Many future residents who have relocated within the region therefore, will have preconceptions that are favourable to cycle use. In this context, the proposals seek to develop cycling as a more significant mode within Woodstock.

4.4.2 Cycling is typically evaluated on the basis of the distance that can be covered in a 20-30 minute time period as this broadly equates to a commuter journey by car. This results in a typical catchment area of 5km. Here this covers Woodstock, Kidlington, villages including Yarnton, the Begbroke Science Park, the Langford Lock employment area and a wider rural hinterland.

4.4.3 Ultimately though many peak hour journeys with destinations such as Oxford City are likely to exceed 20-30 minute travel times and therefore it would be appropriate to consider and where possible consider longer trips also in particular trips to Oxford itself (circa 45-50 minutes journey time by cycle).

4.4.4 The development will adopt contemporary design guidance, including Manual for Streets, to establish the 'place' function within the site that will seek to manage vehicle speeds to around 20mph to the benefit of cycling by all. Development within the site will be provided with secure locations to store bicycles. This may be within garages, bespoke cycle storage or incorporated within the streetscape.

4.4.5 The site benefits from being well located in terms of the existing cycle network and this will be maintained and increased as part of the development. The proposed cycling infrastructure within the site will connect the development to the existing cycle network and create an integrated network that permeates the site.

4.4.6 There are three key links that will need to be provided as part of the development:

- An enhanced off-road cycle path from the site along Shipton Road to Marlborough School;
- An enhanced off-road cycle path from the Bladon Roundabout to the site access roundabout on A4095 Upper Campsfield Road; and
- An enhanced off-road cycle path from the Bladon Roundabout to the priority site access on A44 Oxford Road.

4.4.7 In addition to these links it will be necessary to provide appropriate crossing facilities. The most suitable locations are at the roundabouts where the vehicle speeds are geometrically constrained to 30mph or less. Accordingly the site access roundabout on A4095 Upper Campsfield Road will include splitter islands on all approaches. The preliminary designs have made allowance for the inclusion of uncontrolled crossings on all arms. Similar provision will be made on the A4095 Upper Campsfield Road arm of the Bladon Roundabout.

4.4.8 The proposed cycle links are shown on **DTA Drawing 15291-19**.

4.4.9 Cycle parking will be provided throughout the development for the various land uses on site. For the residential development cycle parking will be provided within the curtilage of garages. Where garages are not provided for dwellings, a dedicated cycle storage area will be provided.

4.4.10 The West Oxfordshire's Parking Standards also sets out the standards for food retail uses. The maximum parking standards are 1 space per 12m². The overall cycle parking provision will be designed to accord with the requirements as set out above.

4.4.11 For employment uses on-site the standards are set out in West Oxfordshire's Parking Standards which states that for Land Use B1, the maximum parking standards are 1 space per 150m², for Land Use B2, the maximum parking standards is 1 space per 350m², and for B8 1 space per 500m². The overall cycle parking provision will be designed to accord with the requirements as set out above.

4.4.12 Cycle parking for the retail, locally led employment and care village will be secure, lit, covered and located in convenient positions.

4.5 Public transport users

4.5.1 Woodstock already benefits from significant and high quality public transport network. This is broadly based around the S3 service to Oxford but OCC are progressing proposals to also improve other routes which serve the town, most notably the 233 service to Witney.

4.5.2 The public transport strategy seeks to make bus use on high demand corridors more efficient and attractive to both future residents on the site as well as the existing population within these corridors. This has wider sustainability benefits but also makes effective use of existing infrastructure and has the potential to enhance access to Oxford City centre particularly during the peak periods. One significant challenge to achieving this is congestion at key locations within the network and the limited priority afforded to public transport.

4.5.3 The response to this is the introduction of bus priority on the A44 corridor through a reallocation of existing road space and junction improvement works. In addition to

this, it is proposed that a transport interchange will be created on the site that would allow a wider catchment area to be served by the bus services by enabling users from adjacent villages to drive or cycle into the interchange before travelling onwards to Woodstock or Oxford. The transport interchange supports the Local Transport Plan 3 Policy PT3 which states that Oxfordshire County Council will support and promote the development of high quality public transport interchanges and the corridor strategy which proposes a 'small park and ride' style of facility. It is envisaged that the interchange would be located to the East of the site adjacent to the site access roundabout. The interchange would have circa 300 car parking spaces as well as cycle parking spaces. The overall bus access strategy plan is shown on **DTA Drawing 15291-24**.

4.5.4 Increased demand for public transport will have operational implications. Discussions have been held with Stagecoach, one of the principal public transport service operators, with regard to such service enhancements including increases in capacity and headway reduction (more frequent buses/reduced mean wait times).

4.5.5 Overall, the proposals significantly enhance the opportunity for future residents to travel by passenger transport options to all popular journey purpose destinations, including health, employment, retail, leisure, and education. The benefits arising from these service proposals are discussed below in **Section 8**.

4.5.6 The proposals also enhance public transport provision for existing residents in Woodstock and in a wider area within the catchment of the proposed link-and-ride interchange. This will mitigate a substantial part of car trip generation from the development, as set out in **Section 7**.

4.6 Car

4.6.1 Car ownership and use is likely to, in the short term at least, comprise a significant element of the overall transport mix. With alternative fuels and ownership models emerging, the development has been planned to maximise the potential of these new innovations. This includes consideration of the requirements for electric vehicles and the support for shared car ownership models (car clubs).

4.6.2 At this outline application stage, precise details of the internal infrastructure are subject to on-going refinement and therefore these elements have been incorporated into the Travel Plan.

4.6.3 In terms of access, there are three links which largely define the site boundaries and all of which are technically capable of providing access to the site. Vehicular access is to be taken from A4095 Upper Campsfield Road and A44 Oxford Road. The two points of access provide for more efficient servicing and penetration of the site by public transport, greater flexibility in the phasing of the development and create redundancy in the case of emergency.

4.6.4 The access onto the A4095 Upper Campsfield Road would be the main point of access onto which the majority of the traffic from the site would route. It is proposed that this would be a roundabout junction to safely accommodate the forecast traffic turning movements whilst also creating a lower speed environment to allow pedestrians and cyclists to cross. The proposed site access is shown on **DTA Drawing 15291-21**.

4.6.5 The access onto the A44 Oxford Road would be a secondary point of access to deliver good integration with the existing community and local facility. Its purpose is therefore to facility existing and local trips. This route is there envisaged for access rather than through traffic.

4.6.6 It is proposed that this would be a priority junction within right turn harbourage as shown on **DTA Drawing 15291-22**. In terms of the form of this junction it would largely replicate the existing junctions (Churchill Gate and Cadogan Park) on the A44 Oxford Road approach into Woodstock. The 30mph speed limit could be extended out to this location (however this is not considered to be essential) and details of this will be discussed with OCC together with opportunities to introduce further traffic calming and speed restraint. In the meantime the junction design has been prepared based on the prevailing speed limits.

4.6.7 Access onto Shipton Road has been the subject to some debate. Shipton Road is largely rural in nature along the site frontage. It does not carry a significant volume

of traffic. It does however accommodate a significant number of the school coaches for Marlborough School for which the geometry of Shipton Road is poorly adapted.

4.6.8 To improve access to the school for the buses it is proposed that the right angle bend near to Randolph Avenue is realigned to accommodate the swept path of buses without unduly encroaching across the centreline as shown on **DTA Drawing 15291-23**. At the second right angle bend immediately to the south, it is proposed to extend Shipton Road into the site.

4.6.9 The existing road would then be left as a rural lane or stopped up to through traffic as required by the Local Highway Authority i.e. maintaining access to existing properties.

4.7 Travel planning and demand management

4.7.1 Travel Plans are management tools designed to minimise the negative impact of travel and transport on the environment. A Travel Plan's aim, through a set of mechanisms, targets and initiatives, is to incorporate transport and other issues into a coordinated strategy.

4.7.2 A Framework Travel Plan has been prepared under a separate cover as part of the progression of the masterplan. The document sets out how the aims and objectives of reducing travel demand will be managed and monitored within the development.

5 PROPOSED DEVELOPMENT

5.1 Internal Layout

5.1.1 A key part of the transport strategy for the site is to ensure that the internal layout is consistent with current design guidance in the context of the development and its relationship to the existing transport system. Manual for Streets has been closely followed in this respect as the most comprehensive contemporary national design guidance embodying prevailing residential design philosophy. This is succinctly summarised in the introduction.

> *1.1.4 Streets should not be designed just to accommodate the movement of motor vehicles. It is important that designers place a high priority on meeting the needs of pedestrians, cyclists and public transport users, so that growth in these modes of travel is encouraged*

> *1.1.5 MfS aims to assist in the creation of streets that:*

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

5.1.2 For Woodstock East a network residential street is sought that will encourage walking and cycling, encourage public transport use and manage vehicular traffic in the interests of safety and general amenity. Whilst MfS advises that 'in a residential environment, flow is unlikely to be high enough to determine street widths and the extent of parking provision will depend on what is appropriate for the site', there are

street character types within the development that reflect the demands that they need to meet.

5.1.3 Transport systems are often described by applying hierarchies. Hierarchies are a useful way of imposing a structure on complex transport systems. Elements within the system can be classified into hierarchies based on a range of criteria which may include characteristics such as function, form, management and speed amongst many others. The choice of criteria will in turn influence the shape of the system as defined by that hierarchical structure.

5.2 Residential Car Parking

5.2.1 Residential parking standards are set out in Oxfordshire's 'Parking Standards for New Residential Development'. The policy document sits under the overarching policies set out in OCC's Local Transport Plan. Outside of the Oxford areas, the standards dictate that for 1 bedroom dwellings, 1 allocated space should be provide, plus an allowance for unallocated parking. For 2+ bedroom dwellings, 2 allocated spaces should be provided, plus an allowance for unallocated parking.

5.2.2 The car parking provision and layout will be designed to accord with the requirements of adopted Local Transport Plan. It is envisaged that the development will include a mix of frontage access car parking and garages for the houses.

5.2.3 The larger plots will have garages and adequate parking provision for visitors on plot. The additional unallocated provision will need to be calculated in accordance with OCC standards as they will vary depending on the site layout.

5.2.4 Any additional shortfall in unallocated parking provision can be safely accommodated on-street.

5.2.5 Electric car charging points will also be provided at a ratio and specification to be determined at reserved matters stage.

5.3 Employment Car Parking

5.3.1 For employment uses on-site the standards are set out in West Oxfordshire's Parking Standards which states that for Land Use B1 and B2, the maximum parking standards are 1 space per 30m², and for Land Use B8, the maximum parking standards is 1 space per 200m². On the basis of predominantly B1 and B2 uses there could be up to 250 car parking spaces. For B8 uses, the number of spaces would be reduced accordingly. The overall car parking provision will be designed to accord with the requirements as set out above.

5.3.2 Electric car charging points will also be provided in accordance with local parking standards.

5.4 Retail Car Parking

5.4.1 The West Oxfordshire's Parking Standards also sets out the standards for food retail uses. The maximum parking standards are 1 space per 14m². On this basis up to 66 spaces would be permitted. Given that the proposed convenience store will primarily serve the site, the number of car parking spaces can be reduced to reflect the likelihood that residents on site will either walk or cycle to the convenience store to circa 50 spaces.

5.5 Care Home Car Parking

5.5.1 There are no specific car parking standards relating to care home accommodation. The masterplan has however assumed 1 space per bed space. On this basis up to 150 spaces would be provided.

5.6 Detailed Application

5.6.1 Although outline planning permission is sought for the site there is a detailed element. There are 29 dwellings (including 12 affordable dwellings) which are subject to a detailed planning application. The residential accommodation schedule includes:

- 10 No. 2 beds;

- 11 No. 3 beds;
- 2 No. 4 beds; and
- 6 No. 5 beds.

5.6.2 This element of development is located adjacent to the A44 and would be accessed from the A44 access which would be delivered as part of this initial development.

5.6.3 The majority of the 4 and 5 bed dwellings will have two allocated parking spaces (within the on plot garages) and two unallocated parking spaces (in front of the garages).

5.6.4 The 3 bed dwellings will have two allocated parking spaces on plot with an allowance for unallocated parking spaces to be provided elsewhere as visitor parking spaces.

5.6.5 The 2 bed dwellings will have either one or two allocated parking spaces on plot with an allowance for unallocated parking spaces to be provided elsewhere as visitor parking spaces.

5.6.6 A total of 7 visitor parking spaces will be provided.

5.6.7 The first phase of development therefore fully complies with local car parking standards and delivers the part of the overall site access strategy.

6 TRIP GENERATION

6.1 Introduction

6.1.1 This section considers the traffic generation of the site having regard to the mix of uses proposed and the availability / form of access to facilities off site. To estimate the trip generation of any new development the GTA advises at para 4.61 that:

> Typically, trip generation assessments are based on the identification of suitable (person or vehicle) trip rates, having regard to industry standard databases such as TRICS, GENERATE and TRAVL. These trip rates should be derived on the basis of site-specific details of the proposed development - for example, proposed gross floor area, number of dwelling units, number of hotel rooms, availability and accessibility of non-car modes of travel, provision and nature of travel plans.

6.1.2 No allowance in terms of overall trip generation has been made to account for measures in the Transport Strategy or initiatives emerging from the Travel Planning process.

6.2 Residential

6.2.1 There will be a mix of unit sizes and tenure within the proposed development and therefore the TRICS 2014 v.7.1.3 online database was interrogated for multi-modal surveys of mixed residential sites to derive a trip generation per household. The surveys were selected for sites in England excluding Greater London from which a weighted average trip rate has been calculated. The Greater London surveys were excluded as there is a denser rail network within London and the peak hour periods are typically extended. The peak hour periods here are longer than would normally be expected as is apparent from the 7 day automatic traffic counters installed to inform this survey.

6.2.2 The trip rates for the peak hour periods are summarised in **Table 12** by person trips per household and vehicle trips per household. Full details of the TRICS output is provided at **Appendix D**.

Table 12 Residential trip rates (per unit)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	0.119	0.317	0.436	0.302	0.161	0.463
Person	0.203	0.668	0.871	0.510	0.275	0.785

6.2.3 The trip rates detailed in **Table 12** are generally consistent with the site-specific traffic count undertaken for Randolph Avenue as part of the consented residential development on land adjacent to Randolph Avenue (the Transport Assessment for the site was prepared by DTA). The site-specific vehicular trip rate for the AM peak was identified as 0.650 and the PM peak 0.461. The AM peak trip rate is higher as it includes a proportion of vehicles using Randolph Avenue to park for educational trips to the nearby primary and secondary schools. The PM peak trip rate is consistent with the trip rate in **Table 12**. It is therefore considered that these trip rates are valid.

6.2.4 Adopting a TRICS assessment of wholly private housing would provide higher trip rates, although the mode share between private and rented housing would be comparable. This confirms that tenure has a greater influence on the propensity to travel than the accessibility of the site.

6.3 Small and Medium-Sized Enterprises (SME) Employment Buildings

6.3.1 There will be employment units within the site totalling 7,500m² GFA to increase the range of employment opportunities available locally. It is envisaged that the employment units would be for small to medium sized enterprises.

6.3.2 To estimate the trip generation of the employment unit's rates have been derived from the TRICS database based on the Industrial estate category. The resulting trip rates are summarised in **Table 13** below. The TRICS output is provided at **Appendix D** and summarised below.

Table 13 Employment trip rates (per 100m² GFA)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	0.970	0.372	1.342	0.179	0.737	0.916
Person	1.157	0.466	1.623	0.224	0.928	1.152

6.3.3 The resulting overall vehicular and person traffic generation is presented in **Table 14** below.

Table 14 Employment trip estimates

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	73	28	101	13	55	69
Person	87	35	122	17	70	86

6.4 Retirement Village

6.4.1 It is proposed that there will be a retirement village which will include up to 150 individual units (houses & apartments) together with recreational and social facilities (this may include a cafe/bar, restaurant and gym). The proposals for the site include self-contained accommodation that allow residents to maintain a higher degree of independence for longer, whilst providing a level of care which can be increased over time in line with the resident's requirements. The facilities on-site and the demographics of this component of the overall development will result in a low level of trip generation during the normal peak hour periods which are dominated by the journey to work and education trips. There will, however, be employees working on the site some of whom will travel during the peak hour periods.

6.4.2 The person trip generation of the care village has also been based on trip generation rates per flat derived from the TRICS database. Retirement Flats have been selected within TRICS as it is considered representative of the care village proposals. These are summarised in **Table 15**. The TRICS output is provided at **Appendix D** and summarised below.

Table 15 Retirement flats trip rate (per residential unit)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	0.036	0.036	0.072	0.060	0.071	0.131
Person	0.071	0.083	0.154	0.119	0.185	0.304

6.4.3 The resulting overall vehicular and person traffic generation is presented in **Table 16** below.

Table 16 Retirement village trip estimates

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	5	5	11	9	11	20
Person	11	12	23	18	28	46

6.5 Local Retail

6.5.1 There will be local shops provided on the site with a GFA of 930m². It is envisaged that this could include a medium sized convenience store/supermarket although no operator is know at this point. The store will therefore provide for the day-to-day needs of residents within the site whilst broadening the retail offer within Woodstock as a whole.

6.5.2 It is therefore envisaged that much of the demand for the store will be generated within the site. To produce a robust assessment however the traffic generation of the store has been estimated based on trip rates derived from the TRICS database. These rates are summarised in **Table 17** below. The TRICS output is provided at **Appendix E** and summarised below.

Table 17 Retail (food) trip rates (per 100m²)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	6.109	5.600	11.709	8.689	8.787	17.476
Person	14.945	13.964	28.909	23.967	23.803	47.77

6.5.3 The resulting overall vehicular and person traffic generation is presented in **Table 18** below.

Table 18 Retail trip estimates

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	57	52	109	81	82	163
Person	139	130	269	223	221	444

6.5.4 As set out above, it is envisaged that a significant proportion of the demand will be internally generated including the majority of the walk-in trips to and from the store. There will also be vehicle trips, including pass-by trips, generated from within the site, for example people calling in on their way to or from work. It has been assumed that 90% of trips will be internal trips. The overall external trip demand is set out in **Table 19** below.

Table 19 Overall External Retail Trips – Vehicular and Person

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	6	5	11	8	8	16
Person	14	13	27	22	22	44

6.6 Primary School

6.6.1 The vehicular and person trip generation of the primary school has also been based on the TRICS database. The TRICS output is provided at **Appendix D** and summarised below.

Table 20 Primary school trip rates (per pupil)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	0.284	0.202	0.486	0.016	0.032	0.048
Person	1.445	0.466	1.911	0.037	0.101	0.138

6.6.2 The resulting overall vehicular and person traffic generation is presented in **Table 21** below.

Table 21 Primary school trip estimates

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	119	85	204	7	13	20
Person	607	196	803	15	42	57

6.7 Football Pitch

6.7.1 Old Woodstock Town F.C currently play their home games at grounds on New Road, Woodstock, Oxfordshire (OX20 1PD). The club currently plays in the Hellenic Football League Division One East. Matches are typically played on Saturdays during the football season. Typically therefore weekday trip generation during the peak hour periods will be negligible and may relate to training or ground maintenance activities.

6.7.2 For completeness vehicular and person trip generation estimates of the football facility have been based on the TRICS database. The football sites within TRICS are however commercial 5-a-side pitches that are rented on an hourly basis by members of the public. As such this approach will be a robust appraisal. The resulting rates are summarised in **Table 22** below. The TRICS output is provided at **Appendix D** and summarised below.

Table 22 Football pitch trip rates (per 100m²)

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	0.550	0.250	0.800	2.725	1.200	3.925
Person	1.950	0.450	2.400	4.900	2.075	6.975

6.7.3 The resulting overall vehicular and person traffic generation is presented in **Table 23** below.

Table 23 Football pitch trip estimates

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	1	0	1	3	1	4
Person	2	0	2	5	2	7

6.8 Net Traffic Generation

6.8.1 The trip generation rates set out above a garden gate trip generation rates, i.e. the trips that would be seen by an observer at the entrance to any one element of the development proposed. Within the wider network these will balance against new employment trip ends. In practice the dynamics of people changing jobs and moving

houses make reconciliation of these patterns difficult. It is therefore common practice to make the robust assumption that these trips are in fact all new. The exception is those trips where the origin and destination are in fact within the development site itself, i.e. the trips which are effectively internalised within the development and reflect the synergies from matching amenities to the new residential development. These are set out below.

6.8.2 **Employment** - It has been assumed that 20% of employment trips will be made internal to the site. This figure reflects the 2011 Census data which shows 20% of residents live and work in the West Oxfordshire 004 area and also the proposed employment on site. This discount is applied to the employment trip generation assessment as set out in **Section 5.3**.

Table 24 Internal employment trips

	Total Forecast Trips			Internal movements		
	In	Out	Total	In	Out	Total
08:00-09:00	73	28	101	6	14	20
17:00-18:00	13	55	69	11	3	14

Table 25 Net (external) employment trips

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	58	22	81	11	44	55
Person	70	28	98	13	56	69

6.8.3 **Retail** - A further correction has been applied for movements to the retail proposed on the site assuming 90% of trips will be internal.

6.8.4 This figure has been applied and the internal reduction for retail trips is therefore set out below.

Table 26 Internal retail trips

	Total Forecast Trips			Internal movements		
	Arrive	Depart	Total	Arrive	Depart	Total
08:00-09:00	57	52	109	51	47	98
17:00-18:00	81	82	163	73	74	146

Table 27 Net (external) retail trips

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	6	5	11	8	8	16
Person	4	3	6	7	8	15

6.8.5 **Primary School** - It is envisaged that primary school provision will be met on site and that the primary school pupil generation could equate to 66% of all pupils living on site. It can be assumed that 66% will be internal to the site (primary schools) and the remainder external (to other primary schools and secondary school). The internal reduction for education trips is therefore as set out below in **Table 28**.

Table 28 Internal education trips

	Total Forecast Trips			Internal movements		
	In	Out	Total	In	Out	Total
08:00-09:00	119	85	204	79	56	135
17:00-18:00	7	13	20	4	9	13

6.8.6 Taking into account the 66% internalised movements as derived above in **Table 28**, the overall external trip demand is set out in **Table 29** below.

Table 29 External education trips

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	41	29	69	2	5	7
Person	206	67	273	5	14	20

6.8.7 **Residential** - Taking into consideration with allowance for internal trips, the resultant residential traffic generation is presented in **Table 30** below.

Table 30 Residential net trips

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Vehicular	118	364	482	378	198	576
Person	228	794	1021	602	299	902

6.8.8 **Net External Trips** - Based on the above the overall, the overall external vehicular and person trip generation is set out below in **Table 31** and **32**.

Table 31 Net external vehicle trips

Land Use	AM Peak (0800-0900)			PM Peak (1700-1800)		
	IN	OUT	Total	IN	OUT	Total
Residential	118	364	482	378	198	576
Retail	6	5	11	8	8	16
Employment	58	22	81	11	44	55
Care Village	5	5	11	9	11	20
Education	41	29	69	2	5	7
Football Facility	2	0	2	5	2	7
Total	230	426	656	413	268	680

Table 32 Net external person trips

Land Use	AM Peak (0800-0900)			PM Peak (1700-1800)		
	IN	OUT	Total	IN	OUT	Total
Residential	115	452	567	578	291	870
Retail	4	3	6	7	8	15
Employment	70	28	98	13	56	69
Care Village	11	12	23	18	28	46
Education	206	67	273	5	14	20
Football Facility	2	0	2	5	2	7
Total	407	562	969	627	399	1026

7 TRIP DISTRIBUTION AND ASSIGNMENT

7.1 Residential

7.1.1 The proposed residential traffic generation has been distributed using Census Journey to Work data (2011) for the Super Middle Output Area of West Oxfordshire 004.

7.1.2 A breakdown of the distribution trips from this area is summarised in **Table 33** below and set out in **Appendix E**.

Table 33 Proposed residential trip distribution

Destination	Percentage
West Oxfordshire 004	20%
West Oxfordshire – remaining areas	20%
Oxford	34%
Cherwell	18%
Vale of White Horse	5%
South Oxfordshire	1%
Other – Westminster, Stratford-upon-Avon, City of London, Milton Keynes, Wycombe, Aylesbury Vale	2%
Total	100%

7.1.3 Using the Middle Output Area and Google maps to ascertain the most direct route to the destinations, the distribution of trips by the key routes in the area are set out in **Table 34** below.

Table 34 Residential vehicle trip assignment

Route	Percentage
A34 N	5%
A34S	24%
A40 (Oxford)	10%
A40 East	7%
Frieze Way	0%
A4095 West	18%
A4095 East	1%
A4260	1%
A44 north	24%
Kidlington	10%
Shipton Road	0%
Total	100%

7.2 Employment and Care Home

7.2.1 The proposed employment and care home traffic generation has been distributed using Census Journey to Work data (2011) for the Super Middle Output Area of West Oxfordshire 004.

7.2.2 A breakdown of the distribution trips from this area is summarised in **Table 35** below and set out in **Appendix E**.

Table 35 Employment trip distribution

Destination	Percentage
West Oxfordshire 004	26%
West Oxfordshire – remaining areas	30%
Oxford	6%
Cherwell	19%
Vale of White Horse	4%
South Oxfordshire	2%
Other	13%
Total	100%

7.2.3 Using the Middle Output Area and Google maps to ascertain the most direct route to the destinations, the distribution of trips by the key routes in the area are set out in **Table 36** below.

Table 36 Proposed employment vehicular trip assignment

Route	Percentage
A34 N	4%
A34S	10%
A40 (Oxford)	2%
A40 East	9%
Frieze Way	0%
A4095 West	25%
A4095 East	8%
A4260	2%
A44 north	34%
Kidlington	6%
Shipton Road	0%
Total	100%

7.3 School

7.3.1 It is envisaged that the majority of school pupil will be from the development itself with a proportion from Woodstock and surrounding areas. The likely route of trips are as follows:

- 30% along A4095 West from Long Hanborough;
- 40% north along the A44 Oxford Road;
- 20% south along the A44 Woodstock Road from Kidlington;
- 5% along Shipton Road; and
- 5% along A4095 East.

7.4 Retail

7.4.1 Given the scale of the retail proposals, it is envisaged that the majority of trips will be routes to and from Woodstock. The key routes are therefore:

- 50% along Shipton Road; and
- 50% along the A44 Oxford Road.

7.5 Football Club

7.5.1 The existing football facility in Woodstock will be relocated to the site. The existing football facility primarily serves Woodstock.

7.6 Traffic Assignment

7.6.1 The overall traffic generation by route is set out in **Table 37** below.

Table 37 Traffic Flow Forecasts by Route

Route	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	IN	OUT	TOTAL	IN	OUT	TOTAL
A34 N	9	20	29	21	13	33
A34 S	35	91	126	94	53	147
A44 (Oxford)	13	37	49	38	21	58
A40 East	14	27	41	27	19	46
Frieze Way	0	0	0	0	0	0
A4095 West	49	81	130	73	51	124
A4095 East	8	7	16	6	7	12
A4260 North	2	4	6	4	3	7
A44 north	69	110	178	101	71	172
Kidlington	18	40	58	40	24	64
Shipton Road	13	8	21	9	7	16
Total	230	426	656	413	268	680

7.6.2 As can be seen in **Table 37**, a significant proportion of development traffic will route north along the A44 Oxford Road. These flows are as a result of residents working and living in the West Oxfordshire 004 output area.

8 FUTURE TRAFFIC CONDITIONS

8.1 Future Baseline Traffic Flows and Cumulative Development

8.1.1 The existing traffic flows on the local network have been quantified using surveys, the majority of which were commissioned for this study. There are however significant changes in the number of households and workplaces planned within Oxfordshire which must be taken into account within this study.

8.1.2 In accordance with DfT Guidance, the assessment requires an assessment of future base line conditions 10 years following submission of the planning application. However, for this case and given the long build out of the site and to allow for appropriate Local Plan growth a future year assessment of 2031 has been adopted. The growth has been estimated with reference to the National Trip End Model (NTEM) using TEMPRO. Local TEMPRO growth factors have been used for Cherwell (rural 38UB0) which covers the majority of the site and the A44 corridor (growth for the adjacent West Oxfordshire area would be slightly lower). The resulting factors are shown in **Table 38**. These are equivalent to 1.2 – 1.4% growth per annum over a 17 year period.

Table 38 Traffic Growth Rates from TEMPRO (NTM)

Year	AM Peak	PM Peak
2014-2031	1.2193	1.2347

8.1.3 For robustness the growth rates have not been adjusted for any double counting with the explicitly allowed traffic for the development site or committed development sites. As agreed with the Local Planning Authorities, in addition to wider traffic growth, specific reference has been made to the cumulative impact of the developments at Northern Gateway, Begbrook Science Park and Shipton Road where appropriate.

8.1.4 The development at Northern Gateway comprises:

- Up to 90,000m² of employment development;
- Up to 500 new dwellings;

- A range of local scale retail uses (up to 2,500m² GIA); and
- A hotel with associated leisure facilities (up to 180 bedrooms)

8.1.5 The development at Shipton Road comprises 58 residential dwellings.

8.1.6 Flows for the Northern Gateway Development have been derived from the North Oxford Transport Strategy (NOTS) June 2014 and these are assessed in detail where the junction impact assessments overlap and this principally relates to the A34 Pear Tree Roundabout. In addition to considering the cumulative of the traffic generated by both developments, the assessment assumes in that case that the mitigation measures identified in NOTS are also in place.

8.1.7 In addition to the Northern Gateway Development, OCC are progressing and have funding for significant improvements to the Wolvercote and Cuttleslowe Roundabouts. Capacity constraints at the Wolvercote and Cuttleslowe junctions result in traffic congestion on all junction approaches, but particularly on the A40. As well as congestion, there are concerns about poor pedestrian and cycle access, noise and air pollution.

8.1.8 The OCC proposed improvements are designed to address the current problems and ensure development in Oxfordshire does not lead to worse problems in future. These improvements are assessed in NOTS at a local level.

8.1.9 Development at Begbroke Science Park cannot be explicitly represented in the absence of detailed proposals of scale and mitigation. The development is already operating however and the access has been implemented in advance of an application for additional development and the operation of this junction has been assessed. In accordance with the above, TEMPRO has been applied to the development arms, equating to around 23% in uplift in flows.

8.1.10 The West Oxfordshire Scoping response requested that implications of new development in the Cherwell and West Oxfordshire Local Plans be considered as part of the cumulative impact assessment. The only areas within the agreed geographic

scope of the assessment (as defined in the WODC scoping opinion), could be development at Witney which in traffic terms interacts with the A40 and A44.

8.1.11 There are no fixed proposals for development in this area at present and significant objections are outstanding to the potential sites that WODC have identified. Furthermore, there is no defined assessment by the Council of the mitigation measures that such development would have to bring forward as part individual or cumulative impact.

8.1.12 On this basis and in the absence of any wider assessment by the Council the cumulative impact of those sites has been approached on the basis of the TEMPRO based core scenario (which allows for a 24% growth in traffic flows on the network). This is likely to be at the upper end of growth possible on the network due to wider and localised constraints across the area. For robustness the transport strategies and mitigation delivered by specific sites has not been included in the cumulative impact assessment.

8.2 Change in Flows as a result of OCC North Oxford Transport Strategy (NOTS)

8.2.1 It is clear that the current high levels of flow on the A4095 from Witney to Woodstock and consequently on the A44 south of Woodstock are a result, in part, of significant congestion at Wolvercote. This coupled with poor accessibility from the A40 to the A34 at Pear Tree results is an significant assignment of Oxford and A34 bound traffic from the west of Woodstock using the A44 in preference to the A40.

8.2.2 Whilst the NOTS assessment considers the localised impact of the junction changes it is clear that significant additional capacity will be created on the A44. At present and based on the traffic modelling in NOTS, the junction constrains link capacity to around 800 PCUs (passenger car unit) per hour on the inbound approach, with a queue of at least 36 PCUs.

8.2.3 The proposed improvements will provide stop line capacity (3 lanes) of around 2,160 PCUs an hour (assuming 30-40% green time is allocated to the entry), and therefore

the capacity of the A40 link itself will become the constraining feature – circa 1,500 PCUs an hour.

8.2.4 On this basis, there is significant scope of strategic reassignment of flows from the A44 corridor to the A40 for extraneous traffic from Witney in particular. It is beyond the scope of this assessment to define that effect but it is likely to amount to at least 150 – 200 vehicles in peak direction during peak periods.

8.2.5 Furthermore, as set out above strategic plans exist to improve the bus service between Witney, Hanborough and Woodstock, to operate two times per hour. Furthermore, there is an aspiration to extend this service to Water Eaton (and possibly Headington) via Langford Lane and Kidlington. OCC are collecting Section 106 contributions from various sites to assist in achieving this desired improved bus service and extended route towards Kidlington and beyond. This will have a further effect of reducing background growth.

8.3 Change in Flows as a result of Development Transport Strategy

Improvements to S3

8.3.1 We are in discussion with Stagecoach regarding the patronage increase that would arise from an improvement in the service S3 timetable, and will work with them on the commercial appraisal of such improvements. This is likely to further reduce the level of traffic.

Link and Ride Demand Forecast

8.3.2 The link-and-ride proposals are further specifically designed to act as an interchange for car-borne commuters.

8.3.3 The link-and-ride catchment would comprise settlements to the north, east and west of the development site, from which residents could access the A44 or A4095 to reach Woodstock. The target users are residents in such settlements that drive into Oxford for work, or other purposes.

8.3.4 Some of the settlements within the catchment have an existing bus or train service into Oxford. In cases where that service is infrequent, providing access to the frequent S3 bus service would promote increased use of public transport for trips into Oxford. Therefore, the catchment area from which a modal shift from car could be achieved includes settlements on the existing public transport network. This extends to settlements on the service S3 routes north of Woodstock, which have a less frequent service than S3 provides between Woodstock and Oxford.

8.3.5 Settlements with a frequent and/or fast public transport service into Oxford have been excluded from the catchment; for example, Woodstock, Witney and Banbury.

8.3.6 The catchment has been defined in terms of Census output areas, as set out in **Table 39**.

Table 39 Link-and-Ride Catchment: Census Output Areas

District	Medium-layer Super Output Areas	Lower-layer Super Output Areas
Cherwell	010	016C
West Oxfordshire	001	003B
	002	006B
	004 excluding 004D and 004E [1]	006C
	005	006D
		007B
		007C

Notes: 1. Lower-layer Super Output Areas 004D and 004E make up Woodstock village.

8.3.7 Travel-to-work data for these output areas was extracted from the 2011 Census using the Neighbourhood Statistics website; see **Appendix F**. This shows that in the defined link-and-ride catchment there are 29,724 residents aged 16-74. Subtracting those residents not in employment and those who work mainly at or from home, there are 19,078 who travel to work.

Link-and-Ride Modal Shift Calculation

8.3.8 The forecast of peak-period modal shift from car to link-and-ride bus has been based on work commuting journeys only. Trips for other purposes that could switch to link-and-ride, e.g. shopping and higher education, might also take place in the peak

periods. These have not been included and thus the forecast modal shift from car to bus could be an under-estimate.

8.3.9 The bus mode share (bus, minibus and coach in Census definitions) of commuting trips in the link-and-ride catchment is 3.7%; see **Appendix F**.

8.3.10 The travel-to-work data for Woodstock was analysed to identify the bus mode share, which is 10.3% of commuting; see **Table 40**. The modal split calculation was based on those residents who travel out of the home for work, i.e. it excluded those who work mainly at or from home and those not in employment, as this is the relevant modal split to apply to commuting trips in the link-and-ride catchment.

Table 40 – Woodstock Travel-to-Work Modal Split

Method of Travel to Work (QS701EW)	004D Persons		004E persons		Woodstock persons	
All Usual Residents Aged 16 to 74	891		1057		1948	
Work Mainly at or From Home	75		66		141	
Metro, Light Rail, Tram	0	0.0%	3	0.4%	3	0.2%
Train	28	4.5%	9	1.3%	37	2.8%
Bus, Minibus or Coach	63	10.2%	75	10.4%	138	10.3%
Taxi	0	0.0%	0	0.0%	0	0.0%
Motorcycle, Scooter or Moped	7	1.1%	7	1.0%	14	1.0%
Driving a Car or Van	381	61.7%	462	64.3%	843	63.1%
Passenger in a Car or Van	19	3.1%	27	3.8%	46	3.4%
Bicycle	26	4.2%	34	4.7%	60	4.5%
On Foot	91	14.7%	100	13.9%	191	14.3%
Other Method of Travel to Work	3	0.5%	2	0.3%	5	0.4%
Not in Employment	198		272		470	
Travels to Work	618	100.0 %	719	100.0 %	1337	100.0 %

8.3.11 The proposed link-and-ride will provide residents in its catchment with access to the same standard of bus service enjoyed by Woodstock residents. The potential for increased bus commuting via link-and-ride has been estimated by applying the Woodstock bus mode share to the travel-to-work volume from each of the catchment output areas.

8.3.12 It is recognised that the use of the link-and-ride would involve a trip route deviation and an interchange time penalty. Interchange is therefore most likely to occur during periods of peak demand. On this basis, of the 1,200 commuters resident in the catchment area, it is likely that around 700 of these commuter trips would be co-incident with the peak travel demand periods have been attracted to use the link-and-ride service in the 2011 model base year; see Appendix G. In practice if half of this potential demand is captured at Woodstock, rather than say Peartree or Watereaton, then this is equivalent to 350 commuter trips.

8.3.13 Trip growth to the 2031 forecast year has been forecast using National Trip End Model [NTEM] data. Using TEMPRO, car driver trip growth factors were extracted for Cherwell district and for West Oxfordshire district. Link-and-ride trips at Woodstock must have their home-end rather than their destination-end in one of these districts; therefore, the NTEM production data has been used to calculate the growth rates.

Table 41 Link and Ride Trip Growth to 2031 Forecast Year

District	Car Driver Trip Productions		
	2011	2031	Growth Factor
Cherwell, rural	36,168	41,704	1.153
West Oxfordshire, rural	47,690	52,401	1.099

Source: National Trip End Model, dataset 6.2.

8.3.14 Applying these growth factors to each of the Census output areas in the link-and-ride catchment, the forecast number of catchment area residents that would use the proposed link-and-ride on a typical weekday in 2031 would 385 – 400 commuter trips.

Weekday Peak Period Link & Ride Car Trip Abstraction

8.3.15 Each commuter generates two one-way trips; thus, the 400 link-and-ride commuters would make 800 one-way trips to/from work. Allowing for a commuter car occupancy of 1.2 persons [Source: National Travel Survey Table 0906], this amounts to 667 one-way commuter car driver trips per weekday that could be abstracted to link-and-ride in 2031; see **Appendix F**.

8.3.16 The peak period proportions of commuter trips have been obtained from National Travel Survey data; see **Table 41**. These have been applied to the 2031 forecast weekday one-way car-driver trips per weekday to calculate the hourly peak period car trip volumes abstracted to link-and-ride, which are presented in **Table 42**. This shows that in the modelled AM peak hour 0800-0859, 130 car trips would be abstracted by the link-and-ride; in the PM peak hour 1700-1759, 135 car trips would be abstracted.

Table 42– Weekday Peak Period Hourly Link-and-Ride Trips, 2031 Forecast Year

Weekday Link-and-Ride Commuters		914	Weekday Link-and-Ride Commuters		914
AM Peak	Proportion of Weekday	Hourly Car Trips	PM Peak	Proportion of Weekday	Hourly Car Trips
0700-0759	15.9%	145	1600-1659	9.2%	83
0800-0859	14.2%	130	1700-1759	14.8%	135
0900-0959	3.7%	33	1800-1859	6.9%	64

Source: hourly trip proportions from National Travel Survey Table 0503

8.4 Overall

8.4.1 Overall, it can be seen that the site specific bus measures proposed as part of the scheme, offer the opportunity to reduce peak direction flows on the A44 toward Oxford by in the order of 400 vehicles per hour. This coupled with the strategic interventions currently being promoted by OCC offer significantly better management of traffic flow on the A44.

8.4.2 This level of traffic reduction is higher than the forecast increase in flows as a result of the development and therefore offer significant benefits in terms of peak hour congestion and traffic capacity on the A44 corridor.

8.4.3 For robustness a reduction of 250 vehicles in the peak hours on the peak direction have therefore been applied to the A44 junctions.

9 TRANSPORT IMPACTS AND ASSESSMENT

9.1 Introduction

9.1.1 Based on the above this sections considers the wider transport impacts of the development based on the issues raised during the pre-application consultations.

9.1.2 It is clear from the above that the development site represents a significant opportunity to achieve sustainable and accessible development. On this basis, the scheme is fundamentally wholly consistent with all the requirements of NPPF in that regard.

9.2 Travel Plan Framework

9.2.1 A fundamental part of the package, as already discussed, will be the implementation of a comprehensive travel plan package to cover all elements of the development. The strategy includes a detailed breakdown, by phase, of the interventions and initiatives to be implemented on a phase by phase basis. This is provided in Section 9.2 of the Framework Document.

9.2.2 This includes a detailed public transport strategy which considers the phased introduction of a high quality public transport service to the site.

9.2.3 It is intended that this document will be appended to and secured by the Section 106 agreement.

9.3 Link and Ride

9.3.1 It is clear from the above that the link and ride offers significant improvements and mode shift away from the private car. In addition to the impacts on the A44 as defined above, there are relevant other benefits which have not been specifically assessed.

9.3.2 From some of the catchment of the link-and-ride, the drive route into Oxford could be along the A4260, not the A44. Thus, a commuter who switches to link-and-ride at Woodstock would remove a car from that route, not from the A44 junctions.

9.3.3 With network equilibrium effects in a heavily congested network, it is clear that reducing traffic demand on the A4260 will relieve congestion on parallel routes too, i.e. traffic whose natural line-of-route would be the A4260 but which avoids it and uses the A44 would switch back to the A4260 due to some A4260 traffic switching to link-and-ride.

9.3.4 Furthermore it is likely that, from villages north of Kidlington along the A4260, commuters into Oxford would in reality be using the A4095 - A44 route to avoid driving through Kidlington itself, so we there will be further benefit of switching to link-and-ride from catchment along the A4260 corridor as relieving traffic flows on the A44.

9.4 Impact on S3 Routing

9.4.1 The public transport strategy for the site has been devised in consultation with the local operator, Stagecoach, who have recommended that the S3 be upgraded to three to four departures per hour each way between Woodstock and Oxford city centre during the weekday and Saturday inter-peak periods, and that enhancements to off-peak, i.e. evening and Sunday, service frequency would also be desirable. The site layout has been designed to offer flexibility in terms of future bus accessibility and to account for likely development phasing. A letter of support by Stagecoach is attached at **Appendix G**.

9.4.2 As an overall principle, the site access strategy has been developed to allow a direct route for bus services into site. This includes two points of access onto the A44 and the A4095 to allow services to route from either road through the site. Internally the site layout has been designed to facilitate penetration of buses to enable residents and employees of all parts the development to access public transport services.

9.4.3 This is reflected in the overall internal layout of the roads, including routes with 6.5m carriageways able to easily accommodate two-way bus movements, and the location of stops to provide good coverage and excellent accessibility. As such all of the development would be within 250m of a local bus service stop and within 400m of

the inter-urban service stops. The layout of the development ensures that all pedestrian routes to these stops are convenient and safe.

9.4.4 In addition to this stopping provision will be made on the A44 itself, to allow the site to be served by the S3. Two sets of stops are proposed, the first at the northern site access. This will serve, at least in the early phases, all of the northern element of the site which will be within 500m of the bus stops. It is expected that a heritage type shelter will be provided on the southbound stops.

9.4.5 A further set of stops will be provided adjacent to the Bladon Roundabout with a pedestrian route through the frontage landscaping to provide access to the existing S3 / A44 route.

9.4.6 As set out above, the strategy allows for the S3 to be either routed through the site (the developers preference), run along the A4095 to the interchange or continue on the A44.

9.4.7 Assuming that the S3 routed through the site, this would result in a diversion of around 1.5km, an overall journey increase of around 700m. This equates to around 2 minutes travel time (at 20kph). The delay at the A44 Oxford Road arm would equate to 17 secs in the AM peak and 16 secs in the PM peak. On the A4095 arm would equate to 14 secs in the AM peak and 9 secs in the PM peak.

9.4.8 The delay at the bus stops within the site would be comparable with that incurred if the S3 used the two stops on the A44 (instead of routing through the site).

9.4.9 On this basis the impact would be negligible to overall journey time. It is expected that through a combination of reduced background traffic (See **Section 7**, off-site capacity improvements (see **Section 9**) and if necessary specific bus priority measures, this additional journey would be mitigated.

9.5 Car parking in Woodstock

9.5.1 The issue of car parking in Woodstock has long been the subject to local debate and concern. Following a detailed review by the Town Council, OCC undertook their own review of parking and proposed providing a 2hr restriction over most of the town centre, a further restriction of 1hr nr to the Co-op, and 3hrs on Park Street. The

consultation draft of the changes are attached at **Appendix H**. The outcome of that consultation is awaited.

9.5.2 Ultimately the OCC proposals are a sensible response to the concerns, which relate primarily to concern about commuters using the village parking areas an informal park and ride.

9.5.3 The proposed development offers the opportunity to provide an alternative to this in the form of the Link and Ride which will provide a long stay facility for the town. As set out above, the development will have walking and cycling links so that residents will be able to walk/cycle into town. Furthermore, it includes a small supermarket allowing residents a nearby location for top-up shopping easily accessible by foot.

9.5.4 On this basis, the development will have a positive impact on this issue. However, it is noted that the Council are still reviewing options for parking generally and it would be appropriate to await the outcome of that scheme. If appropriate, the application is willing to fund a review of the issue. This is set out in the Travel Plan.

9.6 Construction Traffic

9.6.1 A detailed assessment of Construction Traffic and its management has been undertaken under a separate cover.

10 TRAFFIC IMPACT AND JUNCTION ASSESSMENTS

10.1 Introduction

10.1.1 The OCC Local Transport Plan (LTP) focuses on attracting and supporting economic investment and growth, delivering transport infrastructure, tackling congestion and improving quality of life.

10.1.2 The Oxford – Woodstock – Chipping Norton corridor is highlighted within the inter-urban corridors strategies and sets out the current problems along the corridor along with how OCC plan to mitigate them. The document recognises that the A44 corridor in Oxfordshire accommodates significant movements of both long distance inter-county journeys and more localised commuter journeys. The A44 is an important alternative to the M40 and A40 routes for traffic moving east from Gloucestershire, Worcestershire and mid Wales to Oxford and onwards to London.

10.1.3 The document identifies that congestion is presence at a number of the following locations:

- the A44 approaching Wolvercote roundabout is severely congested due to the traffic volumes exceeding the capacity of the roundabout and traffic often backs up to Peartree and Loop Farm roundabouts in the morning peak;
- Loop Farm roundabout can itself also be a source of congestion even when traffic ahead of it is free flowing; and
- the A44 approaching the Bladon roundabout south of Woodstock is often slow moving due to the volume of traffic.

10.1.4 The following junctions have been modelled within this Transport Assessment at the requested by OCC and the Highways Agency:

- A44 Oxford Road - A4095 Bladon Road Roundabout;
- A4095 Upper Campsfield Road - A4260 Banbury Road;
- A4095 Main Road - Lower Road;
- A44 Woodstock Road - Langford Lane;

- A44 Woodstock Road - Spring Hill Road;
- A44 Woodstock Road - Begbroke Science Park;
- A44 Woodstock Road - Rutten Lane - Sandy Lane;
- A44 Woodstock Road - Cassington Road;
- Loop Farm Roundabout;
- Peartree Roundabout;
- Site Access – A4095 Upper Campsfield Road; and
- Site Access – A44 Oxford Road.

10.1.5 For the operational assessment of the junctions industry standard software package has been used. ARCADY 8 has the functionality to model both priority controlled 'T' junctions and roundabout junctions. LINSIG has the functionality to model signalised junctions and networks. The geometric parameters have been measured using OS detailed mapping.

10.1.6 For robustness the junction assessments do not take account of reduction in development flows through travel planning measures, but do take account, in the 2031 year of the benefits of the link and ride, OCC strategic improvements and enhancements to bus services.

10.1.7 The traffic analyses have been carried out for a weekday AM and PM period of 07:45 – 09:15 and 16:45 – 18:15. The following scenarios have been modelled:

- 2014 Base;
- 2031 Base;
- 2031 Base + Development + OCC Transport Strategy + Improvements to bus services + Link-and-ride Reductions (as discussed in **Section 7**); and
- 2031 Base + Development + OCC Transport Strategy + Improvements to bus services + Link-and-ride Reductions (as discussed in **Section 7**) + Mitigation Measures (where required)

10.2 Junction Assessments

A44 Oxford Road - A4095 Bladon Roundabout

10.2.1 This junction has been modelled as a priority controlled roundabout junction using ARCADY 8.

2014 Base Scenario

10.2.2 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix I** and the results summarised in the table below.

Table 43 2014 Base scenario at A44 - A4095 Bladon Roundabout

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Upper Campsfield Rd	0.71	2.33	16.57	0.58	1.35	8.98
A44 Woodstock Rd	0.39	0.64	3.04	0.92	10.22	22.76
Bladon Rd	0.77	3.24	11.68	0.66	1.93	9.88
A44 Oxford Rd	0.88	6.59	25.28	0.60	1.46	7.18

10.2.3 The capacity test results show that the junction does already experience periods of operation when it is approaching capacity. These manifest themselves as queuing to the north of the junction in the southbound direction in the AM peak and queuing to the south of the junction in the northbound direction in the PM peak period. The mean maximum queues however are not particularly long and all the traffic clears the junction by the end of the modelled periods.

10.2.4 The 2014 Base flows have been growthed to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix I** and the results are summarised **Table 44** below.

Table 44 2031 Base scenario at A44 - A4095 Bladon Roundabout

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Upper Campsfield Rd	0.95	10.71	64.07	0.82	4.10	22.95
A44 Woodstock Rd	0.49	0.94	3.69	1.20	185.12	332.35
Bladon Rd	1.00	23.02	67.01	0.85	5.18	22.12
A44 Oxford Rd	1.20	105.90	307.90	0.78	3.51	14.23

10.2.5 By 2031 the operation of the roundabout is degraded in the peak hour periods with more widespread queuing expected on all approaches arms to the junction.

10.2.6 The development traffic has been added to the 2031 Base flows. The junction assessment outputs are attached at **Appendix I** and the results are summarised in the table below.

2031 Base + Development + Mitigation Scenario

10.2.7 The above assessment show that there are periods when the junction will be operating at capacity during the peak hour periods and that additional capacity will be required to accommodate existing traffic, growth and the traffic from the proposed development. Accordingly it is proposed to signalise the A4095 Bladon Road entry and the A44 entries as shown on **DTA Drawing 15291-14**. This offers significant benefits in terms of throughput by allowing a more even balancing of flows at the entries making better use of the existing road space. Moreover the signal control lanes have inherently more capacity than priority controlled lanes as the flow rate is not constrained by individual gap acceptance judgments and the formation of traffic into platoons narrows the headway between vehicles. The platooning of traffic on the approaches does require localised changes to the geometry on the approaches including additional widening on approaches and merges.

10.2.8 In addition to improving the throughput of this junction, the traffic signals should better manage the conflicts at this location and thereby improve the safety performance of this junction. The signalisation will also improve pedestrian connectivity allowing new pedestrian routes across the A44 with controlled crossing points. These crossings will operate on the basis of walk with traffic. As such the

crossings will be called every cycle of the traffic signals. The results of the model is attached at **Appendix I**.

Table 45 2031 Base + Development + Mitigation at Bladon Roundabout with mitigation

	AM		PM	
	Practical Reserve Capacity	Total Network Delay	Practical Reserve Capacity	Total Network Delay
Signal Option	26.5%	28.6	19.2%	32.0

10.2.9 As can be seen in the table above the junction operates with good levels of practical reserve capacity in both the AM and PM peak hour periods. The proposed signal junction arrangement would significantly reduce delay and queuing on all arms when compared against the existing roundabout layout. In the AM peak the average queue length on the A44 Woodstock Road north arm is 6.5 pcus and 3.7 pcus on the A44 Woodstock Road south arm. In the PM peak the average queue length on the A44 Woodstock Road north arm is 5.0 pcus and 8.1 pcus on the A44 Woodstock Road south arm.

Bladon Roundabout Junction Conclusion

10.2.10 The Bladon Roundabout does already experience periods of operation when it is at or near capacity. Queuing and delay is experienced on all arms in both the AM and PM peak periods. With future background growth the junction will continue to operate with high levels of queuing and delay and therefore junction improvements are required at this location.

10.2.11 It is proposed to signalise the A4095 Bladon Road entry and the A44 entries. The signalisation of the roundabout would significantly increase the throughput of the junction, better manage the conflicts at this location reducing delay and queuing currently experienced and improve the safety performance of this junction. The traffic signals also allow for the provision of controlled crossings for pedestrians and cyclists which will aid links to Bladon, A44 bus stops and the A44 cycle paths.

A4095 Upper Campsfield Road - A4260 Banbury Road

10.2.12 The A4095 Upper Campsfield Road – A4260 Banbury Road is a priority controlled T-junction with a ghost island right turn lane. As set out in section 3.5 there is a cluster of accidents recorded at this location which whilst not high in terms of the number of incidents are high in terms of severity. However there is no clear trend with respect to periods of high vehicular demand.

10.2.13 With respect to the operation of the junction, there is queuing on the minor arm in the AM and PM peak periods. These queues do dissipate generally by the end of the peak hour however the junction clearly operating at a high ratio of flow to capacity.

10.2.14 To assess the junction, a JUNCTIONS 8 model has been developed. Full details are attached in **Appendix J**.

2014 Base Scenario

10.2.15 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix J** and the results summarised in the table below.

Table 46 2014 Base scenario at A4095 – A4260 junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A4095 Left Turn Out	0.84	4.62	30.87	0.97	12.77	91.04
A4095 Right Turn Out	0.09	0.09	27.76	0.78	0.62	1289.51
A4260 Right Turn In	0.49	0.95	9.95	0.54	1.14	13.89

10.2.16 As can be seen in **Table 47** above, the junction is operating for periods close to capacity, in both the AM and PM peak periods where queuing occurs on the minor arm (A4095). There is no significant main line queuing and the right turn movement into the A4095 operates well within capacity. Note that the right turn demand out demand is very low as in practice there are alternative routes.

10.2.17 The 2014 Base flows have been growthed to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix J** and the results are summarised in the table below.

Table 47 2031 Base scenario at A4095 - A4260 junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A4095 Left Turn Out	1.04	26.66	134.25	1.31	88.81	588.81
A4095 Right Turn Out	1.04	1.86	525.75	0.99	1.31	1638.19
A4260 Right Turn In	0.61	1.51	13.06	0.72	2.49	25.04

10.2.18 In the 2031 Base Scenario, the demand exceeds the available capacity on the minor arm (A4095) and queuing is forecast to increase. Again there is no mainline queuing and there is capacity for the right turn in movement.

2031 Base + Development Scenario

10.2.19 The proposed development increases the traffic flow through the junction by to 0.8%. The development traffic does not therefore materially impact on the operation of the junction. To put this into context, the general traffic growth during this periods is 20 – 25% upto 2031.

10.2.20 In terms of practical improvements that can be made to the junction some localised flaring will ensure that the small number of right turning movements do not block the majority of traffic which is left turning out from Upper Campsfield Road.

A4095 – A4260 Junction Summary

10.2.21 The A4095 Left Turn Out and Right Turn Out does already experience periods of operation when it is approaching capacity. Queuing and delay is experienced on all arms in both the AM and PM peak periods. With future background growth the junction will continue to operate with high levels of queuing and delay. There will be a need for Oxfordshire County Council as highway authority to carry out improvements by 2031 as the road will have exceeded capacity due to non-development related impacts.

10.2.22 The addition of the development traffic the development impact the junction will continue to operate over capacity, however by widening the flare length on the A4095 Upper Campsfield Road will makes best use of the existing capacity.

A4095 Main Road - Lower Road

10.2.23 The A4095 Main Road – Lower Road is a priority controlled T-junction with a ghost island right turn lane. As set out in section 3.5 there is a cluster of accidents recorded at this location which whilst not high in terms of the number of incidents are high in terms of severity. The cause of the collisions were mainly a result of driver error rather than road layout.

10.2.24 With respect to the operation of the junction, there is queuing on the minor arm in the AM and PM peak periods. These queues do dissipate generally by the end of the peak hour however they are indicative of a junction operating a high ratio of flow to capacity.

10.2.25 To assess the junction, a JUNCTIONS 8 model has been developed. Full details are attached in **Appendix K**.

2014 Base Scenario

10.2.26 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix K** and the results summarised in the table below.

Table 48 2014 Base Scenario at A4095 Main Road - Lower Road Junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Lower Road Left Turn Out	0.31	0.43	30.64	0.94	2.61	217.67
Lower Road Right Turn Out	0.84	4.32	62.40	0.91	6.20	114.42
A4095 Right Turn In	0.06	0.06	7.02	0.15	0.17	10.54

10.2.27 For the base 2014 scenario, results of which are summarised in **Table 49**, the junction is operating for periods close to, but not exceeding capacity, in both the AM and PM peak periods where queuing occurs on the minor arm (Lower Road). There

is no significant main line queuing and the right turn movement into the A4095 operates well within capacity.

10.2.28 The high RFC's on the Lower Road Left Turn Out and Right Turn Out are likely to be a result of existing capacity constraints at the Wolvercote and Cuttleslowe roundabouts resulting in traffic congestion on all junction approaches, and particularly on the A40.

2031 Base Scenario

10.2.29 The 2014 Base flows have been growth to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix K** and the results are summarised in the table below.

Table 49 2031 Base Scenario at A4095 Main Road - Lower Road Junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Lower Road Left Turn Out	1.24	7.94	485.54	1.72	11.73	975.23
Lower Road Right Turn Out	1.21	34.26	366.72	1.68	57.69	896.23
A4095 Right Turn In	0.07	0.08	7.63	0.22	0.27	13.93

10.2.30 By the 2031 base scenario, the demand exceeds the available capacity on the minor arm and queuing is forecast to increase. Again there is no mainline queuing and there is ample capacity for the right turn in movement.

2031 Base + Development + Mitigation Scenario

10.2.31 With the additional traffic from the development the junction would operate further over capacity on the Lower Road arms in the AM and PM peak periods. The development flows together with a reduction of 150 vehicles (through NOTS Strategy and public transport improvements) will decrease the RFC, queuing and delay at the junction.

10.2.32 It is therefore proposed to widen Lower Road arm to create a longer flare length. The results of the model is attached at **Appendix K**.

Table 50 2031 + Development Scenario at A4095 Main Road - Lower Road Junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Lower Road Left Turn Out	1.07	5.22	282.24	1.75	11.78	972.38
Lower Road Right Turn Out	1.05	15.17	199.27	1.69	58.03	884.88
A4095 Right Turn In	0.08	0.08	8.01	0.21	0.26	13.22

10.2.33 As can be seen in **Table 51** above the proposed increase in flare length will reduce the RFC, queue and delay on the Lower Road arm.

A4095 Main Road – Lower Road Junction Summary

10.2.34 The A4095 Main Road – Lower Road junction already experiences delay and queuing on Lower Road. The traffic survey results show a heavy right turn movement from Lower Road to the A4095 Main Road. This is likely to be the result of existing capacity constraints at Wolvercote and Cutteslowe roundabouts creating significant queuing and delay along the A40. There will be a need for Oxfordshire County Council as highway authority to carry out improvements by 2031 as the road will have exceeded capacity due to non-development related impacts.

10.2.35 With the addition of the development traffic the development impact the junction will continue to operate over capacity, however by widening the flare length on Lower Road the overall queuing and delay will decrease.

A44 Woodstock Road - Langford Lane

10.2.36 The A44 Woodstock Road – Langford Lane is a three arm signalised junction. The Langford Lane arm is a single lane carriageway with two lane approach at the signals. Langford Lane is one of the main points of access to Oxford Airport.

10.2.37 As set out in section 3.5 there is a cluster of accidents recorded at this location which whilst not high in terms of the number of incidents are high in terms of severity. The collisions were mainly rear shunts as a result a driver error rather than junction layout.

2014 Base Scenario

10.2.38 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix L** and the results summarised in the table below.

Table 51 2014 Base Scenario at A44 Woodstock Road - Langford Lane Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
A44 Woodstock (N) Ahead	57.2	9.8	36.9	5.4
A44 Woodstock (N) Ahead	57.2	9.8	36.9	5.4
Langford Lane Right	48.8	2.3	56.6	4.8
Langford Lane Right	48.8	2.3	56.6	4.8
A44 Woodstock (s) Right	70.9	8.5	55.3	4.8
A44 Woodstock (s) Ahead	22.8	2.0	39.8	5.4

10.2.39 As can be seen in **Table 52** the junction is operating within capacity, in both the AM and PM peak periods. There is no significant main line queuing and the right turn movement into the A44 Woodstock Road operates well within capacity.

2031 Base Scenario

10.2.40 The 2014 Base flows have been growth to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix L** and the results are summarised in the table below.

Table 52 2031 Base Scenario at A44 Woodstock Road - Langford Lane Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
A44 Woodstock (N) Ahead	72.8	14.1	47.7	7.3
A44 Woodstock (N) Ahead	72.8	14.1	47.7	7.3
Langford Lane Right	59.4	3.0	65.7	6.1
Langford Lane Right	59.4	3.0	65.7	6.1
A44 Woodstock (s) Right	79.4	11.0	64.4	6.2
A44 Woodstock (s) Ahead	27.8	2.6	49.9	7.6
A44 Woodstock (N) Ahead	27.8	2.6	49.9	7.6

10.2.41 By the 2031 base scenario, the degree of saturation and queuing increases marginally although still within theoretical capacity. Again there is no significant mainline queuing and there is ample capacity for the right turn in movement from the A44 Woodstock Road.

2031 Base + Development Scenario

10.2.42 The development traffic has been added to the 2031 Base flows. The junction assessment outputs are attached at **Appendix L** and the results are summarised in the table below.

Table 53 2031 + Development Scenario at A44 Woodstock Road - Langford Lane Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
A44 Woodstock (N) Ahead	70.5	13.2	54.0	8.7
A44 Woodstock (N) Ahead	70.5	13.2	54.0	8.7
Langford Lane Right	57.8	3.1	67.6	6.6
Langford Lane Right	57.8	3.1	67.6	6.6
A44 Woodstock (s) Right	79.4	11.0	68.2	6.4
A44 Woodstock (s) Ahead	30.8	3.1	48.0	7.2
A44 Woodstock (N) Ahead	30.8	3.1	48.0	7.2

10.2.43 With the addition of the development flows together with the reduction in flows, the degree of saturation and queuing decreases marginally and is still within theoretical capacity. Again there is no significant mainline queuing and there is ample capacity for the right turn in movement from the A44 Woodstock Road.

A44 Woodstock Road – Langford Lane Junction Summary

10.2.44 The results of the junction modelling for this junction in the 2014 Base scenario shows that the junction currently operates within capacity on all arms in the AM and PM peak periods. With future background growth the junction will continue to operate within capacity.

10.2.45 With the addition of the development traffic the junction will continue to operate within capacity on all arms.

A44 Woodstock Road - Spring Hill Road

10.2.46 The A44 Woodstock Road – Spring Hill Road roundabout is a three arm roundabout junction to the north of Yarnton. To the north and south of the junction the A44 Woodstock Road is a dual two lane carriageway. The dual two lane carriageway to the north and south reduces to a single lane carriageway on both approaches to the roundabout. Spring Hill Road is a single two lane carriageway road leading to a small number of residential dwellings.

10.2.47 This junction has been modelled as a priority controlled roundabout junction using TRL's ARCADY 8.

2014 Base Scenario

10.2.48 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix M** and the results summarised in the table below.

Table 54 2014 Base Scenario at A44 Woodstock Road - Spring Hill Road

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A44 Woodstock Rd (S)	0.68	2.11	6.42	0.83	4.74	11.82
Spring Hill Road	0.04	0.04	7.37	0.13	0.15	11.16
A44 Woodstock Rd (N)	0.74	2.86	8.45	0.77	3.28	9.66

10.2.49 The model of the existing operation show that in isolation the junction operates within capacity during the AM and PM peak hour period.

2031 Base Scenario

10.2.50 The 2014 Base flows have been growth to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix M** and the results are summarised in the table below.

Table 55 2031 Base Scenario at A44 Woodstock Road - Spring Hill Road

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A44 Woodstock Rd (S)	0.97	18.17	47.05	1.19	161.22	367.59
Spring Hill Road	0.06	0.06	9.48	0.17	0.20	11.84
A44 Woodstock Rd (N)	1.04	48.41	107.06	1.10	83.41	177.57

10.2.51 Allowing for purely baseline growth in traffic demand shows that the ratio of flow to capacity increases on all approaches as do queue lengths. In the AM peak the junction is operating within capacity. During the PM peak period, the A44 Woodstock Road South approach has further increased resulting in additional queuing. The Spring Hill Road approach continues to operate within capacity.

2031 Base + Development Scenario

10.2.52 A rebalancing of priority between public transport and car traffic is essential on the A44 corridor to encourage mode shift and thereby increase the overall capacity of the corridor.

10.2.53 The bus current exits the A44 in advance of this junction and runs along a service road to rejoin the A44 to the south. It is proposed to allow the main buses to remain on the mainline. This will be achieved by changing the road markings on the A44 (in both directions) so that general traffic uses the outside lane which is currently hatched out and the inside lane becomes a dedicated bus lane. This will aid both speed and reliability of bus services.

10.2.54 The development traffic has been added to the 2031 Base flow together with the adjustments resulting from the mode shift set out above. The junction assessment outputs are attached at **Appendix M** and the results are summarised in the table below.

Table 56 2031 + Development Scenario at A44 Woodstock Road - Spring Hill Road

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A44 Woodstock Rd (S)	0.82	4.42	11.42	0.94	12.45	28.48
Spring Hill Road	0.06	0.06	10.07	0.21	0.26	16.55
A44 Woodstock Rd (N)	0.83	4.77	12.81	0.96	15.40	38.11

A44 Woodstock Road – Spring Hill Road Junction Summary

10.2.55 The results of the junction modelling for this junction in the 2014 Base scenario shows that the junction currently operates within capacity on all arms in the AM and PM peak periods. With future background growth the junction will operate over its theoretical capacity on the A44 Woodstock Road approaches. This is not surprising considering the mainline flow.

10.2.56 With the addition of the development traffic but a reduction in flows due to mode shift the junction will operate close to capacity on the A44 Woodstock Road approaches.

Begbroke Science Park Access

10.2.57 The Begroke Science Park access is a three-arm signalised junction to the North of Yarnton. The Science Park arm is a single lane carriageway with a two lane approach at the signals.

2014 Base Scenario

10.2.58 The junction assessment outputs are attached at **Appendix N** and the results summarised in the table below.

Table 57 2014 Base Scenario at A44 Woodstock Road - Begbrook Science Park Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
Begbroke Science Park Left	7.7	0.4	38.8	2.4
Begbroke Science Park Right	11.1	0.5	56.0	2.8
A44 Woodstock Road (S) Ahead	55.5	10.0	70	15.0
A44 Woodstock Road (S) Ahead	51.7	9.7	65.2	14.1
A44 Woodstock Road (S) Right	63.0	3.2	1.3	0.1
A44 Woodstock Road (N) Left Ahead	68.8	14.2	68.1	14.0
A44 Woodstock Road (N) Ahead	73.1	14.8	73.1	14.8

10.2.59 As can be seen in **Table 60** the junction is operating within capacity, in both the AM and PM peak periods. There is no significant main line queuing.

2031 Base Scenario

10.2.60 The 2014 Base flows have been growth to 2031 using the TEMPRO growth. The junction assessment outputs are attached at **Appendix N** and the results are summarised in the table below.

Table 58 2031 Base Scenario at A44 Woodstock Road - Begbrook Science Park Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
Begbroke Science Park Left	7.7	0.4	38.8	2.4
Begbroke Science Park Right	11.1	0.5	56.0	2.8
A44 Woodstock Road (S) Ahead	55.5	10.0	70.0	15.0
A44 Woodstock Road (S) Ahead	51.7	9.7	65.2	14.1
A44 Woodstock Road (S) Right	63.0	3.2	1.3	0.1
A44 Woodstock Road (N) Left Ahead	68.8	14.2	68.1	14.0
A44 Woodstock Road (N) Ahead	73.1	14.8	73.1	14.8

10.2.61 By the 2031 base scenario, the degree of saturation and queuing increases marginally although still within theoretical capacity. Again there is no significant mainline queuing.

2031 Base + Development Scenario

10.2.62 The development traffic has been added to the 2031 Base flow. The junction assessment outputs are attached at **Appendix N** and the results are summarised in the table below.

Table 59 2031 + Development Scenario at A44 Woodstock Road - Begbrook Science Park Junction

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
Begbroke Science Park Left	7.7	0.4	38.8	2.4
Begbroke Science Park Right	11.1	0.5	56.0	2.8
A44 Woodstock Road (S) Ahead	58.5	11.0	67.2	13.9
A44 Woodstock Road (S) Ahead	54.5	10.5	62.6	13.1
A44 Woodstock Road (S) Right	63.0	3.2	1.3	0.1
A44 Woodstock Road (N) Left Ahead	65.3	13.0	73.5	15.9
A44 Woodstock Road (N) Ahead	69.4	13.6	78.8	17.0

10.2.63 With the additional of the development traffic together with the reduction in flows, the junction will continue to operate within capacity on all arms in the AM and PM peak periods.

A44 Woodstock Road – Begbroke Science Park Junction Summary

10.2.64 The results of the junction modelling for this junction in the 2014 Base scenario shows that the junction currently operates within capacity on all arms in the AM and PM peak periods. With future background growth the junction will continue to operate within capacity.

10.2.65 With the addition of the development traffic the junction will continue to operate within capacity on all arms.

A44 Woodstock Road - Rutten Lane - Sandy Lane

10.2.66 The A44 Woodstock Road – Rutten Lane – Sandy Lane roundabout is a four arm roundabout junction to the north of Yarnton. To the north and south of the junction the A44 Woodstock Road is a dual two lane carriageway. The dual two lane

carriageway to the north and south reduces to a single lane carriageway on both approaches to the roundabout. Rutten Road and Sandy Lane is a single two lane carriageway road.

10.2.67 This junction has been modelled as a priority controlled roundabout junction using TRL's ARCADY 8.

2014 Base Scenario

10.2.68 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix O** and the results summarised in the table below.

Table 60 2014 Base Scenario at A44 Woodstock Road - Rutten Lane - Sandy Lane

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Sandy Ln	0.18	0.21	4.46	0.22	0.28	5.02
A44 Woodstock Rd (S)	0.69	2.20	7.30	0.84	5.19	14.37
Rutten Lane	0.45	0.80	12.15	0.54	1.15	18.99
A44 Woodstock Rd (N)	0.73	2.71	8.19	0.80	3.88	10.68

10.2.69 The model of the existing operation show that in isolation the junction should operate within capacity during the AM and PM peak hour period.

2031 Base Scenario

10.2.70 The 2014 Base flows have been growth to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix O** and the results are summarised in the table below.

Table 61 2031 Base Scenario at A44 Woodstock Rd - Rutten Lane - Sandy Lane

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Sandy Ln	0.26	0.34	5.91	0.33	0.49	7.20
A44 Woodstock Rd (S)	0.86	5.62	15.69	1.06	61.76	121.06
Rutten Lane	0.71	2.30	29.82	0.92	6.78	94.69
A44 Woodstock Rd (N)	0.91	8.56	22.09	1.00	26.49	58.13

10.2.71 Allowing for purely baseline growth in traffic demand shows that the ratio of flow to capacity increases on all approaches as do queue lengths. In the AM peak the junction is operating within capacity. During the PM peak period, the A44 Woodstock Road South and North approach has further increased resulting in additional queues. The Sandy Lane and Rutten Lane approach continues to operate within capacity.

2031 Base + Development Scenario

10.2.72 As with the Spring Hill Lane roundabout, there is extensive hatching in-situ which it is proposed to employ to provide bus priority. The precise form of bus priority at this location will depend on bus routeing. Assuming that all services continue to run through Yarnton, then the outside lane would be converted to a bus lane and the bus stop related onto Rutten Lane. If it is deemed that L&R services should operate express services, then the bus priority would be provided on the nearside lane.

10.2.73 Irrespective of the final option, the roadspace available to general traffic will be broadly the same. Accordingly the development traffic has been added to the 2031 Base flows. The junction assessment outputs are attached at **Appendix O** and the results are summarised in the table below.

Table 62 2031 Base + Development Scenario at A44 Woodstock Road - Rutten Lane - Sandy Lane

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Sandy Ln	0.24	0.32	5.48	0.34	0.51	7.55
A44 Woodstock Rd (S)	0.91	8.65	23.25	1.01	33.42	73.59
Rutten Lane	0.79	3.27	43.18	0.90	5.82	81.45
A44 Woodstock Rd (N)	0.86	5.70	15.26	1.07	69.50	127.04

10.2.74 With the additional traffic from the development the demand shows that the ratio of flow to capacity increases on all approaches as do queue lengths. In the AM peak the junction will continue to operate within capacity, while in the PM peak the junction continues to operate over capacity.

A44 Woodstock Road – Rutten Lane – Sandy Lane Junction Summary

10.2.75 The results of the junction modelling for this junction in the 2014 Base scenario shows that the junction currently operates within capacity on all arms in the AM and PM peak periods. With future background growth the junction will operate over its theoretical capacity on the A44 Woodstock Road approaches.

A44 Woodstock Road - Cassington Road

10.2.76 The A44 Woodstock Road – Cassington Road roundabout is a three arm roundabout junction to the south of Yarnton. In addition to these three arms there is a direct access from the circulatory carriageway into the Turnpike Public House to the north of the junction. To the north of the junction the A44 Woodstock Road is a dual two lane carriageway. To the south of the junction the A44 Woodstock Road reduces from dual two lane at the roundabout to a good standard single two lane carriageway. The lanes drop over circa 60m. Cassignton Road is a single two lane carriageway road.

10.2.77 This junction has been modelled as a priority controlled roundabout junction using TRL's ARCADY 8.

2014 Base Scenario

10.2.78 This junction has been modelled using the flows from the traffic surveys undertaken in July 2014. The junction assessment outputs are attached at **Appendix P** and the results summarised in the table below.

Table 63 2014 Base Scenario at A44 Woodstock Road - Cassington Road

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A44 Woodstock Rd (S)	0.63	1.69	4.98	0.87	6.41	14.33
Cassington Road	0.53	1.11	10.78	0.69	2.14	22.20
A44 Woodstock Rd (N)	0.55	1.20	3.72	0.62	1.60	4.43

10.2.79 The model of the existing operation show that in isolation the junction should operate within capacity during the AM peak hour period. In the PM peak hour period the junction is operating approaching its theoretical capacity on the A44 Woodstock Road South approach.

2031 Base Scenario

10.2.80 The 2014 Base flows have been growth to 2031 using the TEMPRO growth factors. The junction assessment outputs are attached at **Appendix P** and the results are summarised in the table below.

Table 64 2031 Base Scenario at A44 Woodstock Road - Cassington Road

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A44 Woodstock Rd (S)	0.77	3.30	8.06	1.08	92.70	143.19
Cassington Road	0.79	3.49	28.80	1.08	23.62	185.76
A44 Woodstock Rd (N)	0.68	2.12	5.42	0.77	3.32	7.55

10.2.81 Allowing for purely baseline growth in traffic demand shows that the ratio of flow to capacity increases on all approaches as do queue lengths. In the AM peak the junction is still operating in isolation within capacity. During the PM peak period, the A44 Woodstock Road South approach has further increased resulting in additional queues. The Cassington Road approach is also operating in excess of capacity in 2031.

2031 Base + Development Scenario

10.2.82 A44 – Cassington Lane Roundabout is a small roundabout to the south of which the A44 drops from a dual two lane standard to a single two lane standard. Queuing is

forecast to increase on both the A44 and Cassington Lane approaches. This location is also critical in terms of establishing bus priority on the A44 corridor.

10.2.83 To address these issues it is proposed to convert the junction to a signalised junction arrangement as shown on **Drawing 15291-15**.

10.2.84 In addition a short section of bus lane on the Cassington Lane approach will be provided for approximately 100m with buses receiving preferential green time at the traffic signals. The A44 Woodstock Road South approach will be widened providing additional capacity.

10.2.85 The junction assessment outputs are attached at **Appendix P** and the results are summarised in the table below.

Table 65 2031 Base + Development + Mitigation Scenario at A44 Woodstock Road – Cassington Road

Arm	AM		PM	
	Deg of Sat %	Max Q	Deg of Sat %	Max Q
A44 Woodstock Road (N) Ahead Right Left	73.2%	5.8	89.5%	13.4
Right Right2	20.9%	0.9	33.2%	1.5
A44 Woodstock Road (S) Ahead Ahead2	50.5%	5.5	63.8%	8.4
A44 Woodstock Road (S) Ahead	50.5%	5.5	63.8%	8.4
Cassington Road Ahead Left	42.6%	1.4	45.2%	1.9
Cassington Road Ahead	27.6%	0.7	35.3%	1.3
Right Ahead	46.7%	2.4	62.6%	3.2
Right	50.7%	2.8	68.4%	3.9
Turnpike Left Ahead	0.2%	0.0	2.7%	0.0

10.2.86 As can be seen in **Table 66** above, the improvements works to the junction by way of signalisation will improve the overall capacity of the roundabout on all approaches, particularly on the A44 Woodstock Road approaches. The signalised roundabout will therefore operate within capacity on all arms in the AM and PM peak periods.

A44 Woodstock Road – Cassington Road Junction Summary

10.2.87 The results of the junction modelling for this junction in the 2014 Base scenario shows that the junction currently operates within capacity on all arms in the AM and PM peak periods. With future background growth the junction will operate over its theoretical capacity on the A44 Woodstock Road approaches. This is not surprising considering the mainline flow.

10.2.88 With the addition of the development traffic and reduction in flows the junction will operate close to capacity on the A44 Woodstock Road approaches.

10.2.89 To address these issues it is proposed to convert the junction to a signalised junction arrangement. In addition a short section of bus lane on the Cassington Lane approach will be provided for approximately 100m with buses receiving preferential green time at the traffic signals. The A44 Woodstock Road South approach will be widened providing additional capacity.

Loop Farm Roundabout

10.2.90 The Loop Farm Roundabout comprising of Frieze Way and the A44 Woodstock Road (north and south) is a three arm roundabout to the south of Yarnton. To the Northwest of the junction the A44 Woodstock Road is a single two lane carriageway. To the South of the junction the A44 Woodstock Road is a dual two lane carriageway connecting to the A34 Peartree Interchange. Frieze Way is also a dual two lane carriageway connecting to Kidlington roundabout.

10.2.91 The junction currently experiences congestion during the peak periods. In part this is due to interaction with junctions downstream most notably the Wolvercote roundabout. This is supported on site observations. However as set out in the operational review of the corridor within LTP3 reports, the junction is likely to be a constraint in isolation.

10.2.92 Additional demand will increase delay and queuing. In the absence of bus priority measures this will also impact on the bus strategy.

10.2.93 To address these issues it is proposed to change the method of control to traffic signals together with geometric improvements to the A44 Woodstock northwest arm with the addition of a bus lane on the A44 Woodstock Road approach as shown on **Drawing 15291-17a**. Primarily this affords greater priority to the A44 corridor whilst signal controlled lanes have inherently more capacity than priority controlled lanes. The roundabout layout does however efficiently handle the right turn movements to and from Frieze Way.

10.2.94 Such movements are particularly significant in the consideration of the cumulative impact of the Northern Gateway development. The design flows have been tested in terms of the LINSIG assessment, which is attached at **Appendix Q**.

Peartree Interchange

10.2.95 The Peartree Interchange is a grade separated junction on the A34 providing access from this road to the A40, A44 and North Oxford. The Oxfordshire Local Transport Plan (2011-2030) recognises that the Peartree Interchange currently experiences localised delays and queuing due to the capacity constraints at Wolvercote roundabout resulting in traffic backing up to Peatree and Loop Farm Roundabout in the morning peak periods. Without any future mitigation the junction will continue to operate with increase delay and queuing.

10.2.96 OCC are progressing and have funding for significant improvements to the Wolvercote and Cuttleslowe Roundabouts which will alleviate the capacity constraints currently experienced at both roundabouts.

10.2.97 In addition to this, the NOTS Strategy proposes improvements to Peartree Interchange in the form of signalisation of the junction. The scheme will also improve the overall safety of the junction for non-motorised users by providing signal controlled pedestrian and cycle facilities on each major approach. The cumulative impact of the Northern Gateway scheme together with the development flows has been tested in terms of the LINSIG assessment, which is attached at **Appendix R**.

Table 66 2031 Base + Development + Mitigation at Peartree Roundabout

	AM		PM	
	Practical Reserve Capacity	Total Network Delay	Practical Reserve Capacity	Total Network Delay
Signal Option	12.5%	80.97	4.6%	92.29

10.2.98 The results of the LINSIG assessment shows that the proposed development flows together with the cumulative impact of Northern Gateway can be accommodated on the junction.

Peartree Roundabout Junction Summary

10.2.99 The Peartree roundabout currently experiences localised delays and queuing. The NOTS Strategy suggests that queuing is transient and related to delays at Wolvercote queuing back to the junction. Without any future mitigation the junction will continue to operate with increased delay and queuing.

10.2.100 The NOTS Strategy proposes improvements to Peartree Interchange in the form of signalisation of the junction to accommodate future growth and the Northern Gateway development proposals. That scheme will also improve the overall safety of the junction for non-motorised users by providing signal controlled pedestrian and cycle facilities on each major approach.

10.2.101 The proposed scheme together with junction improvements at Wolvercote roundabout will therefore significantly improve the capacity of the roundabout.

A44 Oxford Road Site Access Junction

10.2.102 The proposed site access junction would be a priority T-junction with a right turn harbourage similar in form to the existing junction to the West (e.g. Churchill Gate and Cadogan Park). The preliminary design has been based on the prevailing 50mph speed limit (i.e. the deceleration lengths and the taper lengths). The site access design is shown on **Drawing 15291-22**.

10.2.103 This junction has been modelled as a priority controlled junction using JUNCTIONS 8 using the PICADY module. The junction assessment outputs are attached at **Appendix S** and the results summarised in the table below.

Table 67 2031 Base + Development Scenario at A44 Site Access Junction

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
Site Access Left Out	0.69	2.05	39.73	0.47	0.85	26.97
A44 Oxford Road Right In	0.08	0.09	7.98	0.12	0.14	7.42

10.2.104 The results show that the junction would operate within capacity in the 2031 future year scenarios with minimal queuing on the main-line.

A4095 Upper Campsfield Road Site Access Junction

10.2.105 The proposed site access junction would be a 3-arm roundabout junction with an inscribed circular diameter of 45m. All arms have been designed to ensure that the entry deflection path for vehicles is 100m or less in line with the guidance within TD16/07. The site access design is shown on **Drawing 15291-21**.

10.2.106 The operation of the junction has been modelled as a priority controlled junction using ARCADY 8. The junction assessment outputs are attached at **Appendix S** and the results summarised in the table below.

Table 68 2031 Base + Development Scenario at A4095 Upper Campsfield Road Site Access

Arm	AM			PM		
	RFC	Queue	Delay (sec)	RFC	Queue	Delay (sec)
A4095 (N)	0.66	1.92	10.51	0.69	2.17	11.88
A4095 (S)	0.61	1.56	5.90	0.58	1.35	5.07
Site Access	0.33	0.48	6.58	0.55	1.22	10.07

10.2.107 The results show that the junction would operate within capacity in the 2031 future year scenarios with minimal queuing on the main-line.

10.3 Local Roads & Coach Parking for Marlborough School

10.3.1 The main development site accesses are located on the principal road network. The site also connects into Shipton Road. This is important for the integration of the site into the town to allow existing residents access to the facilities within the site. It is therefore to facilitate traffic which is already on the local road network.

10.3.2 The internal road layout is structured via a primary route between the main site accesses. The site access junctions have been design with sufficient capacity that will avoid the need for traffic to seek alternative routes to the town centre. It is therefore anticipated that vehicular traffic to the town centre will use the A44.

10.3.3 Shipton Road route is a secondary access to the site and to ensure that amenity is maintained the traffic calming measures will be extend to the site.

10.3.4 The linking of Shipton Road through the site also significantly improves access to Marlborough School particularly for school coaches. At present however there are no dedicated set down provision for these coaches. It is proposed that this will be addressed by the creation of a dedicated coach park area to allow the safe boarding of coaches. A design for this facility is shown on **DTA Drawing 15291-23** however it may be possible to provide an equivalent facility within the existing school site shown within the red line boundary (south of Shipton Road).

10.4 Mitigation

10.4.1 The works and plans provided as part of this development are in part direct mitigation in response to changes in travel demand patterns and part works to direct the change changes in travel demand patterns in accordance with the stated aims and policies of National and Local Government.

10.4.2 The OCC LTP recognises that the A44 corridor experiences delays and queuing as a result of the volume of traffic using the corridor. Capacity constraints at Wolvercote and Cutteslowe roundabouts exasperate delays and queuing resulting in tailbacks to the Peartree interchange and Loop Farm roundabout. OCC are progressing and have

funding for significant improvements to the Wolvercote and Cuttleslowe Roundabouts.

10.4.3 The OCC LTP strategy for the A44 corridor recognises that optimising management of the network and alternatives to car travel serving key settlements such as Woodstock will be the key to reducing congestion on the A44. In addition the strategy highlights a small park and ride site to serve this corridor. The localised capacity improvements along the A44 corridor together with bus priority measures, the new interchange within the site and travel planning initiatives will ensure a high level of accessibility to Oxford reducing the overall congestion on the A44 corridor. The developer will seek to work with OCC to ensure that a programme of works is co-ordinated.

10.4.4 The above assessment demonstrates that the following junctions are capable of accommodating the development traffic without any further works:

- A44 – Langford Lane;
- A44 – Begbroke Science Park Access; and,
- Peartree Roundabout.

10.4.5 The above assessment demonstrates that the following junctions are capable of accommodating the development traffic but bus priority works are required:

- A44 – Spring Hill Road; and,
- A44 – Rutten Lane – Sandy Lane; and

10.4.6 The following junctions will require mitigation to accommodate the development traffic and to provide bus priority:

- A44 Site Access Junction;
- A4095 Site Access Junction;
- A4095 – A4260 Junction;

- A4095 Main Road – Lower Road;
- Bladon Roundabout;
- A44 – Cassington Lane; and
- Loop Farm Roundabout.

10.4.7 Improvements will also be made to accessing Marlborough School by coach by the creation of a dedicated coach parking area. Additional traffic calming is also proposed to maintain the Shipton Road route for local traffic (which is already on the network).

10.4.8 In addition to the above works, the travel will be actively managed through the Travel Plan process.

11 SUMMARY AND CONCLUSIONS

11.1 This Transport Assessment has reviewed the highways and transport implications of the proposed residential-led mixed use development to the East of Woodstock. The proposed development has direct access to the principal road network and will be served by a direct bus route providing connections into Oxford.

11.2 The proposed development however represents a significant increase in size of the town of Woodstock. A Transport Strategy has therefore been devised to ensure that the resulting trip patterns that are generated by the development are efficient and sustainable.

11.3 The public transport strategy for the site seeks to develop existing direct bus services increasing demand through more development which is served directly and by the provision of a new interchange within the site which will be accessible by pedestrians, cyclists and car users. Car (circa 300 spaces) and cycle parking will be provided at this interchange.

11.4 Localised capacity improvements are planned for the local road network. These include works at Bladon Roundabout together with bus priority measures on the A44 corridor. Works are already planned to the East of the A34 by Oxfordshire County Council and others and the developer will seek to work with OCC to ensure that a programme of works is co-ordinated to ensure that a highly level of accessible to Oxford is attained.

11.5 The development provides expanded employment and services for Woodstock including a new local centre and a primary school. These will minimise the need to travel and contribute to increased sustainability of the wider community. Overall it is considered that the proposed development makes good use of existing infrastructure and public transport services.

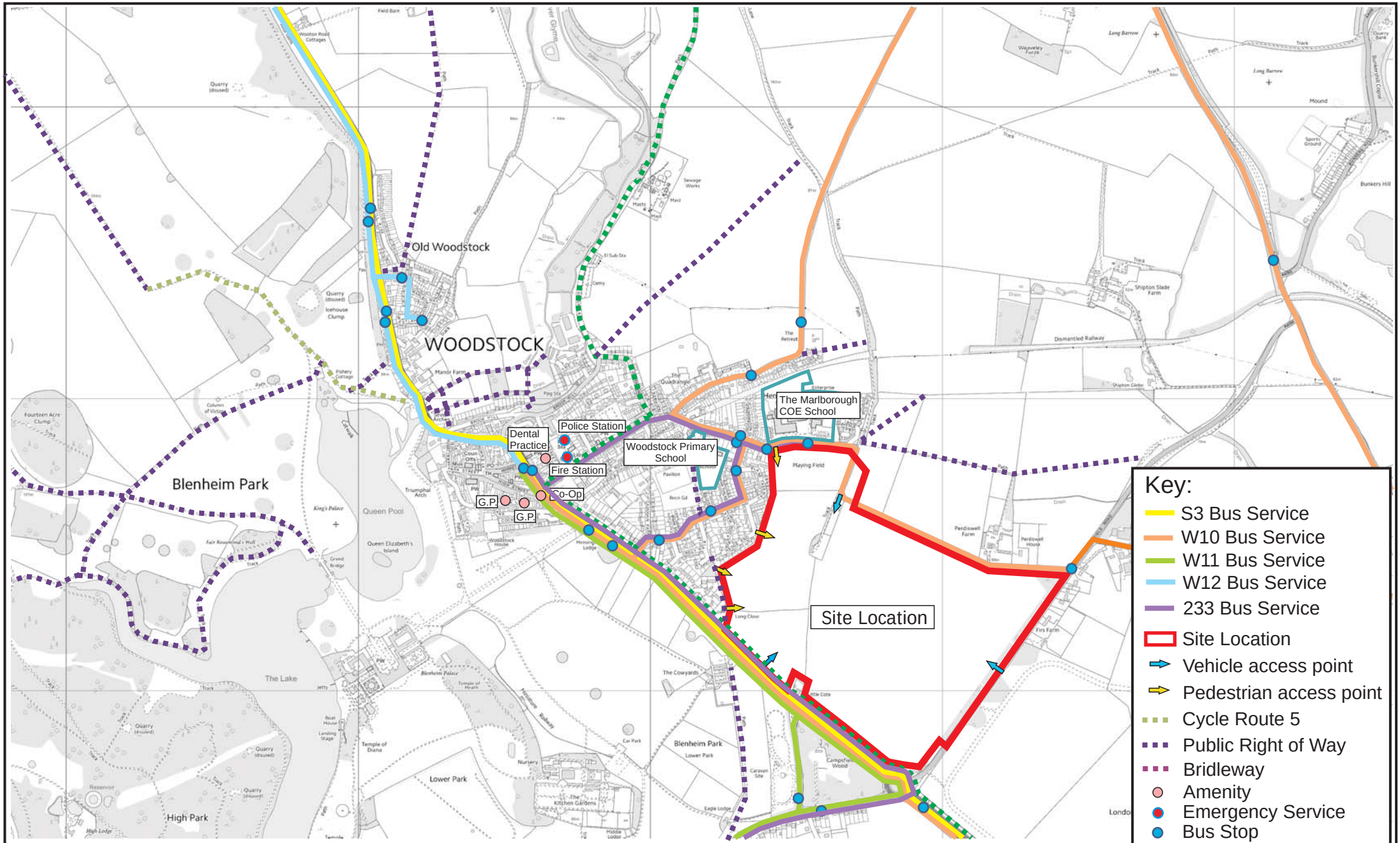
11.6 For a development of this scale and notwithstanding it's excellent locational advantages, it is inevitable that impacts will require mitigation and the strategy for this, as discussed in detail above is summarised below in **Table 71**.

Table 69 Mitigation and Phasing

	Pye/Blenheim led development	Oxfordshire County Council led development
Phase 1	• Development to commence from A44 junction. Bus stops constructed adjacent to access. • 350 houses constructed • Travel Plan implementation • Construction Management Plan Implementation.	• Wolvercote roundabout works constructed • Cuttleslowe roundabout works constructed
Phase 2	• Link to Shipton Road created and improved coach facilities for school. • Access provided from A4095/ Link and Ride created • Additional 350 houses constructed • Bus priority measures on the A44 • Capacity improvements to Bladon Roundabout and Loop Farm Roundabout • Extension of A44 cycle route to connect to key destinations within Woodstock • Travel Plan implementation and monitoring. • Construction Management Plan Review and Implementation.	• Northern Gateway infrastructure works constructed
Phase 3	• Additional 350 houses constructed • Bus priority measures on the A44 • Travel Plan implementation and monitoring	
Phase 4	• Additional 350 houses constructed • Travel Plan implementation and monitoring	

11.7 With respect to the planning policy requirements set out in NPPF, it is considered that the development is sustainable in transport terms. Specifically in terms of the requirements of paragraph 32 it has been demonstrated that safe and suitable access can be achieved moreover that the impacts of the development can be appropriately mitigated and that the residual impact will not be severe.

Drawings



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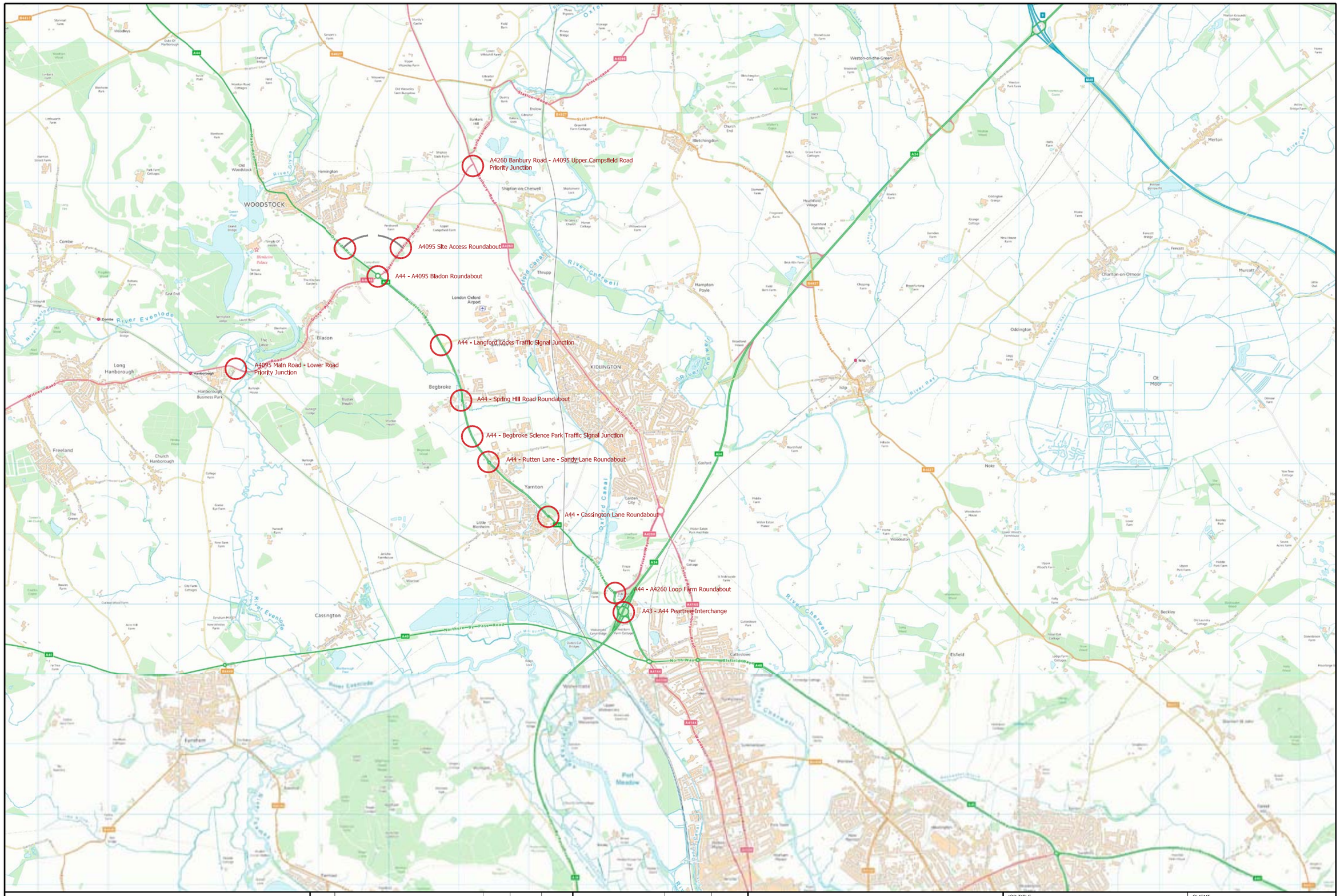
Notes:

Figure 1
Drawing Title 15291-10 Site Location Plan
Job Title East Woodstock
Client Pye Homes Ltd & Vanbrugh Unit Trust

Scale : NTS

NORTH



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JOB TITLE	CLIENT
Woodstock East	Pye Homes\Vanbrugh Trust

DRAWING TITLE

Junctions subject to detailed appraisal in TA

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
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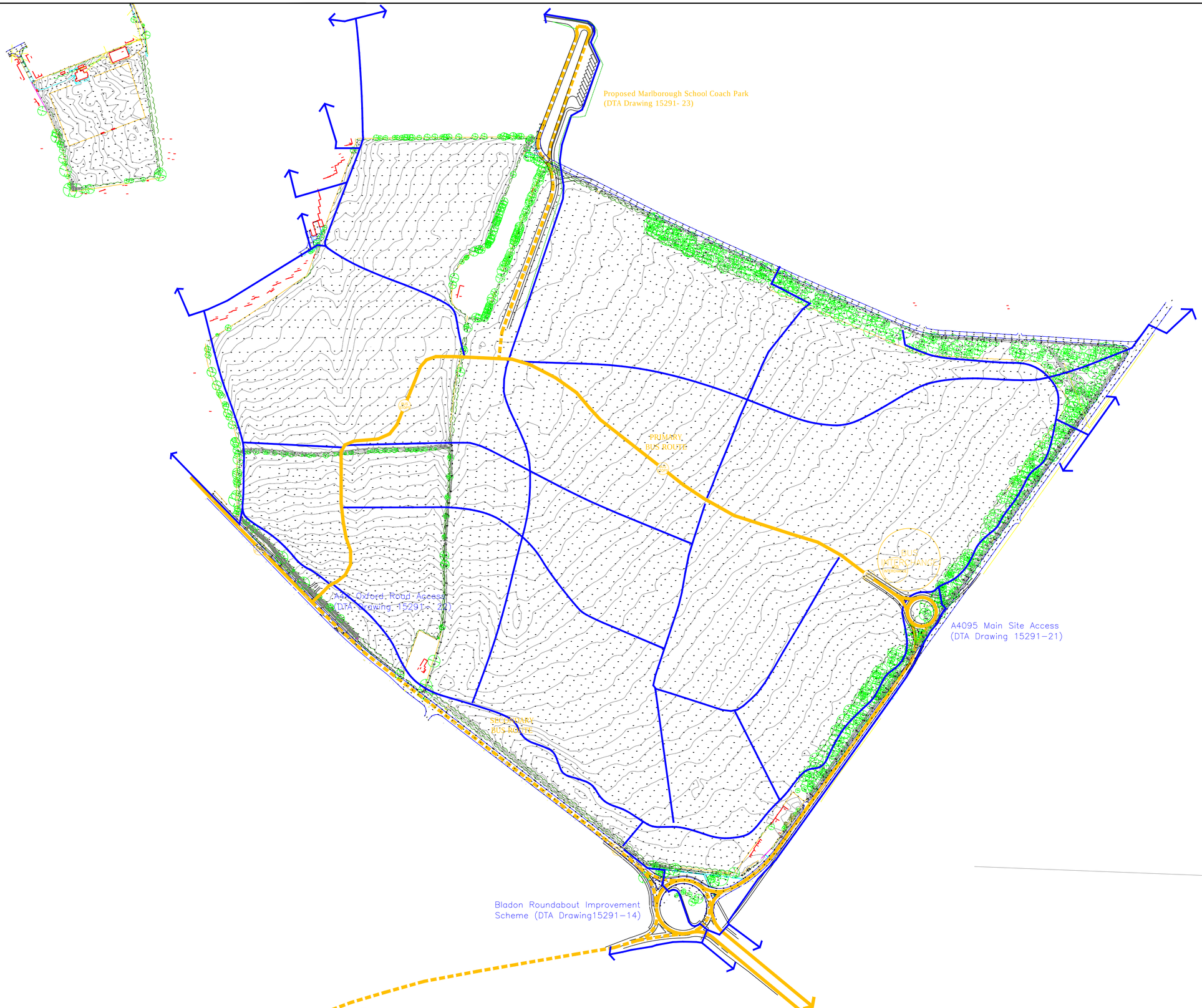

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JOB TITLE	CLIENT
Woodstock East	Pye Homes | Vanbrugh Trust

DRAWING TITLE

Proposed Transport Connections

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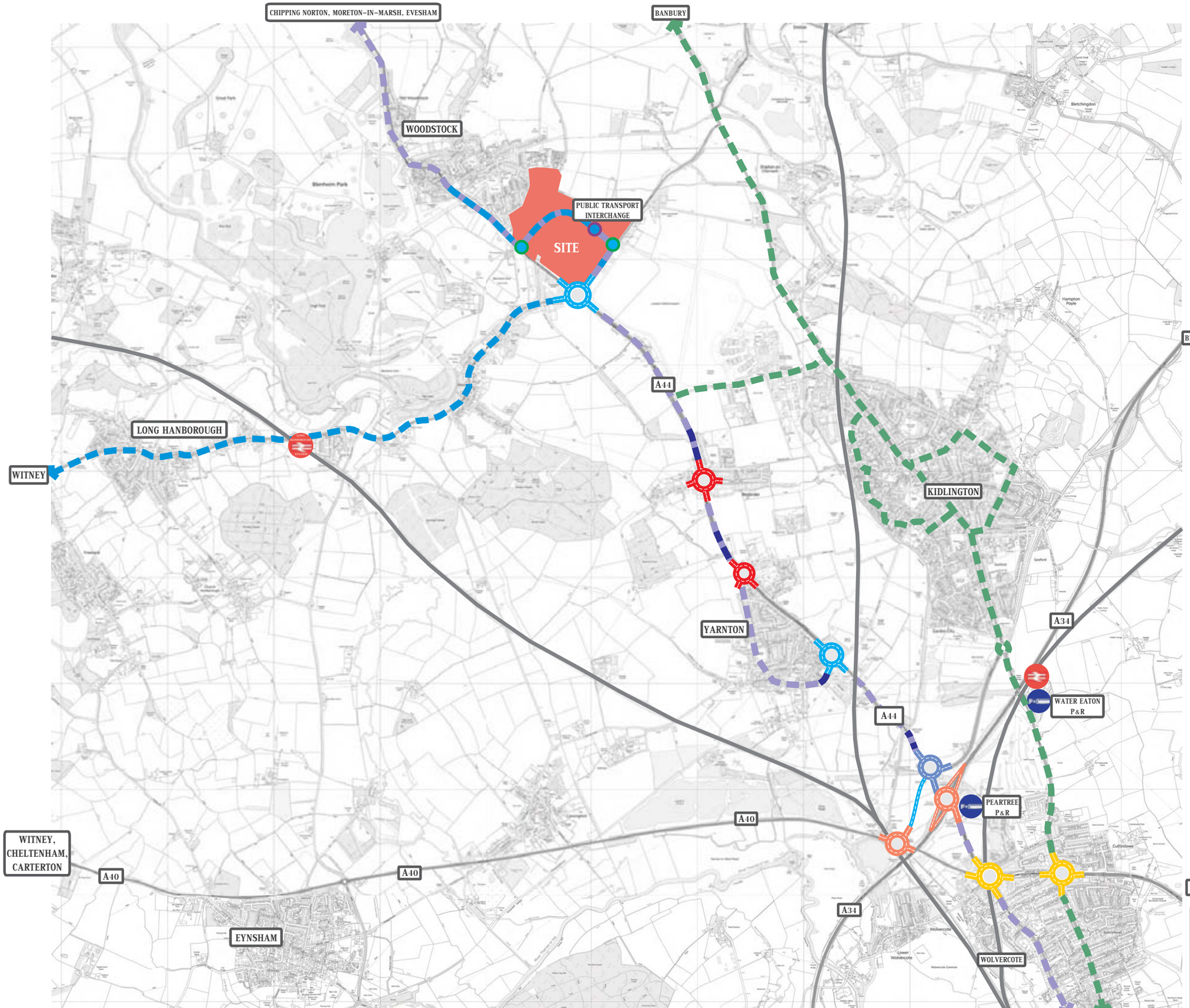

EXISTING S3 BUS SERVICE RE-ROUTED INTO THE SITE

EXISTING 233 BUS SERVICE RE-ROUTES INTO THE SITE

KIDLINGTON BUS SERVICES

PROPOSED SITE ACCESSES - A44 OXFORD ROAD AND A4095 UPPER CAMPSFIELD ROAD

PROPOSED USE OF HATCHED CARRIAGEWAY TO PROVIDE BUS PRIORITY

PROPOSED SIGNALISATION OF ROUNDABOUT TO MINIMISE DELAYS

PROPOSED USE OF HATCHED CARRIAGEWAY TO PROVIDE BUS PRIORITY

PROPOSED SIGNALISATION OF ROUNDABOUT WITH BUS LANE ON APPROACH AND PRIORITISATION OF BUS THROUGH SIGNALS

NORTH OXFORD TRANSPORT STRATEGY PROPOSED SCHEME

OCC FUNDED IMPROVEMENTS TO ROUNDABOUTS

FUTURE A40 / A44 LINK ROAD

RAIL SERVICES

EXISTING P&R SITE

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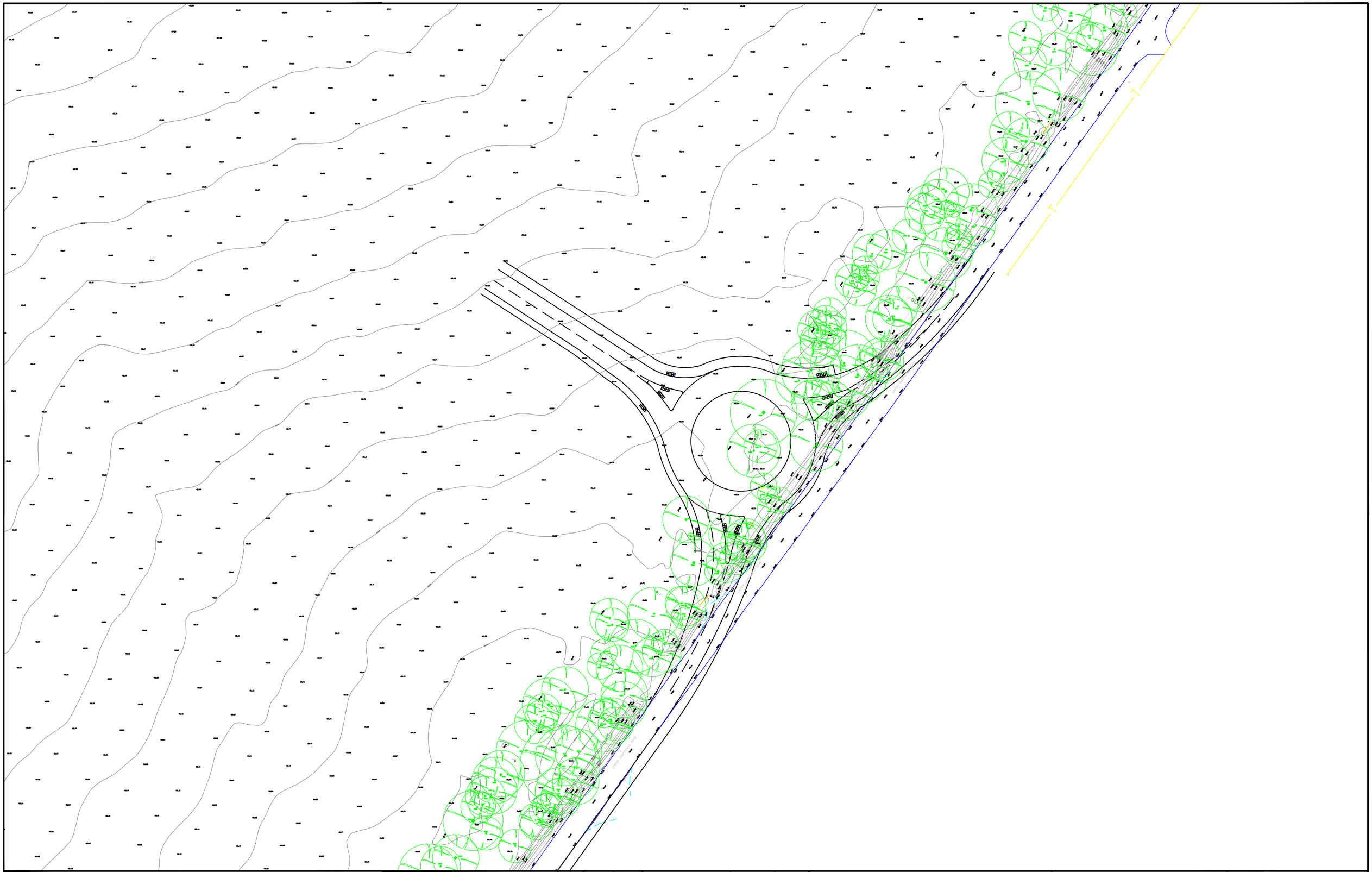
15291-24 Scale : NTS
Drawing Title: Strategy Transport Plan
Job Title: Woodstock East
Client: Pye Homes Ltd & Vanbrugh Unit Trust



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JOB TITLE	CLIENT
Woodstock East	Pye Homes & Vanbrugh Trust

DRAWING TITLE

Proposed 45m Roundabout Access

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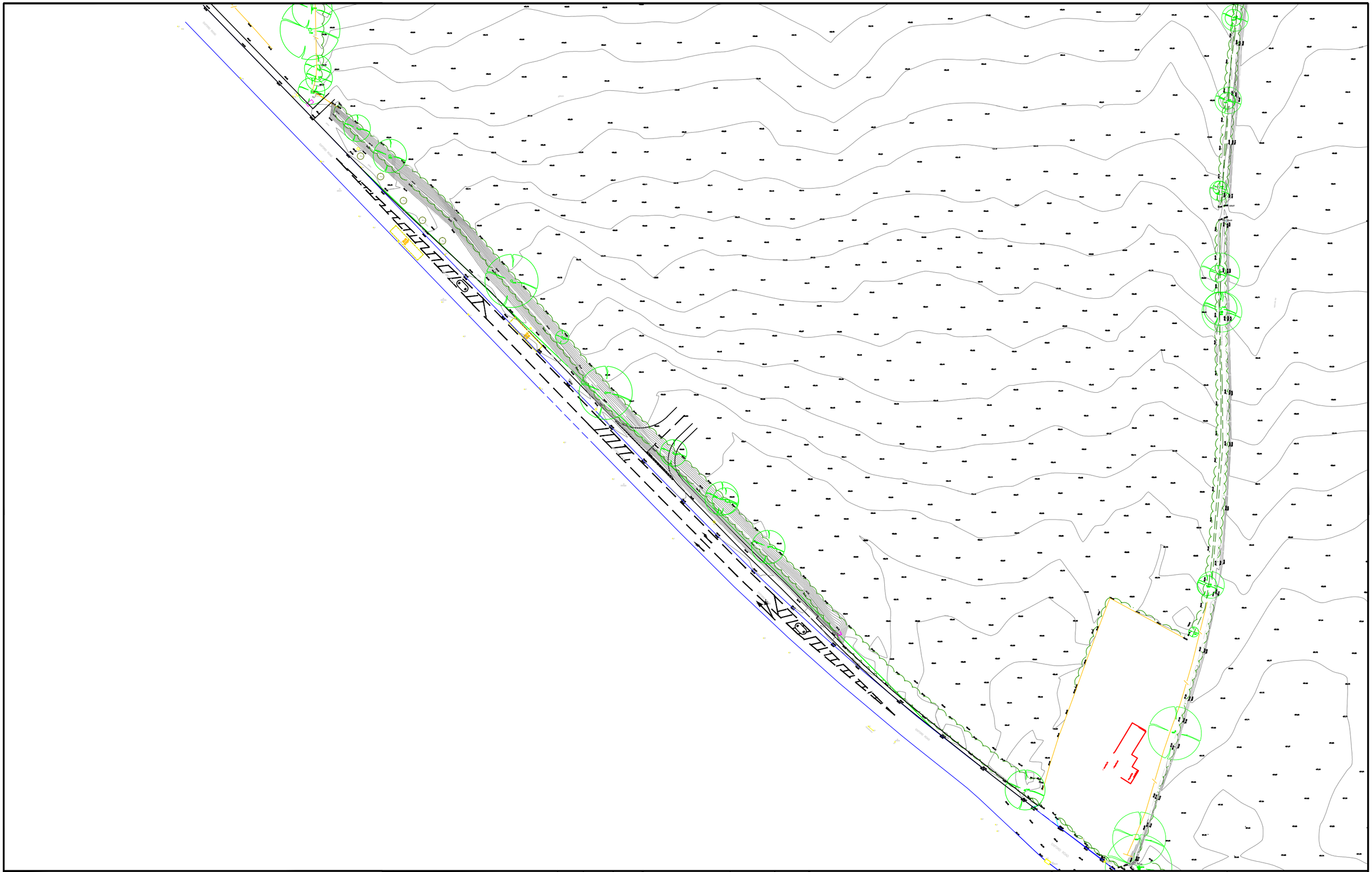

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JOB TITLE: Woodstock East

CLIENT: Pye Homes|Vanbrugh Trust

DRAWING TITLE: Proposed A44 site access

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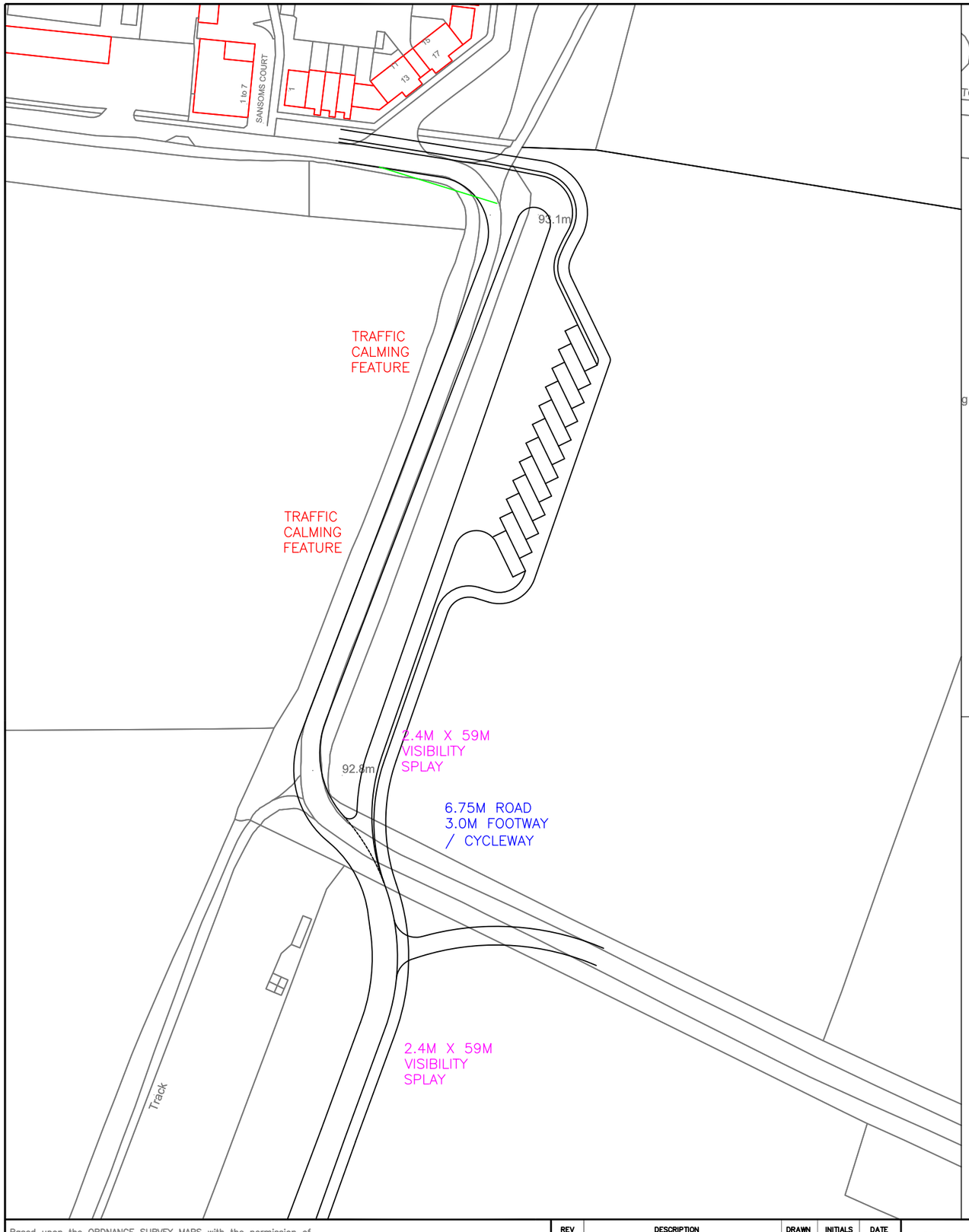

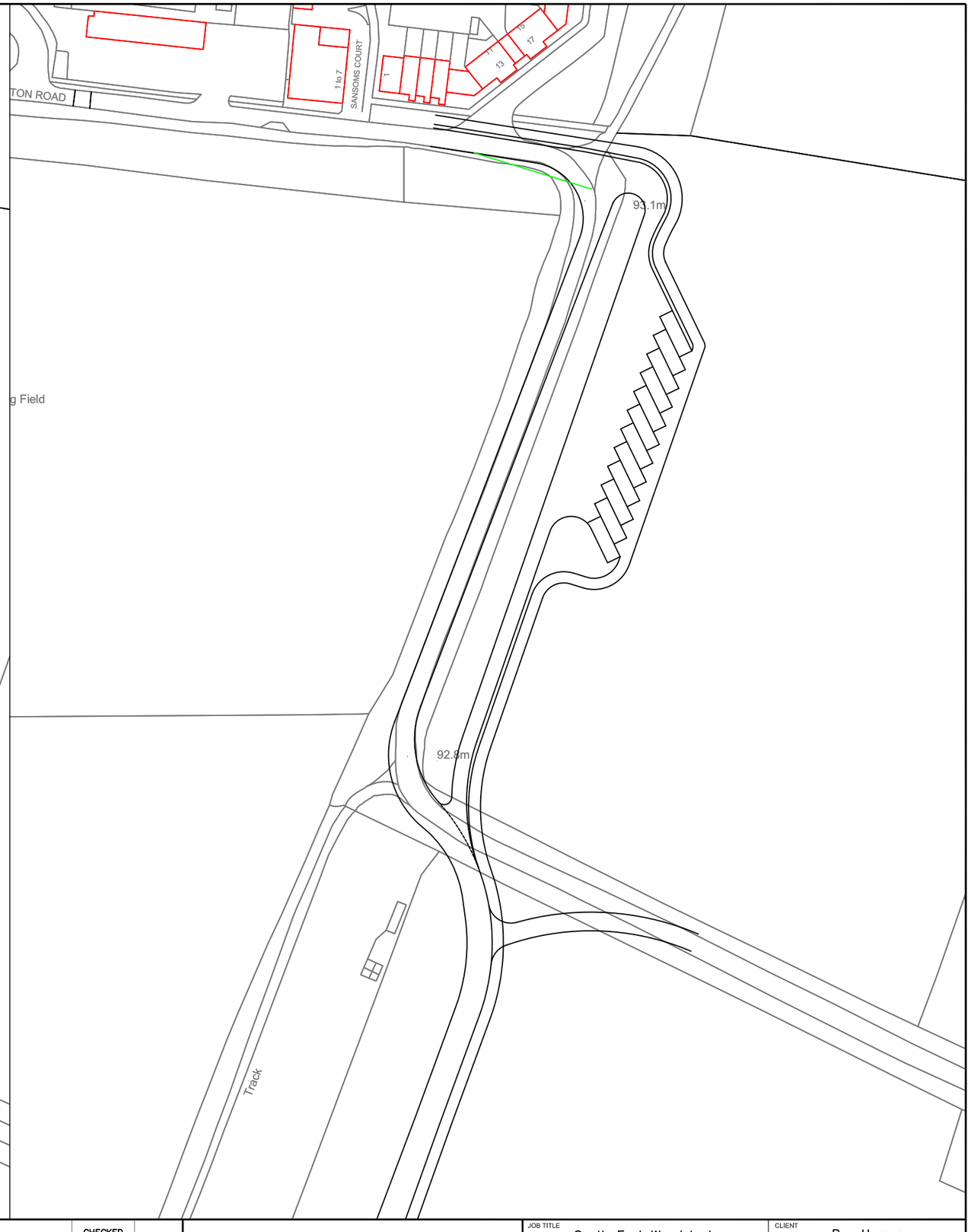

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JOB TITLE	CLIENT
South East Woodstock	Pye Homes

DRAWING TITLE

Marlborough School Coach Park

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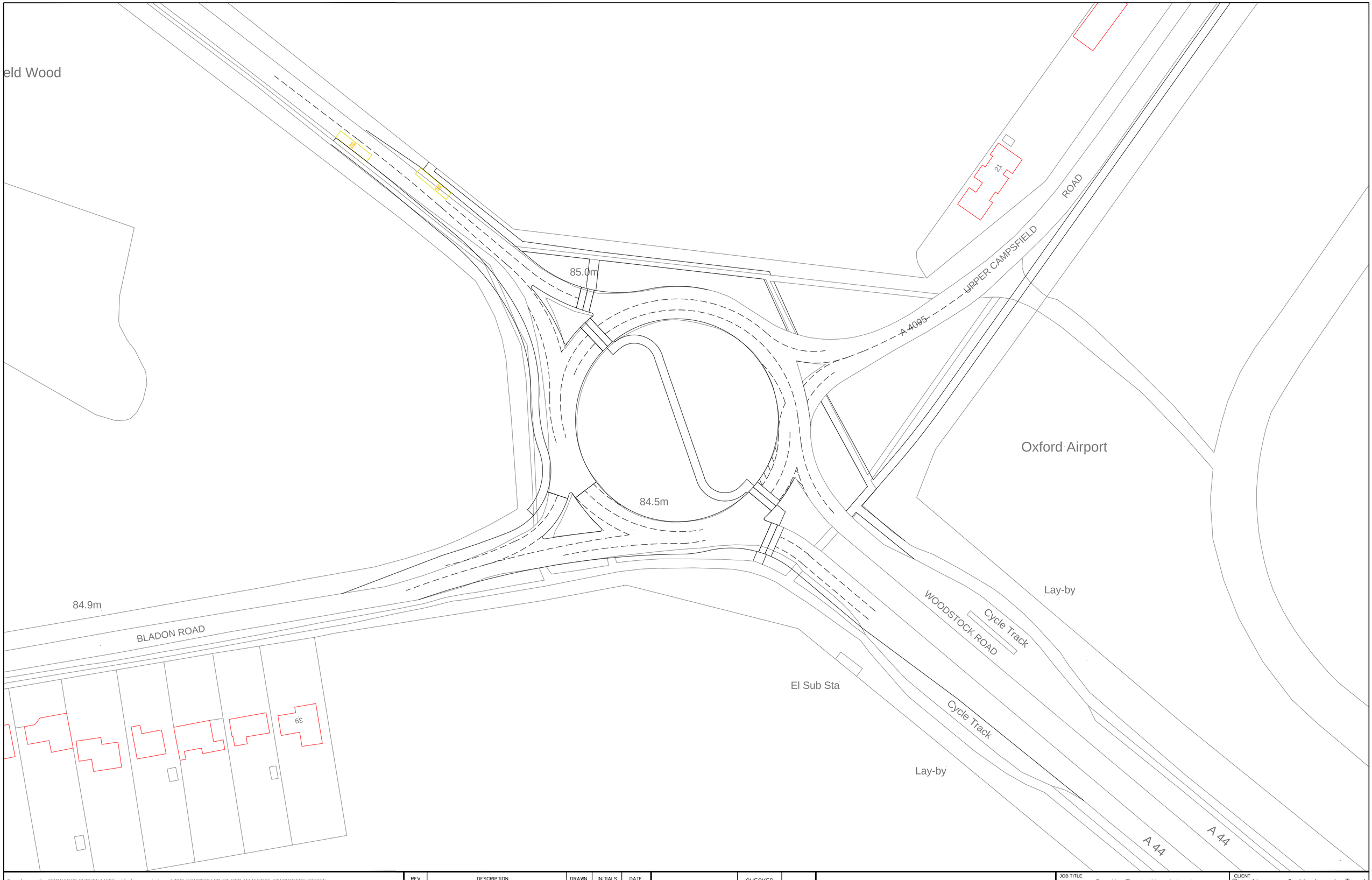

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JOB TITLE: South East Woodstock

CLIENT: Pye Homes & Vanbrugh Trust

DRAWING TITLE: Proposed Bladon Roundabout Improvement Works

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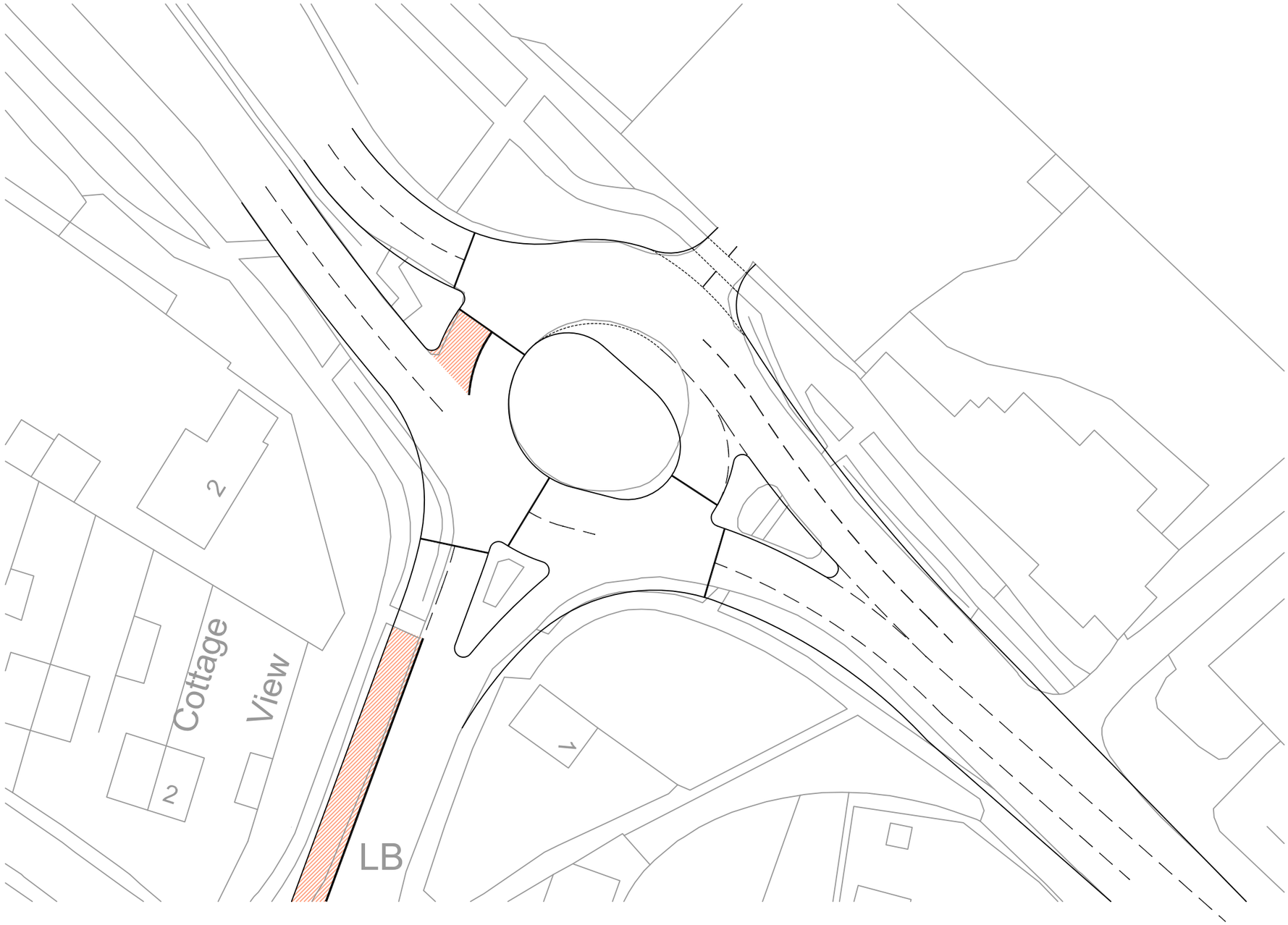

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JOB TITLE	CLIENT
Woodstock East	Pye Homes & Vanb. Trust

DRAWING TITLE

A44 - Cassington Lane Improvement

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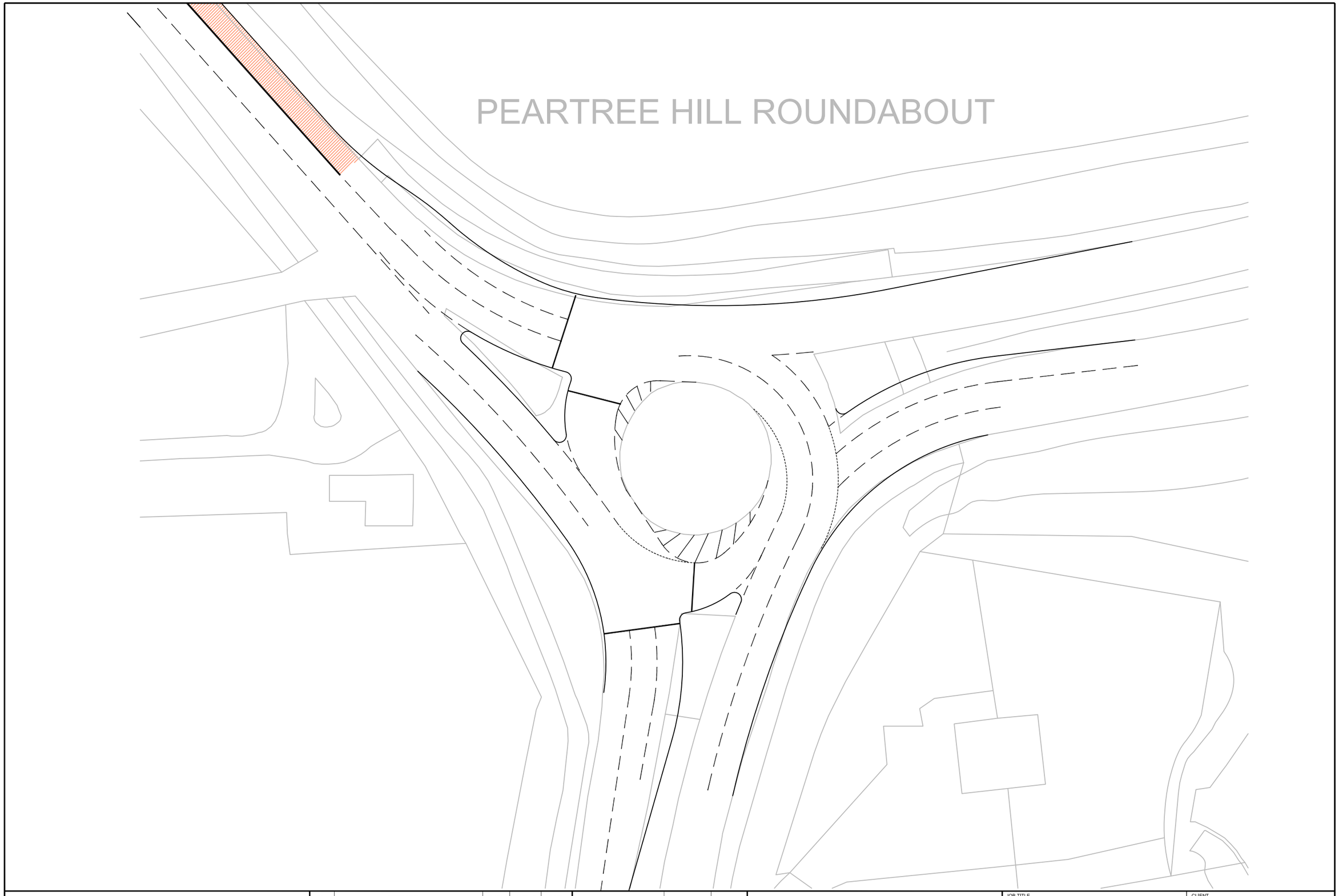

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JOB TITLE	CLIENT
Woodstock East	Pye Homes & Vanb. Trust

DRAWING TITLE

Loop Farm Roundabout Improvement

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
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73.7m

x Close

GP

69.4m

The Wolfram Centre

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Woodstock East	Pye Homes\Vanbrugh Trust

DRAWING TITLE

A4095 - Lower Road Junction Improvement

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JOB TITLE	CLIENT
Woodstock East	Pye Homes\Vanbrugh Trust

DRAWING TITLE

A4095 - A4260 Junction Improvement

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