

OXFORDSHIRE COUNTY COUNCIL

Headington Transport Strategy

Development Pressures Note

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WYG
Executive Park
Avalon Way
Anstey
Leicester
LE7 7GR

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Primary Author	Jethro Punter	Initialled:	JP
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Contributor	John Colclough	Initialled:	ED / JC
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Review By	Alistair Gregory	Initialled:	AG
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1 Introduction

BACKGROUND

- 1.1 Following a review of baseline transport and travel conditions in the Headington area, summarised in report ref. A082520-01, a number of consistent existing or legacy transport issues have been identified.
- 1.2 In addition to addressing the identified existing transport issues, there is also a need for the Headington Transport Strategy to take into account the impacts of predicted development and growth. One of the main objectives of the strategy is to positively plan for and enable the major developments expected in the study area during the Oxford Core Strategy Plan period.
- 1.3 The following technical note provides a summary of the main development pressures expected to have an effect upon demands for travel to, from and within the study area to 2030 and the methodology used to assess the potential impacts arising from these developments.

RESIDENTIAL DEVELOPMENT

- 1.4 Whilst the majority of future development transport impacts within the study area are expected to be related to a number of major employment sites, Headington is also expected to experience a degree of residential development during the study period, split between two main development types:
- A major housing site to the east of the study area known as the Barton development. This development site is located on the eastern side of the northern bypass and will deliver a total of 885 houses alongside a new primary school, a hotel and local retail facilities.
 - A number of smaller, predominantly brownfield infill development sites spread across the study area, with the potential to deliver a further 292 residential properties of various types / tenures.
- 1.5 **Table 1** provides details of each of the residential sites considered likely to come forward, based upon the figures contained within the Oxford City Council 2012 Strategic Housing Land Availability Assessment, (in the case of smaller brownfield development sites), and the housing

figures quoted within the May 2013 Transport Assessment (in the case of the Barton development).

Table 1 – Residential Development within Study Area

Site Number	Location	Number of Units
3	Barton Cricket Ground	35
7	Churchill Hospital	60
18	Government Buildings	25
19	Harcourt House	30
21	John Radcliffe	35
31	Northway Centre	20
37	Townsend House	24
39	Warneford Hospital	45
40	Warren Crescent	18
61	Barton	885

EMPLOYMENT DEVELOPMENT

- 1.6 There are a number of major development and re-development proposals across the study area expected to be delivered within the study period. Summary information for each of the employment sites proposed, including predicted additional floorspace and new jobs delivered (by 2030) is provided in **Table 2**.

Table 2 – Employment Development within Study Area

Location	Floorspace	Number of Jobs	Use Class
Churchill	16,000	335	'B' class employment uses
John Radcliffe	8,000	165	'B' class employment uses
Nielsens	9,480	405	'B' class employment uses
Old Road Campus	48,000	995	'B' class employment uses
Warneford Hospital	12,000	250	'B' class employment uses
Nuffield	8,400	175	Healthcare

- 1.7 The combined new employment sites within Headington are therefore expected to result in an increase of approximately 2,325 new jobs,

- 1.8 In general terms, when considered in combination with the additional housing, (particularly at Barton), this level of employment growth is expected to result in an increase in travel demands by all modes to, from and across Headington which will have to be catered for within the Headington Transport Strategy.
- 1.9 More specifically, the baseline study work identified a number of areas of existing congestion and delay within Headington on routes serving a number of the major trip attractors within the area. One identified route was the London Road corridor, which provides access to the John Radcliffe Hospital site and Oxford Brookes University, with another being Old Road, which provides access to the Churchill, Nuffield and Warneford Hospital sites and to the Oxford University Old Road Campus.
- 1.10 As the major employment developments identified in **Table 2** are largely related to the consolidation or further development of existing major trip attractors within Headington, these sites can be expected to result in increases in travel demands and potential congestion being concentrated in areas which are already under pressure.
- 1.11 The main development sites expected to result in increased pressure on the transport network are summarised on the plan provided in **Appendix A**.

ASSESSMENT METHODOLOGY

- 1.12 In order to assess the broad impacts of proposed development the following methodology has been used:
1. The identification of current traffic demands on major junctions and links in the study area, using recent available traffic count information growthed to a consistent base year (2012);
 2. Estimating future background traffic by 2030, using a locally agreed growth factor to increase the 2012 flows to predicted 2030 levels;
 3. Estimation of the traffic which could be generated by the proposed developments using person trip rates obtained from the TRICS database (TRICS Version 2013 (b));
 4. Use of the most recently available journey to work information for distributing new development trips to and from the proposed major employment sites;

5. Use of the mode share identified in the Old Road Campus Transport Assessment for trips to and from the Old Road site and use of census journey to work mode share information when assigning modes to and from other destinations;
6. Use of journey planner software to identify the fastest routes from each of the main roads into the Headington area for car borne journeys, which then assigns trips to individual more minor roads within the study area;
7. Adding in changes in traffic related to the Barton residential development and the infrastructure associated with the development (including the signalisation of the Cherwell Drive / Marston Road / Marsh Lane staggered junction), taken from the May 2013 Barton Transport Assessment.
8. The combined traffic flows from the proposed development sites and the predicted 2030 background traffic provide an estimate of overall future traffic levels in the study area; and
9. Non car trips expected to be generated by new development were grouped according to main origin / destination areas, split between:
 - a. Headington
 - b. Other Oxford City Wards
 - c. Market Towns (Bicester, Banbury etc)
 - d. Other Oxfordshire
 - e. Other

1.13 A plan showing the network assessed is provided in **Appendix B**.

2 Predicted Changes in Traffic Levels

- 2.1 As identified in Section 1 there are three main factors which will influence changes in traffic levels within Headington. These are as follows.

Growth in Background Traffic

- 2.2 Initially standard TEMPRO factors for the Oxford area were applied to estimate growth in background traffic levels, (attributable to wider development across Oxford and also Countywide, Regional and National growth in addition to development specific to Headington).
- 2.3 However, as identified during the baseline review work, traffic levels on the main roads in the Headington study area have not experienced any growth over the last 10 year period, so it is likely that the application of a blanket growth factor could overestimate background traffic growth.
- 2.4 In light of this a more specific set of growth factors have been applied to the study area, with the growth factors agreed as part of the Barton development transport assessment applied to the road network within Headington. This equates to an assumed increase of 5.76% between 2012 and 2030.
- 2.5 Growth on the major road network, specifically on the northern and eastern bypass routes has been estimated using flows from the Central Oxfordshire Transport Model (COTM), which includes allowances for both background traffic and for the impacts of specific development sites.

Growth due to Residential Development

- 2.6 Due to the small scale and dispersed nature of the majority of the residential sites within the study area, these were considered to be included within the background growth factor applied across the network.
- 2.7 The Barton development Transport Assessment identifies changes in traffic levels across the Headington network taking into account both new traffic related to the development and the impacts of the infrastructure changes proposed as part of the mitigation package agreed for the site. As such the net impacts of the development are sometimes negative, i.e. resulting in

a reduction in some flows. The biggest increases in traffic levels predicted were on Marsh Lane in the evening peak hour, with an additional **112** two way trips.

- 2.8 Changes in predicted traffic levels on London Road related to the Barton development were more limited, with an increase of **22** two way trips in the AM peak hour and **61** two way trips in the PM peak hour.

Growth due to Employment Development

- 2.9 The combined car traffic estimated as being generated by the employment sites summarised in **Table 2** is predicted to result in the following increases in trip levels on specific routes with the Headington Study area:

- London Road – Increase of **200** two way trips in the AM peak hour and **152** in the PM peak.
- Old Road – Increase of **143** two way trips in the AM peak hour and **220** in the PM peak.
- Horspath Driftway – Increase of **178** two way trips in the AM peak hour and **135** trips in the PM peak hour.
- Headley Way – Increase of **21** two way trips in the AM peak hour and **16** in the PM peak.
- Warneford Lane – Increase of **69** two way trips in the AM peak hour and **51** in the PM peak.

- 2.10 A review of the expected changes in car traffic on the road network in Headington by 2030 shows the most significant expected impacts being to the south and east of the study area, largely focused on Horspath Driftway, Old Road and London Road, whilst growth in traffic levels are predicted to be more limited on roads to the north and west.

3 Predicted Changes in Non-Car Journeys

- 3.1 In addition to changes in the levels of car borne traffic, development will also generate additional demand for travel by non-car modes. In order to estimate what the growth in these demands may be the total number of non-car trips were estimated using the methodology outlined in **Section 1**; resulting in the following:

Table 3 - Predicted new development non-car trips

Origin / Destination	AM			PM		
	IN	OUT	2 Way	IN	OUT	2 Way
Headington	476	61	537	40	371	411
Rest of Oxford	221	57	279	40	173	213
Market Towns	49	2	51	2	38	40
Oxfordshire	60	5	65	3	47	50
Other	24	7	31	5	18	23
Total	830	133	963	91	647	738

- 3.2 **Table 5** identifies an expected increase in **963** development related non-car trips during the AM peak hour (of which **537** are expected to have an origin/destination within Headington) and **738** non-car trips during the PM peak hour (of which **411** are predicted to have an origin/destination within Headington).
- 3.3 Whilst the growth in demand for travel by non-car modes has not been split between modes (i.e. pedestrian, cycle and bus), the origin location of these trips allows reasonable assumptions as to possible mode choice to be made. For example trips with an origin within Headington could reasonably be targeted as trips which could be made on foot or by cycle, with trips outside Headington (but from within the rest of the City), could be considered as trips which could be undertaken by public transport, or in the case of adjacent wards by cycle.
- 3.4 It is important to note that the numbers of non-car trips detailed in **Table 3** are based upon the current patterns of travel to and from Headington or those predicted within Transport Assessments related to major development sites. It is possible that, following the introduction of further sustainable transport measures, there could be an increase in the demand for non-car journeys. This could particularly be the case for those trips within an origin outside of the Headington which are currently predicted as being undertaken by car and which could transfer to either bus or Park and Ride.

4 Expected Impacts of Growth and Development

4.1 As summarised in previous sections of this report the levels of growth planned in and around the Headington study area are expected to result in related increases in demand by all modes of travel.

4.2 Whilst the detailed impacts of growth cannot be fully quantified at this stage, the following section provides a broad overview.

Link Capacity

4.3 The baseline review identified a number of sections of carriageway within Headington operating at or over their reasonable link capacity during some periods of the day. In particular sections of London Road and Old Road.

4.4 The following table (**Table 4**) provides a summary of the changes in predicted congestion on the most sensitive links identified during the baseline work.

4.5 It can be seen that the levels of predicted congestion on Old Road are predicted to worsen as a result of development pressures in the surrounding area, as might be expected with the concentration of planned development in the area.

4.6 Congestion along London Road is also predicted to worsen, with the eastern end of the road expected to exceed capacity by the end of the study period. Marsh Lane is also expected to become increasingly congested, as one of the other main entry points into the Headington area from the ring road.

Table 4 – Headington Roads, Changes in Congestion 2012 - 2030

Location	% of AAWT to CRF 2012	% of AAWT to CRF 2030
Old Road (between Lime Walk and Windmill Drive)	104%	125%
London Road (West of A40)	92%	112%
London Road (between Headley Way and Lime Walk)	86%	93%
Marsh Lane	80%	91%
London Road (between Lime Walk and Windmill Drive)	64%	73%

Junction Capacity

- 4.7 The baseline review work also included an initial assessment of the operation of a number of key signal controlled junctions within the Headington study area, which identified a number of junctions currently operating over reasonable levels of capacity.
- 4.8 The operation of these junctions has been re-assessed for a future assessment year of 2030, taking into account the potential increases in traffic summarised in **Section 2**, with a summary of the results provided in **Table 5** below.

Table 5 – Headington Signal Junction Operation (2030 Forecast Traffic)

Junction	AM Peak			PM Peak		
	Highest Degree of Sat (max %)	Largest Queue (Total)	PRC (%)	Highest Degree of Sat (max %)	Largest Queue (Total)	PRC (%)
Headington Road / Gipsy Lane	90.1	18	-0.1	86.1	26	4.5
Gipsy Lane / Old Road	86.3	17	4.3	102.2	32	-13.5
London Road / Headley Way	107.4	34	-19.4	87.8	13	2.6%
London Road / Windmill Road	116.5	120	-29.5	125.9	94	-39.9
Windmill Road / Old Road	115.8	44	-28.6	127.4	108	-43.6

- 4.9 Following the addition of traffic growth predicted by 2030, most of the major junctions within Headington are predicted to be operating well over capacity, with significant queues predicted at the London Road / Windmill Road and Old Road / Windmill Road junctions.

Pedestrian and Cycle Connectivity

- 4.10 As identified in the baseline work, walking and cycling remain a key mode of travel for journeys to and from work, particularly for trips originating from within the Headington area.
- 4.11 Whilst it is not expected that there will be any issues in terms of shortfall in capacity for pedestrian and cycle trips, there is likely to be an increase in demand for journeys between Headington and Cowley (as a result of increase employment provision in both locations).
- 4.12 Consultation with stakeholders also identified local concerns with regards to the safety and quality of some cycle provision within Headington, as such there may be a need to provide

new or alternative routes to existing facilities to encourage greater cycling mode share for trips to and from development sites which expand or consolidate facilities in existing areas, (such as the John Radcliffe and Churchill Hospital sites).

Public Transport - Bus Services

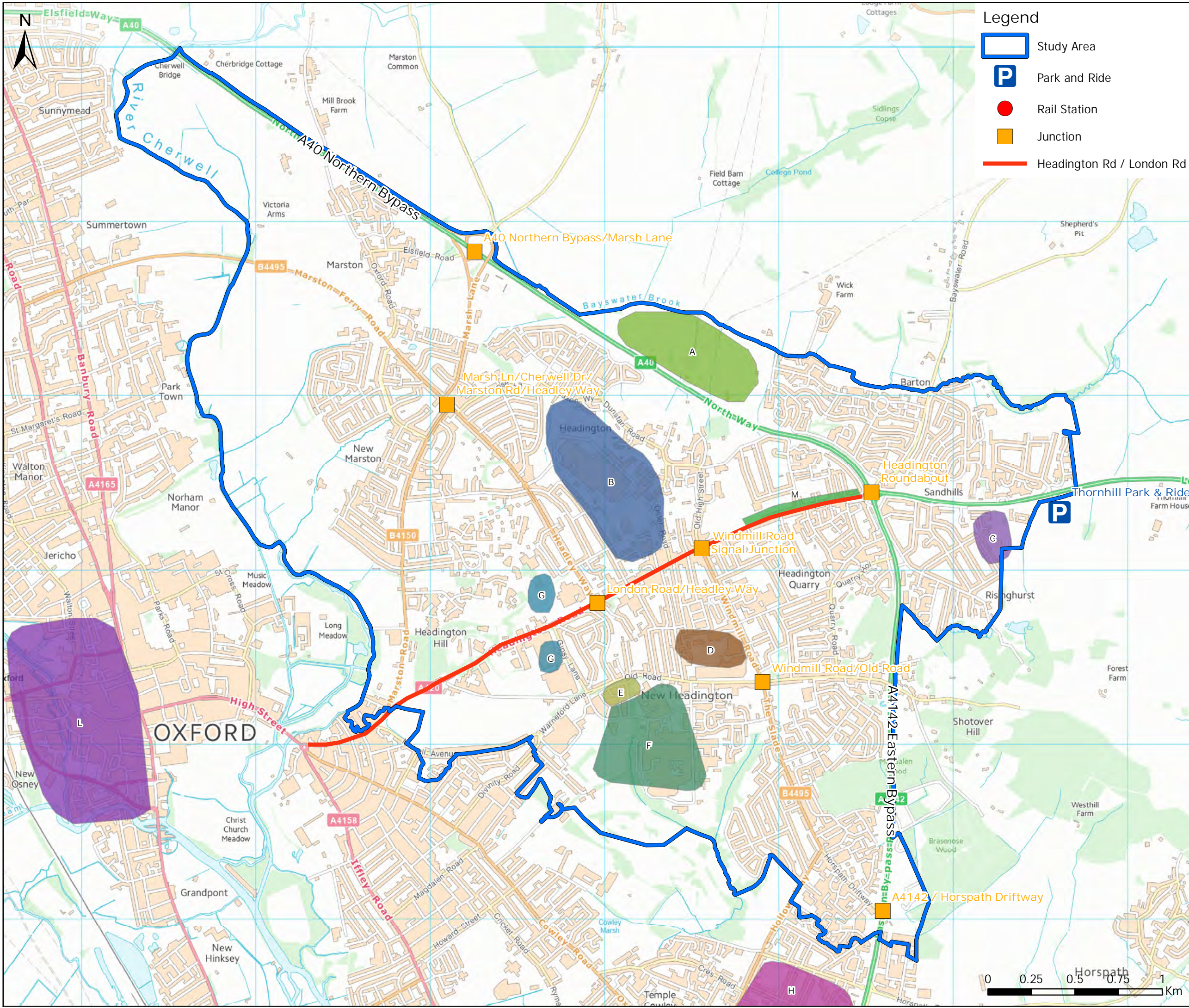
- 4.13 As also previously identified for walking and cycling trips the planned level of development in Headington and the surrounding areas is expected to result in an increase in demand for a number of key movements across the city, particularly between Headington and Cowley. The baseline report identified that there could be scope for further improving the public transport links between these areas (and the remainder of the 'eastern arc'), with planned development likely to increase the potential viability of new or improved services.

Public Transport - Park and Ride






- 4.14 Park and Ride is expected to be a core element of any overarching transport strategy for enabling the delivery of major development and growth. The baseline review identified a large proportion of staff at sites including the John Radcliffe and Churchill as travelling into the study area from outside the City and from a range of relatively dispersed home locations. The dispersed nature of these trip origins makes providing commercial bus routes challenging, with park and ride offering the opportunity to funnel these trips into a single location and transfer them to bus before they enter the congested local road network within Headington.
- 4.15 Park and Ride already forms the 'cornerstone' of transport proposals related to major employment sites such as the Old Road Campus development, which includes a target of 10% of all trips to and from the site being via park and ride. If these targets are achieved this site alone could therefore be expected to result in an increase in demand for Park and Ride spaces of approximately 250 (including existing and future staff).

Taking into account the use of Thornhill Park and Ride for longer distance coach services in addition to traditional Park and Ride, (which was predicted within demand modelling work undertaken by the County Council as making up approximately 50% of the overall demand at the site), it appears likely that further Park and Ride capacity will be required if this is to continue to form an integral part of any comprehensive transport strategy to accommodate planned growth.

Appendix A – Headington Growth Sites



Legend

-  Study Area
-  Park and Ride
-  Rail Station
-  Junction
-  Headington Rd / London Rd

Details

-  A - Barton
-  B - John Radcliffe Hospital
-  C - Nielsen House
-  D - Nuffield Orthopaedic Hospital
-  E - Oxford University Old Road Campus
-  F - Churchill Hospital
-  G - Oxford Brookes University Headington Hill/Gipsy Lane Campus.
-  H - Oxford Business Park
-  I - BMW Plant
-  J - Blackbird Leys
-  K - Oxford Science Park
-  L - West End (Mixed Development)
-  M - Outbound London Road bus priority (Windmill Rd to Green Rd Roundabout)

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A	Additional junctions labelled	JJC	JP	ASG	25/11/13
REV	DESCRIPTION	BY	CHK	APP	DATE

Client:



EXECUTIVE PARK
AVALON WAY
ANSTLEY
LEICESTER
LE7 7GR
TEL: +44 (0)116 234 8000
FAX: +44 (0)116 234 8001
e-mail: leicester@wyg.com



Project:
Headington Transport Study

Drawing Title:
Study Area Context Plan

Scale @ A3 NTS	Drawn JJC	Date 07/06/13	Checked JP	Date 07/06/13	Approved ASG	Date 07/06/13
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Appendix B – Headington Network

