

# Oxford Technology Park

## Transport Assessment

On behalf of **Hill Street Holdings Ltd**

Project Ref: 23588/003 | Rev: Final | Date: December 2014



## Document Control Sheet

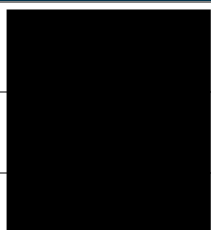
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## Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Background .....	1
1.2	Development Proposals .....	1
1.3	Scoping of the Transport Assessment .....	1
1.4	Content of TA Report.....	1
<b>2</b>	<b>Policy Review .....</b>	<b>3</b>
2.1	National Planning and Transport Policy Context.....	3
2.2	National Planning Policy Framework (NPPF) .....	3
2.3	NPPG – Transport Assessment .....	4
2.4	Local Policy Guidance .....	5
2.5	Summary .....	7
<b>3</b>	<b>Existing Transport Conditions.....</b>	<b>8</b>
3.1	Introduction .....	8
3.2	Strategic Location and Site Description .....	8
3.3	Local Facilities and Amenities .....	8
3.4	Local Highway Network.....	9
3.5	Existing Traffic Flows and Vehicle Speeds .....	9
3.6	Walking and Cycling .....	10
3.7	Public Transport .....	10
3.8	Personal Injury Collision Data (PIC).....	12
3.9	Summary .....	14
<b>4</b>	<b>Development Proposals .....</b>	<b>15</b>
4.1	The Proposals .....	15
4.2	Site Access and Sustainable Transport Proposals .....	16
4.3	Travel Plan .....	16
4.4	Walking and Cycling Strategy .....	16
4.5	Public Transport Strategy .....	17
4.6	Vehicular Access Strategy .....	18
4.7	Vehicular Parking Strategy.....	18
<b>5</b>	<b>Travel Demand.....</b>	<b>20</b>
5.1	Introduction .....	20
5.2	Development Vehicle Trip Generation .....	20
5.3	Development Proposal Vehicular Trip Distribution.....	22
5.4	Mode Split and Person Trip Generation .....	22
5.5	Summary .....	23
<b>6</b>	<b>Traffic Impact Assessment .....</b>	<b>24</b>
6.1	Introduction .....	24
6.2	Assessment Years and Traffic Growth.....	24

6.3	Future Years and Committed Development .....	25
6.4	Base Case Traffic Flows .....	26
6.5	Development Traffic Assignment and Distribution .....	26
6.6	Quantification of Development Impact .....	26
6.7	Junction Capacity Assessment .....	27
6.8	Summary .....	75
<b>7</b>	<b>Mitigation Measures .....</b>	<b>76</b>
7.1	Introduction .....	76
7.2	Proposed Highway Mitigation Schemes.....	77
7.3	Summary .....	79
<b>8</b>	<b>Conclusions .....</b>	<b>80</b>
8.1	Introduction .....	80
8.2	Development Proposals .....	80
8.3	Transport Proposals .....	80
8.4	Highway Impact Mitigation .....	81
8.5	Overall Conclusion .....	81

## Figures

Figure 1.1: Site Location Plan  
Figure 3.1: Local Facilities  
Figure 3.2: Peak Hour Traffic Surveys (am)  
Figure 3.3: Peak Hour Traffic Surveys (pm)  
Figure 3.4: Existing Bus Services Plan  
Figures 5.1 to 5.2: Vehicular Trip Distribution  
Figures 6.1 to 6.12: Development Traffic

## Drawings

PBA Drawing 23588/001/001  
PBA Drawing 23588/001/SK004  
PBA Drawing 23588/001/SK005

## Tables

Table 3.1: Distance to Key Local Facilities.....	8
Table 3.2: Existing Public Transport Facilities.....	10
Table 3.3: Existing Rail Service Provision.....	12
Table 4.1: Area Schedule .....	15
Table 4.2: Cycle Parking Provision at Oxford Technology Park .....	17
Table 4.3: Vehicle Parking Provision at Oxford Technology Park.....	19
Table 5.1: Development Vehicular Trip Rates.....	21
Table 5.2: Oxford Technology Park Vehicular Trip Generation .....	21
Table 5.3: 85th Percentile Development Vehicular Trip Rates .....	21
Table 5.4: Sensitivity Testing of Oxford Technology Park Vehicular Trip Generation .....	22
Table 5.5: Modal Split (2001 Census) .....	22
Table 5.6: Person Trip Generation .....	23

Table 6.1: Temporo Growth Factors for Background Traffic.....	25
Table 6.2: Proportional Impact of Development.....	27
Table 6.3: A44 Woodstock Road / Langford Lane Base Year Operation – Model Validation.....	28
Table 6.4: 2015 – A44 Woodstock Road / Langford Lane Base Case .....	29
Table 6.5: 2015 – A44 Woodstock Road / Langford Lane ‘With Development’ Scenario.....	30
Table 6.6: 2015 – A44 Woodstock Road / Langford Lane ‘With Development’ Sensitivity Scenario ...	31
Table 6.7: 2021 – A44 Woodstock Road / Langford Lane Base Case .....	32
Table 6.8: 2021 – A44 Woodstock Road / Langford Lane ‘With Development’ Scenario.....	32
Table 6.9: 2021 – A44 Woodstock Road / Langford Lane ‘With Development’ Sensitivity Scenario ...	33
Table 6.10: 2025 – A44 Woodstock Road / Langford Lane Base Case .....	34
Table 6.11: 2025 – A44 Woodstock Road / Langford Lane ‘With Development’ Scenario.....	35
Table 6.12: 2025 – A44 Woodstock Road / Langford Lane ‘With Development’ Sensitivity Scenario .	36
Table 6.13: A4260 Banbury Road / Langford Lane Base Year Operation – Model Validation.....	38
Table 6.14: 2015 – A4260 Banbury Road / Langford Lane Base Case.....	39
Table 6.15: 2015 – A4260 Banbury Road / Langford Lane ‘With Development’ Scenario .....	39
Table 6.16: 2015 – A4260 Banbury Road / Langford Lane ‘With Development’ Sensitivity Scenario..	40
Table 6.17: 2021 – A4260 Banbury Road / Langford Lane Base Case.....	41
Table 6.18: 2021 – A4260 Banbury Road / Langford Lane ‘With Development’ Scenario .....	42
Table 6.19: 2021 – A4260 Banbury Road / Langford Lane ‘With Development’ Sensitivity Scenario..	43
Table 6.20: 2025 – A4260 Banbury Road / Langford Lane Base Case.....	44
Table 6.21: 2025 – A4260 Banbury Road / Langford Lane ‘With Development’ Scenario .....	44
Table 6.22: 2025 – A4260 Banbury Road / Langford Lane ‘With Development’ Sensitivity Scenario..	45
Table 6.23: Langford Lane / Oxford Motor Park / The Boulevard Base Year Operation – Model Validation .....	47
Table 6.24: 2015 – Langford Lane / Oxford Motor Park / The Boulevard Base Case .....	48
Table 6.25: 2015 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Scenario .....	48
Table 6.26: 2015 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Sensitivity Scenario.....	49
Table 6.27: 2021 – Langford Lane / Oxford Motor Park / The Boulevard Base Case .....	49
Table 6.28: 2021 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Scenario .....	50
Table 6.29: 2021 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Sensitivity Scenario.....	50
Table 6.30: 2025 – Langford Lane / Oxford Motor Park / The Boulevard Base Case .....	51
Table 6.31: 2025 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Scenario .....	51
Table 6.32: 2025 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Sensitivity Scenario.....	52
Table 6.33: A44 / A4095 Base Year Operation – Model Validation .....	53
Table 6.34: 2015 – A44 / A4095 Base Case.....	53
Table 6.35: 2015 – A44 / A4095 ‘With Development’ Scenario .....	54
Table 6.36: 2015 – A44 / A4095 ‘With Development’ Sensitivity Scenario.....	54
Table 6.37: 2021 – A44 / A4095 Base Case.....	55
Table 6.38: 2021 – A44 / A4095 ‘With Development’ Scenario .....	55
Table 6.39: 2021 – A44 / A4095 ‘With Development’ Sensitivity Scenario.....	56
Table 6.40: 2025 – A44 / A4095 Base Case.....	56
Table 6.41: 2025 – A44 / A4095 ‘With Development’ Scenario .....	57
Table 6.42: 2025 – A44 / A4095 ‘With Development’ Sensitivity Scenario.....	57
Table 6.43: Kidlington Roundabout Base Year Operation – Model Validation .....	58
Table 6.44: 2015 – Kidlington Roundabout Base Case .....	59
Table 6.45: 2015 – Kidlington Roundabout ‘With Development’ Scenario .....	59
Table 6.46: 2015 – Kidlington Roundabout ‘With Development’ Sensitivity Scenario .....	60
Table 6.47: 2021 – Kidlington Roundabout Base Case .....	60
Table 6.48: 2021 – Kidlington Roundabout ‘With Development’ Scenario .....	61
Table 6.49: 2021 – Kidlington Roundabout ‘With Development’ Sensitivity Scenario.....	61
Table 6.50: 2025 – Kidlington Roundabout Base Case .....	62
Table 6.51: 2025 – Kidlington Roundabout ‘With Development’ Scenario .....	62

Table 6.52: 2025 – Kidlington Roundabout 'With Development' Sensitivity Scenario .....	63
Table 6.53: A4260 Oxford Road/ Bicester Road Base Year Operation – Model Validation .....	64
Table 6.54: 2015 – A4260 Oxford Road/ Bicester Road Base Case .....	65
Table 6.55: 2015 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario .....	65
Table 6.56: 2015 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario .....	66
Table 6.57: 2021 – A4260 Oxford Road/ Bicester Road Base Case .....	67
Table 6.58: 2021 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario .....	67
Table 6.59: 2021 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario .....	68
Table 6.60: 2025 – A4260 Oxford Road/ Bicester Road Base Case .....	69
Table 6.61: 2025 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario .....	70
Table 6.62: 2025 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario .....	71
Table 6.63: 2015 – Langford Lane / Proposed Site Access 'With Development' Scenario .....	72
Table 6.64: 2015 – Langford Lane / Proposed Site Access 'With Development' Sensitivity Scenario .....	72
Table 6.65: 2021 – Langford Lane / Proposed Site Access 'With Development' Scenario .....	73
Table 6.66: 2021 – Langford Lane / Proposed Site Access 'With Development' Sensitivity Scenario .....	73
Table 6.67: 2025 – Langford Lane / Proposed Site Access 'With Development' Scenario .....	74
Table 6.68: 2025 – Langford Lane / Proposed Site Access 'With Development' Sensitivity Scenario .....	74
Table 7.1: A44/A4095 – Suggested Changes to Geometry .....	78
Table 7.2: 2025 – A44 / A4095 'With Development' Scenario With Mitigation .....	79

## Appendices

Appendix A	Scoping
Appendix B	Personal Injury Collision Data
Appendix C	TRICS Outputs
Appendix D	Capacity Modelling Outputs
Appendix E	Mitigation

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# 1 Introduction

## 1.1 Background

- 1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Hill Street Holdings Ltd to provide highway and transport advice in support of an outline application for the proposed Oxford Technology Park development, which is anticipated to deliver up to 413,270sqft of B-use employment space.
- 1.1.2 This Transport Assessment (TA) provides an overview of the proposed development, sets out an assessment of the transport issues associated with the site and identifies a package of transport measures aimed at encouraging sustainable travel, managing the existing transport networks and mitigating the residual transport impacts of the development.

## 1.2 Development Proposals

- 1.2.1 The site covers 8.2 hectares and is located to the northwest of Kidlington. The site fronts onto Langford Lane, situated to the south of London-Oxford Airport and west of Oxford Motor Park. The location of the site is illustrated in **Figure 1.1**.
- 1.2.2 The proposals for the development comprise the following:
- B1(a) office use, up to 128,260sqft;
  - B1(b) Research & Development use, up to 47,960sqft;
  - B8 warehousing use, up to 237,050sqft;
  - Parking provided at the site in accordance with Oxfordshire County Council (OCC) parking standards; and
  - A new site access via a single priority T-junction on Langford Lane.
- 1.2.3 The site, and the surrounding employment area along Langford Lane, is identified within the Cherwell Local Plan 2006-2031 Submission Document (January 2014) as a Strategic Development area to accommodate 'High Value Employment Needs' in Kidlington.

## 1.3 Scoping of the Transport Assessment

- 1.3.1 PBA consulted with OCC via email on 3<sup>rd</sup> February 2014 to discuss the emerging development proposals and agree the requirements for a Transport Assessment. A response from OCC Transport team was received on 5<sup>th</sup> February and subsequently on 11<sup>th</sup> March 2014 (Application no. 14/00045/PREAPP). Further information was received from OCC as part of pre-application discussions, detailing the County's main concerns about the development and highlighting their requirements, including pump-priming of an improved bus service provision for the Langford Lane area, the provision of associated bus stops to serve the site and the guarantee of the delivery of a Travel Plan to be controlled by planning condition. A copy of the scoping correspondence is contained at **Appendix A**.

## 1.4 Content of TA Report

- 1.4.1 This report includes the following sections:
- Policy review;



- Existing transport conditions;
- Description of the proposed development;
- Development's travel demand;
- Traffic impact assessment;
- Mitigations; and
- Conclusions.

## 2 Policy Review

### 2.1 National Planning and Transport Policy Context

- 2.1.1 A review has been undertaken of the national and local transport policy documents in order to inform the development proposals. This section of the report sets out the key relevant policies and demonstrates how the development proposals accord and comply with these policies.

### 2.2 National Planning Policy Framework (NPPF)

- 2.2.1 The National Planning Policy Framework (NPPF, Department for Communities and Local Government, 2012) sets out the Government's economic, environmental and social planning policies for the country. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

- 2.2.2 The NPPF sets out the Government's commitment to ensuring that the planning system does everything it can to support sustainable economic growth. A positive planning system is essential because, without growth, a sustainable future cannot be achieved. Planning must operate to encourage growth and not act as an impediment. Therefore, significant weight should be placed on the need to support economic growth through the planning system.

- 2.2.3 The NPPF sets out 12 Core Planning Principles at paragraph 17. With regards to the principles that Authorities should consider in determining planning applications (rather than those which specifically relate to plan making), these state that planning should:

*"3. Pro-actively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business, and other development needs of an area, and respond positively to wider opportunities for growth.*

*9. Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas*

*11. Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable."*

- 2.2.4 The NPPF recognises the importance transport policies have in facilitating development but also in contributing to wider sustainability and health objectives. The Framework identifies at paragraph 32, 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"*.

2.2.5 NPPF, in paragraphs 34 to 36, identifies that *“Local Authority plans and decisions should ensure developments that generate significant movements are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised... Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods and people. Therefore, developments should be located and designed where practical to:*

- *Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *Create safe and secure layouts which minimise the 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.”*

2.2.6 NPPF recognises that a key tool to facilitate this will be a Travel Plan such that all developments which generate significant amounts of movement should be required to provide a Travel Plan.

## 2.3 NPPG – Transport Assessment

2.3.1 The National Planning Practice Guidance provides the overarching framework within which the transport implications of development should be considered. It provides advice on the preparation of Transport Assessment, Transport Statements and Travel Plans. The key advice is as follows:

*“Travel Plans, Transport Assessments and Statements are all ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development. They are required for all developments which generate significant amounts of movements.”*

2.3.2 The key principles on which Transport Assessments should be undertaken are detailed as follows:

*“Travel Plans, Transport Assessments and Statements should be:*

- *proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;*
- *established at the earliest practicable possible stage of a development proposal;*
- *be tailored to particular local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally);*
- *be brought forward through collaborative ongoing working between the Local Planning Authority/ Transport Authority, transport operators, Rail Network Operators, Highways Agency where there may be implications for the strategic road network and other relevant bodies. Engaging communities and local businesses in Travel Plans, Transport Assessments and Statements can be beneficial in positively supporting higher levels of walking and cycling (which in turn can encourage greater social inclusion, community cohesion and healthier communities)”.*

- 2.3.3 The guidance emphasises the importance to consult the relevant local authority at the outset in order to scope the transport assessment work, on the basis of the principles highlighted above.

## 2.4 Local Policy Guidance

### Oxfordshire Local Transport Plan 2011-2030

- 2.4.1 The current Oxfordshire Local Transport Plan 2011-2030 (LTP3) focuses on attracting and supporting economic investment and growth, delivering transport infrastructure, tackling congestion and improving quality of life. Oxfordshire County Council adopted the document as policy in April 2011, with amendments being adopted in July 2012.
- 2.4.2 The LTP considers both national and local targets to then identify local transport goals, with the view to in turn prioritising schemes. It identifies four local transport goals:
- *“to support the local economy and the growth and competitiveness of the county;*
  - *to make it easier to get around the county and improve access to jobs and services for all by offering real choice;*
  - *to reduce the impact of transport on the environment and help tackle climate change; and*
  - *to promote healthy, safe and sustainable travel”.*
- 2.4.3 Following on from these transport goals, LTP3 develops objectives. A set of 9 objectives form the basis for actions to deliver the LTP including:
- Improve the condition of local roads, footways and cycleways, including resilience to climate change;
  - Reduce congestion;
  - Reduce casualties and the dangers associated with travel;
  - Improve accessibility to work, education and services;
  - Secure infrastructure and services to support development;
  - Reduce carbon emissions from transport;
  - Improve air quality, reduce other environmental impacts and enhance the street environment;
  - Develop and increase the use of high quality, welcoming public transport; and
  - Develop and increase cycling and walking for local journeys, recreation and health.
- 2.4.4 The 9 objectives outlined above are applicable to the whole of Oxfordshire, with varying levels of priority in each settlement type. Promoting cycling, walking and public transport tend to have a similar level of priority across the county. Smaller towns such as Kidlington, as well as rural areas, have prioritised maintenance, casualty reduction, and accessibility.
- 2.4.5 The LTP3 recognises that strategies should be different for different parts of the county. Part 2 of the LTP3 identifies the Implementation Plan and includes the Kidlington Area Strategy.

- 2.4.6 The Kidlington Area Strategy chapter of the LTP3 identifies that in addition to shops and offices within the main part of the village, Kidlington has 'an expanding office and commercial area along Langford Lane to the north of the village' (para. 23.3).
- 2.4.7 Kidlington's transport strategy outlines the need for an improved pedestrian environment and improved cycle network. If resources allow, these policies will improve accessibility to the Langford Lane area, and support the economic success of the business parks. In terms of public transport in Kidlington, the LTP3 outlines plans to improve both bus and train services, with a new station at Water Eaton. Promoting travel choices and traffic management will support these measures.
- 2.4.8 At the time of writing, the Cherwell Local Plan (previously called the Core Strategy) is in the process of being adopted. The proposed new Local Plan (2006-2031) was submitted to the Secretary of State for Communities and Local Government for formal examination on 31<sup>st</sup> January 2014. The Hearing Sessions of the Examination started after the submission of the document but were then suspended to late 2014 by the Inspector.

#### **Cherwell Adopted local Plan 1996**

- 2.4.9 Existing planning policy for Cherwell District is contained in the saved policies of the Cherwell Local Plan, adopted in 1996. Planning decisions use these policies, and they can continue to be used until the Local Plan 2006-2031 (see below) is adopted. Policies that are not listed in the schedule have expired.
- 2.4.10 The proposals map identifies that the development site lies within the Green Belt. Saved policy GB1 recognises development in the Green Belt will be severely restricted, and approval will only be given in special circumstances. This is to protect the special character of Oxford and its landscape setting, prevent urban sprawl, and prevent coalescence of settlements. It is recognised, however, that appropriate development that does not conflict with the purposes of the Green Belt may be permitted.
- 2.4.11 Saved policy GB3 acknowledges Major Development Sites in the Green Belt, and includes Oxford Airport in Kidlington. The policy recognises that development of this site in the Green Belt will not be considered inappropriate.
- 2.4.12 Saved policy TR1, 'Transportation Funding', outlines that development proposals will need to show that all required transport measures, including highway-mitigation, traffic management, and public transport improvements, will be provided. This therefore includes *"the provision of new roads, the improvement of existing roads, the provision of cycle ways, footpaths, traffic controls, crossings, signing, road closures, traffic-calming measures, pedestrian-priority schemes, park and ride facilities and bus priority measures, both on-site and off-site, as circumstances require"* (para 5.10).

#### **Cherwell Local Plan 2006-2031: Submission Document (January 2014)**

- 2.4.13 The Cherwell Local Plan sets out how the district will grow and change up to 2031. It sets out the proposals for how the District will develop and how policies will support the local economy, protect villages and strengthen town centres. The Vision for Cherwell District is for residents to enjoy a good quality of life and for the District to be more prosperous than it is today.
- 2.4.14 In order to do this, Cherwell District Council *"will develop a sustainable economy that is vibrant and diverse with good transport links and sound infrastructure"* (para A.9). Furthermore, the District's economy will *"grow to provide more diverse employment for the increasing population, reducing the need for residents to travel outside the district for work"*.
- 2.4.15 Additionally, the intention is to improve road, rail and public transport links, providing increased access to services and facilities. In particular, there is a pledge to focus on

measures aimed at managing road congestion, improving public transport and improving access to town centres and other shops and services.

- 2.4.16 The Local Plan identifies Policies for Development in Cherwell, outlining that there will be small-scale employment growth at Kidlington. This will *“allow for appropriate growth plans”* in the vicinity of Langford Lane Industrial Estate following a small scale Green Belt review (para B. 33).
- 2.4.17 Policy: Kidlington 1 – Accommodating High Value Employment Needs identifies that Kidlington ‘plays an important role in the district’s wider employment context’ (para C.192).
- 2.4.18 The Local Plan acknowledges that the development site on Langford Lane is in the Green Belt. However, the Employment Land Review (2012) identifies a need for additional employment land in the Kidlington Area, which it is not anticipated can be accommodated on sites within the built-up limits of Kidlington (para C.191a) i.e. on non-Green Belt Land. Therefore, the District Council proposes that a small-scale review of the Green Belt be undertaken to accommodate the identified high value employment needs at both Langford Lane and Begbroke Science Park. The Kidlington Inset Maps, Kidlington 1A, illustrates the identified area along Langford Lane.
- 2.4.19 The Local Plan recognises that over the medium to longer term, ‘progressive improvements to the Langford employment area will be encouraged to accommodate higher value employment uses such as high technology industries’ (para C.193). Development here is thought to reinforce and strengthen the emerging cluster of such industries in this area.
- 2.4.20 The Policy states that good accessibility to public transport services should be provided for. Furthermore, a Transport Assessment and Travel Plan should accompany any development proposals, which should show how public transport links to the area will be improved.

## 2.5 Summary

- 2.5.1 It is evident from the review of the transport policy context that there is an underlying requirement to deliver sustainable development supported by an integrated transport network. At the local level there is a specific requirement for high value employment to be delivered along Langford Lane Kidlington which maximises opportunities for travel by sustainable modes.
- 2.5.2 This TA demonstrates that the development proposals comply with this policy context, delivering a set of proposals contributing to the sustainability of the development and mitigating the development’s impacts so that their residual effects are not severe.

## 3 Existing Transport Conditions

### 3.1 Introduction

- 3.1.1 This section considers the existing transport conditions in the vicinity of the development site. It provides details of the site's location, its proximity to local facilities and amenities and its accessibility by walking, cycling and public transport. Finally, it provides an overview of the operation of the local highway network and a review of local Personal Injury Collision data.

### 3.2 Strategic Location and Site Description

- 3.2.1 The development is located approximately 9.5 km to the north of Oxford city centre, with the A44 and A4260 providing the main access routes. The A44 also provides access to the A34 to Bicester to the north and, via the M4, to Reading and London to the south.
- 3.2.2 The site is located off Langford Lane immediately to the north west of Kidlington.
- 3.2.3 The site comprises 8.2 hectares (20 acres) of land and the northern boundary fronts onto Langford Lane. The site lies to the south of London Oxford Airport and west of Oxford Motor Park. The southern boundary of the site is bordered by agricultural land.
- 3.2.4 The location of the site is illustrated in **Figure 1.1**.
- 3.2.5 There is a dropped kerb access to the site along the southern footway of Langford Lane, which is currently fenced. The proposed development will require the construction of a new access.

### 3.3 Local Facilities and Amenities

- 3.3.1 A range of local services and facilities can be found within a 2km walk distance of the site located to the south-east in Kidlington town centre. These facilities include a health centre, post office, local supermarkets, banks, restaurants and public houses.
- 3.3.2 **Figure 3.1** illustrates the location of Oxford Technology Park in relation to local facilities and amenities, demonstrating that there is a range of retail, education, leisure and health opportunities within the vicinity of the site.
- 3.3.3 **Table 3.1** provides as-the-crow-flies distances to key local facilities from the development site with distances measured from centre of the site frontage on Langford Lane.

Table 3.1: Distance to Key Local Facilities

Facility	Distance (as the crow flies)
Cygnets Nursery	290m
The Co-Operative Food	830m
Kidlington High Street	1.7km
Medical Centre	1.9km
Leisure Centre	2.7km



- 3.3.4 Higher order services and facilities can be found in Oxford city centre which is located approximately 9.5km south of the site.

### **3.4 Local Highway Network**

- 3.4.1 Langford Lane is subject to a 30mph speed limit in the vicinity of the site. To the north and south of the respective junctions with Langford Lane, the A4260 Banbury Road and A44 Woodstock Road are subject to a 50mph speed limit.
- 3.4.2 Langford Lane is accessed from the A4260 and A44 via signalised T-junctions. From site observations, both junctions appear to operate well although neither have formal pedestrian crossing facilities.
- 3.4.3 A roundabout is located approximately 20m to the east of the site on Langford Lane and provides access to the London-Oxford Airport and to Oxford Motor Park.

### **3.5 Existing Traffic Flows and Vehicle Speeds**

- 3.5.1 In order to establish the baseline traffic conditions and to enable junction capacity analysis to be carried out, traffic flow information has been obtained.
- 3.5.2 PBA commissioned Community Systems Ltd. (CSL) to carry out Manual Classified Counts (MCC) traffic surveys on Thursday 21<sup>st</sup> November 2013 between the hours of 0700-1000 and 1600-1900 at the following locations:
- Langford Lane/The Boulevard roundabout;
  - Langford Lane/A4260 Banbury Road signalised junction; and
  - Langford Lane/A44 Woodstock Road signalised junction.
- 3.5.3 An ATC survey was undertaken on Langford Lane, west of The Boulevard, also by CSL, for seven consecutive days between the 12<sup>th</sup> and 18<sup>th</sup> December 2013.
- 3.5.4 Vehicle speeds were recorded by the ATC survey on Langford Lane. The average westbound and eastbound speeds were recorded as 35.2mph and 35.0mph respectively. The 85th percentile westbound speed was recorded as 42mph and eastbound as 41.9mph. This demonstrates that a large proportion of vehicles are travelling along Langford Lane in the vicinity of the site above the current speed limit of 30mph. This is likely to be exacerbated by the current open nature of Langford Lane between the A44 Woodstock Road and the site.
- 3.5.5 In response to scoping discussions with OCC, PBA commissioned Advanced Transport Research (ATR) to carry out MCC traffic surveys at three further junctions on Tuesday 1<sup>st</sup> April 2014 also between the hours of 0700-1000 and 1600-1900. These junctions included:
- A4260 Oxford Road / Bicester Road signalised T-junction;
  - A44 Woodstock Road / A44 Oxford Road / A4095 Bladon Road / Upper Campsfield roundabout (Bladon Roundabout); and
  - A4620 Oxford Road / A4620 Frieze Way / A4165 Oxford Road / Bicester Road roundabout (Kidlington Roundabout).
- 3.5.6 Analysis of the survey data across the six surveyed junctions identified the AM and PM peak traffic hours to be:
- AM peak – 0745-0845; and



- PM peak – 1630-1730.

3.5.7 The 2013/2014 peak hour traffic flows which have been obtained through the surveys are shown on **Figures 3.2 to 3.3** for the AM and PM peak hours respectively.

### 3.6 Walking and Cycling

3.6.1 A footway, approximately 1.8m wide, is provided along the entire southern edge of Langford Lane providing a continuous route from the site to the A4260 Banbury Road and A44 Woodstock Road via a number of informal crossing points with dropped kerbs and tactile paving across minor access roads.

3.6.2 A short length of footway is provided on the northern edge of Langford Lane in the vicinity of the Langford Lane/The Boulevard roundabout which provides connections into the Oxford Spires Business Park via The Boulevard. This footway is accessed from the southern side of Langford Lane at the roundabout via an informal crossing with dropped kerbs and tactile paving. Apart from this, there is no footway along the northern edge of Langford Lane in the vicinity of the site.

3.6.3 A footway/cycleway, approximately 3.0m wide, is provided along the A4260 from the junction with Langford Lane providing onward connections to/from Kidlington town centre.

3.6.4 National cycle route number 55 runs adjacent to the A44 Woodstock Road providing a direct connection from its junction with Langford Lane through to Oxford city centre to the south.

3.6.5 There are no Public Right of Way (PROW) routes through the site.

### 3.7 Public Transport

3.7.1 A review of existing public transport services operating within 400 metres of the site has been undertaken, with routes illustrated in **Figure 3.4** and summarised in **Table 3.2** below:

Table 3.2: Existing Public Transport Facilities

Service / Operator	Route	Frequency	
		Mon-Sat	Eve-Sun
<b>2C/2D Stagecoach in Oxfordshire and Oxford Bus Company</b>	Oxford – Summertown – Kidlington – London-Oxford Airport	Every 15 minutes Mon-Fri peak hours only	No Service
<b>S4 Stagecoach in Oxfordshire</b>	Oxford - Kidlington – London-Oxford Airport - Shipston on Cherwell - Tackley - Steeple Aston - (Middle Barton - Duns Tew) - Deddington - Adderbury - Horton Hospital - Banbury	About 1 an hour Mon-Sat (off-peak)	4 journeys Sun

Service / Operator	Route	Frequency	
		Mon-Sat	Eve-Sun
<b>224 Heyfordian</b>	Kidlington – London-Oxford Airport – Begbroke – Yarnton – Kidlington (circular) (1-2 PM journeys to Woodstock – Wootton – Glympton)	7 journeys Mon-Fri; 4 journeys Sat	No service
<b>224A Heyfordian</b>	Glympton – Wootton – Woodstock or Kidlington then Begbroke – Yarnton – London-Oxford Airport – Kidlington	3 journeys Mon-Fri AM peak hour only	No service

- 3.7.2 The table indicates that the site is served by three distinct service groups – services 2C/2D on the primary corridor to Oxford, route S4 to the north and services 224/224A providing local links around Kidlington.
- 3.7.3 Services 2C/2D, operated by both the Oxford Bus Company and Stagecoach, are the main services operating locally and call at stops within 250 metres of the northern site boundary. These services operate on Mondays to Fridays broadly every 15 minutes between 05.30 and 09.00 in the mornings and between 15.45 and 19.15 in the evenings. In the AM peak, services towards the site operate as route 2D direct via the A4260 Oxford Road, whilst services towards Oxford operate as service 2C via Lyne Mead and Grovelands (this is reversed in the PM peak period).
- 3.7.4 The 2C/2D service provides peak time links to central and north Oxford, and also for certain areas of Kidlington close to the A4260. Interchange is available in central Oxford with services from all areas of the city and 'The Key' freedom passes can be used on any of these routes.
- 3.7.5 Outside peak hours, Stagecoach route S4 provides a more limited service between London-Oxford Airport and central Oxford on the same corridor as Oxford Bus route 2D, but with journeys to/from Banbury via a number of villages to the north of Kidlington. These journeys run approximately hourly throughout the off-peak periods on Mondays to Fridays and all day on Saturdays.
- 3.7.6 Heyfordian Travel operate services 224/224A which are contracted services operated on behalf of OCC, and provide services around Kidlington village and to outlying villages such as Yarnton and Begbroke; there are also some limited extensions north-west to Woodstock, Wootton and Glympton.
- 3.7.7 It should be noted that the A4260 and A44 corridors to the east and west of the site carry additional bus services not considered in detail within this report, although local bus stops providing access to these services are approximately 900 metres from the northern site boundary. In particular, the A44 is the principal bus corridor between Oxford, Woodstock, Charlbury and Chipping Norton, with bus service S3 operating every 30 minutes every daytime and every 60 minutes Monday to Saturday evenings.
- 3.7.8 The nearest bus stop location from the site is on The Boulevard and currently serves Oxford Spires Business Park and London-Oxford Airport. The bus stop has a shelter, and service and timetable information. This stop is used by Stagecoach and Oxford Bus Company services

2C/2D and S4 to Oxford in the south and Banbury in the north. It is located within 400m of the centre of the development site as the crow flies and can be accessed via the existing footway on Langford Lane and then crossing at the informal crossing point by the Langford Lane west approach into the Oxford London Airport roundabout, before using the footways on The Boulevard.

- 3.7.9 Two other bus stop locations exist on Langford Lane, to the west of the site and to the east of the site and Oxford London Airport roundabout. To the east, the stops serve the 224/224A and are hail and ride stops. On the western side, the stops serve the 2C/2D, S4 as well as Heyfordian services 224/224A. These stops provide service and timetable information. The eastbound stop includes a shelter and the westbound stop is marked by a flag pole. These stops can be accessed on foot using the footway on Langford Lane and the informal crossing points provided on the approaches to the Oxford London Airport roundabout. They are located a bit more than 400m from the centre of the site as the crow flies.
- 3.7.10 There are four railway stations locally accessible to Kidlington, although not in Kidlington itself. See [Table 3.3](#) for a summary of rail provision.

Table 3.3: Existing Rail Service Provision

Railway Station	Distance (as the crow flies)	Destinations
Hanborough	4.3km	London, Worcester, Hereford
Tackley	5.8km	Oxford, Banbury
Oxford	9.0km	Stratford-upon Avon, Birmingham, Manchester, Newcastle Reading, London, Southampton
Bicester Town	13.2km	Oxford
Bicester North	13.8km	London, Birmingham

- 3.7.11 In addition, it must be highlighted that the local growth strategy includes the creation of a new Oxford Parkway Station in Water Eaton. The new station would be located adjacent to the existing Park and Ride site and would be served by bus services serving the Langford Lane area, as it is on the route of the 2C/2D services. There is therefore the opportunity in the near future to deliver a suitable link to railway services in proximity to the development site using the 2C/2D bus service.

### 3.8 Personal Injury Collision Data (PIC)

- 3.8.1 PIC data was obtained from OCC for a 70 month period from 01/01/2008 ending 31/10/2013, across an area covering the A4260 and A44 approaches to Langford Lane and the entire extent of Langford Lane. A review of the data (attached at [Appendix B](#)), shows that a total of 17 collisions involving 22 casualties have been recorded, one of which was fatal.
- 3.8.2 Additional PIC was obtained from OCC for a 5-year period from 01/01/2009 and ending 30/04/2014. The area covers the A44 / Bladon roundabout, Kidlington roundabout, A4260 / Bicester Road junction and the A4260 stretching from Kidlington roundabout to the A4260 / Langford Lane junction. In the 5 year time period, 89 collisions occurred in the area, 1 fatal, 17 serious and 71 slight in severity involved a total of 109 casualties.

### **Langford Lane / A4260 Banbury Road**

- 3.8.3 Two collisions occurred at or close to the junction of Langford Lane with the A4260, including one serious and one slight collision. Both of these were recorded to have occurred due to driver error when the vehicle in front has been waiting to turn into the Public House, including failing to look, and following too close.

### **Langford Lane / A44 Woodstock Road**

- 3.8.4 Six collisions occurred at or close to the junction of Langford Lane with the A44, two of which involved vehicles failing to stop at the signals turning right from Langford Lane and colliding with vehicles oncoming from the north. The first of these was a fatal collision, and the second was serious in severity. Three further collisions were slight in severity and recorded to have occurred due to drivers failing to slow for the signals and colliding with a vehicle in front. The final collision slight in severity occurred when a vehicle failed to give way.

### **Langford Lane**

- 3.8.5 A total of nine collisions occurred on Langford Lane, one serious and eight slight in severity. The serious collisions was recorded as; a car turning left onto Langford Lane failed to look properly and collided with another car making the same manoeuvre. The slight collisions were all recorded to be the result of driver error or impairment, including failing to look properly, failing to give way, and failing to slow. One collision involved a pedestrian, but no further details were recorded.

### **A44 / A4095 Bladon Roundabout**

- 3.8.6 A total of 15 collisions occurred on the A44 / A4095 Bladon roundabout, 11 slight and 4 serious in severity. Two collisions involved cyclists, one serious and one slight. The serious collision occurred when a car failed to give-way to the cyclist on the roundabout, the slight collision occurred when a cyclist exited the cycle path into oncoming traffic. The other three serious collisions involved a motorcyclist losing control, a car losing control after a medical incident, and an intoxicated driver respectively. Of the 11 slight collisions the majority were reported to be due to driver error, failing to slow adequately or loss of control of the vehicle. The remaining slight collisions were cited to be due to reasons unrelated to the design of the roundabout.

### **Kidlington Roundabout**

- 3.8.7 In the vicinity of Kidlington roundabout 18 collisions occurred, one of which was serious in severity. This incident involved a car failing to give way to a cyclist on the roundabout. The majority of the slight in severity collisions were reported as failing to slow down, driver error, and failing to give way. Two slight collisions occurred between cyclists and vehicles, one occurred as the cyclist failed to stop for slow moving traffic, the other occurred when a car failed to give way to the cyclist on the roundabout.

### **A4260 / Bicester Road Junction**

- 3.8.8 A total of six collisions occurred at the A4260 / Bicester Road junction one of which was serious in severity; this involved a cyclist crossing the A4260 into an oncoming bus. Of the remaining collisions, three slight collisions involved cyclists, two of whom were teenagers failing to look adequately before crossing and the other involved a car failing to stop for a red traffic signal resulting in a collision with a cyclist. The other slight collisions involved cars and were reported to be due to failure to look adequately, and not slowing for a red traffic signal and colliding with a car in front.

### **A4260**

- 3.8.9 There was a total of 38 collisions along the A4260 between Kidlington Roundabout and the A4260 / Langford Lane junction, excluding the accidents in the immediate vicinity of the A4260 / Bicester Road junction. Of the 38 collision, 16 involved vulnerable road users. Of these one was fatal, eight were serious, and seven were slight in severity. The remaining collisions were slight in severity and involved motorised vehicles.
- 3.8.10 The fatal collision involved a car slowly reversing out of a private drive into an oncoming mobility scooter, causing head injuries to the rider, which later proved fatal.
- 3.8.11 The eight serious collisions involved three cyclists, three pedestrians and two motorcyclists. The three collisions involving the cyclists were recorded to be due to a car pulling a trailer causing the rider to fall off, a passenger opening a car door into the path of the cyclist and a cyclist travelling on the inside of a queue of traffic colliding with a car turning through a gap left in the queue.
- 3.8.12 The three pedestrians in serious collisions were recorded to be due to a light goods vehicle failing to stop for a pedestrian at a pelican crossing, and two pedestrians crossing the A4260 failing to look sufficiently and were struck by oncoming traffic.
- 3.8.13 The two motorcyclists in serious collisions were recorded to be due to cars turning right failing to give way to the oncoming motorcyclists.
- 3.8.14 The seven vulnerable road users involved in slight collisions, were recorded to be due to a light goods vehicle causing a cyclist to fall off, cars turning right failing to give way to oncoming cyclists, a car colliding with the rear of a cyclist, a car failing to give way to a pedestrian using a pelican crossing, and a pedestrian crossing the A4260 failing to look adequately and stepping out into slow moving oncoming traffic.
- 3.8.15 The remaining 22 collisions were slight in severity and did not involve vulnerable road users. The majority of the collisions were recorded to be due to vehicles failing to stop for red lights, failing to look sufficiently when turning right and loss of control of the vehicle due to the influence of alcohol or drugs.

### **PIC Data Summary**

- 3.8.16 The PIC data review shows that the vast majority of accidents recorded in the vicinity of the site are mainly due to driver/user error. The number of accidents on the right turn into Langford Road from the A44 Woodstock Road is flagged up as a potential issue, although the residual impact of development on this movement is not predicted to warrant any specific mitigation. Equally, the number of vulnerable users involved in collisions along the A4260 corridor is noted. However, most collisions relate to driver/user error and it is noted that the A4260 corridor benefits from good facilities for pedestrians and cyclists, including wide footways, marked crossing points and advanced cycle stop-lines at signal controlled junctions. The Framework Travel Plan that accompanies this Transport Assessment suggests providing site users access to suitable training in order to address potential safety issues related to walking and cycling to the development site.

## **3.9 Summary**

- 3.9.1 The proposed development site benefits from good accessibility by all modes of transport with connections available to key local destinations such as Kidlington and Oxford city centre possible by all modes of transport. The development proposals will build on this and connect the development to the existing adjacent facilities, supporting the delivery of a sustainable development in transport terms.

## 4 Development Proposals

### 4.1 The Proposals

- 4.1.1 The proposed Oxford Technology Park is anticipated to deliver a total of 413,270sqft (38,394sqm) of employment, the occupiers of which are currently unknown. The development will be made up of multiple units and will come forward in multiple phases, as shown in **Table 4.1** below:

Table 4.1: Area Schedule

Unit	Land Use (sqft)			Total
	B1(a)	B1(b)	B8	
2015: Opening Year				
1	38,610	-	-	38,610
Opening Year Sub-Total	38,610	-	-	38,610
2021: Phase 1				
2	42,900	-	-	42,900
3	5,000	5,000	20,000	30,000
4	5,000	5,000	20,000	30,000
5a	3,000	3,220	13,100	19,320
5b	3,000	3,220	13,100	19,320
6a	3,000	2,950	11,750	17,700
6b	3,000	2,950	11,750	17,700
7	4,350	4,800	19,650	28,800
8	3,900	4,320	17,700	25,920
Phase 1 Sub-Total	73,150	31,460	127,050	231,660
2025: Phase 2				
9	4,500	4,500	30,000	39,000
10	4,500	4,500	30,000	39,000
11	3,750	3,750	25,000	32,500
12	3,750	3,750	25,000	32,500
Phase 2 Sub-Total	16,500	16,500	110,000	143,000
Total	128,260	47,960	237,050	413,270

- 4.1.2 Unit 1 is anticipated to be opened in 2015, with Phase 1 being complete by 2021, and the site becoming fully operational in 2025.

## 4.2 Site Access and Sustainable Transport Proposals

- 4.2.1 A set of transport proposals has been developed to maximise the potential to travel by modes other than the private car and hence limit the potential traffic impacts arising from the development. The transport proposals consist of the following packages of measures that are discussed in more detail within this section:

- Workplace Travel Plan;
- Walking and Cycling Proposals;
- Public Transport Proposals;
- Vehicle Access Proposals; and
- Vehicle Parking Proposals.

## 4.3 Travel Plan

- 4.3.1 A Framework Travel Plan (FTP) for the site has been developed for the site in accordance with appropriate guidance including DfT's 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process'.

- 4.3.2 The key aim of the FTP is to:

*"Reduce the need to travel by car, focusing on single occupancy car trips associated with the development, by promoting more sustainable alternatives such as car sharing, public transport and walking and cycling."*

- 4.3.3 This objective will be achieved through a combination of hard and soft measures aimed at discouraging single occupancy car use and facilitating the use of alternative modes of transport. The Framework Travel Plan should be read in parallel to this Transport Assessment.

## 4.4 Walking and Cycling Strategy

- 4.4.1 Pedestrian and cycle accessibility is given a high priority in the proposed access strategy and this is reflected in the facilities to be provided.
- 4.4.2 As detailed in **Section 3** there is currently a footway, approximately 1.8m wide, provided along the entire southern edge of Langford Lane providing a continuous route from the site to the A4260 Banbury Road and A44 Woodstock Road via a number of informal crossing points with dropped kerbs and tactile paving across minor access roads.
- 4.4.3 The pedestrian access to the proposed site will be provided in the same location as the vehicle access with a 2.0m wide footway on both sides of the carriageway into the site. An informal crossing will be provided across the site access with a pedestrian refuge island, dropped kerbs and tactile paving. This will maintain the continuous route for pedestrians along the site frontage to the A4260 Banbury Road and A44 Woodstock Road at either end of Langford Lane.
- 4.4.4 Footway facilities will be provided within the site to provide continuous pedestrian access through the site to each employment unit.



- 4.4.5 With regards to existing cycle facilities **Section 3** details that a footway/cycleway, approximately 3.0m wide, is provided along the A4260 from the junction with Langford Lane providing onward connections to/from Kidlington town centre. National cycle route number 55 runs adjacent to the A44 Woodstock Road providing a direct connection from its junction with Langford Lane through to Oxford city centre to the south.
- 4.4.6 These two facilities ensure that the Langford Lane area is well provided for cycle commuting. As a result, the development will incorporate the relevant suite of facilities to make commuting by cycle a realistic possibility. Cycle parking for employees and visitors will be provided on site in accordance with the OCC guidance 'Cycle Parking Standards – Minimum Levels'. Cycle parking will be provided in secure and convenient locations and together with adequate storage facilities. **Table 4.2** shows the resulting number of cycle parking spaces across the site is 208.

Table 4.2: Cycle Parking Provision at Oxford Technology Park

Parking Type	B1 Office			B8 Warehousing		
	OCC Standard	sqm	Cycle spaces	OCC Standard	sqm	Cycle spaces
Long stay/employee	1 stand per 150 sqm	16,371 sqm	109	1 stand per 500 sqm	22,023 sqm	44
Visitor	1 stand per 500 sqm		33	1 stand per 1000 sqm		22
Total	208 cycle parking spaces					

- 4.4.7 Finally, as detailed in the Framework Travel Plan, units on site will provide adequate shower and changing facilities to cyclists.

## 4.5 Public Transport Strategy

- 4.5.1 As previously set out in **Section 3**, the site is accessible by bus with existing services offering connections to Oxford city centre and Kidlington in particular. Locally, the provision in the future of the new Oxford Parkway Station also has a strong bearing on the future of public transport accessibility to the Kidlington area and therefore to the development site.
- 4.5.2 In their scoping response, Oxford County Council have indicated that they would expect the proposed development to contribute as follows:
- Provide pump priming funding for an improvement in bus accessibility to the Langford Lane development area – This is to focus on providing all day, including evening and weekends, connection to Oxford city centre and to the future Water Eaton railway station. A figure of £400,000 is mentioned although no justification for this figure is provided; and
  - Provide the means to deliver a new bus stop on the northbound side of The Boulevard to complement the existing stop on the southbound side. The standard of stops required would need to be clarified with OCC
- 4.5.3 The public transport strategy for the site reflects these requirements but makes the following offer:
- To provide, through a Section 106 contribution, pump priming and revenue support to improved bus services to the area, especially from Oxford city centre and the proposed new railway station at Water Eaton. The proposal would focus on supporting revenue for



the delivery of off peak and evening services between Oxford city centre and the stops on The Boulevard on weekdays and at a frequency of one bus an hour. This is to reflect the employment nature of the proposed development and the recognition that bus access to the development will be beneficial through the working day. However, it is not considered necessary to provide weekend services in order to support the development, as travel demand to and from the development at weekends is likely to be low and as a result the likely impact of the development on a Saturday and Sunday is not likely to be severe and warrant specific measures. The payment of the contribution would be phased in line with the phasing of the introduction of the proposed bus service improvements and the construction of the development and subject to further analysis and demonstration that a viable service can be delivered taking into account other planned developments along the Kidlington corridor and their potential for patronage and contribution; and

- To provide an additional bus stop on the northbound side of The Boulevard to a similar standard to the existing stop on the southbound side of The Boulevard. This will allow the creation of a stronger bus terminus serving potentially the entire Langford Lane area and would locate a bus stop closer to the development site entrance than currently. This new stop would be served by the improved 2C/2D bus services. This could be delivered either via a S278 agreement or by OCC through a S106 contribution.

- 4.5.4 The FTP would also include the provision of suitable information to the occupiers of the site so that they are aware of the opportunity to use public transport to access the site.

## 4.6 Vehicular Access Strategy

- 4.6.1 The proposed vehicular site access is shown on **PBA Drawing 23588/001/001** and the details are summarised below.
- 4.6.2 A single point of access is proposed for vehicles via a priority T-junction onto Langford Lane. A right turn ghost island is proposed for movements from Langford Lane west into the site. The proposed site access junction can be accommodated within development and highway land.
- 4.6.3 Due to the commercial nature of the proposed development and the anticipated volume of HGVs to/from the site, visibility splays have been based on standards set out in the Design Manual for Roads and Bridges (DMRB) and 85<sup>th</sup> percentile speeds on Langford Lane as recorded by traffic surveys at 42mph (68kph) (see **Section 3**). A major road design speed of 70kph necessitates visibility splays of 4.5mx120m which can be accommodated.
- 4.6.4 A footway is provided along both sides of the carriageway and a pedestrian refuge island is also provided to accommodate east-west pedestrian movements.
- 4.6.5 Swept path analysis has shown the proposed site access to fully accommodate heavy vehicle movements as shown on **PBA Drawing 23588/001/SK004**.

## 4.7 Vehicular Parking Strategy

- 4.7.1 Vehicular parking will be provided within the site in accordance with the OCC's 'Car Parking Standards – Maximum Levels'.
- 4.7.2 The parking strategy for the site will ensure that vehicles which are associated with the development proposals will be contained within the site and not park on-street on the adjacent highway network. Therefore the appropriate level of car parking provision will be accommodated within close proximity of each individual unit.
- 4.7.3 **Table 4.3** shows the resulting number of car parking spaces across the site, by individual unit. The total maximum parking provision across the site is 656 car parking spaces.

Table 4.3: Vehicle Parking Provision at Oxford Technology Park

Phase	Unit	Land Use (sqm)			OCC Parking Standard B1	OCC Parking Standard B8	Parking Provision
		B1(a)	B1(b)	B8			
Opening year	1	3,587	-	-	1 space per 30sqm	1 space per 200 sqm	120
Phase 1	2	3,986	-	-			133
	3	465	465	1,858			40
	4	465	465	1,858			40
	5a	279	299	1,217			25
	5b	279	299	1,217			25
	6a	279	274	1,092			24
	6b	279	274	1,092			24
	7	404	446	1,826			37
	8	362	401	1,644			34
Phase 2	9	418	418	2,787			42
	10	418	418	2,787			42
	11	348	348	2,323			35
	12	348	348	2,323			35
	<b>Total</b>	<b>11,916</b>	<b>4,456</b>	<b>22,023</b>			<b>656</b>

4.7.4 In addition to the provision of car parking spaces, an appropriate number of loading bays will be provided for heavy vehicles to the rear of each warehousing unit.

## 5 Travel Demand

### 5.1 Introduction

- 5.1.1 This section of the TA considers the travel demand arising from the development proposal of 413,270sqft of B1(a), B1(b) and B8 use. This will consider the scale of development and the resulting vehicular and person trip generation.
- 5.1.2 This section provides an overview of the likely travel demand resulting from the proposed development by all modes of travel including walking, cycling, public transport and private car trips. The predicted person trip generation has been derived by land use and the modal split of those journeys has been considered.
- 5.1.3 The AM and PM peak hours have been assessed and, whilst it is recognised that these periods do not represent the entire travel demand resulting from the development proposals, they do provide a recognised benchmark from which to consider the access and movement needs of future occupants to the site, the development being for employment use and most employees working on the basis of the typical 09.00am to 05.00pm day, Monday to Friday.

### 5.2 Development Vehicle Trip Generation

- 5.2.1 The TRICS database has been interrogated in order to derive multi-modal trip rates for the proposed development where available. Only two multi-modal surveyed B8 sites were available in TRICS one of which is notably larger than the proposed development, therefore vehicle trip rates have been extracted for B8 for a larger sample of 5 sites.
- 5.2.2 Sites in the database were selected on the basis of a set of criteria that best reflect the development type, size and location. The derived trip rates form the basis for a robust and worst case assessment of the expected trip generation from the proposed development.
- 5.2.3 Sites with multi-modal surveys labelled as 100% B1(b) are scarce in TRICS. Therefore detailed analysis has been undertaken of all B1 and B2 TRICS sites to determine those which best fit the proposed development. The site deemed most representative of the type of B1(b) development proposed at Oxford Technology Park is TRICS site CA-02-B-01 Cambridge Science Park therefore trip rate for Cambridge Science Park site has been used to generate the proposed vehicular traffic for the B1(b) element of Oxford Technology Park.
- 5.2.4 The proposed development is supported by a Framework Travel Plan that aims at reducing vehicular trip generation from the development and sets targets for modal shift away from the private car. The assessment presented in this section does not take account of the potential for reduced vehicular trip generation that the Travel Plan could lead to. In this respect the assessment presented here is robust.
- 5.2.5 Outputs from the TRICS database used in the assessment are presented in [Appendix C](#).
- 5.2.6 The trip rates derived are shown in [Table 5.1](#) below, which have been agreed with

5.2.7 Oxfordshire County Council in correspondence dated 11<sup>th</sup> March 2014.

Table 5.1: Development Vehicular Trip Rates

Land Use	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
B1(a) Offices	1.533	0.141	1.674	0.111	1.602	1.713
B1(b) Research & Development	1.191	0.078	1.269	0.086	0.914	1.0
B8 Warehousing	0.214	0.090	0.304	0.051	0.165	0.216

5.2.8 **Table 5.2** provides the resulting vehicular trip generation predicted to arise from the full development.

Table 5.2: Oxford Technology Park Vehicular Trip Generation

Land Use	Estimated GFA (m <sup>2</sup> )	AM Peak			PM Peak		
		Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
B1(a)	11,916	183	17	199	13	191	204
B1(b)	4,456	53	3	57	4	41	45
B8	22,023	47	20	67	11	36	48
<b>Total</b>	<b>38,394</b>	<b>283</b>	<b>40</b>	<b>323</b>	<b>28</b>	<b>268</b>	<b>296</b>

5.2.9 Oxfordshire County Council have recommended that a sensitivity test is also run using higher trip generation rates. In order to do this, the TRICS database has been used to determine the 85<sup>th</sup> percentile trip rates, through the rank order procedure. This method ranks the surveys according to the two-way trip rates.

5.2.10 The surveys that were used to determine the trip rates shown in **Table 5.1** for the B1(a) land use have been used to determine the 85<sup>th</sup> percentile trip rates shown in **Table 5.3** below. For the B8 trip rates, the search criteria was expanded to allow the derivation of an 85<sup>th</sup> percentile value. Since only one B1(b) site was used to determine average trip rates, the B1(b) 85<sup>th</sup> percentile rates were determined using the B1(a) factor of average to 85<sup>th</sup> percentile rates. The derived trip rates for each of the land uses are shown in **Table 5.3** below.

Table 5.3: 85th Percentile Development Vehicular Trip Rates

Land Use	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
B1(a) Offices	1.760	0.280	2.040	0.160	2.440	2.600
B1(b) Research & Development	1.367	0.155	1.522	0.124	1.392	1.516
B8 Warehousing	0.400	0.200	0.600	0.022	0.314	0.336

- 5.2.11 **Table 5.4** provides the resulting vehicular trip generation predicted to arise from the sensitivity testing of the full development.

Table 5.4: Sensitivity Testing of Oxford Technology Park Vehicular Trip Generation

Land Use	Estimated GFA (m <sup>2</sup> )	AM Peak			PM Peak		
		Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
B1(a)	11,916	210	33	243	19	291	310
B1(b)	4,456	61	7	68	6	62	68
B8	22,023	88	44	132	5	69	74
<b>Total</b>	<b>38,394</b>	<b>359</b>	<b>84</b>	<b>443</b>	<b>29</b>	<b>422</b>	<b>451</b>

### 5.3 Development Proposal Vehicular Trip Distribution

- 5.3.1 It is considered that existing turning movements in and out of adjacent employment sites on Langford Lane can be used to distribute development traffic from the site. This is deemed most appropriate since existing development along Langford Lane is predominantly employment-based. Therefore, the proportion of existing turning movements, as recorded by traffic survey data, provides a distribution based on recent patterns of movements at other adjacent commercial developments. This distribution can be seen in **Figure 5.1** and **Figure 5.2**.

### 5.4 Mode Split and Person Trip Generation

- 5.4.1 The modal split of trips generated by the development has been determined from the 2001 Census journey to work data for workers of ward 38UBHE Kidlington North. This ward includes the employment area along Langford Lane, London-Oxford Airport and the residential area of north Kidlington. This results in the baseline modal split shown in **Table 5.5**.

Table 5.5: Modal Split (2001 Census)

Mode	Total
Vehicles	77.0%
Passengers	5.6%
Motorcyclists	1.3%
Cyclists	5.6%
Pedestrians	5.6%
Public Transport	4.8%
Other	0.1%
<b>Total</b>	<b>100%</b>

- 5.4.2 Consequently, provisional multi-modal person trip generation for the development has been determined by factoring the vehicle trip generation shown in **Table 5.2** by the 2001 Census modal split shown in **Table 5.5**, such that car driver trip represent 77% of the modal share. The resulting person trip generation is shown in **Table 5.6**.

Table 5.6: Person Trip Generation

Mode	AM			PM		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Vehicles	283	40	323	28	268	296
Passengers	21	3	23	2	19	22
Motorcyclists	5	1	5	0	5	5
Cyclists	21	3	23	2	19	22
Pedestrians	21	3	23	2	19	22
Public Transport	18	2	20	2	17	18
Other	0	0	0	0	0	0
<b>Total</b>	<b>367</b>	<b>52</b>	<b>419</b>	<b>37</b>	<b>348</b>	<b>385</b>

- 5.4.3 As shown in **Table 5.6**, the modal split derived from the 2001 Census highlights the main mode of travel is likely to be car driver. However, this reflects in particular the current public transport provision within the Langford Lane area that will be improved as a result of the proposed development, generating potentially additional PT trips and therefore reducing the number of vehicular trips generated by the development.

## 5.5 Summary

- 5.5.1 This section of the TA has set out details in respect of the proposed development expected vehicular and person trip generation, confirming that the development proposals are predicted to generate up to 419 person trips in the AM peak hour and 385 person trips in the PM peak hour. This is based on a robust assessment of trip generation and a modal split which does not reflect any potential modal shift away from the private car that the Framework Travel Plan could achieve.
- 5.5.2 The vehicular and person trip generation detailed within this section of the TA have informed the strategy and assessment works presented in the following sections, including the identification of site specific mitigation measures, where required.

## 6 Traffic Impact Assessment

### 6.1 Introduction

- 6.1.1 This section of the TA considers the vehicular traffic impact of the proposed development upon the local highway network. The conclusions of this section will quantify the severity of the traffic impact and confirm whether intervention will be required to mitigate the traffic impact predicted.

### 6.2 Assessment Years and Traffic Growth

- 6.2.1 In accordance with scoping discussions with Oxfordshire County Council, it has been agreed that the following assessment years will be used for traffic impact assessment:
- 2013 / 2014 base situation;
  - 2015 year of opening;
  - 2021 Phase 1; and
  - 2025 Phase 2.
- 6.2.2 A 2013 or 2014 base assessment has been undertaken for junctions depending on the year in which they were surveyed as detailed in **Section 3**.
- 6.2.3 As detailed in **Section 5** a sensitivity assessment has also been undertaken for each future year using 85<sup>th</sup> percentile trip rates.
- 6.2.4 Background traffic growth factors have been derived using TEMPRO version 6.2, which have been adjusted with National Road Traffic Forecasts (NRTF). The following criteria have been used in the analysis:
- The development lies within the National Trip Ends Model zone for Kidlington area (zone 38UB3); and
  - The TEMPRO growth factors were adjusted using National Transport Model (NTM) data to derive highway growth figures for the weekday AM (0700-0959) and PM (1600-1859) peak periods, for the mode of car driver and all journey purposes.
- 6.2.5 The calculated growth factors are detailed in **Table 6.1** below.

Table 6.1: Tempro Growth Factors for Background Traffic

Base Year	Forecast Year	Growth Factors	
		AM	PM
2013	2015	1.01332	1.01406
2013	2021	1.10838	1.112363
2013	2025	1.17610	1.184000
2014	2015	1.00660	1.00690
2014	2021	1.10100	1.104600
2014	2025	1.16830	1.175700

- 6.2.6 The surveyed peak hour traffic flows, shown on **Figures 3.2 and 3.3**, have been adjusted using the TEMPRO growth factors above to form the base traffic flows for future year assessments.

### 6.3 Future Years and Committed Development

- 6.3.1 The following three committed developments have been factored into the assessment:
- Thames Valley Police Headquarters – Erection of a three-storey building to provide additional office space (1572sqm ) (11/01151/F);
  - Oxford Spires Business Park (Phase 3) – Construction of a new three-storey office block (4,017sqm of B1(a)) (11/01484/F); and
  - The Rookery – Site redevelopment to include 11 residential dwellings (12/01321/OUT).
- 6.3.2 Traffic flows associated with each of these developments have been included in all future year scenarios.
- 6.3.3 The estimated peak hour vehicular trip generation and distribution of the Thames Valley Police Headquarters committed development has been taken from the Transport Assessment (RPS, July 2011), submitted in support of the Police application.
- 6.3.4 The peak hour vehicular trip generation and distribution of the Oxford Spires Business Park (Phase 3) committed development has been estimated by PBA since no such information was publicly available with the planning application. Since this is an office development, the same B1(a) trip rates as have been used in this TA (**Table 5.1**) have been applied to the total committed floor space of 4,017sqm. The distribution of these trips has been undertaken using observed turning movements from the existing Oxford Spires Business Park employment site to the north of the Langford Lane / The Boulevard roundabout. This is consistent with the methodology employed for Oxford Technology Park trips as described below.
- 6.3.5 Finally, the estimated peak hour vehicular trip generation of The Rookery development has been taken from the Transport Statement (Glanville, September 2012) supporting the development. No distribution has been provided within the Transport Statement so PBA have estimated this. As a worst case, it has been assumed that all vehicular trips associated with this development impact the A4260. It has been assumed that from the junction of the A4260



with Lyne Road, one third of trips travel north on A4260 Banbury Road and two thirds south of A4260 Oxford Road. This is based on the relative attraction of these directions. From Lyne Road, the distribution of trips has been based on observed turning movements at each junction in the study area.

## 6.4 Base Case Traffic Flows

6.4.1 Predicted traffic flows generated by the identified committed development have been added to the factored background flows to generate the relevant future year base case traffic flows for the purpose of assessment.

6.4.2 **Figures 6.1 to 6.6** detail the base case traffic flows derived.

## 6.5 Development Traffic Assignment and Distribution

6.5.1 The proposed development traffic flows have been distributed onto Langford Lane in accordance with the surveyed traffic turning proportions identified for the adjacent employment site of Oxford Spires Business Park which accesses onto Langford Lane at the Boulevard roundabout. Beyond Langford Lane, existing turning proportions have been used at each of the surveyed junctions. This distribution is deemed appropriate as it is based on recently observed patterns of traffic movement in the local vicinity.

6.5.2 The distribution of the development traffic is illustrated on **Figures 5.1** and **5.2** in the AM and PM peak respectively.

6.5.3 The predicted development traffic flows have been added to the base case traffic flows to derive 'with development' traffic scenarios for the relevant future assessment years.

6.5.4 **Figures 6.7 to 6.12** detail the 'with development' traffic flows derived

## 6.6 Quantification of Development Impact

6.6.1 This section of the TA considers the net change in traffic resulting from the development proposals and how that development is predicted to impact upon local routes and junctions within the study area. This assessment establishes the proportional impact at each local junction in the study area.

6.6.2 The likely traffic impact of the development proposals has been assessed at the following local junctions:

- A44 Woodstock Road/Langford Lane signalised T-junction;
- A4260 Banbury Road/Langford Lane signalised T-junction;
- Langford Lane/Oxford Motor Park/The Boulevard roundabout;
- A4260 Oxford Road / Bicester Road signalised T-junction;
- A44 Woodstock Road / A44 Oxford Road / A4095 Bladon Road / Upper Campsfield roundabout (Bladon Roundabout); and
- A4620 Oxford Road / A4620 Frieze Way / A4165 Oxford Road / Bicester Road roundabout (Kidlington Roundabout).

6.6.3 The summary of the development impact at each junction is shown below in **Table 6.2** below.

Table 6.2: Proportional Impact of Development

Junction / Two Way Link	Development Impact on 2015 Base + Committed Development		Development Impact on 2021 Base + Committed Development		Development Impact on 2025 Base + Committed Development	
	AM	PM	AM	PM	AM	PM
A44 Woodstock Road/Langford Lane junction	1.2%	1.1%	4.7%	3.7%	5.8%	4.4%
A4260 Banbury Road/Langford Lane junction	1.4%	1.7%	5.2%	5.8%	6.5%	6.9%
Langford Lane/Oxford Motor Park/The Boulevard roundabout	1.4%	1.9%	5.4%	6.6%	6.7%	8.0%
A4260 Oxford Road / Bicester Road junction	0.9%	0.9%	3.3%	3.3%	4.1%	4.0%
Bladon Roundabout	0.5%	0.4%	1.9%	1.5%	2.4%	1.7%
Kidlington Roundabout	0.5%	0.5%	1.8%	1.6%	2.3%	2.0%

6.6.4 **Table 6.2** shows that the largest proportional development impact is at Langford Lane / Oxford Motor Park / The Boulevard roundabout junction in the PM peak at 8.0%. The impact of the development on traffic flows on the local road network then reducing the further away from the site. In particular, the impact of the development on junctions such as the Bladon and the Kidlington Roundabouts becomes negligible and below what is typically considered the daily variation of traffic at junctions of this type.

6.6.5 After consideration of the proportional impact of the development on the junctions in the study area, and for a robust assessment, further analysis has been undertaken for the six junctions examined in **Table 6.2**.

## 6.7 Junction Capacity Assessment

6.7.1 This section considers the detailed impact assessment work undertaken for each of the six off-site junctions within the study area and the proposed site access junction.

6.7.2 For the purpose of model validation, the modelled average queue (mean max queue) on each arm of each junction in both modelled peak hours has been compared with queue survey results recorded during the 2013 / 2014 traffic surveys.

6.7.3 Using validated models, the impact of the proposed development on the operation of each junction has been tested. Model results for the 'base case' and 'with development' scenarios are presented below for each future year as well as a sensitivity scenario using 85<sup>th</sup> percentile trip rates.

6.7.4 In the future year 'base case' and 'with development' scenarios each junction has been assessed in terms of its modelled capacity against the following thresholds:

- Signalised Junctions - Degree of Saturation (DOS) up to 90%; and
- Priority Junctions - Ratio of Flow to Capacity (RFC) up to 0.85.

6.7.5 In the 'sensitivity' scenarios, each junction has been assessed in terms of its modelled capacity against higher thresholds, due to the use of 85<sup>th</sup> percentile trip rates. These thresholds are as follows:

- Signalised Junctions - Degree of Saturation (DOS) up to 100%; and
- Priority Junctions - Ratio of Flow to Capacity (RFC) up to 1.00.

### A44 Woodstock Road / Langford Lane

6.7.6 A44 Woodstock Road / Langford Lane is a signalised T-junction, and as such it has been assessed using the industry standard TRANSYT (Version 15) software.

6.7.7 The eastern arm of this junction, Langford Lane, leads to the proposed development, existing employment and London-Oxford Airport. On-site observations during the peak hours were of a junction operating within capacity, with periods of queuing on the approaches during the red signal period, which cleared in the green period.

### Base Year

6.7.8 In order to provide an accurate representation of existing operational junction capacity, the model has set up using the T400 Controller works specification provided by OCC and validated using observed traffic flows and observations on site. The junction model was run using 2013 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.

6.7.9 The optimal cycle time has been determined within the TRANSYT software in the 2013 Base scenario. This cycle time is recorded within **Table 6.3** along with the Practical Reserve Capacity of the junction which is the percentage by which the arrival rate on the traffic stream with the least modelled capacity could increase before the stream would be at practical capacity.

6.7.10 **Table 6.3** also provides a comparison of the modelled queue results against surveyed queues for the purpose of model validation.

Table 6.3: A44 Woodstock Road / Langford Lane Base Year Operation – Model Validation

A44 Woodstock Road / Langford Lane						
Base Year (2013)	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	Surveyed Queue	Modelled Queue	DOS %	Surveyed Queue	Modelled Queue
<b>A44 Woodstock Road (North)</b>						
1	36%	0	2	9%	0	0
2	65%	3	7	48%	5	4
3	60%	2	8	45%	2	4
<b>Langford Lane</b>						
1	21%	0	1	54%	0	2
2	39%	2	2	60%	3	3
3	37%	2	2	56%	5	3

A44 Woodstock Road / Langford Lane						
Base Year (2013)	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	Surveyed Queue	Modelled Queue	DOS %	Surveyed Queue	Modelled Queue
<b>A44 Woodstock Road (South)</b>						
1	22%	2	2	44%	3	4
2	20%	1	2	41%	2	4
3	76%	9	10	59%	2	3
Cycle Time	77 seconds			53 seconds		
PRC	18%			51%		

DOS = Degree of Saturation, PRC = Practical Reserve Capacity, 1 = nearside lane

- 6.7.11 **Table 6.3** shows that the modelled queues for A44 Woodstock Road / Langford Lane junction are a fair representation of the observed queues, with a slight overestimation of queues in the AM peak, namely on the A44 Woodstock Road (North). The largest observed and modelled queue is on A44 Woodstock Road south right turn into Langford Lane in the AM peak, at 9 and 10 respectively. This is considered to be a robust model to assess the impact of the development in future years.
- 6.7.12 Each scenario has been assessed using the optimal cycle time as determined within the TRANSYT software. The chosen cycle time is recorded within the results tables below.
- 6.7.13 Where flared traffic streams are present on the approach to the junction, as is the case on all three arms of the A44 Woodstock Road / Langford Lane, the modelling results of the downstream traffic streams have also been reported. This is so that any queuing back, beyond the flare, can be identified.
- 6.7.14 The output of the modelling work carried out is presented in **Appendix D**.

## Opening Year

Table 6.4: 2015 – A44 Woodstock Road / Langford Lane Base Case

A44 Woodstock Road / Langford Lane						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	38%	2.01	3.45	10%	0.01	0.13
2	66%	8.00	29.66	48%	3.82	18.01
Downstream of 1+2	44%	0.18	0.72	23%	0.03	0.27
3	62%	7.93	27.59	45%	3.95	17.27
<b>Langford Lane</b>						
1	21%	1.48	3.18	54%	1.77	4.95
2	41%	1.59	39.33	60%	2.91	29.34
3	38%	1.57	38.28	56%	2.82	27.65
Downstream	17%	0.02	0.19	43%	0.85	0.76

A44 Woodstock Road / Langford Lane						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (South)</b>						
1	22%	2.23	3.73	45%	4.62	7.66
2	21%	2.05	3.64	42%	4.02	7.45
3	78%	10.69	32.42	56%	2.72	29.05
Downstream of 2+3	40%	0.13	0.56	33%	0.08	0.42
Cycle Time	78 seconds			56 seconds		
PRC	16%			50%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.5: 2015 – A44 Woodstock Road / Langford Lane 'With Development' Scenario

A44 Woodstock Road / Langford Lane						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	40%	2.19	3.80	10%	0.01	0.13
2	67%	8.13	30.54	48%	3.82	18.01
Downstream of 1+2	45%	0.19	0.75	23%	0.03	0.27
3	63%	8.07	28.36	45%	3.95	17.27
<b>Langford Lane</b>						
1	21%	1.48	3.25	56%	1.82	5.30
2	42%	1.65	40.26	62%	3.05	30.19
3	39%	1.62	39.11	58%	2.96	28.31
Downstream	18%	0.02	0.19	44%	0.89	0.8
<b>A44 Woodstock Road (South)</b>						
1	22%	2.23	3.68	45%	4.62	7.66
2	21%	2.05	3.59	42%	4.02	7.45
3	78%	11.03	32.47	57%	2.74	29.16
Downstream of 2+3	40%	0.14	0.58	33%	0.08	0.42
Cycle Time	79 seconds			56 seconds		
PRC	15%			45%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.15 **Tables 6.4** and **6.5** show that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2015 Base and 2015 'with development'.

6.7.16 The maximum DOS in both the 2015 Base and 2015 Base 'with development' scenario is 78% on Woodstock Road south in the offside lane in the AM peak. There is a slight increase in

mean max queue and average delay per PCU on this lane in the 'with development' scenario'. However, the impact of the proposed development on the operation of the junction is not considered severe. The longest average delay per PCU of 40.26 seconds occurs on Langford Lane in the AM peak for those travelling north in the nearside lane and overall the increase in delay due to the proposed development is less than 1 second on each lane.

Table 6.6: 2015 – A44 Woodstock Road / Langford Lane 'With Development' Sensitivity Scenario

A44 Woodstock Road / Langford Lane						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	40%	2.22	3.84	10%	0.01	0.13
2	67%	8.13	30.54	48%	3.82	18.01
Downstream of 1+2	45%	0.19	0.75	23%	0.03	0.27
3	63%	8.07	28.36	45%	3.95	17.27
<b>Langford Lane</b>						
1	21%	1.48	3.28	57%	1.87	5.49
2	42%	1.65	40.26	63%	3.12	30.58
3	39%	1.62	39.11	59%	3.02	28.61
Downstream	18%	0.02	0.19	45%	0.91	0.83
<b>A44 Woodstock Road (South)</b>						
1	22%	2.23	3.68	45%	4.62	7.66
2	21%	2.05	3.59	42%	4.02	7.45
3	79%	11.13	32.76	57%	2.76	29.27
Downstream of 2+3	41%	0.14	0.58	33%	0.08	0.42
Cycle Time	79 seconds			56 seconds		
PRC	14%			43%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.17 **Table 6.6** shows that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2015 'with development' sensitivity scenario.

6.7.18 The maximum DOS in the 2015 'with development' sensitivity scenario is 79% on Woodstock Road south in the offside lane in the AM peak. This confirms that the proposed development would not have a severe impact on the operation of the junction in the 2015 opening year, with predicted increases in delay of the order of 1 second at worst.

## Phase 1

Table 6.7: 2021 – A44 Woodstock Road / Langford Lane Base Case

A44 Woodstock Road / Langford Lane						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	42%	3.06	4.50	11%	0.01	0.14
2	71%	9.58	32.76	53%	4.23	18.83
Downstream of 1+2	48%	0.23	0.85	25%	0.04	0.30
3	67%	9.37	30.06	49%	4.45	17.91
<b>Langford Lane</b>						
1	23%	1.48	4.17	62%	2.21	7.00
2	47%	1.92	44.62	65%	3.30	31.71
3	44%	1.88	43.06	62%	3.18	29.45
Downstream	19%	0.02	0.21	47%	0.96	0.88
<b>A44 Woodstock Road (South)</b>						
1	24%	2.45	3.61	49%	5.26	8.12
2	22%	2.25	3.52	46%	4.84	7.89
3	81%	12.69	35.38	62%	3.09	31.10
Downstream of 2+3	43%	0.17	0.66	36%	0.10	0.48
Cycle Time	83 seconds			56 seconds		
PRC	11%			37%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.8: 2021 – A44 Woodstock Road / Langford Lane 'With Development' Scenario

A44 Woodstock Road / Langford Lane						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	49%	4.01	6.13	11%	0.01	0.15
2	76%	10.22	37.28	56%	4.78	21.04
Downstream of 1+2	51%	0.27	0.96	25%	0.04	0.31
3	71%	10.06	33.67	52%	4.78	19.96



A44 Woodstock Road / Langford Lane						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>Langford Lane</b>						
1	24%	1.49	4.41	65%	2.66	7.96
2	51%	2.09	47.31	64%	3.65	30.12
3	48%	2.05	45.45	60%	3.54	28.21
Downstream	20%	0.14	0.24	53%	1.98	1.22
<b>A44 Woodstock Road (South)</b>						
1	23%	2.45	3.53	50%	5.75	9.03
2	22%	2.25	3.44	47%	5.15	8.79
3	84%	14.68	36.60	60%	3.36	30.83
Downstream of 2+3	46%	0.20	0.74	36%	0.10	0.48
Cycle Time	85 seconds			59 seconds		
PRC	7%			39%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.19 **Tables 6.7** and **6.8** show that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2021 Base and 2021 'with development' scenarios.

6.7.20 The maximum DOS in the 2021 Base scenario is 81% on Woodstock Road south in the offside lane in the AM peak. The maximum DOS in the 'with development' scenario occurs in the same lane, at 84%. The longest average delay per PCU of 47.31 seconds occurs on Langford Lane in the AM peak for those travelling north in the nearside lane. Again, it is considered that the proposed development would not have a severe impact on the operation of the junction in the 2021 Phase 1 scenario, with delay predicted on the lanes at the junction increasing by only a few seconds and reducing in some cases.

Table 6.9: 2021 – A44 Woodstock Road / Langford Lane 'With Development' Sensitivity Scenario

A44 Woodstock Road / Langford Lane						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	51%	4.70	6.61	11%	0.01	0.15
2	77%	10.41	38.46	58%	4.83	21.87
Downstream of 1+2	52%	0.28	0.98	25%	0.04	0.31
3	72%	10.35	34.61	54%	4.81	20.65

A44 Woodstock Road / Langford Lane						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>Langford Lane</b>						
1	25%	1.49	4.60	68%	2.95	8.98
2	54%	2.29	49.67	66%	3.81	30.39
3	51%	2.23	47.42	62%	3.68	28.28
Downstream	21%	0.15	0.26	56%	2.12	1.36
<b>A44 Woodstock Road (South)</b>						
1	23%	2.45	3.49	51%	5.76	9.22
2	22%	2.25	3.40	47%	5.16	8.97
3	85%	14.98	36.60	60%	3.34	30.04
Downstream of 2+3	50%	2.17	0.95	36%	0.10	0.49
Cycle Time	86 seconds			58 seconds		
PRC	6%			32%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.21 **Table 6.9** shows that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2021 'with development' sensitivity scenario. It also confirms that the development would not have a severe impact on the operation of the junction in the 2021 Phase 1 scenario.

6.7.22 The maximum DOS in the 2021 'with development' sensitivity scenario is 85% on Woodstock Road south in the offside lane in the AM peak. The longest average delay per PCU of 49.67 seconds occurs on Langford Lane in the AM peak for those travelling north in the nearside lane.

## Phase 2

Table 6.10: 2025 – A44 Woodstock Road / Langford Lane Base Case

A44 Woodstock Road / Langford Lane						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	46%	3.65	5.49	11%	0.01	0.15
2	74%	10.67	35.54	56%	4.97	20.34
Downstream of 1+2	51%	0.27	0.96	27%	0.05	0.33
3	70%	10.81	32.27	53%	5.08	19.24
<b>Langford Lane</b>						
1	24%	1.52	5.06	64%	2.61	8.16
2	53%	2.23	50.33	67%	3.66	32.80

A44 Woodstock Road / Langford Lane						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
3	50%	2.18	48.17	63%	3.53	30.43
Downstream	20%	0.14	0.24	51%	1.59	1.11
<b>A44 Woodstock Road (South)</b>						
1	25%	2.60	3.48	52%	5.96	8.69
2	23%	2.39	3.39	48%	5.32	8.45
3	83%	14.34	37.22	62%	3.50	31.66
Downstream of 2+3	46%	0.20	0.73	38%	0.12	0.53
Cycle Time	88 seconds			59 seconds		
PRC	8%			35%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.11: 2025 – A44 Woodstock Road / Langford Lane 'With Development' Scenario

A44 Woodstock Road / Langford Lane						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	55%	5.52	8.02	12%	0.01	0.16
2	80%	11.55	41.70	59%	5.33	22.67
Downstream of 1+2	58%	3.13	1.45	27%	0.05	0.34
3	75%	11.75	37.10	55%	5.42	21.36
<b>Langford Lane</b>						
1	25%	1.69	5.38	69%	3.77	9.98
2	59%	2.55	55.53	67%	4.16	32.10
3	55%	2.47	52.57	63%	4.02	29.87
Downstream	22%	0.15	0.26	58%	2.83	1.62
<b>A44 Woodstock Road (South)</b>						
1	24%	2.59	3.37	53%	6.48	9.62
2	23%	2.38	3.28	49%	6.11	9.38
3	87%	15.82	39.39	61%	3.69	31.84
Downstream of 2+3	56%	6.21	2.20	39%	0.12	0.54
Cycle Time	91 seconds			62 seconds		
PRC	3%			30%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.23 **Tables 6.10** and **6.11** show that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2025 Base and 2025 'with development'. The

optimum cycle time increases in order to deal with the higher volume of traffic predicted at the junction. However, the PRC values remain positive and the increase in delay on the approaches to the junction as a result of development remains of the order of only a few second. As a result, it is considered that the proposed development will not have a severe impact on the operation of the junction in the 2025 Phase 2 scenario.

- 6.7.24 The maximum DOS in both scenarios occurs on Woodstock Road south in the offside lane in the AM peak at 83% in 2025 Base and 87% in the 'with development' scenario. The longest average delay per PCU of 55.53 seconds occurs on Langford Lane in the AM peak for those travelling north in the nearside lane, in line with the increase in cycle time.

Table 6.12: 2025 – A44 Woodstock Road / Langford Lane 'With Development' Sensitivity Scenario

A44 Woodstock Road / Langford Lane						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A44 Woodstock Road (North)</b>						
1	57%	6.26	8.47	12%	0.01	0.16
2	82%	11.81	44.00	60%	5.45	23.47
Downstream of 1+2	59%	3.20	1.50	27%	0.05	0.34
3	77%	11.90	38.57	56%	5.54	22.08
<b>Langford Lane</b>						
1	27%	1.85	5.62	72%	4.23	11.23
2	63%	2.82	57.97	68%	4.41	31.57
3	59%	2.72	54.32	64%	4.26	29.40
Downstream	24%	0.3	0.32	62%	3.41	1.86
<b>A44 Woodstock Road (South)</b>						
1	24%	2.60	3.40	54%	6.66	10.19
2	23%	2.38	3.32	50%	6.28	9.95
3	89%	16.32	40.99	63%	3.85	33.24
Downstream of 2+3	58%	7.26	2.6	39%	0.12	0.54
Cycle Time	90 seconds			63 seconds		
PRC	1%			24%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.25 **Table 6.12** shows that the A44 Woodstock Road / Langford Lane junction is predicted to operate within capacity in the 2025 'with development' sensitivity scenario. The maximum DOS occurs on Woodstock Road south in the offside lane in the AM peak at 89%. In addition, the table confirms that the proposed development would have a negligible impact on the operation of the junction in the 2025 Phase 2 scenario.

#### A44 Woodstock Road / Langford Lane Summary

- 6.7.26 In every future year scenario the A44 Woodstock Road south offside lane is predicted to operate with the least capacity, in the AM peak. The reduction in capacity of this lane is a

reflection of the increase in right turning traffic from A44 Woodstock Road south onto Langford Lane, both due to growth in background traffic and that of the proposed development.

- 6.7.27 As traffic increases in future year scenarios, there is a corresponding, albeit modest, increase in delay, particularly for Langford Lane right turning traffic onto A44 Woodstock Road north.
- 6.7.28 Nonetheless the junction is predicted to operate within capacity in each future year scenario, including the sensitivity scenarios. The predicted PRC values in every runs remains positive which indicate that the junction is predicted to be able to handle the development traffic. Furthermore, the optimum cycle times predicted by the models remain within typical levels of around 90 seconds, indicating that even if PRC values decline as background traffic increases and development traffic is added, delays at the junction will not significantly increase.
- 6.7.29 As a result, it is concluded that the proposed development will not have a severe impact on the operation of the junction in any of the future year scenarios considered.

### A4260 Banbury Road / Langford Lane

- 6.7.30 A4260 Banbury Road / Langford Lane is a signalised junction, and as such it has been assessed using the industry standard TRANSYT (Version 15) software.
- 6.7.31 A4260 Banbury Road / Langford Lane is a three arm junction, its western arm leading to the proposed development, existing employment and London-Oxford Airport on Langford Lane. On-site observations during the peak hours were of a junction operating within capacity with periods of queuing on the approaches during the red period, which largely cleared in the green period.
- 6.7.32 The A4260 Banbury Road / Langford Lane junction currently operates by MOVA such that it operates to minimise delay and the green times given to each stage will be altered dependent on the flow arriving at the junction.

### Base Year

- 6.7.33 In order to provide an accurate representation of existing operational junction capacity, the model has been set up using the signal specification provided by OCC and validated using observed traffic flows and observations on site. The junction model was run using 2013 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.
- 6.7.34 The optimal cycle time has been determined within the TRANSYT software in the 2013 Base scenario. This cycle time is recorded within **Table 6.13** along with the Practical Reserve Capacity of the junction.
- 6.7.35 **Table 6.13** also provides a comparison of the modelled queue results against surveyed queues for the purpose of model validation.
- 6.7.36 The AM peak period has been modelled with three stages, one of which provides additional green time for right turning traffic into Langford Lane from A4260 Banbury Road North. The PM peak has been modelled with only two stages since the right turning flow from the north is, in an average cycle, not of a significant magnitude to necessitate the additional stage. This staging methodology is considered appropriate following a review of the video footage of the junction.

Table 6.13: A4260 Banbury Road / Langford Lane Base Year Operation – Model Validation

A4260 Banbury Road / Langford Lane						
Base Year (2013)	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	Surveyed Queue	Modelled Queue	DOS %	Surveyed Queue	Modelled Queue
A4260 Banbury Road (North)						
1	42%	2	3	39%	3	2
2	64%	4	5	8%	1	1
Right turn storage	40%			6%		
Langford Lane						
1	13%	1	1	47%	4	3
2	71%	4	4	68%	4	5
A44 Woodstock Road (South)						
1	50%	2	3	23%	3	1
2	53%	4	3	65%	1	5
Cycle Time	42 seconds			41 seconds		
PRC	27%			33%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.37 **Table 6.13** shows that the modelled queues for the A4260 Banbury Road / Langford Lane junction are an accurate representation of the observed queues, with a small amount of queuing on each arm in both peak periods. This is considered to be a robust model to assess the impact of the development in future years.
- 6.7.38 Each scenario has been assessed using the optimal cycle time as determined within the TRANSYT software. The chosen cycle time is recorded within the results tables below.
- 6.7.39 Where flared traffic streams are present on the approach to the junction, as is the case on all three arms of the A4260 Banbury Road / Langford Lane, the modelling results of the downstream traffic streams have also been reported. This is so that any queuing back, beyond the flare, can be identified. Additionally for the A4260 Banbury Road north, results are presented for the right turn storage which is in front of the stop line for traffic waiting to turn into Langford Lane.
- 6.7.40 The output of the modelling work carried out is presented in **Appendix D**.

## Opening Year

Table 6.14: 2015 – A4260 Banbury Road / Langford Lane Base Case

A4260 Banbury Road / Langford Lane						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	43%	3.13	8.11	41%	2.35	11.77
2	68%	3.66	15.33	8%	0.40	9.01
Downstream	43%	0.16	0.70	17%	0.02	0.19
Right turn storage	43%	2.15	5.72	6%	0.53	9.30
<b>A4260 Banbury Road (South)</b>						
1	52%	3.19	5.97	23%	1.48	1.02
2	54%	3.22	17.48	70%	5.14	17.19
Downstream	42%	0.15	0.68	42%	0.15	0.69
<b>Langford Lane</b>						
1	13%	1.46	12.43	49%	2.75	11.26
2	72%	4.23	23.73	70%	4.70	15.64
Downstream	21%	0.03	0.25	44%	0.18	0.74
Cycle Time	42 seconds			40 seconds		
PRC	25%			29%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.15: 2015 – A4260 Banbury Road / Langford Lane 'With Development' Scenario

A4260 Banbury Road / Langford Lane						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	43%	3.13	8.11	40%	2.49	12.12
2	70%	3.82	16.14	8%	0.43	9.44
Downstream	44%	0.17	0.72	17%	0.02	0.19
Right turn storage	44%	2.16	5.79	6%	0.56	9.89
<b>A4260 Banbury Road (South)</b>						
1	54%	3.36	6.13	23%	1.48	0.94
2	54%	3.22	17.48	67%	5.24	16.97



A4260 Banbury Road / Langford Lane						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
Downstream	43%	0.16	0.70	42%	0.16	0.69
<b>Langford Lane</b>						
1	13%	1.46	12.45	49%	3.27	11.96
2	73%	4.27	23.95	71%	5.54	16.57
Downstream	21%	0.03	0.25	46%	0.19	0.79
Cycle Time	42 seconds			44 seconds		
PRC	24%			28%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.41 **Tables 6.14** and **6.15** show that the A4260 Banbury Road / Langford Lane junction is predicted to operate within capacity in the 2015 Base and 2015 'with development'.
- 6.7.42 The maximum DOS in the 2015 Base scenario is 72% on Langford Lane in the offside (right turn) lane in the AM peak. A maximum DOS of 73% is predicted for the same lane in the 2015 'with development' scenario. Similarly there are minimal increases in mean max queue and average delay per PCU predicted in the 'with development' scenario. On that basis, it is considered that the proposed development does not have a severe impact on the operation of the junction.

Table 6.16: 2015 – A4260 Banbury Road / Langford Lane 'With Development' Sensitivity Scenario

A4260 Banbury Road / Langford Lane						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	43%	3.13	8.11	43%	2.44	12.41
2	70%	3.85	16.38	8%	0.42	9.47
Downstream	44%	0.17	0.72	17%	0.02	0.20
Right turn storage	44%	2.17	5.79	6%	0.56	9.78
<b>A4260 Banbury Road (South)</b>						
1	54%	3.27	6.15	23%	1.48	1.00
2	54%	3.22	17.48	71%	5.32	18.85
Downstream	43%	0.16	0.70	42%	0.16	0.69

A4260 Banbury Road / Langford Lane						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>Langford Lane</b>						
1	13%	1.46	12.45	49%	3.16	11.15
2	73%	4.32	24.17	71%	5.36	15.70
Downstream	21%	0.03	0.25	47%	0.20	0.82
Cycle Time	42 seconds			41 seconds		
PRC	23%			26%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.43 **Table 6.16** shows that the A4260 Banbury Road / Langford Lane junction is predicted to operate within capacity in the 2015 'with development' sensitivity scenario. It also confirms that the development will not have a severe impact on the operation of the junction in the 2015 scenario.

6.7.44 The maximum DOS in the 2015 sensitivity scenario is 73% on Langford Lane in the offside (right turn) lane in the AM peak.

### Phase 1

Table 6.17: 2021 – A4260 Banbury Road / Langford Lane Base Case

A4260 Banbury Road / Langford Lane						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	47%	3.41	8.55	44%	3.07	12.59
2	76%	4.32	19.03	8%	0.47	9.46
Downstream	47%	0.21	0.82	19%	0.02	0.22
Right turn storage	48%	2.21	6.00	7%	0.64	11.14
<b>A4260 Banbury Road (South)</b>						
1	57%	3.45	6.53	25%	1.49	0.99
2	59%	3.41	18.62	73%	6.00	19.18
Downstream	46%	0.19	0.80	46%	0.20	0.20
<b>Langford Lane</b>						
1	14%	1.46	12.56	52%	3.47	12.35
2	79%	5.04	28.06	74%	6.04	18.04
Downstream	23%	0.03	0.28	48%	0.23	0.88

A4260 Banbury Road / Langford Lane						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
Cycle Time	42 seconds			44 seconds		
PRC	14%			21%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.18: 2021 – A4260 Banbury Road / Langford Lane 'With Development' Scenario

A4260 Banbury Road / Langford Lane						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	46%	3.52	8.62	47%	3.11	13.76
2	76%	4.82	19.28	9%	1.45	10.19
Downstream	49%	0.24	0.90	19%	0.02	0.22
Right turn storage	52%	2.28	5.78	8	0.68	11.30
<b>A4260 Banbury Road (South)</b>						
1	67%	5.04	9.59	26%	1.49	1.02
2	70%	4.08	25.52	78%	6.52	22.67
Downstream	49%	0.23	0.89	47%	0.21	0.83
<b>Langford Lane</b>						
1	14%	1.46	13.27	55%	3.77	12.09
2	80%	5.55	30.01	79%	6.83	19.17
Downstream	24%	0.04	0.29	56%	1.22	1.24
Cycle Time	45 seconds			44 seconds		
PRC	12%			14%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.45 **Tables 6.17** and **6.18** show that the A4260 Banbury Road / Langford Lane is predicted to operate within capacity in the 2021 Base and 2021 'with development' scenario. The maximum DOS in the 2021 Base scenario is 79% on Langford Lane in the offside lane in the AM peak. The maximum DOS in the 2021 'with development' scenario occurs in the same peak and lane, and increases to 80%, with minimal increase in queue and delay. As a result it is considered that the development will not have a severe impact on the operation of the junction in the 2021 Phase 1 scenario.

Table 6.19: 2021 – A4260 Banbury Road / Langford Lane 'With Development' Sensitivity Scenario

A4260 Banbury Road / Langford Lane						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	47%	4.16	10.55	48%	3.32	15.25
2	86%	7.17	31.57	10%	1.45	11.39
Downstream	50%	0.25	0.92	19%	0.02	0.22
Right turn storage	57%	2.37	6.68	8%	0.76	12.23
<b>A4260 Banbury Road (South)</b>						
1	61%	5.05	7.99	25%	1.49	0.96
2	64%	4.38	25.33	80%	7.50	25.48
Downstream	49%	0.24	0.92	47%	0.21	0.84
<b>Langford Lane</b>						
1	13%	1.46	13.73	55%	4.09	11.93
2	71%	5.75	24.06	79%	7.12	18.49
Downstream	25%	0.04	0.31	63%	3.60	2.13
Cycle Time	54 seconds			48 seconds		
PRC	5%			12%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.46 **Table 6.19** shows that the A4260 Banbury Road / Langford Lane junction is predicted to operate within capacity in the 2021 'with development' sensitivity scenario. The maximum increase in DOS as a result of development is predicted to be on the A4260 Banbury Road north in the offside lane in the AM peak, with a predicted average delay per PCU of 31.57 seconds but a DOS of 86% suggesting that all traffic clears the junction within a cycle. The increased delay is reflective of the predicted increase in cycle time and as a result, it is considered that the impact of the proposed development will not be severe in the 2021 Phase 1 scenario.

## Phase 2

Table 6.20: 2025 – A4260 Banbury Road / Langford Lane Base Case

A4260 Banbury Road / Langford Lane						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	45%	4.11	8.88	47%	3.17	12.96
2	79%	5.31	24.12	9%	1.45	9.50
Downstream	50%	0.25	0.92	20%	0.03	0.24
Right turn storage	54%	2.32	7.21	8%	0.70	11.78
<b>A4260 Banbury Road (South)</b>						
1	56%	4.75	7.15	26%	1.50	1.04
2	54%	4.18	19.93	78%	6.67	21.39
Downstream	49%	0.23	0.89	49%	0.24	0.91
<b>Langford Lane</b>						
1	15%	1.46	16.31	55%	3.72	12.88
2	82%	6.96	35.16	79%	6.73	20.32
Downstream	24%	0.04	0.30	51%	0.27	0.99
Cycle Time	56 seconds			44 seconds		
PRC	10%			14%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.21: 2025 – A4260 Banbury Road / Langford Lane 'With Development' Scenario

A4260 Banbury Road / Langford Lane						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	45%	4.11	8.88	49%	3.53	15.16
2	87%	7.66	32.25	10%	1.45	11.20
Downstream	53%	0.30	1.04	20%	0.03	0.24
Right turn storage	62%	2.50	7.74	9%	0.84	13.02

A4260 Banbury Road / Langford Lane						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (South)</b>						
1	65%	5.63	9.03	27%	1.50	0.99
2	58%	4.34	21.56	82%	8.09	26.28
Downstream	52%	0.29	1.03	50%	0.25	0.94
<b>Langford Lane</b>						
1	16%	1.46	16.38	57%	4.33	12.74
2	86%	7.95	40.76	82%	7.60	20.95
Downstream	26%	0.18	0.33	67%	5.39	2.97
Cycle Time	56 seconds			49 seconds		
PRC	3%			10%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.47 **Tables 6.20 and 6.21** show that A4260 Banbury Road / Langford Lane is predicted to operate within capacity in the 2025 Base and 2025 'with development'.
- 6.7.48 The maximum DOS in the 2025 Base scenarios occurs on Langford Lane offside lane at 82% in the AM peak and in the 2025 'with development' scenario on A4260 Banbury Road north in the offside lane at 87%. The longest average delay per PCU of 40.76 seconds occurs in the 'with development' scenario on Langford Lane in the AM peak for those travelling south in the offside lane.
- 6.7.49 Overall, the predicted increases in queues and delays at the junction as a result of development remain modest and the junction is able to accommodate predicted future flows. As a result, it is considered that the impact of the proposed development on the operation of the junction in the 2025 Phase 2 scenario will not be severe.

Table 6.22: 2025 – A4260 Banbury Road / Langford Lane 'With Development' Sensitivity Scenario

A4260 Banbury Road / Langford Lane						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (North)</b>						
1	47%	4.62	9.64	51%	3.74	16.55
2	91%	9.26	40.91	11%	1.46	12.16
Downstream	54%	0.31	1.07	20%	0.03	0.24
Right turn storage	64%	2.57	7.90	9%	0.89	13.15

A4260 Banbury Road / Langford Lane						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Banbury Road (South)</b>						
1	66%	5.83	9.37	27%	1.50	0.97
2	62%	4.52	23.52	85%	8.92	30.94
Downstream	53%	0.30	1.07	50%	0.26	0.96
<b>Langford Lane</b>						
1	16%	1.46	15.61	58%	4.41	12.32
2	87%	8.26	39.49	84%	7.89	21.14
Downstream	30%	1.09	0.59	75%	8.48	4.85
Cycle Time	56 seconds			51 seconds		
PRC	-1%			6%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

- 6.7.50 **Table 6.22** shows that the A4260 Banbury Road / Langford Lane junction is predicted to operate within capacity in the 2025 'with development' sensitivity scenario. The maximum DOS occurs on A4260 Banbury Road north in the offside lane in the AM peak at 91%. The junction would still be able to accommodate development even in the sensitivity test conditions. This confirms that the impact of the proposed development will not be severe in the 2025 Phase 2 scenario.

#### A4260 Banbury Road / Langford Lane Summary

- 6.7.51 In every future year scenario the A4260 Banbury Road north offside lane or Langford Lane offside Lane are predicted to operate with the least capacity, in the AM peak, but still within capacity.
- 6.7.52 As traffic increases in future year scenarios, there is a corresponding increase in delay and queuing, particularly for traffic in these two lanes, commensurate to the predicted increase in cycle time advocated by the model optimisation process.
- 6.7.53 Nonetheless the A4260 Banbury Road / Langford lane junction is predicted to operate within capacity in each future year scenario, including the sensitivity scenarios. The proposed development will lead to minimal increases in delay, and in the worst instances lanes are still predicted to operate within capacity. In this context, it is concluded that the proposed development will not have a severe impact on the operation of the junction.

#### Langford Lane / The Boulevard

- 6.7.54 Langford Lane / Oxford Motor Park / The Boulevard junction is a roundabout, and as such it has been assessed using the industry standard Junctions 8 software.



- 6.7.55 The roundabout is a four arm junction with the northern and southern arms providing access to large employment sites. On-site observations were of a junction operating within capacity with short periods of queuing on the approaches in the peak hours, which cleared quickly.

#### 2013 Base Year

- 6.7.56 In order to provide an accurate representation of existing operational junction capacity, the model has been validated using observed traffic flows and observations on site. The junction model was run using 2013 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.
- 6.7.57 A comparison of the modelled queue results are shown against surveyed queues in **Table 6.23**.

Table 6.23: Langford Lane / Oxford Motor Park / The Boulevard Base Year Operation – Model Validation

Langford Lane / Oxford Motor Park / The Boulevard				
Base Year (2013)	AM Peak (07:45 – 08:45)		PM Peak (16:30 – 17:30)	
Lane	Surveyed Queue	Modelled Queue	Surveyed Queue	Modelled Queue
Langford Lane (East)	0	1	1	1
Oxford Motor Parks Access Road	0	0	0	0
Langford Lane (West)	1	2	0	0
The Boulevard	0	0	1	1

- 6.7.58 **Table 6.23** shows that the modelled queues for Langford Lane / Motor Oxford Park / The Boulevard roundabout are an accurate representation of the observed queues, with minimal queuing on each arm in both peak periods. This is considered to be a robust model to assess the impact of the development in future years.
- 6.7.59 Using the validated model, the impact of the proposed development on the operation of the junction has been tested. Model results for the 'base case' and 'with development' scenarios are presented below for each future year considered.
- 6.7.60 The output of the modelling work carried out is presented in **Appendix D**.

## Opening Year

Table 6.24: 2015 – Langford Lane / Oxford Motor Park / The Boulevard Base Case

Langford Lane / Oxford Motor Park / The Boulevard						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.51	1.04	4.66	0.41	0.70	4.34
Oxford Motor Parks Access Road	0.05	0.05	2.91	0.11	0.12	3.36
Langford Lane (West)	0.71	2.44	8.08	0.20	0.25	2.65
The Boulevard	0.14	0.17	4.40	0.55	1.20	5.49

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.25: 2015 – Langford Lane / Oxford Motor Park / The Boulevard 'With Development' Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.53	1.11	4.82	0.42	0.71	4.35
Oxford Motor Parks Access Road	0.05	0.05	2.95	0.11	0.12	3.37
Langford Lane (West)	0.71	2.46	8.12	0.22	0.28	2.69
The Boulevard	0.14	0.17	4.40	0.56	1.24	5.67

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.61 **Tables 6.24** and **6.25** show that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within capacity in the 2015 Base and 2015 'with development'. They show that the proposed development would not have a severe impact on the operation of the junction in the 2015 opening year case.

6.7.62 The maximum RFC in the 2015 Base and 2015 Base 'with development' scenarios is 0.71 on Langford Lane west in the AM peak.

Table 6.26: 2015 – Langford Lane / Oxford Motor Park / The Boulevard 'With Development' Sensitivity Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.53	1.12	4.84	0.42	0.71	4.36
Oxford Motor Parks Access Road	0.05	0.05	2.96	0.11	0.12	3.37
Langford Lane (West)	0.72	2.49	8.19	0.23	0.29	2.72
The Boulevard	0.14	0.17	4.41	0.56	1.26	5.77

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.63 **Table 6.26** shows that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within capacity in the 2015 'with development' sensitivity scenario, with the maximum RFC of 0.72 occurring on Langford Lane west in the AM peak. It confirms that the impact of the development on the operation of the junction will not be severe in the 2015 opening year case.

### Phase 1

Table 6.27: 2021 – Langford Lane / Oxford Motor Park / The Boulevard Base Case

Langford Lane / Oxford Motor Park / The Boulevard						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.56	1.27	5.24	0.46	0.85	4.81
Oxford Motor Parks Access Road	0.05	0.05	3.04	0.13	0.15	3.61
Langford Lane (West)	0.79	3.72	11.41	0.22	0.28	2.73
The Boulevard	0.16	0.19	4.67	0.60	1.52	6.39

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.28: 2021 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.63	1.69	6.20	0.47	0.89	4.91
Oxford Motor Parks Access Road	0.06	0.06	3.25	0.13	0.15	3.65
Langford Lane (West)	0.80	3.97	12.06	0.29	0.40	2.94
The Boulevard	0.16	0.20	4.72	0.64	1.77	7.44

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

- 6.7.64 **Tables 6.27 and 6.28** show that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within capacity in the 2021 Base and 2021 ‘with development’.
- 6.7.65 The maximum RFC in the 2021 Base scenario is 0.79 on Langford Lane west in the AM peak. This increases to 0.80 in the 2021 Base ‘with development’ scenario. Predicted increases in delay would remain within a second and as a result the impact of development is considered not severe in the 2021 Phase 1 case.

Table 6.29: 2021 – Langford Lane / Oxford Motor Park / The Boulevard ‘With Development’ Sensitivity Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.69	2.22	7.44	0.48	0.90	4.98
Oxford Motor Parks Access Road	0.06	0.06	3.45	0.13	0.15	3.66
Langford Lane (West)	0.82	4.39	13.18	0.32	0.48	3.07
The Boulevard	0.17	0.20	4.80	0.66	1.94	8.17

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

- 6.7.66 **Table 6.29** shows that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within capacity in the 2021 ‘with development’ sensitivity scenario, with the maximum RFC of 0.82 occurring on Langford Lane west in the AM peak. These results also confirm that the impact of development on the operation of the junction will not be severe in the 2021 Phase 1 scenario.

## Phase 2

Table 6.30: 2025 – Langford Lane / Oxford Motor Park / The Boulevard Base Case

Langford Lane / Oxford Motor Park / The Boulevard						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.60	1.47	5.73	0.50	0.98	5.23
Oxford Motor Parks Access Road	0.06	0.06	3.16	0.14	0.17	3.81
Langford Lane (West)	0.85	5.48	16.09	0.24	0.31	2.80
The Boulevard	0.18	0.21	4.87	0.65	1.83	7.29

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.31: 2025 – Langford Lane / Oxford Motor Park / The Boulevard 'With Development' Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.68	2.06	7.11	0.51	1.03	5.38
Oxford Motor Parks Access Road	0.06	0.07	3.41	0.14	0.17	3.86
Langford Lane (West)	0.87	6.08	17.71	0.31	0.45	3.05
The Boulevard	0.18	0.22	4.94	0.69	2.22	8.86

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.67 **Tables 6.30 and 6.31** show that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate at or slightly above the capacity assessment threshold of 0.85 for priority junctions, in the 2025 Base and 2025 'with development' scenarios.

6.7.68 The maximum RFC in the 2025 Base scenario is 0.85 on Langford Lane west in the AM peak. This increases to 0.87 in the 2025 Base 'with development' scenario. However, the development does not lead to significant increases in queues or delay (less than 2 seconds on the most affected arm). Therefore, it is considered that the proposed development will not have a severe impact on the operation of the junction in the 2025 Phase 2 scenario.

Table 6.32: 2025 – Langford Lane / Oxford Motor Park / The Boulevard 'With Development' Sensitivity Scenario

Langford Lane / Oxford Motor Park / The Boulevard						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Langford Lane (East)	0.71	2.40	7.88	0.52	1.07	5.54
Oxford Motor Parks Access Road	0.06	0.07	3.53	0.14	0.17	3.90
Langford Lane (West)	0.90	7.74	22.29	0.37	0.58	3.29
The Boulevard	0.18	0.22	5.10	0.73	2.66	10.69

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

- 6.7.69 **Table 6.32** shows that the Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within the capacity assessment threshold for sensitivity scenarios (RFC less than or equal to 1.0) in the 2025 'with development' sensitivity scenario. A maximum RFC of 0.90 occurs on Langford Lane west in the AM peak. However, the predicted increase in queue on this arm is limited to 2.16 pcus and the related increase in delay is 6.2 seconds. Therefore, this confirms that even in the extremely robust assessment using 85<sup>th</sup> percentile traffic generation assumptions, the impact of development will not be severe at this junction.

#### Langford Lane / Oxford Motor Park / The Boulevard Summary

- 6.7.70 The Langford Lane / Oxford Motor Park / The Boulevard junction is predicted to operate within or at capacity in each future year scenario. The predicted increases in queues and delay as a result of the proposed development are modest and as a result it is considered that the impact of the proposed development on the operation of the junction is not severe.

#### A44 / A4095 Roundabout

- 6.7.71 A44 / A4095 is a roundabout junction, and as such it has been assessed using the industry standard Junctions 8 software.
- 6.7.72 The roundabout is a four arm junction providing access to the villages of Woodstock to the north and Bladon to the west. On-site observations during the AM peak were of a junction operating within capacity with short periods of queuing on the approaches in the peak hours, which cleared quickly. During the PM peak, longer queues were observed on the A44 Woodstock Road (northbound) arm as traffic headed away from Oxford/Kidlington to the surrounding villages.

#### 2014 Base Year

- 6.7.73 In order to provide an accurate representation of existing operational junction capacity, the model has been validated using observed traffic flows and observations on site. The junction model was run using 2014 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.

6.7.74 A comparison of the modelled queue results are shown against surveyed queues in **Table 6.33**.

Table 6.33: A44 / A4095 Base Year Operation – Model Validation

A44 / A4095				
Base Year (2014)	AM Peak (07:45 – 08:45)		PM Peak (16:30 – 17:30)	
Lane	Surveyed Queue	Modelled Queue	Surveyed Queue	Modelled Queue
A4095 Upper Campsfield	5	4	4	2
A44 Woodstock Road	4	1	15	14
A4095 Bladon Road	6	3	2	1
A44 Oxford Road	7	4	2	1

6.7.75 **Table 6.33** shows that the modelled queues for A44 / A4095 roundabout are an accurate representation of the observed queues with minimal queuing on each arm apart from the A44 Woodstock Road in the PM peak which the model closely reflects. Therefore, this is considered to be a robust model to assess the impact of the development in future years.

6.7.76 Using the validated model, the impact of the proposed development on the operation of the junction has been tested. Model results for the base case and ‘with development’ scenarios are presented below for each future year considered.

6.7.77 The output of the modelling work carried out is presented in **Appendix D**.

### Opening Year

Table 6.34: 2015 – A44 / A4095 Base Case

A44 / A4095						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	0.82	4.23	29.25	0.64	1.72	10.73
A44 Woodstock Road	0.48	0.93	4	0.96	17.4	37.41
A4095 Bladon Road	0.78	3.43	12.81	0.54	1.14	7.06
A44 Oxford Road	0.82	4.25	16.76	0.45	0.81	4.8

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue



Table 6.35: 2015 – A44 / A4095 'With Development' Scenario

A44 / A4095						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	0.83	4.44	30.73	0.64	1.72	10.73
A44 Woodstock Road	0.48	0.93	4.01	0.97	19.33	40.9
A4095 Bladon Road	0.78	3.53	13.11	0.54	1.15	7.1
A44 Oxford Road	0.83	4.47	17.55	0.45	0.81	4.8

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.78 **Tables 6.34 and 6.35** show that the A44 / A4095 junction is predicted to operate within capacity in the AM peak but above the capacity assessment threshold of 0.85 in the PM peak in the 2015 Base and 2015 'with development' scenarios.

6.7.79 In the PM peak, the maximum RFC predicted occurs on the A44 Woodstock Road, as observed in the current situation, with a value of 0.96 in the 2015 Base 'base case' scenario and a value of 0.97 in the 2015 Base 'with development' scenarios. Although the junction is predicted to operate above capacity in the PM peak, the impact of the proposed development in the 2015 opening year is not considered severe with an increase in RFC of only 0.01 and associated increase in queue and delay of less than 2 pcus and about 3.5 seconds respectively. In this situation, it is considered that no mitigation measures are required at the junction in the 2015 opening year scenario.

Table 6.36: 2015 – A44 / A4095 'With Development' Sensitivity Scenario

A44 / A4095						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	0.83	4.5	31.1	0.64	1.72	10.76
A44 Woodstock Road	0.48	0.94	4.01	0.98	20.77	43.45
A4095 Bladon Road	0.79	3.53	13.13	0.54	1.16	7.14
A44 Oxford Road	0.83	4.5	17.64	0.45	0.81	4.81

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.80 **Table 6.36** shows that the A44 / A4095 junction is predicted to operate within the capacity assessment threshold for sensitivity scenarios (RFC less than or equal to 1.0) in the 2015 'with development' sensitivity scenario, with a maximum RFC of 0.98 occurring on A44

Woodstock Road in the PM peak. This is consistent with the other assessment carried out, and still shows only a small increase in delay even in the sensitivity test. This confirms that the impact of development will not be severe and that mitigation measures are not required in the 2015 opening year case.

### Phase 1

Table 6.37: 2021 – A44 / A4095 Base Case

A44 / A4095						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	0.97	12.96	79.91	0.73	2.57	14.78
A44 Woodstock Road	0.54	1.14	4.5	1.08	80.94	133.42
A4095 Bladon Road	0.88	6.44	22.56	0.6	1.45	8.2
A44 Oxford Road	0.94	11.24	41.62	0.5	1	5.43

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.38: 2021 – A44 / A4095 'With Development' Scenario

A44 / A4095						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	1.01	18.17	106.12	0.73	2.6	14.93
A44 Woodstock Road	0.54	1.16	4.52	1.11	105.71	169.01
A4095 Bladon Road	0.9	7.63	26.34	0.6	1.46	8.23
A44 Oxford Road	0.98	17.57	60.81	0.5	1.01	5.46

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.81 **Tables 6.37** and **6.38** show that the A44 / A4095 junction is predicted to operate above capacity in the 2021 Base and 2021 'with development' in both peak periods.

6.7.82 The maximum RFC in the 2021 Base scenario is 1.08 on A44 Woodstock Road in the PM peak. This increases to 1.11 in the 2021 Base 'with development' scenario. The development leads to significant increases in queues and delay at the junction. In this case, it is considered that the proposed development will have a severe impact on the operation of the junction and that mitigation measures would be required.

Table 6.39: 2021 – A44 / A4095 'With Development' Sensitivity Scenario

A44 / A4095						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	1.02	19.53	112.64	0.73	2.61	15.01
A44 Woodstock Road	0.54	1.18	4.58	1.12	118.76	187.89
A4095 Bladon Road	0.9	8.05	27.77	0.6	1.47	8.26
A44 Oxford Road	0.99	19.85	67.16	0.5	1.01	5.48

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

- 6.7.83 **Table 6.39** shows that the A44 / A4095 junction is predicted to operate above capacity in the 2021 'with development' sensitivity scenario in both peak periods, with the maximum RFC of 1.12 occurring on A44 Woodstock Road in the PM peak. This tests confirms the impact of the proposed development and the need for mitigations to be identified.

## Phase 2

Table 6.40: 2025 – A44 / A4095 Base Case

A44 / A4095						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	1.07	29.36	155.97	0.8	3.71	20.33
A44 Woodstock Road	0.57	1.31	4.86	1.16	132.30	262.36
A4095 Bladon Road	0.95	12.34	41.25	0.63	1.69	8.98
A44 Oxford Road	1.03	32.41	100.05	0.54	1.17	5.99

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.41: 2025 – A44 / A4095 'With Development' Scenario

A44 / A4095						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	1.1	37.59	198.65	0.8	3.78	20.7
A44 Woodstock Road	0.57	1.33	4.88	1.2	187.56	342.75
A4095 Bladon Road	0.97	17.09	54.48	0.63	1.71	9.05
A44 Oxford Road	1.09	53.39	151.48	0.54	1.18	6.03

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.84 **Tables 6.40 and 6.41** show that the A44 / A4095 junction is predicted to operate above capacity in the 2025 Base and 2025 'with development' in both peak periods.

6.7.85 The maximum RFC in the 2025 Base scenario is 1.16 on A44 Woodstock Road in the PM peak. This increases to 1.2 in the 2025 Base 'with development' scenario. This indicates that the impact of the proposed development on the operation of the junction would be significant in the 2025 Phase 2 scenario and as a result that mitigation measures would need to be identified.

Table 6.42: 2025 – A44 / A4095 'With Development' Sensitivity Scenario

A44 / A4095						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4095 Upper Campsfield	1.11	38.98	212.19	0.8	3.81	20.85
A44 Woodstock Road	0.58	1.38	5	1.22	206.96	386.39
A4095 Bladon Road	0.98	19.62	61.21	0.64	1.72	9.07
A4095 Upper Campsfield	1.1	59.47	166.56	0.55	1.19	6.05

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.86 **Table 6.42** shows that the A44 / A4095 junction is predicted to operate above capacity in the 2025 'with development' sensitivity scenario in both peak periods, with the maximum RFC of 1.22 occurring on A44 Woodstock Road in the PM peak. This confirms that the impact of the proposed development will be significant at the junction in the 2025 Phase 2 scenario.

### A44/A4095 Roundabout Summary

6.7.87 The capacity assessment carried out at the A44/A4095 roundabout junction shows that the proposed development will not have a severe impact on the operation of the junction in the 2015 opening year scenario. However, the junction is observed to experience some level of delay and queuing on the A44 Woodstock Road approach in the PM peak and background growth in the 2021 and 2025 scenarios make this problem worth. The addition of the proposed development compounds this issue and generate significant predicted increases in queues and delays, with additional arms of the junction predicted to operate above capacity in both the AM and PM peak periods.

6.7.88 As a result, it is considered that mitigation measures need to be identified at the junction.

### A4620 Oxford Road / A4620 Frieze Way / A4165 Oxford Road / Bicester Road Roundabout (Kidlington Roundabout)

6.7.89 A4620 Oxford Road / A4620 Frieze Way / A4165 Oxford Road / Bicester Road is a roundabout junction, and as such it has been assessed using the industry standard Junctions 8 software.

6.7.90 The roundabout is a five arm junction with the southern arms providing access to Oxford and the A40. The northern arms provide access to south Kidlington and the A34 leading to Bicester. The western arm gives residential access on Oxford Road. On-site observations were of a junction operating within capacity with short periods of queuing on the approaches in the peak hours, which cleared quickly.

### 2014 Base Year

6.7.91 In order to provide an accurate representation of existing operational junction capacity, the model has been validated using observed traffic flows and observations on site. The junction model was run using 2014 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.

6.7.92 The modelled average queue on each junction arm in each of the modelled peak hours has been compared with queue survey results recorded during the 2014 traffic surveys. Queues (stationary traffic) were recorded on a lane by lane basis at five minute intervals on each arm of the study area junctions.

6.7.93 A comparison of the modelled queue (mean max queue) results is shown against surveyed queues in **Table 6.43**.

Table 6.43: Kidlington Roundabout Base Year Operation – Model Validation

Kidlington Roundabout				
Base Year (2014)	AM Peak (07:45 – 08:45)		PM Peak (16:30 – 17:30)	
Lane	Surveyed Queue	Modelled Queue	Surveyed Queue	Modelled Queue
A4260 Oxford Road	3	1	3	2
Bicester Road	3	0	0	0
A4165 Oxford Road	2	0	8	1
A4260 Frieze Way	1	0	3	0
Oxford Road	2	1	1	0

- 6.7.94 **Table 6.43** shows that the modelled queues for Kidlington Roundabout are a fair representation of the observed queues, with minimal queuing on each arm in both peak periods. The only notable discrepancy is the surveyed queue of 8 vehicles in the PM against the 1 modelled queue on the A4165 Oxford Road in the PM peak. On-site observations on the day of the survey showed queues to clear quickly on this roundabout with no significant capacity issues. On that basis, it is considered that the model is fit for the purpose of assessing the impact of the development in future years.
- 6.7.95 Using the validated model, the impact of the proposed development on the operation of the junction has been tested. Model results for the base case and 'with development' scenarios are presented below for each future year considered.
- 6.7.96 The output of the modelling work carried out is presented in **Appendix D**.

### Opening Year

Table 6.44: 2015 – Kidlington Roundabout Base Case

Kidlington Roundabout						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.38	0.61	3.36	0.70	2.28	6.67
Bicester Road	0.26	0.35	2.63	0.18	0.22	2.61
A4165 Oxford Road	0.26	0.35	2.24	0.51	1.05	3.40
A4260 Frieze Way	0.19	0.23	1.68	0.29	0.40	2.14
Oxford Road	0.36	0.57	7.52	0.27	0.38	8.48

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.45: 2015 – Kidlington Roundabout 'With Development' Scenario

Kidlington Roundabout						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.38	0.61	3.37	0.71	2.37	6.84
Bicester Road	0.26	0.35	2.63	0.18	0.23	2.62
A4165 Oxford Road	0.26	0.35	2.24	0.52	1.06	3.41
A4260 Frieze Way	0.19	0.23	1.68	0.29	0.40	2.14
Oxford Road	0.37	0.57	7.56	0.27	0.38	8.49

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.97 **Tables 6.44** and **6.45** show that the Kidlington Roundabout is predicted to operate within capacity in the 2015 Base and 2015 'with development'. The results also show that the proposed development would not have a severe impact on the operation of the junction in the 2015 opening year case.

6.7.98 The maximum RFC in the 2015 Base and 2015 Base 'with development' scenarios is 0.71 on A4260 Oxford Road in the PM peak.

Table 6.46: 2015 – Kidlington Roundabout 'With Development' Sensitivity Scenario

Kidlington Roundabout						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.38	0.61	3.37	0.71	2.41	6.93
Bicester Road	0.26	0.35	2.64	0.18	0.23	2.63
A4165 Oxford Road	0.26	0.35	2.24	0.52	1.06	3.41
A4260 Frieze Way	0.19	0.23	1.69	0.29	0.40	2.14
Oxford Road	0.37	0.58	7.57	0.28	0.38	8.50

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.99 **Table 6.46** shows that the Kidlington Roundabout is predicted to operate within capacity in the 2015 'with development' sensitivity scenario, with the maximum RFC of 0.71 occurring on A4260 Oxford road in the PM peak. Even in the sensitivity scenario, the predicted increases in delays and queues are negligible, which confirms that the proposed development will not have a severe impact on the operation of the junction in 2015.

## Phase 1

Table 6.47: 2021 – Kidlington Roundabout Base Case

Kidlington Roundabout						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.42	0.72	3.65	0.78	3.38	9.12
Bicester Road	0.29	0.41	2.82	0.21	0.26	2.80
A4165 Oxford Road	0.29	0.40	2.35	0.57	1.33	3.91
A4260 Frieze Way	0.21	0.26	1.75	0.32	0.48	2.33
Oxford Road	0.41	0.70	8.50	0.33	0.49	10.06

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue



Table 6.48: 2021 – Kidlington Roundabout 'With Development' Scenario

Kidlington Roundabout						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.43	0.74	3.69	0.81	4.03	10.51
Bicester Road	0.29	0.41	2.84	0.21	0.27	2.86
A4165 Oxford Road	0.30	0.42	2.38	0.58	1.35	3.98
A4260 Frieze Way	0.21	0.27	1.77	0.33	0.48	2.35
Oxford Road	0.42	0.73	8.78	0.34	0.50	10.18

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.100 **Tables 6.47 and 6.48** show that the Kidlington Roundabout is predicted to operate within capacity in the 2021 Base and 2021 'with development'. The results also show that the proposed development will not have a severe impact on the operation of the junction in the 2021 Phase 1 case.

6.7.101 The maximum RFC in the 2021 Base scenario is 0.78 on A4260 Oxford Road in the PM peak. This increases to 0.81 in the 2021 Base 'with development' scenario.

Table 6.49: 2021 – Kidlington Roundabout 'With Development' Sensitivity Scenario

Kidlington Roundabout						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.43	0.77	3.77	0.82	4.47	11.45
Bicester Road	0.29	0.41	2.86	0.21	0.27	2.89
A4165 Oxford Road	0.30	0.42	2.39	0.58	1.37	4.01
A4260 Frieze Way	0.22	0.27	1.78	0.33	0.48	2.35
Oxford Road	0.43	0.74	8.86	0.34	0.50	10.22

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.102 **Table 6.49** shows that the Kidlington Roundabout is predicted to operate within capacity in the 2021 'with development' sensitivity scenario, with the maximum RFC of 0.82 occurring on A4260 Oxford Road in the PM peak. It also confirms that the proposed development will not have a severe impact on the operation of the Kidlington Roundabout in the 2021 Phase 1 scenario.

## Phase 2

Table 6.50: 2025 – Kidlington Roundabout Base Case

Kidlington Roundabout						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.45	0.81	3.88	0.83	4.78	12.28
Bicester Road	0.31	0.46	2.98	0.23	0.30	2.96
A4165 Oxford Road	0.31	0.44	2.43	0.61	1.58	4.39
A4260 Frieze Way	0.22	0.28	1.80	0.35	0.54	2.49
Oxford Road	0.45	0.82	9.42	0.38	0.60	11.59

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

Table 6.51: 2025 – Kidlington Roundabout 'With Development' Scenario

Kidlington Roundabout						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.46	0.85	3.96	0.87	6.36	15.78
Bicester Road	0.32	0.46	3.00	0.23	0.31	3.04
A4165 Oxford Road	0.32	0.47	2.48	0.62	1.63	4.50
A4260 Frieze Way	0.23	0.30	1.83	0.36	0.55	2.51
Oxford Road	0.47	0.87	9.89	0.38	0.61	11.77

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.103 **Table 6.50** shows that the Kidlington Roundabout is predicted to operate within capacity in the 2025 'base case' scenario with a maximum RFC of 0.83 on A4260 Oxford Road in the PM peak.

6.7.104 **Table 6.51** shows that the addition of development traffic would slightly increase the predicted RFC value to 0.87 in the 2025 'with development' scenario. However, the resultant increases in queue and delay remain modest (+1.58 pcu and +5sec respectively) and as a result it is considered that the proposed development will not have a severe impact on the operation of the Kidlington Roundabout in the 2025 Phase 2 case.

Table 6.52: 2025 – Kidlington Roundabout 'With Development' Sensitivity Scenario

Kidlington Roundabout						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
A4260 Oxford Road	0.47	0.89	4.09	0.89	7.56	18.45
Bicester Road	0.32	0.46	3.03	0.24	0.31	3.09
A4165 Oxford Road	0.32	0.47	2.49	0.62	1.65	4.57
A4260 Frieze Way	0.23	0.30	1.84	0.36	0.55	2.53

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue

6.7.105 **Table 6.52** shows that even in the sensitivity case the predicted increases in queue and delay on the A4260 Oxford Road, in the PM peak would remain low, confirming that the proposed development will not have a severe impact on the operation of the Kidlington Roundabout.

#### Kidlington Roundabout Summary

6.7.106 The tests undertaken indicate that the proposed development will not have a severe impact on the operation of the Kidlington Roundabout.

#### A4260 Oxford Road / Bicester Road

6.7.107 A4260 Oxford Road / Bicester Road is a signalised junction, and as such it has been assessed using the industry standard TRANSYT (Version 15) software.

6.7.108 A4260 Oxford Road / Bicester is a three arm junction, its eastern arm leading to Bicester Road and on to Bicester. On-site observations during the peak hours were of a junction operating within capacity with quick forming queues on the approaches during the red period, which largely cleared in the green period.

6.7.109 The A4260 Oxford Road / Bicester Road junction currently operates by MOVA such that it operates to minimise delay and the green times given to each stage will be altered dependent on the flow arriving at the junction.

#### Base Year

6.7.110 In order to provide an accurate representation of existing operational junction capacity, the model has been validated by using observed current traffic flows and observations on site. The junction model was run using 2014 Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.

6.7.111 The optimal cycle time has been determined within the TRANSYT software in the 2014 Base scenario with a maximum cycle time set at 90 seconds due to the presence of pedestrian crossings. In the PM peak, the model has been set to run two cycles in order to provide better results against observe conditions, and therefore a maximum cycle time of 180 seconds was set. The cycle times provided by TRANSYT are recorded within **Table 6.53** along with the Practical Reserve Capacity of the junction.

6.7.112 **Table 6.53** also provides a comparison of the modelled queue results against surveyed queues for the purpose of model validation.

Table 6.53: A4260 Oxford Road/ Bicester Road Base Year Operation – Model Validation

A4260 Oxford Road / Bicester Road						
Base Year (2014)	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	Surveyed Queue	Modelled Queue	DOS %	Surveyed Queue	Modelled Queue
A4260 Oxford Road (North)						
1	47%	6	6	37%	4	5
2	65%	12	10	51%	11	8
Bicester Road						
1	36%	2	2	38%	2	2
2	63%	11	13	61%	6	11
A4260 Oxford Road (South)						
1	69%	8	12	70%	11	17
2	7%	3	3	10%	1	3
Storage Right Turn	5%			11%		
Cycle Time	86 Seconds			160 Seconds		
PRC	22%			26%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.113 **Table 6.53** shows that the modelled queues for A4260 Oxford Road / Bicester Road junction are a fair representation of the observed queues. It is noted that there is an overestimation of queues in the PM peak on the A4260 Oxford Road south nearside lane at 17 modelled vehicles compared to 11 observed. This is considered to be a robust model to assess the impact of the development in future years.

6.7.114 Each scenario has been assessed using the optimal cycle time as determined within the TRANSYT software. The chosen cycle time is recorded within the results tables below.

6.7.115 Where flared traffic streams are present on the approach to the junction, as is the case on all three arms of the junction, the modelling results of the downstream traffic streams have also been reported. This is so that any queuing back, beyond the flare, can be identified. Additionally for the A4260 Oxford Road south, results are presented for the right turn storage which is in front of the stop line for traffic waiting to turn into Bicester Road.

6.7.116 The output of the modelling work carried out is presented in **Appendix D**.

## Opening Year

Table 6.54: 2015 – A4260 Oxford Road/ Bicester Road Base Case

A4260 Oxford Road / Bicester Road						
2015 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	46%	5.69	19.10	38%	5.15	11.24
2	64%	10.13	23.08	52%	9.11	13.26
Downstream	43%	0.17	0.66	45%	0.19	0.71
<b>Bicester Road</b>						
1	37%	1.76	23.80	39%	1.81	26.35
2	67%	3.43	28.40	62%	3.05	30.23
Downstream	81%	10.99	25.46	72%	8.13	17.16
<b>A4260 Oxford Road (South)</b>						
1	69%	10.78	25.83	71%	11.0	17.28
2	7%	1.45	15.48	10%	1.45	9.23
Downstream	34%	1.64	0.69	49%	6.95	2.28
Right Turn Storage	5%	1.15	18.82	11%	1.48	13.14
Cycle Time	88 Seconds			160 Seconds		
PRC	12%			25%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.55: 2015 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario

A4260 Oxford Road / Bicester Road						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	46%	6.05	19.39	39%	5.26	11.34
2	64%	10.72	23.43	53%	9.27	13.42
Downstream	43%	0.17	0.66	46%	0.20	0.73
<b>Bicester Road</b>						
1	36%	1.75	23.53	39%	1.18	26.35
2	66%	3.42	27.74	62%	3.05	30.23
Downstream	80%	11.12	25.09	72%	8.13	17.16
<b>A4260 Oxford Road (South)</b>						
1	70%	10.89	26.39	71%	11.01	17.23
2	7%	1.45	15.73	10%	1.45	9.23
Downstream	36%	2.37	0.96	49%	7.21	2.31
Right Turn Storage	5%	1.15	19.16	11%	1.48	13.73

A4260 Oxford Road / Bicester Road						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
Cycle Time	90 Seconds			160 Seconds		
PRC	13%			25%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.117 **Tables 6.54** and **6.55** show that the A4260 Oxford Road / Bicester Road junction is predicted to operate within capacity in the 2015 Base and 2015 'with development'. The results also indicate that the proposed development will not have a severe impact on the operation of the A4260 Oxford Road/Bicester Road junction in the 2015 opening year case.

6.7.118 The maximum DOS in the 2015 Base scenario is 81% on Bicester Road downstream lane in the AM peak. A maximum DOS of 80% is predicted for the same lane in the 2015 'with development' scenario. This improvement is due to a slight increase in green time given to this phase by the model's optimiser.

Table 6.56: 2015 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario

A4260 Oxford Road / Bicester Road						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	46%	6.07	19.41	39%	5.31	11.37
2	64%	10.76	23.50	53%	9.37	13.51
Downstream	44%	0.17	0.67	46%	0.20	0.75
<b>Bicester Road</b>						
1	36%	1.75	23.51	39%	1.81	26.35
2	66%	3.43	27.80	62%	3.05	30.23
Downstream	80%	11.17	25.30	72%	8.13	17.16
<b>A4260 Oxford Road (South)</b>						
1	70%	10.90	26.42	71%	11.02	17.34
2	7%	1.45	15.73	10%	1.45	9.23
Downstream	36%	2.38	0.98	49%	7.22	2.33
Right Turn Storage	5%	1.15	19.23	11%	1.50	13.98
Cycle Time	90 Seconds			160 Seconds		
PRC	13%			25%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.119 **Table 6.56** shows that the A4260 Oxford Road / Bicester Road junction is predicted to operate within capacity in the 2015 'with development' sensitivity scenario. It confirms that the proposed development will not have a severe impact on the operation of the junction in the 2015 opening year scenario.

6.7.120 The maximum DOS in the 2015 sensitivity scenario is 80% on Bicester Road downstream lane in the AM peak.

## Phase 1

Table 6.57: 2021 – A4260 Oxford Road/ Bicester Road Base Case

A4260 Oxford Road / Bicester Road						
2021 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	51%	6.75	21.08	42%	5.99	11.70
2	71%	12.58	26.70	57%	10.54	14.17
Downstream	47%	0.21	0.78	49%	0.24	0.84
<b>Bicester Road</b>						
1	37%	1.81	22.47	42%	1.91	26.78
2	68%	3.51	26.92	67%	3.36	32.32
Downstream	83%	12.44	28.01	78%	9.33	21.55
<b>A4260 Oxford Road (South)</b>						
1	77%	11.40	29.41	78%	11.48	19.05
2	8%	1.45	16.39	11%	1.46	9.26
Downstream	41%	4.11	2.18	57%	10.89	3.80
Right Turn Storage	6%	1.37	22.91	12%	1.62	16.39
Cycle Time	90 Seconds			160 Seconds		
PRC	9%			15%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.58: 2021 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario

A4260 Oxford Road / Bicester Road						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	54%	7.00	22.19	44%	6.36	12.06
2	74%	13.07	28.66	60%	11.22	14.90
Downstream	48%	0.22	0.80	53%	0.29	0.96
<b>Bicester Road</b>						
1	36%	1.74	21.37	42%	1.91	26.80



A4260 Oxford Road / Bicester Road						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
2	69%	3.59	26.06	68%	3.42	32.73
Downstream	83%	12.78	28.16	79%	9.45	22.12
<b>A4260 Oxford Road (South)</b>						
1	84%	12.22	33.94	79%	11.56	19.32
2	8%	1.45	17.01	11%	1.46	9.25
Downstream	46%	5.96	3.66	58%	11.01	4.04
Right Turn Storage	6%	1.33	22.86	13%	1.73	19.31
Cycle Time	90 Seconds			160 Seconds		
PRC	7%			14%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.121 **Tables 6.57** and **6.58** show that the A4260 Oxford Road / Bicester Road junction is predicted to operate within capacity in the 2021 Base and 2021 'with development'. It shows that the proposed development will not have a severe impact on the operation of the A4260 Oxford Road/Bicester Road in the 2021 Phase 1 case.

6.7.122 The maximum DOS in the 2021 Base scenario is 83% on Bicester Road downstream lane in the AM peak. The maximum DOS in the 2021 'with development' scenario is 84% which occurs on the A4260 Oxford Road (South) near side lane in the AM peak.

Table 6.59: 2021 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario

A4260 Oxford Road / Bicester Road						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	54%	7.14	22.40	46%	6.58	12.26
2	76%	13.41	29.38	62%	12.17	15.37
Downstream	49%	0.24	0.83	54%	0.32	1.02
<b>Bicester Road</b>						
1	36%	1.73	21.30	42%	1.91	26.81
2	69%	3.64	26.30	69%	3.45	32.87
Downstream	84%	13.12	29.12	79%	9.49	22.32
<b>A4260 Oxford Road (South)</b>						
1	85%	12.40	34.72	79%	11.60	19.45
2	8%	1.45	17.01	11%	1.46	9.25
Downstream	47%	6.24	3.96	59%	11.33	4.14
Right Turn Storage	6%	1.35	23.44	13%	1.79	20.97



A4260 Oxford Road / Bicester Road						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
Cycle Time	90 Seconds			160 Seconds		
PRC	6%			14%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.123 **Table 6.59** shows that the A4260 Oxford Road / Bicester Road junction is predicted to operate within capacity in the 2021 'with development' sensitivity scenario with the maximum DOS is 85% on the A4260 Oxford Road (South) near side lane in the AM peak. It also confirms that the proposed development will not have a severe impact on the operation of the junction in the 2021 Phase 1 case.

## Phase 2

Table 6.60: 2025 – A4260 Oxford Road/ Bicester Road Base Case

A4260 Oxford Road / Bicester Road						
2025 Base Case	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	55%	7.21	21.74	44%	6.36	12.06
2	76%	13.56	28.63	60%	11.22	14.90
Downstream	50%	0.25	0.87	53%	0.29	0.96
<b>Bicester Road</b>						
1	40%	1.85	22.32	45%	2.10	27.91
2	71%	3.73	28.15	72%	3.81	35.24
Downstream	88%	14.06	34.87	85%	10.78	29.29
<b>A4260 Oxford Road (South)</b>						
1	81%	11.87	31.41	83%	12.08	21.03
2	9%	1.45	16.45	11%	1.46	9.24
Downstream	46%	5.58	3.29	63%	13.69	5.31
Right Turn Storage	6%	1.47	24.73	13%	1.74	19.11
Cycle Time	90 Seconds			160 Seconds		
PRC	6%			6%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

Table 6.61: 2025 – A4260 Oxford Road/ Bicester Road 'With Development' Scenario

A4260 Oxford Road / Bicester Road						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	57%	7.82	22.99	48%	6.87	12.54
2	79%	14.22	31.25	65%	12.72	16.01
Downstream	54%	2.69	1.12	57%	0.37	1.12
<b>Bicester Road</b>						
1	38%	1.77	21.13	45%	2.12	28.12
2	74%	3.9	27.81	73%	3.94	36.15
Downstream	89%	14.99	37.03	86%	11.05	31.02
<b>A4260 Oxford Road (South)</b>						
1	90%	13.76	40.67	84%	12.27	21.62
2	9%	1.45	16.97	12%	1.46	9.26
Downstream	52%	7.97	5.54	65%	14.47	5.79
Right Turn Storage	6%	1.45	23.87	14%	1.91	22.41
Cycle Time	90 Seconds			160 Seconds		
PRC	0%			5%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.124 **Tables 6.57** and **6.58** show that the A4260 Oxford Road / Bicester Road junction is predicted to operate within capacity in the 2025 Base and 2025 'with development'. It shows that the proposed development will not have a severe impact on the operation of the A4260 Oxford Road/Bicester Road junction in the 2025 Phase 2 scenario.

6.7.125 The maximum DOS in the 2025 Base scenario is 88% on Bicester Road downstream lane in the AM peak. The maximum DOS in the 2025 'with development' scenario is 90% which occurs on the A4260 Oxford Road (South) near side lane in the AM peak.

Table 6.62: 2025 – A4260 Oxford Road/ Bicester Road 'With Development' Sensitivity Scenario

A4260 Oxford Road / Bicester Road						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	DOS %	MMQ	Delay (Secs)	DOS %	MMQ	Delay (Secs)
<b>A4260 Oxford Road (North)</b>						
1	59%	8.06	23.38	49%	7.53	12.81
2	81%	14.64	32.64	68%	13.31	16.71
Downstream	57%	4.03	1.49	60%	2.14	1.30
<b>Bicester Road</b>						
1	38%	1.75	21.11	45%	2.10	28.21
2	75%	4.02	28.48	73%	3.98	36.61
Downstream	90%	15.63	39.60	86%	11.24	32.30
<b>A4260 Oxford Road (South)</b>						
1	92%	14.41	43.52	85%	12.37	21.95
2	9%	1.45	16.94	13%	1.46	9.49
Downstream	54%	8.55	6.06	65%	14.85	5.98
Right Turn Storage	6%	1.49	24.22	14%	1.98	23.79
Cycle Time	90 Seconds			160 Seconds		
PRC	-2%			4%		

DOS = Degree of Saturation, MMQ = Maximum Mean Queue, 1 = nearside lane, PRC = Practical Reserve Capacity

6.7.126 **Table 6.62** shows that the A4260 Oxford Road / Bicester Road junction is predicted to operate at capacity in the 2025 'with development' sensitivity scenario. It shows that even in the sensitivity case in 2025 with full development, the junction would still operate at capacity with only small increases in queues and delays, with the worst predicted increases, on the A4260 Oxford Road (South) being +2.54 pcus for the queue and +12 seconds for delay. As a result, it is considered that the proposed development will not have a severe impact on the operation of the A4260 Oxford Road/Bicester Road junction.

#### A4260 Oxford Road / Bicester Road Summary

6.7.127 The modelling work carried out shows that the proposed development will not have a severe impact on the operation of the A4260 Oxford Road/Bicester Road junction in any of the future year scenarios tested.

#### Langford Lane / Proposed Site Access

6.7.128 Langford Lane / Proposed Site Access junction is anticipated to be a priority junction, and as such it has been assessed using the industry standard Junctions 8 software.

6.7.129 As this junction is part of the development proposals, the operation has only been tested for the 'with development' scenarios, which are presented below for each future year considered.

### Opening Year

Table 6.63: 2015 – Langford Lane / Proposed Site Access 'With Development' Scenario

Langford Lane / Proposed Site Access						
2015 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access road to Langford Lane east	0.00	0.00	5.44	0.06	0.07	8.12
Access road Langford Lane west	0.01	0.01	11.86	0.11	0.12	13.06
Langford lane (west)	0.05	0.05	5.43	0.00	0.00	6.80

rfc = ratio of flow to capacity, mmq = maximum mean queue, 1 = nearside lane

Table 6.64: 2015 – Langford Lane / Proposed Site Access 'With Development' Sensitivity Scenario

Langford Lane / Proposed Site Access						
2015 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access Road to Langford Lane East	0.01	0.01	5.65	0.10	0.11	8.54
Access Road Langford Lane West	0.02	0.02	11.69	0.16	0.19	13.90
Langford Lane (West)	0.06	0.06	5.49	0.00	0.00	6.80

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue, 1 = nearside lane

6.7.130 **Tables 6.63** and **6.64** show that the Langford Lane / Proposed Site Access junction is predicted to operate within capacity in the 2015 'with development' and the 2015 'with development' sensitivity scenarios.

6.7.131 The maximum RFC in the 2015 scenarios is 0.16 on the Access Road in the PM peak sensitivity test.

## Phase 1

Table 6.65: 2021 – Langford Lane / Proposed Site Access 'With Development' Scenario

Langford Lane / Proposed Site Access						
2021 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access Road to Langford Lane East	0.03	0.03	7.24	0.28	0.39	8.54
Access Road Langford Lane West	0.08	0.08	19.66	0.45	0.80	24.18
Langford Lane (West)	0.21	0.26	7.03	0.02	0.02	8.68

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue, 1 = nearside lane

Table 6.66: 2021 – Langford Lane / Proposed Site Access 'with Development' Sensitivity Scenario

Langford Lane / Proposed Site Access						
2021 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access Road to Langford Lane East	0.07	0.08	8.89	0.53	1.09	22.85
Access Road Langford Lane West	0.19	0.23	27.09	0.71	2.27	45.87
Langford Lane (West)	0.25	0.34	7.43	0.03	0.03	10.30

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue, 1 = nearside lane

6.7.132 **Tables 6.65** and **6.66** show that the Langford Lane / Proposed Site Access junction is predicted to operate within capacity in the 2021 'with development' and the 2021 'with development' sensitivity scenarios.

6.7.133 The maximum RFC in the 2021 scenarios is 0.71 on the Access Road in the PM peak sensitivity test.

## Phase 2

Table 6.67: 2025 – Langford Lane / Proposed Site Access 'With Development' Scenario

Langford Lane / Proposed Site Access						
2025 Base With Development	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access Road to Langford Lane East	0.05	0.05	8.54	0.41	0.69	17.89
Access Road Langford Lane West	0.15	0.17	28.65	0.63	1.60	39.33
Langford Lane (West)	0.28	0.38	8.06	0.03	0.03	9.22

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue, 1 = nearside lane

Table 6.68: 2025 – Langford Lane / Proposed Site Access 'With Development' Sensitivity Scenario

Langford Lane / Proposed Site Access						
2025 Base With Development Sensitivity	AM Peak (07:45 – 08:45)			PM Peak (16:30 – 17:30)		
Lane	Max RFC	MMQ	Delay (Secs)	Max RFC	MMQ	Delay (Secs)
Access Road to Langford Lane East	0.13	0.14	11.06	1.08	14.49	227.35
Access Road Langford Lane West	0.38	0.58	47.70	1.07	15.35	226.19
Langford Lane (West)	0.35	0.53	8.84	0.04	0.04	12.33

RFC = Ratio of Flow to Capacity, MMQ = Maximum Mean Queue, 1 = nearside lane

6.7.134 **Table 6.67** shows that the Langford Lane / Proposed Site Access junction is predicted to operate within capacity in the 2025 'with development' scenario with a maximum RFC of 0.63 on the Access Road in the PM peak.

6.7.135 **Table 6.68** shows that in the sensitivity test case the junction is predicted to operate above capacity in the 2025 'with development' scenario with a maximum RFC of 1.08 on Langford Lane east in the PM peak, predicting delays for vehicles exiting the proposed development. However, it must be borne in mind that the test presented here is an extreme worst case scenario that includes:

- 85th percentile traffic generation (the test carried out on average trip rates shows that the junction would operate within capacity without any delays to traffic exiting the site);
- a specific traffic profile that generates a peak within the peak hour, making the test robust; and
- no potential reduction in vehicular trip making as a result of travel planning measures.

6.7.136 On that basis it is considered that the proposed site access junction will be able to accommodate the proposed development

## **6.8 Summary**

6.8.1 The traffic modelling work undertaken and presented in this section of the Transport Assessment demonstrates that overall the proposed development will not have a severe impact on the operation of the local road network, with most junctions considered predicted to operate within capacity in all future year scenarios.

6.8.2 This is with the exception of the A44/A4095 where current observed congestion on the A44 Woodstock Road arm of the junction would worsen in the future year scenarios and be compounded by the proposed development. Delays would also appear on other approaches into the junction in the future, and as a result it is considered necessary that mitigations be identified for this junction.

6.8.3 The outputs from the capacity tests carried out are provided in [Appendix D](#).