

## **South West Milton Keynes**

### **Addendum Environmental Statement**

Transport Assessment

AUGUST 2016

# South West Milton Keynes

## Transport Assessment

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## Document Control Sheet

Project Title                South West Milton Keynes

Report Title                Updated Transport Assessment

Report ref no.              R004

Version                      03

Status                        Final

Report Date                10 August 2016

## Record of Issue

Version	Status	Author	Date	Checked by	Date	Approved by	Date
1	DRAFT	RS/SH	25-07-16	SH	25-07-16	MJP	25-07-16
2	FINAL DRAFT	EC	02-08-16	SH	09-08-16	MJP	09-08-16
3	FINAL	EC	10-08-16	SH	10-08-16	MJP	10-08-16

## Distribution

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## Executive Summary

This Transport Assessment has been produced in support of a planning application made by the 'South West Milton Keynes Consortium' for a mixed use sustainable urban extension to the south west of Milton Keynes.

The proposed development comprises up to 1,855 mixed tenure dwellings (C3) on 54.70Ha of land; an employment area (B1) on 2.07Ha of land; a neighbourhood centre on 0.67Ha of land accommodating retail (A1/A2/A3/A4/A5), community (D1/D2) and residential (C3) uses; provision of a primary school on 3.0Ha of land; provision of a secondary school on 5.12Ha of land; and associated infrastructure.

This Transport Assessment demonstrates that the proposed development complies with current Development Plan Policies and Central Government's National Planning Policies Framework (NPPF) and guidance contained in National Planning Practice Guidance. This TA positively responds to the aspirations of Aylesbury Vale District Council and Milton Keynes Council as reflected in the respective Local Transport Plans and Development Plans.

The Site is located in good proximity to public transport connections with bus stops within reasonable walking distance from the Site. Buses provide linkages to Milton Keynes and Bletchley where further bus/rail connections are available.

There is good access to local footways/footpaths and the local cycle network. The pedestrian network provides connections to local places of interest and public transport facilities. Development of the Site therefore offers an excellent opportunity to influence travel behaviour and to encourage sustainable travel.

Access to the proposed development will be via new junctions located on Buckingham Road, Whaddon Road and A421 Standing Way. Parking within the proposed development will comply with the prevailing policies at the time of discharging reserved matters. The proposed development will be designed to include permeability for pedestrians and cyclists and to connect with existing routes.

Public transport connections will be enhanced with the provision of an extension to bus route 8 from Oxley Park to the Site, a direct bus connection between the Site and Milton Keynes Central Station. Pedestrian/Cyclist/Equestrian provision will also be enhanced through the provision of a new bridleway along Whaddon Road within the Site, and a

Pegasus Crossing to the south of Bottle Dump Roundabout to facilitate a connection with the existing Redway network to the north of A421.

Two separate methodologies have been used to assess the impact of traffic generated by the proposed development on the local highway network in accordance with the requirements of the highway authorities.

For Milton Keynes Council (MKC) and Highways England (HE), the Milton Keynes Traffic Model (MKTm) has been used to determine junctions of importance, with local capacity models assessing the traffic flow data from the MKTM at a number of junctions.

For Buckinghamshire County Council (BCC) a series of static junction models built using 2015 traffic survey data have been used to assess the impact of the development on the local highway network.

Within Milton Keynes, the impact of the proposed development has been assessed at a number of junctions for the Base 2026 and Base 2026 + development scenarios. The majority of junctions assessed operate with a Ratio of Flow to Capacity (RFC) below 1.0 in all scenarios, indicating that junction improvements are not required. Three junctions within the study area require some minor mitigation to ensure that the cumulative residual impact of development is not severe in the context of paragraph 32 of the NPPF.

The impact on Bletchley has been assessed, and whilst there is likely to be an increase in traffic through the area, it has been agreed with MKC and their consultant that the impact of the development is not severe and does not require any mitigation.

Within Buckinghamshire, the majority of junctions analysed operate with an RFC below 1.0 in all scenarios, indicating that junction improvements at those locations are not required.

The traffic growth to 2026 in the Base scenario increases traffic along A421, with fewer gaps for right turning traffic at the priority junctions of Shucklow Hill, Little Horwood Road and Warren Road. The roundabouts at Winslow Road/Nash Road, Whaddon Crossroads, and Bottle Dump are all impacted by increased traffic in the 2026 Base scenario, and the operation of the junctions is marginally worse with the proposed development. Should the high level of growth included within these assessments not materialise, the impact along A421 would be considerably less. BCC has confirmed that they do not have any specific proposals for A421 to the west of the Site and is awaiting the recommendations of a more strategic study of the corridor currently being completed by the Department of Transport.

The impact of the development on the villages in Buckinghamshire surrounding the Site has been assessed. The increase in traffic flow is minimal and mitigation is not required within the villages with the exception of Newton Longville. In this regard, a comprehensive traffic calming scheme has been developed to reduce traffic speeds and minimise 'through' traffic. .

Highways England has agreed that the impact of the proposed development on the strategic highway network is negligible and mitigation is not required.

Financial contributions secured by a Section 106 Agreement have been agreed with BCC/MKC and will be provided by the Applicant to mitigate the impact of the proposed development along A421 within Milton Keynes and Buckinghamshire. The financial contribution will be used by both authorities on corridor improvements along A421 to mitigate the impact of the development.

Improvements to Bottle Dump Roundabout and the creation of the three access points will be completed as part of the proposed development by way of a Section 278 Agreement under the Highways Act 1980.

Improvements to public transport, Public Rights of Way, and pedestrian/cyclist facilities will also be provided, along with a comprehensive set of Travel Plans for each land use to encourage the use of sustainable travel modes wherever possible to and from the proposed development.

As a result of the comprehensive mitigation package agreed in principle with BCC, MKC and their respective consultants, the residual cumulative impacts of the proposed development are minimal, and cannot be considered as severe in the context of paragraph 32 of the NPPF. As such, there are no highway, traffic or transport reasons for the revised planning application to be refused.

# Contents

<b>Document Control Sheet.....</b>	<b>i</b>
<b>Limitations .....</b>	<b>ii</b>
<b>Executive Summary .....</b>	<b>iii</b>
<b>Contents .....</b>	<b>vi</b>
<b>1 Introduction .....</b>	<b>7</b>
<b>2 Policy Context .....</b>	<b>9</b>
<b>3 Existing Conditions.....</b>	<b>33</b>
<b>4 The Proposed Development.....</b>	<b>56</b>
<b>5 The Transport Strategy.....</b>	<b>60</b>
<b>6 Access Strategy .....</b>	<b>68</b>
<b>7 Assessment Methodology.....</b>	<b>75</b>
<b>8 Site Access Assessments .....</b>	<b>90</b>
<b>9 Off-Site Impact Assessments.....</b>	<b>94</b>
<b>10 Mitigation .....</b>	<b>134</b>
<b>11 Cumulative Residual Impact .....</b>	<b>163</b>
<b>12 Summary and Conclusions .....</b>	<b>164</b>
<b>13 Appendices .....</b>	<b>166</b>



## Figures

Figure 3.1: Site Location .....	33
Figure 3.2: Local Highway Context .....	36
Figure 3.3: Strategic Highway Context.....	37
Figure 3.4: Collisions by Severity Between 2011 and 2015.....	38
Figure 3.5: Collisions by Weather Conditions 2011-2015.....	39
Figure 3.6: Collisions at Whaddon Crossroads 2011-2015.....	40
Figure 3.7: Collisions in Little Horwood 2011-2015.....	41
Figure 3.8: Collisions in Great Horwood, 2011-2015 .....	41
Figure 3.9: Collisions in Nash, 2011-2015 .....	42
Figure 3.10: Collisions in Mursley, 2011-2015 .....	42
Figure 3.11: Collisions in Whaddon, 2011-2015 .....	42
Figure 3.12: Collisions in Newton Longville, 2011-2015 .....	43
Figure 3.13: PROW Network in the Vicinity of the Site .....	47
Figure 3.14: Whaddon Road ATC Locations .....	52
Figure 3.15: Location of Traffic Surveys (October 2015) .....	53
Figure 5.1: Indicative Bus Route Extension .....	63
Figure 5.2: Wider Bus Route Connections.....	64
Figure 6.1: Proposed Whaddon Road Access .....	69
Figure 6.2: Proposed A421 Standing Way Access .....	71
Figure 6.3: Proposed Buckingham Road Access.....	72
Figure 6.4: Proposed Buckingham Road Access.....	73
Figure 7.1: Link Stability in AM Peak Model.....	77
Figure 7.2: Link Stability in PM Peak Model.....	78
Figure 7.3: Milton Keynes Junction Assessment Locations .....	83
Figure 7.4: Junction Locations .....	88
Figure 8.1: Buckingham Road Access .....	90
Figure 8.2: Whaddon Road Access .....	92
Figure 9.1: Location of Link Flows .....	100
Figure 9.2: TA 79/99 Link Capacities .....	102

Figure 9.3: Location of Junctions in Bletchley.....	103
Figure 9.4: Bottle Dump Roundabout.....	106
Figure 9.5: Whaddon Crossroads .....	108
Figure 9.6: A421/Warren Road .....	110
Figure 9.7: A421/Shucklow Hill/Little Horwood Road.....	112
Figure 9.8: A421/Nash Road/Winslow Road.....	114
Figure 9.9: Stock lane/Shenley Road/Coddimore Lane .....	116
Figure 9.10: Whaddon Road/Westbrook End .....	117
Figure 9.11: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road.....	119
Figure 9.12: Locations of Link Flows.....	120
Figure 9.13: Location of ATC Speed Data .....	125
Figure 9.14: SWMK Development Trips on A5 in 2026 (pcus) .....	128
Figure 9.15: 2026 Base + Development Queues at Redmoor Roundabout on A5 .	131
Figure 10.1: MK Mitigation Locations.....	135
Figure 10.2: Emerson Roundabout.....	136
Figure 10.3: Emerson Roundabout – Proposed Mitigation .....	137
Figure 10.4: Elfield Park Roundabout .....	138
Figure 10.5: Elfield Park Roundabout – Proposed Mitigation .....	139
Figure 10.6: Bleak Hall Roundabout .....	140
Figure 10.7: Bleak Hall Roundabout – Proposed Mitigation .....	141
Figure 10.8: B4034 Buckingham Road between Shenley Road and Sherwood Drive .....	143
Figure 10.9: Bottle Dump Roundabout.....	145
Figure 10.10: Bottle Dump Roundabout – Proposed Mitigation.....	146
Figure 10.11: Whaddon Crossroads .....	147
Figure 10.12: Whaddon Crossroads – Proposed Mitigation .....	148
Figure 10.13: A421/Nash Road/Winslow Road.....	149
Figure 10.14: A421/Nash Road/Winslow Road – Proposed Mitigation.....	150
Figure 10.15: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road.....	152
Figure 10.16: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road – Proposed Mitigation .....	152

Figure 10.17: A421/Shucklow Hill/Little Horwood Road.....	154
Figure 10.18: A421/Shucklow Hill/Little Horwood Road – Proposed Mitigation.....	154
Figure 10.19: A421/Warren Road .....	156
Figure 10.20: A421/Warren Road – Proposed Mitigation .....	157

## Tables

Table 3.1: Summary of Collisions and Casualties Between 2011 and 2015 (BCC)..	39
Table 3.2: Summary of Collisions Between 2009 and 2014 (MKC) .....	44
Table 3.3: Rail Services From Bletchley .....	50
Table 3.4: Rail Services From Milton Keynes Central.....	51
Table 3.5: Speed of Traffic Along Whaddon Road.....	52
Table 3.6: Speed of Traffic Through Buckinghamshire Villages .....	53
Table 3.7: Traffic Volumes on Local Roads .....	55
Table 6.1: Whaddon Road Speed Data .....	70
Table 7.1: MKTM Convergence and Stability.....	76
Table 7.2: Land Use and Quantum of Development Assumed in MKTM .....	79
Table 7.3: Trip Generation (PCUs) in MKTM .....	79
Table 7.4: Trip Generation (Rates) in MKTM .....	80
Table 7.5: Internalisation and Trip Distribution of Development Traffic in AM Peak .	80
Table 7.6: Internalisation and Trip Distribution of Development Traffic in PM Peak .	80
Table 7.7: TEMPRO Growth Factors .....	85
Table 7.8: Secondary Education Trips .....	86
Table 7.9: Total Development Trips .....	87
Table 8.1: Buckingham Road Access AM Peak.....	91
Table 8.2: Buckingham Road Access PM Peak.....	91
Table 8.3: Whaddon Road Access AM Peak .....	92
Table 8.4: Whaddon Road Access PM Peak .....	93
Table 9.1: ARCADY Results – Tattenhoe Roundabout .....	95
Table 9.2: ARCADY Results – Kingsmead Roundabout.....	95
Table 9.3: ARCADY Results – Westcroft Roundabout .....	96

Table 9.4: ARCADY Results – Windmill Hill Roundabout .....	96
Table 9.5: ARCADY Results – Furzton Roundabout .....	97
Table 9.6: ARCADY Results – Emerson Roundabout .....	97
Table 9.7: ARCADY Results – Elfield Park Roundabout .....	98
Table 9.8: ARCADY Results – Bleak Hall Roundabout .....	99
Table 9.9: Traffic Flows Through Bletchley – 2026 Base.....	100
Table 9.10: Traffic Flows Through Bletchley – SWMK Development Traffic .....	101
Table 9.11: Traffic Flows Through Bletchley – 2026 Base + Development .....	101
Table 9.12: Traffic Flows through Bletchley – Two-way Link Capacity .....	103
Table 9.13: Traffic Flow Increases at Bletchley Junctions – 2026 Base Vs 2026 Base + Development.....	104
Table 9.14: Sherwood Drive/Water Eaton Road/B4034 roundabout, AM peak .....	105
Table 9.15: Sherwood Drive/Water Eaton Road/B4034 roundabout, PM peak .....	105
Table 9.16: Bottle Dump Roundabout AM Peak .....	107
Table 9.17: Bottle Dump Roundabout PM Peak .....	107
Table 9.18: Whaddon Crossroads AM Peak.....	109
Table 9.19: Whaddon Crossroads PM Peak.....	109
Table 9.20: A421/Warren Road AM Peak.....	111
Table 9.21: A421 Warren Road PM Peak.....	111
Table 9.22: A421/Shucklow Hill/Little Horwood Road AM Peak .....	113
Table 9.23: A421/Shucklow Hill/Little Horwood Road PM Peak .....	113
Table 9.24: A421/Nash Road/Winslow Road AM Peak .....	115
Table 9.25: A421/Nash Road/Winslow Road PM Peak .....	115
Table 9.26: Stock lane/Shenley Road/Coddimoor Lane AM Peak.....	116
Table 9.27: Stock lane/Shenley Road/Coddimoor Lane PM Peak.....	117
Table 9.28: Whaddon Road/Westbrook End AM Peak.....	118
Table 9.29: Whaddon Road/Westbrook End PM Peak.....	118
Table 9.30: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road AM Peak	119
Table 9.31: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road PM Peak	119
Table 9.32: Traffic Flows Through Villages - 2015.....	121
Table 9.33: Traffic Flows Through Villages - 2026 Base .....	121

Table 9.34: Traffic Flows Through Villages - SWMK 2026 Development Traffic ....	122
Table 9.35: Traffic Flows Through Villages – 2026 Base + Development .....	123
Table 9.36: Traffic Flows Through Villages – Two-way Link Capacity (approx. average).....	124
Table 9.37: Traffic Speeds Through Villages (mph).....	125
Table 9.38: Predicted Collisions (number per annum).....	126
Table 10.1: Emerson Roundabout - After Mitigation .....	137
Table 10.2: Elfield Park Roundabout - After Mitigation .....	139
Table 10.3: Bleak Hall Roundabout - After Mitigation .....	141
Table 10.4: Bottle Dump Roundabout - After Mitigation.....	146
Table 10.5: Whaddon Crossroads - After Mitigation .....	148
Table 10.6: A421/Nash Road/Winslow Road - After Mitigation.....	151
Table 10.7: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road - After Mitigation .....	153
Table 10.8: A421/Shucklow Hill/Little Horwood Road - After Mitigation.....	155
Table 10.9: A421/Warren Road - After Mitigation .....	157

## Photos

Photo 3.1: A421/H8 Standing Way .....	34
Photo 3.2: A421 (west of Bottle Dump Roundabout) .....	35
Photo 3.3: Whaddon Road.....	36
Photo 3.4: Weasel Lane.....	45
Photo 3.5: Redway Alongside Buckingham Road.....	47
Photo 3.6: Bus Stops at Chepstow Drive .....	48
Photo 3.7: Cycle Parking at Bletchley Station.....	49
Photo 3.8: Cycle Parking at Milton Keynes Central .....	51

## Appendices

Appendix A	Original TA dated January 2015
Appendix B	Milton Keynes Urban Bus Map
Appendix C	Rail Services from Bletchley Station and Milton Keynes Station
Appendix D	Traffic Speeds Through BCC Villages
Appendix E	Traffic Flow Diagrams – 2015 Base
Appendix F	Bottle Dump Pegasus Crossing
Appendix G	Meeting Note – Arriva Buses
Appendix H	Proposed Access Designs
Appendix I	Stage 1 Road Safety Audits of Proposed Access Designs
Appendix J	Extracts from 'MKTM Traffic Forecasting Report', May 2012
Appendix K	Pell Frischmann Scoping Report
Appendix L	MKTM Base and Base + Development Turning Flows
Appendix M	Additional Education Trip Assessment
Appendix N	Traffic Flow Diagrams – 2026 Base and 2026 Base + Development
Appendix O	Junction Assessment Geometric Parameters
Appendix P	Model Validation Checks
Appendix Q	Junction Modelling Results
Appendix R	Bletchley Traffic Flow Comparisons
Appendix S	A5 Redmoor Roundabout Queue Analysis
Appendix T	Mitigated Junction Modelling Results
Appendix U	Junction Mitigation – Improvement Designs
Appendix V	Newton Longville Strategy
Appendix W	Highway Improvements Masterplan

# 1 Introduction

## Introduction

- 1.1 This Transport Assessment (TA) has been produced in support of an outline planning application made by the South West Milton Keynes Consortium (hereinafter referred to as the Applicant) for a mixed use sustainable urban extension to the south west of Milton Keynes (hereinafter referred to as the Site). This report supersedes the original TA dated January 2015, which is contained on a disc at **Appendix A**.
- 1.2 The content and structure of this TA has been compiled following extensive discussions over the past eighteen months with Milton Keynes Council (MKC), Buckinghamshire County Council (BCC), Highways England (HE) and their respective consultants. The original planning application is now the subject of a Planning Performance Agreement (PPA) and as such, a number of specific transport and highways topic meetings have been held over the past twelve months with the planning authority Aylesbury Vale District Council (AVDC), BCC and MKC.
- 1.3 The outline planning application comprises:
- up to 1,855 mixed tenure dwellings (C3) on 54.70Ha of land;
  - an employment area (B1) on 2.07Ha of land;
  - a neighbourhood centre on 0.67Ha of land accommodating retail (A1/A2/A3/A4/A5), community (D1/D2) and residential (C3) uses;
  - provision of a primary school on 3.0Ha of land;
  - provision of a secondary school on 5.12Ha of land;
  - allotment space on 1.18Ha of land;
  - ground remodelling;
  - 53.67Ha of multi-functional green open space including: parkland, sports and recreational facilities with pavilion/changing facilities; play areas, wildlife areas, a range of strategic open spaces including a community orchard and new landscaping;



- a Sustainable Drainage Scheme including 5.08Ha of land for surface water attenuation measures;
- associated infrastructure including new access junctions to the A421, Whaddon Road and Buckingham Road, primary streets, residential streets, pedestrian footpaths and cycle routes, foul water pumping stations and statutory undertakers equipment;
- a 'Grid Road Reserve' of 7.248Ha;
- highway improvements on 5.21Ha;
- public transport infrastructure, car and cycle parking for all uses; and
- undergrounding of 132Kv overhead power lines.

## Scope

- 1.4 The TA considers the multi-modal access arrangements into the Site, the trips generated by the proposed development and the distribution and impact of vehicular traffic across the strategic and local highway network. The TA also reviews relevant national and local land use planning and transport policies against which the development proposals are considered to assess their compliance with both national and local policy objectives.
- 1.5 A Framework Travel Plan (FTP) that encompasses the arrangements for residential, commercial and school travel planning at the proposed development has been prepared to accompany the planning application and should be considered in conjunction with this TA. The FTP will be used to develop more individual detailed Travel Plans for each of the various land uses in conjunction with the subsequent discharge of reserved matters and various planning obligations under Section 106 of the Town and Country Planning Act 1990.



## 2 Policy Context

### General Planning Policy

- 2.1 There are a number of documents that contain planning policies relevant to transport matters. The National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG) provides guidance at the national level.
- 2.2 This section of the TA sets out the planning policy context against which the proposed development is to be considered, insofar as it relates to transportation and highway matters. It sets out the relevant statements of planning policy within the statutory development plan and the National Planning Policy Framework (NPPF) that relate to the scheme. On 6 March 2014, the Government published the NPPG to explain how NPPF policy should be implemented.
- 2.3 The proposed development straddles the administrative boundaries of two local planning authorities. MKC is a unitary authority and therefore has responsibility for planning, highways and transportation matters within the Milton Keynes jurisdiction. The principal highway access points to the proposed development are taken from A421 in Milton Keynes. However, the Site falls within the administrative area of AVDC, where transport and highway matters are the responsibility of BCC.
- 2.4 The following elements of the statutory Development Plan at national and local level have been considered in the preparation of this TA and the FTP:
- Saved policies of the Aylesbury Vale District Plan (2004)
  - Saved policies of the Milton Keynes Local Plan (2005)
  - Milton Keynes Core Strategy (2013)
  - National Planning Policy Framework (2012)
  - National Planning Practice Guidance (2014)
  - The Strategic Road Network and the Delivery of Sustainable Development (2013)

- The Highways Agency and the Planning Application Process – A Protocol for the handling of Planning Applications (2014)
- A Transport Vision and Strategy for Milton Keynes. Local Transport Plan 3 - 2011 to 2031 (2011)
- Buckinghamshire Local Transport Plan 3 (2011)
- Aylesbury Vale District Local Plan – Parking Guidelines SPG (2002)
- Milton Keynes Residential Design Guide SPD (2012)
- Milton Keynes Local Investment Plan (2013)

### **National Planning Policy Framework (2012)**

2.5 Paragraph 1 of the NPPF states in part that:

*“The National Planning Policy Framework sets out the Government’s planning policies for England and how these are expected to be applied. It sets out the Government’s requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so...”*

2.6 The NPPF is written on the premise that the purpose of planning is to help achieve sustainable development and the sustainable development is about positive growth. The NPPF states that

*“Development that is sustainable should go ahead, without delay.....” and “In order to fulfil its purpose of helping to achieve sustainable development, planning must not simply be about scrutiny.” (Ministerial foreword)*

2.7 In paragraph 17 the NPPF identifies a series of ‘Core planning principles’ that should underpin both plan making and decision taking. Key amongst these is to:

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

2.8 Section 4 of the NPPF addresses the matter of 'Promoting sustainable transport'. The following extracts are considered to be of relevance to the proposed development:

*"Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport"* (paragraph 30)

and

*"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."* (paragraph 32) and

*"Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised..."* (paragraph 34)

and

*'... developments should be located and designed where practical to*

- accommodate the efficient delivery of goods and supplies;*

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

and

*“A key tool to facilitate this will be a Travel Plan. All developments which generate significant amounts of movement should be required to provide a Travel Plan.” (paragraph 36)*

and

*“... Where practical, particularly within large-scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties.” (paragraph 38)*

- 2.9 Paragraph 32 of the NPPFA supports the proposed development and demonstrates that the opportunities for sustainable transport modes have been fully explored in order to reduce the need for major transport infrastructure. There will be safe and suitable access into and within the proposed development for all users, with the needs of pedestrians and cyclists at the forefront of the access hierarchy. In line with the relevant transport policies of MKC and BCC, appropriate mitigation has been discussed and agreed to ensure that the residual cumulative impact in 2026 will not be severe.
- 2.10 Improvements are required by the local and strategic highway authorities to accommodate the projected forecast in traffic demand, taking account of the spatial requirements for new housing, employment and leisure facilities. In this regard, the proposed development would potentially act as a catalyst for

implementing key infrastructure improvements to mitigate impacts and provide wider community benefits.

- 2.11 The mixed-use nature of the proposed development will minimise the need to travel and its location ensures easy and safe access for pedestrians and cyclists on to the established Milton Keynes' Redway network to the north and east. The proposed development infrastructure will improve the overall connectivity of the area and tie-in with existing routes and provide accessible and sustainable options for future residents.
- 2.12 The NPPF recognises the importance of Travel Planning as a key tool to facilitate the use of sustainable transport modes for the movement of goods and people. In this regard, large development proposals should be required to provide a Travel Plan (paragraph 36). A Framework Travel Plan (FTP) that provides details of travel planning at all key elements of the proposed development, has therefore been prepared in conjunction with this TA. .

### **National Planning Practice Guidance (2014)**

- 2.13 On 6<sup>th</sup> March 2014 the Department for Communities and Local Government launched its planning practice guidance web-based resource. The National Planning Policy Practice Guidance (NPPG) has updated and replaced a wide range of Government planning policy and Circular guidance. It addresses transportation and highway matters under the headings of 'Travel plans, Transport Assessments and Statements in decision-taking' and 'Design'.

### **Travel plans, transport assessments and statements in decision-taking**

- 2.14 The NPPG (Reference ID: 42-004-20140306) explains that Travel Plans (TP) and Transport Assessments (TA) are ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development and that they are required for developments which generate significant amounts of traffic movements. A TA may propose mitigation measures which may be required to avoid unacceptable or severe residual impacts. Travel Plans are identified as playing an effective role in taking forward approved mitigation measures which relate to on-going occupation and operation of the development.

2.15 The NPPG (Reference ID: 42-006-20140306) states that TAs can positively contribute to:

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

2.16 In regard to a Travel Plan (TP), the guidance advises that it should identify the specific required outcomes, targets and measures, and set out clear proportionate future monitoring and management arrangements. A TP should also consider what additional measures may be required to offset unacceptable impacts if the targets are not met.

2.17 It is necessary for a TP to set out explicit outcomes rather than just identify processes to be followed. A TP should also address all journeys resulting from a proposed development by anyone who may need to visit or stay and it should seek to fit in with wider strategies for transport in the area (Reference ID: 42-011-20140306).

2.18 An important part of the overall strategy for the proposed development is the implementation, maintenance and monitoring of a FTP that encompasses individual more detailed Travel Plans for the principal land use elements of the proposed development. The FTP in conjunction with the TA are focused towards encouraging sustainable travel.

2.19 NPPG (Reference ID: 42-014-20140306) also requires the appropriate consideration of the cumulative impacts of any adopted Local Plan allocations or committed developments where there is a reasonable degree of certainty of proceeding within the next three years. Through discussions with BCC, the appropriate level of committed/allocated development has been included within the assessments through the use of TEMPRO growth factors.

## Design

2.20 The NPPG notes (Reference ID: 026-042-20140306) that:

*“Successful streets are those where traffic and other activities have been integrated successfully, and where buildings and spaces, and the needs of people, not just of their vehicles, shape the area”.*

It goes on to state that:

*“Every element of the street scene contributes to the identity of the place...” and that “Public transport, and in particular interchanges, should be designed as an integral part of the street layout.”*

2.21 It also notes that:

*“The likelihood of people choosing to walk somewhere is influenced not only by distance but also by the quality of the walking experience. When considering pedestrians plan for wheelchair users and people with sensory or cognitive impairments. Legible design, which makes it easier for people to work out where they are and where they are going, is especially helpful for disabled people”.*

2.22 The design of the proposed development very much responds to this part of the NPPG in that it aims to address the needs of people and to encourage all users of the development to use sustainable modes for travel both within and to and from the development.

## Buckinghamshire's Local Transport Plan 2011-2016

2.23 Buckinghamshire's Local Transport Plan (LTP3) sets out BCC's current transport policies and strategies. Buckinghamshire is divided into nine Local Transport Areas each with its own local area strategy and linked action plan. The proposed development is located within the Buckingham and Winslow area. The headline of the local area strategy for the Buckingham and Winslow area is that

*“In 2026 the Buckingham and Winslow area will have accommodated a significant amount of residential and employment growth, whilst at the same time retaining its local character. The walking and cycling environment in local centres will be improved, in addition to the public realm, and access by*



*all modes will be enhanced to local and regional centres. The impact of transport on the built environment will be reduced, and the roads in the area will be well maintained and safer than they are today.”*

### **A Transport Vision and Strategy for Milton Keynes: Local Transport Plan 3 - 2011 to 2031**

- 2.24 LTP3 acknowledges that Milton Keynes is expected to grow rapidly during the twenty year Plan period and therefore it is essential that as the City grows, so does the transport choice available to residents and visitors alike. LTP3 states that

*“making better use of existing infrastructure, improving highway and Redway connectivity and providing an attractive public transport network are the key.”*

- 2.25 The Transport Vision for Milton Keynes expects that

*“Transport networks, including the unique grid road and Redway networks, will be expanded and fully integrated into new developments and regeneration areas to support more sustainable communities.”*

- 2.26 To support this vision, there are seven objectives, including one for the provision of real and attractive transport choices to encourage more sustainable travel behaviour as Milton Keynes grows.
- 2.27 There is a strategy to deliver the vision and meet the objectives. The strategy contains seven strands; Public Transport, Cycling and Walking, Smarter Choices, Highways and Traffic Management, Technology, Infrastructure Management and Development Planning.
- 2.28 Key interventions are identified to support the strategy and these include expansion of grid roads into and through future Expansion Areas, the dualling of the A421 from M1 Junction 13 to M40 in Oxfordshire and junction improvements.
- 2.29 It is clear that MKC's Vision and Strategy is very much focussed on sustainable travel as a preference to simply increasing highway capacity for general vehicular traffic. The complementary strategies on Public Transport and Travel Demand Management that will be implemented as part of the proposed



development will therefore assist the Council in delivering its Vision for sustainable development and travel.

### **Aylesbury Vale District Local Plan (AVDLP), January 2004**

2.30 The statutory development plan in Aylesbury Vale, insofar as it relates to transportation and highways matters, comprises the following saved policies of the Aylesbury Vale District Plan (AVDLP) which was statutorily adopted in January 2004.

#### **GP.24 Car Parking Guidelines**

2.31 This policy explains that:

*“New development will be required to provide vehicular parking in accordance with the Council’s operative guidelines published as Supplementary Planning Guidance”*

and that the:

*“... guidelines are intended to promote more sustainable transport options and will establish maximum levels of parking appropriate to the scale, type and location of development.”*

2.32 Policy GP.24 seeks to ensure that car parking is provided in accordance with the standards contained in the adopted Aylesbury Vale Parking Guidelines SPG (May 2000). The maximum parking guidelines range from 1 space for a one bedroom flat to 3 spaces for a 4+ bedroom house. Paragraph 39 of the NPPF has introduced a degree of flexibility to car parking standards, so that factors such as accessibility and availability of public transport for example are taken into account. The proposed residential areas will provide sufficient car parking, with the exact amount to be determined at detailed design stage.

#### **GP.25 Re-opening of Rail Routes**

2.33 In this policy the Council states that it:

*“... will resist development that might prejudice the use of the rail route running through the District between Bicester and Bletchley, and the northward link from Aylesbury, by passenger and freight services.”*

- 2.34 A section of the Bicester to Bletchley route, which is part of Phase 2 of the East West Rail scheme, comprises the south east boundary of the proposed development Site.
- 2.35 Phase 2 of the East West Rail scheme comprises the routes from Bicester to Bedford and Milton Keynes to Aylesbury. Currently phase 2 is the subject of public consultation as topographical, environmental and structural surveys continue and a consultant has been appointed to develop outline designs.
- 2.36 Furthermore, the proposed development has made provision to safeguard land through the Site to accommodate the alignment of a new grid road (Policy RA.35 below) at a point where it would be expected to cross the Bicester to Bletchley route by means of an underpass.

#### RA.35 Safeguarded Road Corridor at Newton Longville Brickworks

- 2.37 The development of the Newton Longville Brickworks site in Milton Keynes has made provision for a link road to A4146 Fenny Stratford bypass. Policy RA.35 states that the Council:

*“..... will also seek to ensure that the opportunity for construction of a link between the proposed development in Milton Keynes and the Buckingham Road (A421) is not prejudiced by development.”*

- 2.38 As noted above, the proposed development would facilitate the extension of a link road further south to accommodate the alignment of a new grid road that would extend from the Tattenhoe roundabout on A421 to the southern development boundary.

#### Draft Vale of Aylesbury Local Plan (VALP), July 2016

- 2.39 The Draft VALP was realised for public consultation on 7<sup>th</sup> July 2016. The consultation period runs to 5<sup>th</sup> September 2016, with the expected submission of the Plan in March 2017 and adoption by AVDC in summer 2017.
- 2.40 The Draft VALP allocates the Site (Site Reference: NLV001) for 1,885 residential units as part of the 4,274 homes required in strategic sites adjacent to Milton Keynes.

- 2.41 Draft Policy D3 'Delivering sites adjacent to Milton Keynes' aims to ensure the delivery of the infrastructure to support the 4,274 homes to be built at Newton Longville, Whaddon and Stoke Hammond. A Masterplan and Delivery SPD will be developed for the sites following adoption of the Draft VALP. Policy D3 suggests that the development sites should consider:

*"how the transport challenges for the site can be addressed (including any future A421 and A4146 link road) in accordance with the Aylesbury Vale Rest of District Transport Strategy (BCC, 2009)".*

- 2.42 The Draft VALP commits to continue to cooperate with key delivery partners to secure funding for key infrastructure priorities including East-West Rail and the A421 Expressway between Oxford and Cambridge.
- 2.43 The A421 Expressway is a Government aspiration to link Oxford to Cambridge, via Milton Keynes and Bedford, creating a high-quality link. Route options are under consideration and AVDC considers that any alignment for the Expressway will be safeguarded from development as the Draft VALP progresses through to adoption, as included in Draft Policy S6 'Protected Transport Schemes'.

#### **Milton Keynes Local Plan (MKLP), December 2005**

- 2.44 The statutory Development Plan, insofar as it relates to transportation and highway matters, comprises the following saved policies of the Milton Keynes Local Plan (MKLP) which was statutorily adopted in December 2005, along with the Milton Keynes Core Strategy (MKCS) which was statutorily adopted in July 2013.
- 2.45 Whilst the adopted Development Plan policies will only carry statutory force insofar as they relate to the elements of the scheme that fall within the Council's administrative area, the relevant policies are assessed below to demonstrate how the proposed development reflects the requirements of local planning policy.

#### **Policy D1 – Impact of Development Proposals on Locality**

- 2.46 Policy D1 states that planning permission will be refused for development that would be harmful for a number of reasons including:

*“(i) Additional traffic generation which would overload the existing road network or cause undue disturbance, noise or fumes.....*

and

*“(vi) Inadequate access to, and vehicle movement within, the site”*

2.47 The proposed development will not conflict with this policy. It is a sustainable mixed use proposal which will encourage significant numbers of internal trips, negating the need to travel externally. In order to further encourage the use of more sustainable modes of travel a Transport Strategy as described at Section 5 will be implemented at the proposed development. The proposed development will provide suitable and appropriate mitigation to accommodate the forecast travel demands and therefore additional traffic generation will not overload the existing road network or cause undue disturbance.

2.48

#### Policy T1 – The Transport User Hierarchy

2.49 This policy describes an order of priority in terms of meeting future transportation need, pedestrians and those with impaired mobility; cyclists; public transport users, taxis and motorcyclists; and then ‘others’.

2.50 The proposed development responds to this order of priority by ensuring that pedestrian and cyclist interconnectivity is a key aim of its movement strategy as noted at Section 5 of this TA.

#### Policy T2 – Access for those with Impaired Mobility

2.51 Policy T2 requires development proposals to be designed to meet the access needs of those with impaired mobility. In particular, specifically identified and convenient parking spaces should be provided and the layout of the external environment, including links to adjoining areas, must provide convenient, direct and safe access.

2.52 The proposed development will accommodate the access needs of those with impaired mobility with all public parking areas being equipped with sufficient accessible parking. The principal footway/cycleway routes will provide

convenient, direct and safe access throughout the proposed development and will be suitable for those with impaired mobility.

### Policy T3 – Pedestrians and Cyclists

- 2.53 This policy sets out the Council's requirements for meeting the needs of pedestrians and cyclists with particular reference to layout of the external environment and the provision of direct, secure and legible routes that are not isolated from other transport uses. The policy also requires the provision of cycle parking and associated facilities to meet its standards.
- 2.54 The needs of pedestrians and cyclists are at the forefront of the movement strategy for the proposed development. State-of-the-art cycle storage and parking will be provided where required to meet the needs of all users of the development. The Design and Access Statement (DAS) prepared by David Lock Associates as part of the revised outline planning application provides full details of the movement strategy.

### Policy T4 – Pedestrians and Cyclists

- 2.55 Policy T4 sets out the Council's priorities for improving access and conditions for pedestrians and cyclists. These are, in order: routes from nearby settlements to Milton Keynes City; routes to and within Central Milton Keynes and town centres; and The National Cycle Network.
- 2.56 The proposed development seeks to maintain and improve where possible linkages with existing pedestrian and cycle facilities, both the urban Redway system and rural footpath/bridleway routes.

### Policy T5 – Public Transport

- 2.57 This policy requires development proposals to meet the needs of public transport operators and users. In particular:
- *Road layouts must include direct, convenient and safe bus routes*
  - *Bus priority measures must be implemented, where appropriate*

- *All houses and most other development must be no more than 400m from a bus stop*
- *Bus stops must have suitable shelters, good pedestrian access and be open to public supervision*
- *Specific consideration must be given to the provision of public transport services in planning new development*

2.58 The proposed development has been designed to ensure that the requirements of this policy are met. A main consideration in the design of the road layout has been the need to provide for public transport services within the development to ensure that all residential and commercial premises are within an acceptable walking distance of a bus stop and that bus routes are direct, convenient and safe. Bus infrastructure located within the proposed development would be to the latest design, with shelters, information and access for all users.

2.59 In relation to Policy T5 MKLP also states that:

*“7.17 In major developments and in new development areas, Developers will be expected to help ‘pump prime’ public transport services through planning obligations, to provide a satisfactory level of bus service. This is a minimum of three buses per hour between 7am-7pm Monday – Saturday, 2 buses per hour between 10 am – 6pm on Sunday and an hourly service at other times or the appropriate level of service set out in the Bus Strategy.”*

2.60 A Public Transport Strategy has been developed as part of the proposed development and is included in Section 5 of this TA. To implement the Strategy, the Consortium will ‘pump prime’ a bus service that will be developed to meet the ongoing needs of the proposed development and contribute towards MKC’s wider Public Transport Strategy contained in their LTP3.

#### Policy T9 – The Road Hierarchy

2.61 Policy T9 establishes a road hierarchy within Milton Keynes, comprising Primary Distributors, District Distributors, Local Distributors and Access Roads. It states that planning permission will be refused if proposed highways do not comply with the Council's Highway Design Guide, unless it is necessary to achieve good urban design.

- 2.62 The proposed development will also have a road hierarchy based broadly on established design principles and provide the same priorities to accommodate the need of pedestrians and cyclists and users of public transport.

#### Policy T10 - Traffic

- 2.63 This policy indicates that planning permission will be refused for development if it would be likely to generate motor traffic that exceeds the environmental or highway capacity of the local road network or which would cause significant disturbance, noise, pollution or risk of accidents.
- 2.64 It is considered that this older policy is not consistent with the new test in paragraph 32 of the National Planning Policy Framework which is that development should only be prevented or refused on transport grounds “*where the residual cumulative impacts of development are severe.*”

#### Policy T11 – Transport Assessments and Travel Plans

- 2.65 Policy T11 explains that

*“any development that would increase traffic on an adjoining road by 5% or more, or would lead to any increase in traffic where the road is at or over its environmental or highway capacity”*

must be accompanied by a TA and a TP produced in consultation with local transport providers and agreed with the Council. There is an associated table which provides thresholds based on land-use over which a TA is required.

- 2.66 This TA has been prepared to fully explain the likely impacts of the proposed development and also to provide details of the strategies proposed to mitigate these impacts. An important element of the mitigation strategy will be the implementation, management and monitoring of TPs for all key elements of the proposed development.

#### Policy T12 - Major Transport Schemes

- 2.67 This policy states that planning permission will be refused for development that would prejudice certain road and rail improvement schemes. These include the East West Rail scheme and the Standing Way to Newton Road road link, Bletchley.



- 2.68 As previously explained, the proposed development will make provision of land to accommodate the alignment of a new grid road. The proposed development therefore assumes that the East West Rail link will be reopened during the lifetime of the scheme. The proposed development will make provision for future road and rail improvement schemes and will not compromise their future implementation.

#### Policy T15 – Parking Provision

- 2.69 Policy T15 provides guidance relating to car parking provision. Car parking standards must not exceed the Council's 'maximum standards', nor be reduced below these if it is likely to result in off-site car parking problems; car parking areas must be well designed and assist pedestrian and cycle access.
- 2.70 The MKC maximum parking guidelines contained within the Parking Standards SPD of January 2016 range from 1 space for a one bedroom flat to 3 spaces for a 4+ bedroom house, and are based on accessibility zones with lower standards for areas of high accessibility. The National Planning Policy Framework (at Paragraph 39) has introduced a degree of flexibility to car parking standards, so that factors such as accessibility and availability of public transport for example are taken into account.
- 2.71 Parking will be provided to meet the standards of the Aylesbury Vale Parking Guidelines SPG (May 2000) as the Site falls within AVDC rather than MKC. The proposed residential areas will provide sufficient car parking, with the exact amount to be determined in conjunction with the local planning authority at detailed design stage.

#### Policy T17 – Traffic Calming

- 2.72 This policy explains that the Council will expect new development areas to secure traffic calming as an integral part of street design, whilst ensuring that there is adequate provision for efficient and convenient public transport provision.
- 2.73 As the Illustrative Master Plan evolves in conjunction with discharging reserved matters, traffic calming features will be designed to be an integral part of the public realm rather than something which is 'bolted on' retrospectively. The type of features used will be carefully selected for their appropriateness within the road hierarchy.



## Policy KS1 – Newton Leys

- 2.74 Newton Leys is an allocated site within MKC for a comprehensive development including housing, employment and retail. The site is partially built. Policy KS1 states that within the Newton Leys site there will be a safeguarded route:

*“... for a link road between the A4146 Fenny Stratford bypass and the A421 Buckingham Road / H8 Standing Way.”*

- 2.75 A similarly safeguarded route is to be provided within the proposed development to accommodate the extension of the Grid Road network from Milton Keynes further to the south and east, to link with the Newton Leys grid road reserve.

## Milton Keynes Core Strategy (MKCS), July 2013

- 2.76 The Milton Keynes Core Strategy (MKCS), adopted July 2013, contains a ‘Spatial Vision’ for the Borough in 2026 and identifies a number of specific objectives that will assist in its delivery. Whilst these are not development plan policies, they are material to the consideration of the proposed development in transportation and highways terms. In particular the Spatial Vision states in part that:

*“ The city’s iconic grid road system will have been conserved and extended into any major new development areas. The layout of development areas will route through-traffic onto suitable arteries whilst providing direct routes for public transport and a network of redways for convenient cycling and walking.*

*New public transport routes for low carbon vehicles (such as guided electric buses) will link new and existing communities to the city centre and other important centres and facilities. This will have reduced overall congestion and lowered peak hour commuting by car from 68% to 57% by 2026. Low carbon transport such as electric cars will also be supported.*

*Transport links to other towns, including Aylesbury, Bedford, Luton and Northampton, will have been improved. These include the East - West rail link between Oxford and Cambridge via Milton Keynes, the A421 corridor through the city (linking the A1, M1 and M40)...*

- 2.77 The following ‘Core Strategy Objectives’ are of particular relevance.

*“To work jointly with neighbouring authorities and other key organisations on the planning of any development located on the edge of Milton Keynes (but outside the current MK boundary) so that these areas are integrated with the city and contribute to its role and character.”*

and

*“To manage increased travel demands through:*

- Promoting improvements to public transport and supporting the development of an East - West rail link between Oxford and Cambridge...*
- Encouraging an increased number of people to walk and cycle by developing an expanded and improved Redway network*
- Extending the grid road pattern into any major new development areas*
- Utilising demand management measures to reduce the growth of road congestion, whilst upgrading key traffic routes such as the A421 and the A509”*

2.78 The Public Transport Strategy for the proposed development includes improvements to existing public transport ensuring that an acceptable level of service is provided that will be developed to meet the ongoing needs and assist in reducing the growth of road congestion.

2.79 A main feature of the proposed development is also its linkages with the existing Redway system and an extension of these into all areas allowing ease of access for pedestrians and cyclists which again will assist in reducing the growth of road congestion. This along with a continuation of the grid road pattern into the proposed development will ensure that it is integrated with the city and contributes to its role and character.

#### Policy CS6 Place-shaping Principles for Sustainable Urban Extensions in Adjacent Local Authorities

2.80 Policy CS6 provides a policy framework setting the basis for MKC to respond to development proposals for Sustainable Urban Extensions (SUE) adjoining

the City. It establishes principles that the Council will apply and a number of these relate to transportation and highways matters:

*“ A sustainable, safe and high quality urban extension should be created which is well integrated with, and accessible from, the existing city. Its structure and layout should be based on the principles that have shaped the existing city, especially the grid road system, redways ....*

*Linear parks should be extended into the development where possible to provide recreational, walking and cycling links within the development area and to the city's extensive green infrastructure and redway network.*

*Technical work to be undertaken to fully assess the traffic impacts of the development on the road network within the city and nearby town and district centres and adjoining rural areas, and to identify necessary improvements to public transport and to the road network, including parking.*

*A route for the future construction of a strategic link road(s) and/or rail link should be protected where necessary.*

*The opportunity for new 'Park and Ride' sites for the city should be fully explored and where possible provided and efficiently and effectively linked to the city road system.”*

2.81 The proposed development will be a sustainable, safe and high quality urban extension which will be integrated with, and easily accessible from, the existing Central Milton Keynes. The principles that have shaped the existing city have been used to develop the Illustrative Master Plan that is described in detail in the Design and Access Statement.

2.82

2.83 This TA contains details of the technical work that has been carried out in support of the original planning application in 2015 and more recently to fully assess the traffic impact of the proposed development on the road network within Milton Keynes and also Aylesbury Vale. Improvements to public transport have been discussed in principle with Arriva and a public transport strategy is provided also within this TA.

## Policy CS10 Housing

- 2.84 Policy CS 10 promotes design that encourages access by walking, cycling and other forms of non-car travel within the neighbourhood and across the city; and notes that car parking standards should meet projected levels of car ownership (in addition to visitor parking).
- 2.85 Access by walking, cycling and other forms of non-car travel is at the forefront of the design concept for the proposed development. The design provides excellent walking and cycling facilities within the development and safe, convenient linkages to the existing Redway system.

## Policy CS11 A Well Connected Milton Keynes

- 2.86 Policy CS11 states that the Council will work with its partners to accommodate increasing demand for movement and deliver a reduction in the Borough's carbon footprint. It identifies measures that will be used in this regard:

- *A step change in improvements to public transport... new bus services will be provided to major new areas of development when sufficient buildings are occupied.*
- *More sustainable transport choices for car owners and information and measures to encourage them to use non-car modes for more journeys.*
- *Encouraging greater movement within the Borough by cycling and walking through improvements to the existing Redway network and other paths including more direct routes, enhanced facilities and signage, better integration with transport interchange hubs, and improved surveillance; by extending the Redways network throughout major development areas (including the creation of routes that are shorter than the equivalent road journey).*
- *Planning the development of large housing and employment areas... so that it is well served by public transport and easily accessible by walking and cycling...*
- *Demand management in order to help achieve a shift from journeys by car to more sustainable transport.*

- *Maintaining and future-proofing the city's grid road network and extending it into new development areas whilst safeguarding the corridors for possible mass transit schemes. Road networks in new development areas in neighbouring authorities will be dependent on the strategies and preferences of those neighbouring authorities and partnership working.*
- *Maximising the capacity of the Borough's highway network through phased improvements in step with housing and employment growth...*
- *The highway network will be served by high quality transport interchanges well located to transport nodes and the strategic highway network, and by park and Ride sites on the edge of the city and in close proximity to the strategic highway network.*
- *To engage with Network Rail and relevant stakeholders along the East-West Rail line to identify operational benefits which thereby provides additional support for a more sustainable transport strategy and/or economic growth of the city."*

2.87 The proposed development has been designed to satisfy all relevant elements of this policy, particularly by virtue of its mixed-use nature which will significantly reduce the need to travel to other parts of the Borough for work, education and leisure. It will also be well served by public transport and will also enhance the provision for other users along the route into Central Milton Keynes. Travel planning and personal journey planning will provide information from the outset designed to encourage car users to switch to sustainable modes of travel.

2.88 There will be good linkages with the existing Redway network that will permit permeability with existing communities and allowance will be made for the extension of the City's iconic grid road network through the development.

Policy CS12 Developing Successful Neighbourhoods

2.89 Policy CS 12 encourages development that will support 'sustainable lifestyles' indicating in part that this will include creating

*“... walkable neighbourhoods and extensions of the existing walking, cycling and key public transport networks” and “siting key day-to-day facilities, including schools, shops, leisure and employment in locations easily accessible on foot, by bike and by public transport.”*

- 2.90 The proposed development has been carefully designed to support sustainable lifestyles, incorporating a mix of uses that are located to be easily accessible for pedestrians and cyclists.

### Policy CS13 Ensuring High Quality, Well Designed Places

- 2.91 Policy CS13 deals with the ‘Character of Place’ and the ‘Design of Place’. With regard to Design this policy encourages new developments to *“Champion new approaches to sustainable urban form and structure, which build on the concept of the grid, so that everyone lives within walking distance of a viable bus route, local shops and other day-to-day facilities”*
- 2.92 Policy CS13 also states that “Redways should be built within the landscape corridor of all new grid roads, as well as elsewhere within new developments, having regard to delivery of other sustainable transport and landscape character requirements.
- 2.93 The proposed development is designed to accommodate the concept of the grid, and provides for an extension of this through the development. It also provides for safe, efficient and user-friendly linkages to the existing Redway network, mirroring its concept within the development itself.

### Milton Keynes Transport and Sustainable Transport SPD (June 2009)

- 2.94 The main purpose of the Sustainable Transport SPD is to clarify and advise where developer contributions for transport improvements will be sought and how those contribution sums are calculated and committed. The SPD has been drawn up to interpret several policies of the Local Plan (December 2005) of which T5 and T11 have already been identified as being applicable to the proposed development.



### **Milton Keynes New Residential Development Design Guide SPD (April 2012)**

- 2.95 The Design Guide for New Residential Development in Milton Keynes is intended to ensure a high quality of development for future growth and regeneration of Milton Keynes.
- 2.96 The purpose of the Guide is two-fold; as a tool to assist the Council in the determination of planning applications and reserved matters and to help developers understand what is expected from them particularly in terms of design, layout and landscaping of new residential development. Although the proposed development Site does not fall within the MKC boundary, the guidance has been used to inform the master planning process and MKC has been part of that process, participating in a series of workshops to enable the development of the Illustrative Master Plan.

### **Milton Keynes Local Investment Plan (March 2015)**

- 2.97 The Local Investment Plan (LIP) sets out the vision and aspirations for the Milton Keynes area as it continues to grow with the aim of delivering a further 28,000 new homes and over 40,000 new jobs by 2026. The plan outlines the investment requirements and funding mechanisms to support the delivery of growth.
- 2.98 The Local Investment Plan identifies that the commitment to future growth and the policies and strategies in place for Milton Keynes creates both 'challenges' and 'opportunities' in terms of the infrastructure and investment required.
- 2.99 The 'Capacity of Transport Grid and Transport Links' is identified as an opportunity as the LIP recognises that Milton Keynes has good transport links and was planned to deliver high speed access across the whole city. A specific opportunity that is noted is the extension of the railway through Bletchley and on to Bedford and Cambridge.

### **Summary**

- 2.100 It is clear that there are certain themes running through both national and local policy that the proposed development should respond to. Development proposals should be such that they encourage the use of sustainable modes of transport and give priority to pedestrian and cycle movements, and have

access to high quality public transport facilities. This enables best use to be made of existing infrastructure.

2.101 The NPPF encourages and promotes sustainable development and states that development should only be prevented or refused on transport grounds if the residual cumulative impacts are severe. Appropriate mitigation has been discussed and agreed with BCC and MKC to ensure that the residual cumulative impact is not severe.

2.102 Improvements are required by the local and strategic highway authorities to enable general growth forecasts (without the proposed development) to be accommodated on the highway and transport network and the proposed development is able to facilitate and act as a catalyst for implementing those required infrastructure improvements.

2.103 This TA demonstrates that the proposed development complies with the:

- Current Development Plan Policy;
- NPPF and the NPPG; and
- Positively responds to the movement aspirations of Aylesbury Vale District (AVDC) Council and Milton Keynes Council.



## 3 Existing Conditions

### Application Site

- 3.1 The area of land that will accommodate the proposed development comprises a 'green field' Site, north-west of Newton Longville and immediately west of Far Bletchley and south west of the centre of Milton Keynes. The Site, which covers an area of approximately 144 hectares, is bounded to the north by A421 Standing Way, to the east by the existing built up area of Far Bletchley, to the south by the disused railway line and to the west by Whaddon Road. A plan showing the location of the Site in relation to the surrounding area is provided in **Figure 3.1**.

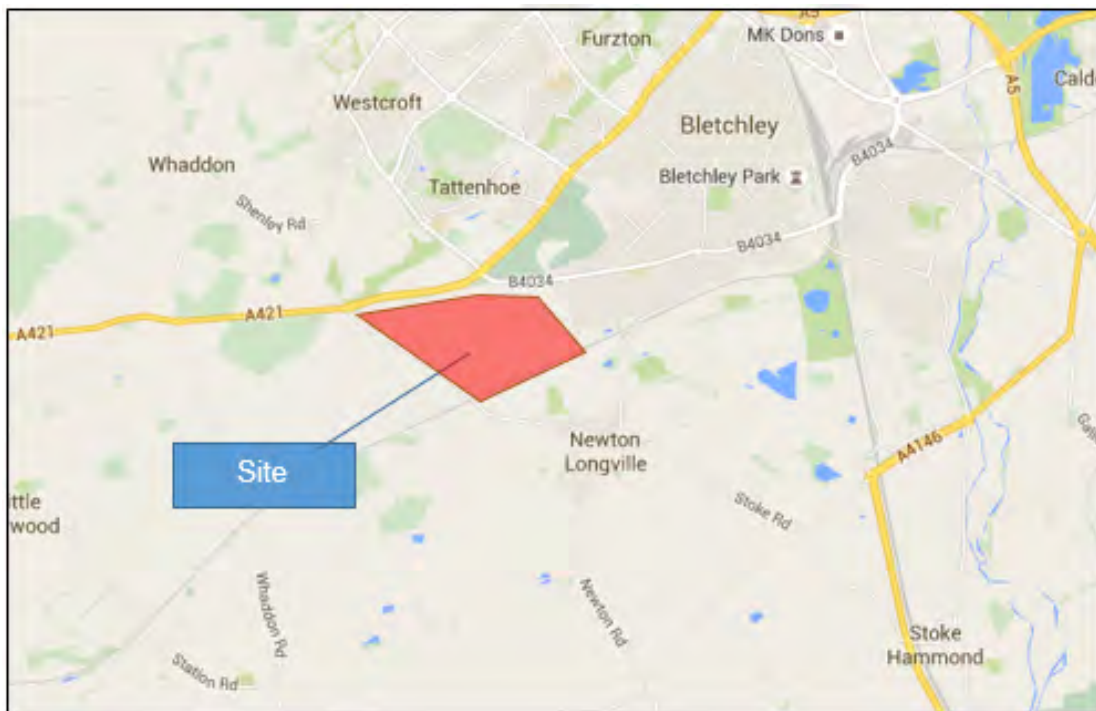


Figure 3.1: Site Location

- 3.2 There is currently no formal means of vehicular access into the Site that could be used to serve the proposed development. Weasel Lane crosses the Site in a north easterly direction from Whaddon Road to B4034 Buckingham Road. Weasel Lane is a restricted byway, a highway over which the public has a right of way on foot, bicycle, horseback, and with non-mechanically propelled vehicles. Notwithstanding its status, Weasel Lane is accessible by motor vehicles from both Whaddon Lane and Buckingham Road by means of 'simple'

priority junctions at both ends and provides access from Whaddon Road to an existing residential property which is currently outwith the Site.

### Local and Regional Highway Network

- 3.3 The Site is well connected on a local, sub-regional and regional scale. A421/H8 Standing Way (**Photo 3.1**) runs in a north easterly direction towards the A5 providing connections to the Bletchley, Emerson Valley and Furzton areas. A roundabout at the junction of H8 Standing Way and V6 Grafton Street (Bleak Hall Roundabout) allows access to Redmoor Roundabout which interchanges with A5. To the east of A5, A421 Standing Way provides access through the Beanhill, Netherfield, Monkston, Kents Hill and Brinklow areas to Junction 13 on the M1 Motorway and also north into Bedford.



*Photo 3.1: A421/H8 Standing Way*

- 3.4 To the west, A421 provides links to Buckingham and A43. A421 extends west from Bottle Dump Roundabout in the north-west corner of the Site, and has a number of junctions along its length providing links to minor roads that serve the surrounding villages (**Photo 3.2**). A421 continues west and meets A413 at a roundabout to the east of Buckingham, some 12.5km west of the Site, before continuing to the south of Buckingham, north of the Buckingham Industrial Estate. A421 continues west from Buckingham, bypassing Tingewick to the south before joining A43 approximately 4km south of the centre of Brackley.



*Photo 3.2: A421 (west of Bottle Dump Roundabout)*

3.5 Whaddon Road (**Photo 3.3**) runs in a south easterly direction along the western edge of the Site, over the disused railway, and into the village of Newton Longville. Within the village, Whaddon Road gives way to Bletchley Road/Drayton Road at a four-arm priority junction before continuing as Stoke Road. Stoke Road provides access to A4146 Stoke Hammond bypass to the south, of which A4146 provides a southern bypass to Leighton Buzzard before joining A505. A505 joins A5 Watling Street at a roundabout junction to the north west of Houghton Regis.





*Photo 3.3: Whaddon Road*

3.6 The location of the Site in relation to the local and strategic highway network is shown on **Figure 3.2** and **Figure 3.3**.



*Figure 3.2: Local Highway Context*

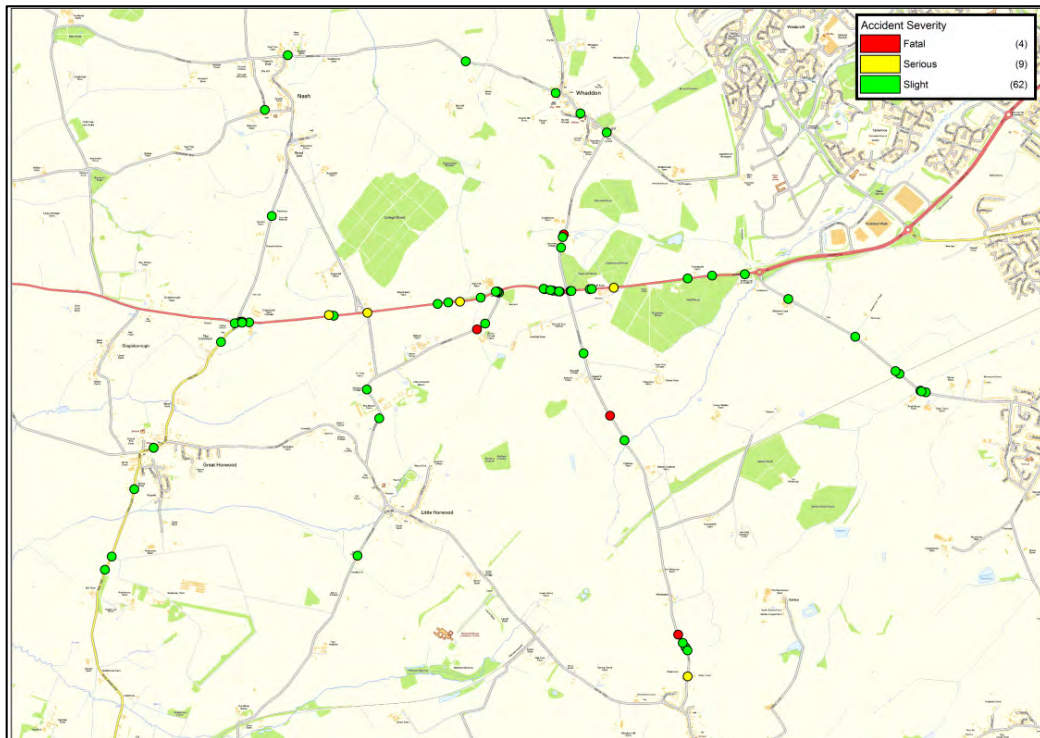


Figure 3.3: Strategic Highway Context

## Personal Injury Collisions

### Buckinghamshire

- 3.7 Personal Injury Collision (PIC) data to cover the last five years have been obtained from BCC in the area of the proposed development and the surrounding villages.
- 3.8 **Figure 3.4** shows the location and severity of all 75 injury collisions in the area of interest that occurred in the 5 year period from 1st January 2011 to 31st December 2015. Overall, 62 collisions were classified as slight in severity, 9 as serious and 4 collisions resulted in a fatality.
- 3.9 Of all collisions, 12% occurred during the morning peak (0700-0900) and 18% occurred during the evening peak (1600-1800).



*Figure 3.4: Collisions by Severity Between 2011 and 2015*

3.10 **Figure 3.5** shows the collisions classified by the weather conditions, with 91% of all the collisions occurring during good weather conditions. This suggests that bad weather was not a major causal factor for the collisions.



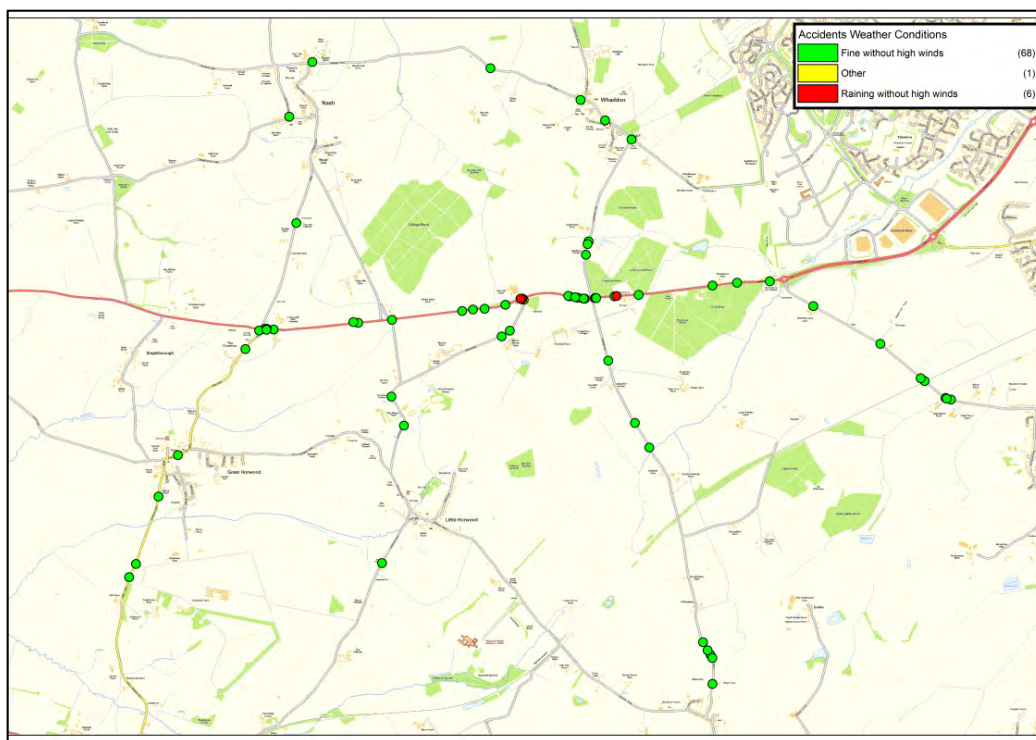


Figure 3.5: Collisions by Weather Conditions 2011-2015

3.11 Within the 75 collisions that were recorded there were 105 casualties, of which 88% were slightly injured, 9% were seriously injured and 4% suffered fatal injuries. **Table 3.1** below summarises the casualties that occurred.

	Fatal	Serious	Slight	Total
Vehicle Drive	3	4	58	65
Passenger	0	0	23	23
Motorcycle	1	4	5	10
Cyclist	0	0	3	3
Pedestrian	0	1	3	4
<b>Total</b>	<b>4</b>	<b>9</b>	<b>92</b>	<b>105</b>

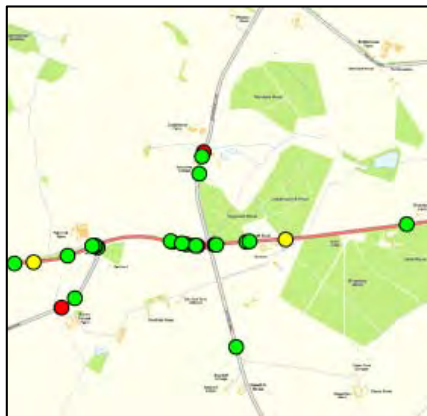
Table 3.1: Summary of Collisions and Casualties Between 2011 and 2015 (BCC)

3.12 When reviewing the collision data for the whole study area (as shown in **Table 3.1**), there were only 4 pedestrian casualties and 3 cyclist casualties, 6 of which



were slightly injured and 1 seriously injured. The proportion of all casualties that are pedestrians or cyclists is just 7%, presumably due to the rural nature of the area and the low usage of these roads by pedestrians and cyclists.

- 3.13 There were 8 collisions at or near Whaddon Crossroads as shown on **Figure 3.6**; all 8 collisions were classified as slight. Whilst 3 collisions involved rear end shunts on the approaches to the roundabout along A421, there does not appear to be an underlying road geometry issue associated with the collisions at this location.



*Figure 3.6: Collisions at Whaddon Crossroads 2011-2015*

- 3.14 There were 5 collisions along Warren Road and Church Street, leading to and from Little Horwood; 1 fatal and 4 slight, as shown on **Figure 3.7**. The fatality was caused by a HGV exiting from a farm, at which point a car hit the offside of the vehicle and ended up in a ditch. There were no collisions within the village of Little Horwood itself.



*Figure 3.7: Collisions in Little Horwood 2011-2015*

3.15 There were 4 collisions along the B4033 through Great Horwood, as shown on **Figure 3.8**. All of which were slight, with no common causal factor.



*Figure 3.8: Collisions in Great Horwood, 2011-2015*

3.16 There were 3 collisions on the roads in and around Nash as shown on **Figure 3.9**. All 3 were slight collisions and there were no common causes behind these collisions.



*Figure 3.9: Collisions in Nash, 2011-2015*

- 3.17 There were 8 collisions along Whaddon Road leading towards Mursley; 2 Fatal, 2 serious and 4 slight as shown on **Figure 3.10**. Of the 2 fatal collisions, one was down to loss of control and the other down to driver error.



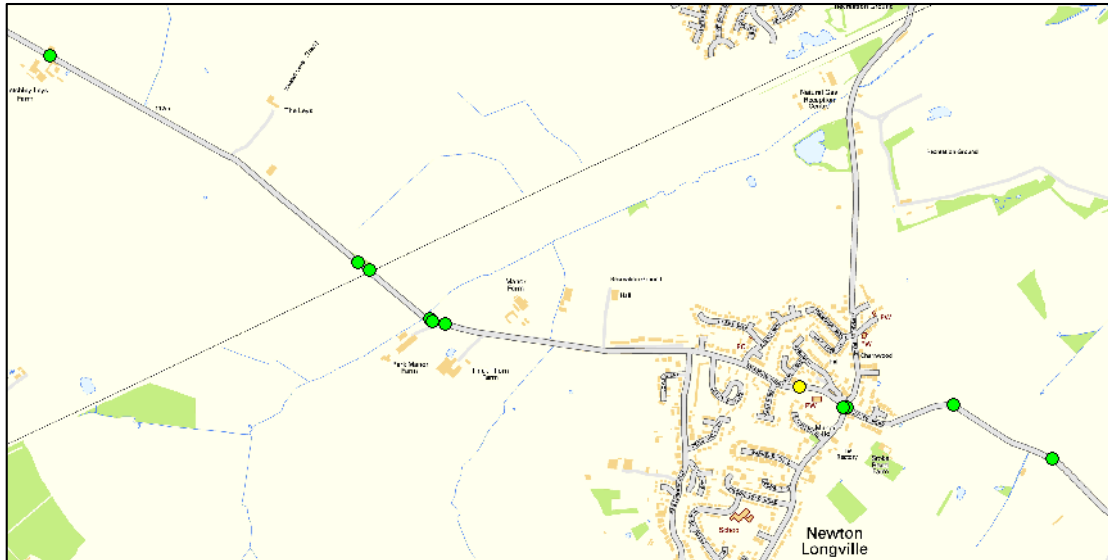
*Figure 3.10: Collisions in Mursley, 2011-2015*

- 3.18 There were 7 collisions along Stock Lane and Coddimoor Lane leading to and from Whaddon village, as shown on **Figure 3.11**. One of those collisions was fatal, whilst the other 6 were slight. The fatal collision was due to loss of control, which seems to be a recurring factor in more than half of the collisions along this stretch of road.



*Figure 3.11: Collisions in Whaddon, 2011-2015*

- 3.19 There were 12 collisions along Whaddon Road and Stoke Road through Newton Longville (including at the junction of Stoke Road and Newton Road) as shown on **Figure 3.12**. There is no common causal factor to these collisions that would suggest an underlying road safety issue.



*Figure 3.12: Collisions in Newton Longville, 2011-2015*

#### Milton Keynes

- 3.20 PIC data was also obtained from Milton Keynes Council to cover a large area of interest including the following roundabouts and the road links between them; Bottle Dump, Tattenhoe, Kingsmead, Westcroft, Furzton, The Bowl, Elfield Park, Emerson and Windmill Hill. The collisions that have occurred within this area of interest in the 5 year period, 1<sup>st</sup> July 2009 to 30<sup>th</sup> June 2014, are summarised in **Table 3.2** below.

Location	Number of PICs		
	Slight	Severe	Fatal
Bottle Dump and Tattenhoe Roundabouts	14	0	0
H8 to Windmill Hill Roundabout	6	3	0
H8 to Emerson Roundabout	14	0	0
H8 to Elfield Park Roundabout	19	2	0
V1 to Kingsmead Roundabout	7	2	0
V2 Tattenhoe Street	7	1	0
V3 Fulmer Street	17	2	1
V4 Watling Street	15	1	1
H7 to Westcroft Roundabout	7	2	1
H7 to Furzton Roundabout	10	1	0
H7 to The Bowl Roundabout	11	3	0

Table 3.2: Summary of Collisions Between 2009 and 2014 (MKC)

- 3.21 An interrogation of the data for the whole study area reveals that there have been only 2 pedestrian casualties albeit one of these was fatal and the other serious. In the same time period there have been 7 cyclist casualties. Road safety does not appear to be a significant issue in relation to users of these modes.
- 3.22 Further collision data was collected from MKC for the area of A421 from Bottle Dump Roundabout to Tattenhoe Roundabout between July 2014 and August 2015. The data shows that during that period there were three collisions with four casualties, all of which obtained slight injuries, and all with causal factors of 'failing to look properly' at the junctions.
- 3.23 The collision records show incidents at junctions but there is no indication from the identified causation factors that there are any underlying road geometry issues at fault.

### Pedestrian & Cycle Routes

- 3.24 National Cycle Route (NCR) 51 runs south-west through the Site, along Weasel Lane from Buckingham Road, crossing Whaddon Road before re-joining the road network on a small farm track, east of Lower Salden Farm. Weasel Lane (**Photo 3.4**) is a restricted byway, with the following public right of way (PROW) classifications:

- NLO/25 at the north eastern end (between Buckingham Road and footpath NLO/19 – around 250metres) with a metalled surface around 4m in width and with verges both sides;
- NLO/20 between footpath NLO/19 and the parish boundary – around 1150m in length generally metalled and with a similar width of around 4m and verges to both sides; and
- MUR/15 between the parish boundary and the track to Lower Salden Farm – around 550m, with width and surface generally as for NLO/20.

3.25 The route is sign-posted throughout as NCR51, providing connections to Bicester and Oxford to the south-west, and Bedford and Huntingdon to the north-east.



*Photo 3.4: Weasel Lane*

3.26 Bridleway WHA/16 extends south from A421 (approximately 150m west of Bottle Dump Roundabout) to Whaddon Road (Mursley) and beyond Whaddon Road to the west as LHO/19.



3.27 Footpath NLO/19 extends from Weasel Lane (250m west of Buckingham Road) south to Whaddon Road, Newton Longville, opposite Westbrook End. The footpath passes under the currently disused route of the East West rail line via an existing underbridge.

3.28 There are two recreational footpath routes in the vicinity of the Site:

- The Midshires Way is a long distance footpath and bridleway that runs from Bledlow in Buckinghamshire, to Stockport in Greater Manchester. Near the Site, it runs along Bridleway WHA/16 from Whaddon Road (Mursley) under the subway at Bottle Dump Roundabout, and north along the western boundary of Tattenhoe Park; and
- The Milton Keynes Boundary Walk is a circular route around Milton Keynes. It runs through Newton Longville, north along footpath NLO/19 to Weasel Lane, along Weasel Lane, north along Whaddon Road to Bottle Dump Roundabout and north along the western boundary of Tattenhoe Park. The route is a 'walk' and is not designated as a Public Right of Way (PROW).

3.29 The Milton Keynes cycle network (i.e: the Redway system) commences west of Bottle Dump roundabout before continuing eastbound, north of A421 Standing Way, reaching Tattenhoe Roundabout where it passes under the Snelshall Street and A421 Standing Way arms of the roundabout via subways. At this point, the Redway splits in three. A route can either be followed north-east alongside the A421 Standing Way towards the City Centre and Central Milton Keynes Railway Station, or to the south east alongside Buckingham Road, and to the north alongside Snelshall Street.

3.30 The Redway network can be accessed from the Site via:

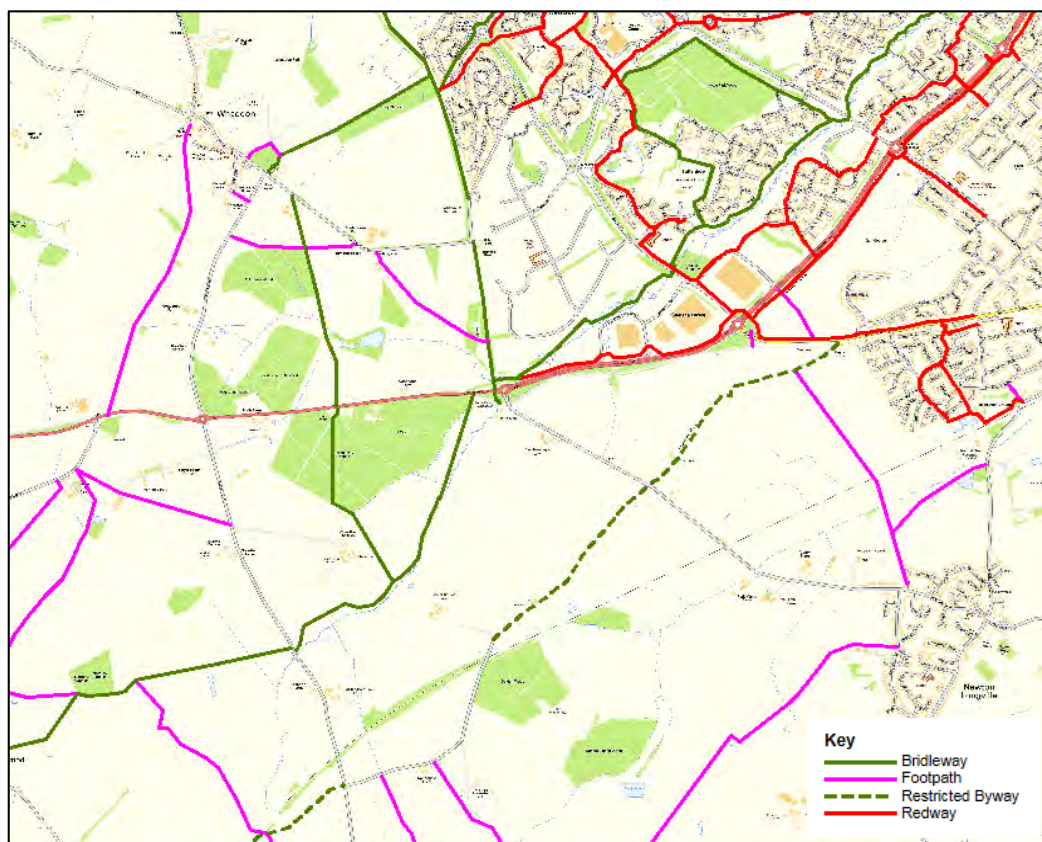
- Whaddon Road, immediately south of Bottle Dump roundabout;
- The subway under A421, east of Steinbeck Crescent; and
- Buckingham Road, south east of Tattenhoe Roundabout (**Photo 3.5**).





*Photo 3.5: Redway Alongside Buckingham Road*

3.31 The existing pedestrian and cycle routes through and around the application Site are shown in **Figure 3.13**.



*Figure 3.13: PROW Network in the Vicinity of the Site*

## Public Transport Provision

### Bus provision

- 3.32 The nearest bus stops that are served by a regular bus service are on Chepstow Drive in Far Bletchley to the east of the Site (**Photo 3.6**). The existing bus stops on Chepstow Drive are currently served by Route 28 operated by Red Rose Travel. On Monday to Saturday an hourly service operates between Central Milton Keynes and Bletchley Bus Station.



*Photo 3.6: Bus Stops at Chepstow Drive*

- 3.33 The nearest bus stops to the Site that provide a more frequent level of service are around 800 metres walking distance from the Site boundary on Whaddon Way. These stops are currently on Route 4, operated by Arriva which provides a 10 minute service from 6am to midnight. Routes 30 and 604 also service at this stop but only for school travel.
- 3.34 An extract from the Milton Keynes Urban Bus Map showing the existing bus routes in the vicinity of the Site is contained at **Appendix B**.

### Rail Provision



- 3.35 Bletchley Railway Station is approximately 4km driving distance from the Site to the east via Buckingham Road and is accessible both by cycle and car. The station has 628 parking spaces with 29 for use by the mobility impaired. There is also sheltered parking for 54 bicycles at the station (**Photo 3.7**).



*Photo 3.7: Cycle Parking at Bletchley Station*

- 3.36 The station, operated by London Midland, is located on the West Coast Main Line, providing connections to Milton Keynes Central and Birmingham New Street to the north, and Watford and Euston to the south. The station also provides links to local stations, including Leighton Buzzard.
- 3.37 Southern Trains operates an hourly service which terminates at South Croydon. **Table 3.3** below provides details of the services from Bletchley Railway Station with the current timetables contained at **Appendix C**.

Monday to Friday							
Route	Origin	Destination	First train	Last train	Total trains	8-9 am	17-18 pm
Croydon and Clapham Jn. To Watford Jn. And Milton Keynes	Clapham Jn/ Brighton	Birmingham/ Northampton	06:34	00:13	22	3	1
	Birmingham/ Northampton	Clapham Jn/ Brighton	05:09	22:27	21	1	1
Bletchley - Bedford	Bletchley	Bedford	05:31	21:01	16	1	1
	Bedford	Bletchley	06:25	22:00	16	1	1
Weekend							
Route	Origin	Destination	Saturday			Sunday	
			First train	Last train	Total trains	First train	Last train
Croydon and Clapham Jn. To Watford Jn. And Milton Keynes	Clapham Jn/ Brighton	Birmingham/ Northampton	06:30	00:02	19	09:48	23:55
	Birmingham/ Northampton	Clapham Jn/ Brighton	04:40	22:26	20	08:14	22:16
Bletchley - Bedford	Bletchley	Bedford	05:41	21:01	16	No service	
	Bedford	Bletchley	06:31	22:00	16		

Table 3.3: Rail Services From Bletchley

3.38 Milton Keynes Central is approximately 7km driving distance from the Site via Snelshall Street, Childs Way and Elder Gate and is accessible by both cycle and car. Cyclists can also use the network of Redways to access the station which provides sheltered storage for 900 bicycles (**Photo 3.8**). Car parking is available at the station although this is more costly than the provision at Bletchley and therefore may be a less attractive option for drivers wishing to access rail services.



*Photo 3.8: Cycle Parking at Milton Keynes Central*

3.39 The train operators serving Milton Keynes Central are London Midland, Southern Trains and Virgin Trains. **Table 3.4** below provides details of the services from Milton Keynes Central with the current timetable also contained at **Appendix C**.

Service	Frequency		
	Monday-Friday	Saturday	Sunday
<b>London Midland</b> Bletchley – Milton Keynes	Hourly	Hourly	No Service
<b>Southern Trains</b> Croydon and Clapham Jn. to Watford Jn. and Milton Keynes (connections to Northampton and Birmingham New Street)	Hourly	Hourly	Hourly
<b>Virgin Trains</b> London & West Midlands - North West & Scotland Milton Keynes - London Euston	Hourly	Hourly	Hourly

*Table 3.4: Rail Services From Milton Keynes Central*

## Traffic Surveys

### Automatic Traffic Counts

3.40 Automatic Traffic Count (ATC) surveys were completed for a period of two weeks between 16<sup>th</sup> June 2015 and 29<sup>th</sup> June 2015 along Whaddon Road. The volume, class and speed of traffic was recorded at four locations along Whaddon Road between Bottle Dump Roundabout and Newton Longville village (**Figure 3.14**).

3.41 The average speed of traffic along Whaddon Road varies, with the highest speeds recorded at the northern end, near Bottle Dump Roundabout and the lowest speeds at the southern end in Newton Longville village. This trend reflects the changing speed limits along the road. The 85<sup>th</sup> percentile are shown in **Table 3.5**.



Figure 3.14: Whaddon Road ATC Locations

Location	Speed Limit	85 <sup>th</sup> Percentile Speed	
		mph	
		Northbound	Southbound
1	60mph (NSL)	54.7	54.7
2	60mph (NSL)	51.5	55.9
3	40mph	51.5	55.7
4	30mph	41.6	36.4

Table 3.5: Speed of Traffic Along Whaddon Road



3.42 A further set of ATCs was completed in the Buckinghamshire villages around the Site between 19<sup>th</sup> October 2015 and 27<sup>th</sup> October 2015 at the locations shown on **Figure 3.15**. The 85<sup>th</sup> percentile speeds through the villages varies, as shown in **Table 3.6**.



Figure 3.15: Location of Traffic Surveys (October 2015)

Location	Speed Limit	85th Percentile Speed mph	
		Northbound	Southbound
Nash	60	35.4	37.4
Great Horwood	60	42.7	44.7
Little Horwood	60	38.6	40.4
Mursley	60	55.4	52.8
Whaddon	60	44.5	47.5
Newton Longville	30 <sup>1</sup>	41.4	36.2

Table 3.6: Speed of Traffic Through Buckinghamshire Villages

3.43 Additional analysis on speeds through the villages is presented in **Appendix D**, including speeds throughout the day by speed band.

<sup>1</sup> At 30/40mph speed limit gateway



### Manual Classified Counts

3.44 Manual Classified Count (MCC) surveys were completed on Thursday 22<sup>nd</sup> October 2015 and Wednesday 4<sup>th</sup> November 2015 at the following locations as shown on **Figure 3.15**.

- A421/Whaddon Road (Bottle Dump Roundabout)
- A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)
- A421/Warren Road
- A421/Shucklow Hill/Little Horwood Road
- A421/Nash Road/Winslow Road
- Stock Lane/Shenley Road/Coddimoor Lane (Whaddon)
- Whaddon Road/Westbrook End (Newton Longville)
- Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)

3.45 The counts include traffic flows between 0700 and 1900 on both days. Network diagrams showing the traffic volumes during the AM and PM peak periods are provided in **Appendix E** with a summary of the overall volume of traffic through the junctions shown in **Table 3.7**.

Location	Junction Traffic Volume	
	AM Peak	PM Peak
A421/Whaddon Road (Bottle Dump Roundabout)	2654	2604
A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)	2567	2483
A421/Warren Road	2072	2114
A421/Shucklow Hill/Little Horwood Road	2007	2091
A421/Nash Road/Winslow Road	2075	2086
Stock Lane/Shenley Road/Coddimoor Lane (Whaddon)	376	280
Whaddon Road/Westbrook End (Newton Longville)	735	665
Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)	995	863

Table 3.7: Traffic Volumes on Local Roads

## Summary

- 3.46 The Site is located in good proximity to public transport connections with bus stops within reasonable walking distance from the Site. Buses provide linkages to Milton Keynes and Bletchley where further bus/rail connections are available.
- 3.47 There is good access to local footways/footpaths and the local cycle network. The pedestrian network provides connections to local places of interest and public transport facilities. Development of the Site therefore offers an excellent opportunity to influence travel behaviour and encourage sustainable travel options.

## 4 The Proposed Development

### Quantum of Development

4.1 The proposal seeks outline planning permission (all matters reserved except for access) for the following:

- a mixed-use sustainable urban extension on 144.77Ha of land to the south west of Milton Keynes, to provide for the following:
  - up to 1,855 mixed tenure dwellings (C3) on 54.70Ha of land;
  - an employment area (B1) on 2.07Ha of land;
  - a neighbourhood centre on 0.67Ha of land accommodating retail (A1/A2/A3/A4/A5), community (D1/D2) and residential (C3) uses;
  - provision of a primary school on 3.0Ha of land;
  - provision of a secondary school on 5.12Ha of land;
  - allotment space on 1.18Ha of land;
  - ground remodelling;
  - 53.67Ha of multi-functional green open space including: parkland, sports and recreational facilities with pavilion/changing facilities; play areas, wildlife areas, a range of strategic open spaces including a community orchard and new landscaping;
  - a Sustainable Drainage Scheme including 5.08Ha of land for surface water attenuation measures;
  - associated infrastructure including new junctions to the A421, Whaddon Road and Buckingham Road, primary streets, residential streets, pedestrian footpaths and cycle routes, foul water pumping stations and statutory undertakers equipment;
  - a Grid Road Reserve of 7.28Ha;
  - highway improvements on 5.21Ha;

- public transport infrastructure, car and cycle parking for all uses;  
and
  - undergrounding of 132Kv overhead power lines.
- 4.2 The residential component of the proposed development includes up to 1,855 new dwellings, the precise mix of which will be fixed through subsequent reserved matters planning applications pursuant to any outline planning permission. There will be a range of residential densities from up to 50 dwellings per hectare abutting the Neighbourhood Centre to 20-25 dwellings per hectare on the southern edge of the development where it meets the open countryside.
- 4.3 The proposed development makes provision for a range of employment uses. Principally, employment uses will be provided within an Employment Zone set around a mixed use Neighbourhood Centre located close to the northern gateway to the Site adjacent to the north western edge of the planning application boundary.
- 4.4 The Employment Zone is likely to accommodate small 'starter' office units that would provide appropriate space for small local businesses, but will not preclude larger single buildings / businesses.
- 4.5 The proposed mix of uses, to include both primary and secondary school provision, will encourage internalisation of trips and therefore satisfies key local and national policy requirements to reduce the impact of development on the wider highway network and to encourage greater use of sustainable modes of travel, in particular walking and cycling.

### **Illustrative Master Plan**

- 4.6 An Illustrative Master Plan that forms the basis of the planning application for the proposed development has been prepared by David Lock Associates in consultation with Officers at AVDC and MKC. The masterplan has evolved following pre-application discussions, workshops and more recently detailed topic meetings to address the issues raised following the submission of the original planning application in January 2015.
- 4.7 The development and details of the refined master plan are described in detail in the Design and Access Statement prepared to accompany the planning

application. The Illustrative Master Plan is included as a planning application document. The extent of the proposed highway improvements is discussed and explained in more detail later in this TA but broadly include the following:

- Weasel Lane and National Cycle Route 51 to be retained and enhanced as an important route through the new development, new homes set back from Weasel Lane and existing landscape features are orientated to provide overlooking of public routes, and provision of appropriately designed, at-grade, road crossings;
- An extensive linear park running alongside Whaddon Road, incorporating new landscape planting, trees, footpaths and cycleway links to 'Redway' standard to enhance the northwest section of MK Boundary Walk;
- Highway improvements to Bottle Dump Roundabout, including a new combined equestrian/pedestrian/cycle crossing across Whaddon Road just to the south of the existing roundabout;
- Access improvements along Whaddon Road, A421 and Buckingham Road to facilitate all travel modes, including combined 'at grade' crossing facilities for pedestrians and cyclists with connections to the wider existing network; ;
- Potential highway improvements across the wider higher network; and
- Improvements to the Public Rights of Way Network (PROW) to create permeability across the Site and strengthen connections with the existing network.

- 4.8 The design of the proposed development and its location in close proximity to Milton Keynes' established network of Redways, will encourage walking and cycling as an alternative method of travel to the private car. Pedestrian and cycling facilities within the proposed development will be designed as high quality, convenient and direct routes to both internal and external destinations.
- 4.9 The provision of the Grid Road reserve is an important element to be accommodated by the proposals in order to satisfy aspirational local planning policies. Whilst the proposed development requires only provision of a single

carriageway road for access, the Illustrative Master Plan seeks to protect the corridor, such that a dual carriageway could be provided by MKC/BCC at some point in the future subject to the prevailing Development Plan policies.

## Summary

- 4.10 The proposed development will provide 1,855 residential units, education facilities, commercial space and a neighbourhood centre. Access will be via Buckingham Road, Whaddon Road and A421 Standing Way. Parking within the proposed development will be in line with policy at the time of completing the detailed design of the development. The proposed development will be designed to include permeability for pedestrians and cyclists to ensure the best opportunity to influence travel behaviour.

## 5 The Transport Strategy

### Introduction

- 5.1 The underlying principle of the Transport Strategy for the proposed development is to provide the future community with a sustainable travel network which will influence behaviour to reduce the need to travel and thereby minimise the impact on the external transport network. A key priority is given to pedestrian and cycle movements, and accessibility to high quality public transport facilities.
- 5.2 At the heart of the overall Transport Strategy is the implementation, monitoring and management of Travel Plans for the residential, commercial/employment and school uses. Travel Plans under the umbrella of the approved FTP will be the key tool for developing a sustainable Travel Demand Management Strategy for all land uses.

### Development Access

- 5.3 The Access Strategy has evolved in line with the Illustrative Master Plan. Pedestrian access to the proposed development will be achieved as follows with all but the recreational footpaths being available for use by cyclists:
- a connection with the existing Redway on the northern side of A421 Standing Way as well as other recreational routes, and via the existing pedestrian / cycle route running along the line of the old Buckingham Road route south of the current A421 dual carriageway:
    - across A421 close to Bottle Dump Roundabout via the existing subway;
    - across A421 to Snelshall West via the existing subway; and
    - via Tattenhoe Roundabout;
  - a connection to the existing Redway network via a new pedestrian/cyclist/equestrian route along Whaddon Road, including a new 'Pegasus' combined crossing to the south of Bottle Dump



Roundabout and the access to Pearce Recycling (Drawing D015D,  
**Appendix F**);

- to Buckingham Road, approximately 600m to the south of Tattenhoe Roundabout, via NCR 51 on Weasel Lane, and via a new access to the Site between this point and Tattenhoe Roundabout;
- to Hamilton Lane, Far Bletchley, on the eastern boundary of the Site, via a cycleway / footway; and
- at four locations to the south and west of the Site, via existing bridleways / footpaths NLO/19, MUR/15, WHA/15 and WHA/16.

5.4 Three vehicular means of access will be provided to the proposed development via:

- Whaddon Road – by means of a priority 'T'-junction with a 'ghost island' right turn lane;
- An extension to Buckingham Road into the proposed development – by means of a four-arm roundabout junction; and
- A421 Standing Way – by means of 'left in only' junction.

### Street Hierarchy

5.5 The key strategic route within the proposed development is the allocation of space for a future Grid Road. This is aligned from the Tattenhoe Roundabout south to the existing disused railway line. A new primary street will be sited within the reserved corridor such that a dual carriageway could be accommodated and extended as a future bypass to the south of Bletchley.

5.6 A network of Primary Streets will form the principal circulation route for all vehicular traffic through the proposed development. This route will connect with the existing highway network at the three proposed points of access. Primary Streets will be designed to achieve three aims:

- to accommodate vehicular capacity without compromising character;

- to provide a network of legible, direct streets design in accordance with the principles set out in Manual for Streets (MfS) and Manual for Streets 2 (MfS2);
  - to complement and enhance the local network of public footpaths, cycle ways and bridleways.
- 5.7 Providing a 'connector' function, linking the primary streets through the development areas, will be secondary streets from which will lead a network of tertiary streets. Tertiary streets will provide a very low speed environment with shared space and 'home zone' principles applied to their design in accordance with MfS and MfS2. Throughout the proposed development on all streets, speeds will be limited to 30mph or less providing a safe and attractive environment to all road users.

## Movement Strategy

### Public Transport

- 5.8 Initial discussions have been held with Arriva in regard to the provision of future bus routes to serve the proposed development (**Appendix G**). Arriva has advised that it would be feasible to extend the Route 8 Oxley Park to Brownswood via Kingsmead, Westcroft, Kingston and Central Milton Keynes.
- 5.9 Route 8 currently extends from Central Milton Keynes in a south westerly direction and follows Childs Way and V3 Fulmer Street to Furzton Roundabout, then turns right on to H7 Chaffron Way. At Kingsmead Roundabout the route currently turns to the right towards Oxley Park.
- 5.10 It is proposed that the existing service should be diverted southwards at Kingsmead Roundabout along Snellshall Street, through Tattenhoe Roundabout and into the proposed development via the Buckingham Road access. It would then follow a circular route, exiting at the Buckingham Road access, through Tattenhoe Roundabout and along Snellshall Street to rejoin its existing route at Kingsmead Roundabout. An indicative route to be followed is shown on **Figure 5.1**.

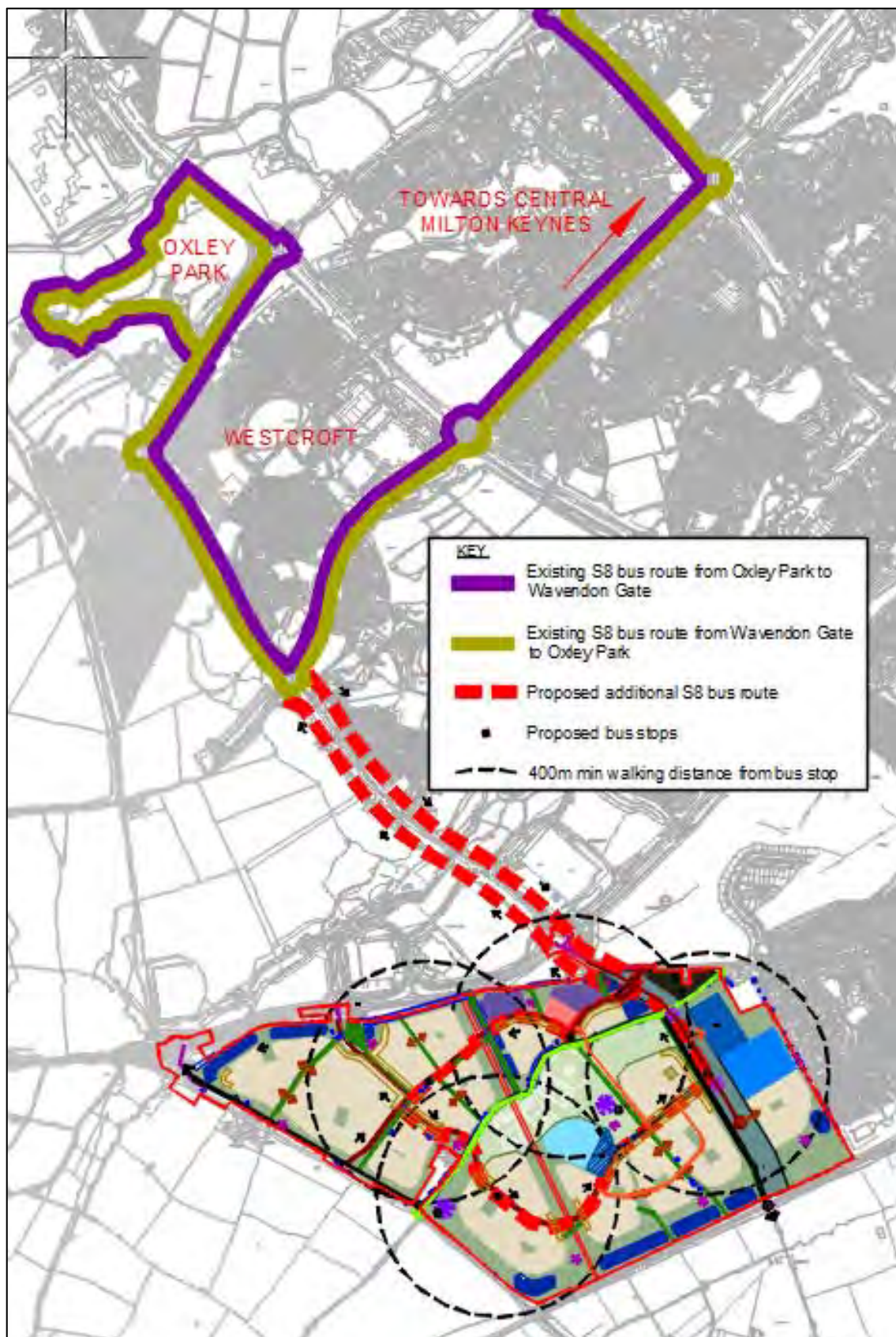


Figure 5.1: Indicative Bus Route Extension



- 5.11 The details of service provision will be considered further, but Arriva currently envisage that there will be three buses per hour to the proposed development, and three per hour to Oxley Park. The total vehicle requirement for this provision will be six buses of which Arriva considers three will be developer funded; 1.5 as part of the proposed development and 1.5 as part of the Oxley Park development.
- 5.12 The bus route will be introduced in phases over the life of the development, to ensure that residents in the early phases will have access to a bus service at the earliest opportunity. The detail of the routing for the early phases will be discussed with Arriva and agreed with MKC and BCC to ensure that the route is operational to coincide with occupation of phase 1 and the proposed educational facilities.
- 5.13 The wider connections for bus travel, including the extended Route 8 service are shown on **Figure 5.2**.

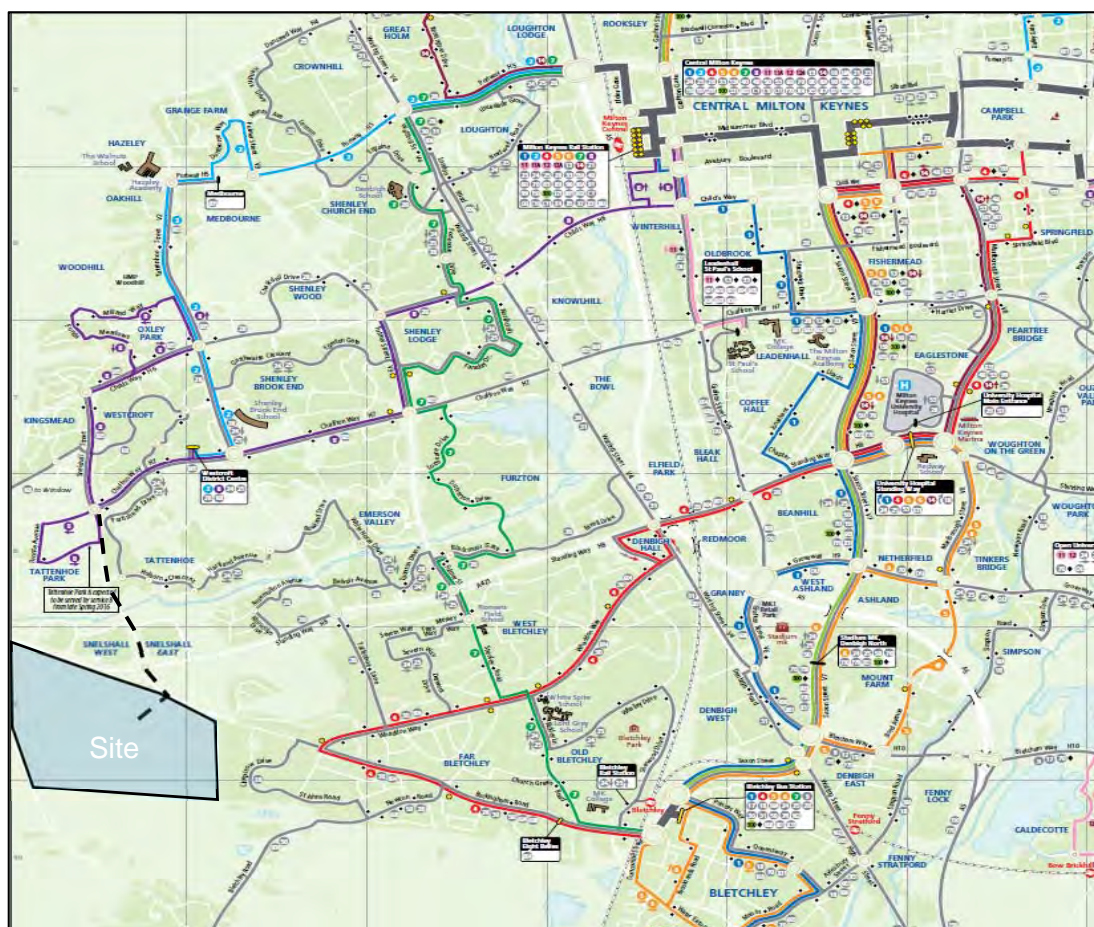


Figure 5.2: Wider Bus Route Connections

- 5.14 Access to Milton Keynes Central Station by public transport would be via the extended Route 8, with an approximate travel time of 18 minutes from the Site.
- 5.15 Access to Bletchley Rail Station would be via Route 4 which operates with a frequency of every 20 minutes. The nearest bus stop for Route 4 is at Whaddon Way in Bletchley, a 950m walk from the Buckingham Road access to the Site. Bus users would alight at Sherwood Road, from where it is a 300m walk into the Rail Station. The total journey time for this route would be 20 minutes (11 minute walk, 5 minutes bus, 4 minute walk).
- 5.16 Alternatively, access to Bletchley Rail Station would be available to cyclists, via Buckingham Road. There is an existing Redway along Buckingham Road for cyclists to Caernarvon Crescent, from where the route would be on-road to the station. The route is 3.2km long, equivalent to a 13 minute cycle (based on an average cycling speed of 15kph<sup>2</sup>). An alternative route would be via the Redway on Buckingham Road initially, then using the quieter on-road routes of Whaddon Way, Shenley Road, Church Green Road, Wilton Avenue and a short cycle path to the station. The route on quieter roads is 4km; equivalent to a 16 minute cycle.
- 5.17 The Applicant is committed to providing a financial contribution towards additional cycle parking at Bletchley Rail Station, to encourage trips by bicycle from the Site.

### Travel Demand Management

- 5.18 Travel Demand Management is an important part of the proposed development. Sustainable development principles are accorded with and a number of key objectives which ensure consistency with relevant policy provisions are met. The design:
- minimises the need to travel by providing a mix of land uses that are within acceptable walking and cycling distances of each other;
  - maximises the opportunity for travel by non-car modes of transport, particularly by the design of the urban form itself, by maximising priority to pedestrians and other non-car users;

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<sup>2</sup> TfL, December 2010, *Analysis of Cycling Potential*, Page 14

- minimising the impact of traffic associated with the development;  
and
  - maximising integration with adjacent development areas.
- 5.19 Furthermore, the Public Transport Strategy is designed to encourage people living and working at the proposed development to use alternative modes of transport than the private car.
- 5.20 It is recognised that communication is a key factor in influencing modal choice and in order to maximise communication to everyone living and working at the proposed development a series of Travel Plans will be implemented, maintained and monitored. As well as assisting in communicating the availability and benefits of non-car modes, the Travel Plans will contain the details of a number of measures and initiatives designed to encourage, promote and maintain mode shift from use of private vehicles, in particular single-occupancy car use, to more sustainable means such as walking, cycling, use of public transport, car sharing and taxis.
- 5.21 A FTP, as agreed with BCC, MKC and Highways England, is provided as a separate document. Following receipt of permission for the first reserved matters planning application, the South West Milton Keynes Consortium will appoint a Travel Plan Manager who will be the main point of contact for all travel planning matters.

## Summary

- 5.22 Current national and local planning policy in respect of transportation matters requires that development should be sustainable and best use should be made of existing infrastructure. Development proposals should therefore encourage the use of sustainable modes of transport and give priority to pedestrian and cycle movements, and provide access to high quality public transport facilities. This enables best use to be made of existing infrastructure.
- 5.23 The proposed development is in a sustainable location in close proximity to existing pedestrian and cycle facilities. The provision of suitable routes across the Site will influence travel behaviour and encourage greater use of these sustainable modes of travel. The Public Transport Strategy is designed to

ensure that future residents and employees have access to high quality public transport facilities both in terms of service and infrastructure provision.



## 6 Access Strategy

### Vehicle Access

- 6.1 There are three points of vehicular access from the development onto the local highway network, at the following locations:
- Whaddon Road;
  - Buckingham Road; and
  - A421 Standing Way.
- 6.2 The principle of gaining vehicle access to the proposed development from these three roads remains unchanged from the original planning application as submitted in January 2015. The detail and form of each access has been modified to reflect comments raised by BCC, MKC and Mouchel's Safety Auditors. The changes made to each access point is explained in greater detail below.
- 6.3 The access onto Whaddon Road joins the public highway under the control of BCC, whilst A421 Standing Way access point joins the highway network controlled by MKC. The Buckingham Road access joins the existing public highway controlled by MKC, but the majority of the new highway layout is located within Buckinghamshire.
- 6.4 Three access points were selected to ensure the efficient distribution of traffic around the local highway network and to provide route choice options for new residents and Site users. The access points (and internal road layout) are designed to discourage through trips, i.e. rat running through the development. The provision of three access points also provides ease of access for local residents onto the highway network and allows for appropriate place-making through design and frontage activity on all three public sides to the Site.

### Whaddon Road

- 6.5 The proposed access at Whaddon Road is a Ghosted Right Turn priority junction, with a single lane minor arm approach with a long flare to two lanes, as shown on drawing D014B (**Appendix H**) and in **Figure 6.1**. The access

arrangement has been enlarged to accommodate a longer flare length along the development access road (i.e: within the Site) as it approaches the junction with Whaddon Road to accommodate peak hour demand for vehicles leaving the Site.

- 6.6 Following the Stage 1 Road Safety Audit (**Appendix I**), the length of the ghost island reservoir has been extended during the detailed design of the junction to ensure sufficient deceleration length is provided for right turning traffic.

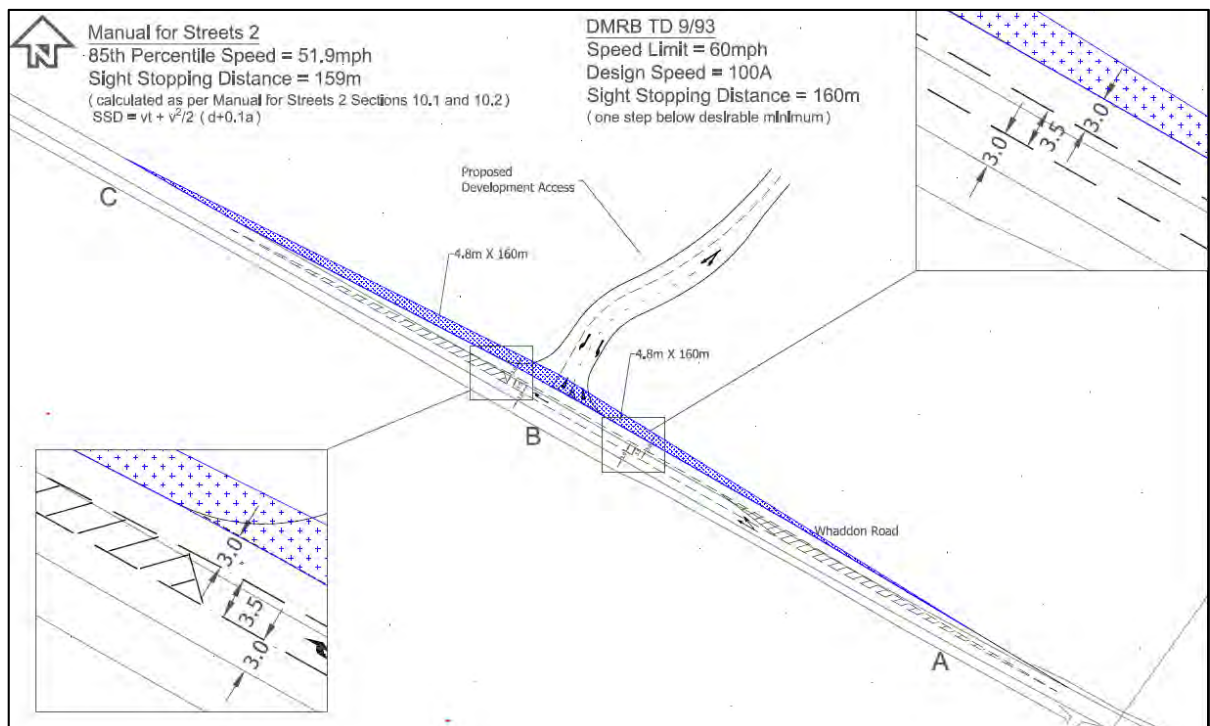


Figure 6.1: Proposed Whaddon Road Access

- 6.7 BCC revert to the highway design guidance as set out by Manual for Streets 2<sup>3</sup>(MfS2). MfS2 states in paragraph 10.1.4 that 85<sup>th</sup> percentile wet weather speeds should be used to determine sight stopping distances, which are in turn used to calculate visibility requirements. Guidance note TA 22/81<sup>4</sup> specifies that the free flow speed of traffic should be used when reviewing speed data,

<sup>3</sup> CIHT, 2010, Manual for Streets 2, CIHT, London

<sup>4</sup> DoT, 1981, TA 22/81 , Vehicle Speed Measurement on All Purpose Roads

and that using a time between 1000-1200 and 1400-1600 is appropriate to determine the free flow speed.

- 6.8 ATC surveys were completed along Whaddon Road in June 2015, with the 85th percentile wet weather speeds as detailed in **Table 6.1**. The highest 85th percentile speed along Whaddon Road is 51.9mph in the southbound direction.

Direction	Mean Wet Weather Speed (mph)	85 <sup>th</sup> Percentile Wet Weather Speed (mph)
Northbound	40.4	46.7
Southbound	44.1	51.9

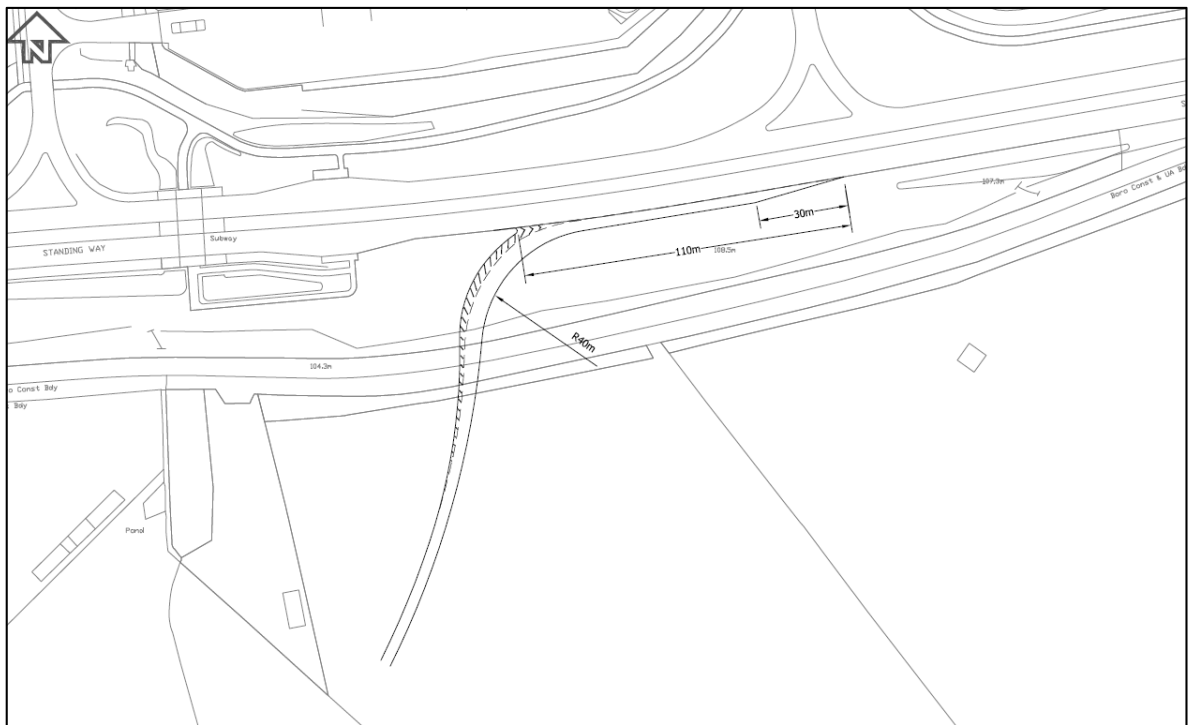
*Table 6.1: Whaddon Road Speed Data*

- 6.9 An 85<sup>th</sup> percentile wet weather speed of 51.9mph requires a sight stopping distance of 159m using the parameters as set out in MfS2. On both the northbound and southbound approaches to the proposed junction, a sight stopping distance of 159m can be accommodated in the vertical plane. Visibility in the horizontal plane can also be accommodated through vegetation clearance within the Site.
- 6.10 DMRB 9/93 'Highway Link Design' requires visibility of 160m (one-step below desirable minimum) for a road with a speed limit of 60mph. The 'x-distance' on the visibility splays has been increased from 2.4m to 4.8m as suggested within the Stage 1 Road Safety Audit.

## **A421 Left In**

- 6.11 The proposed access from A421 Standing Way is in the form of a 'left-in only' junction with a single entry lanes. A 'left in left out' option was originally considered and included within the original planning application. Following subsequent discussions with MKC and BCC and observations from Mouchel's Safety Auditor, it was agreed that access onto A421 in this location would potentially give rise to an increase in weaving movements between passing traffic along A421 and merging traffic from the development. As a consequence, there will be no exit from the proposed development onto A421

Standing Way. A deceleration lane to meet the requirements of TD 42/95<sup>5</sup> of the Design Manual for Roads and Bridges (DMRB) will be provided to ensure highway safety. Following the Stage 1 Road Safety Audit, Vehicle Restraint Systems (crash barriers) will be included within the design of the access road to minimise the impact of any loss of control collisions around the bend. The design of the proposed access is shown on drawing D013A (**Appendix H**) and in **Figure 6.2**.



*Figure 6.2: Proposed A421 Standing Way Access*

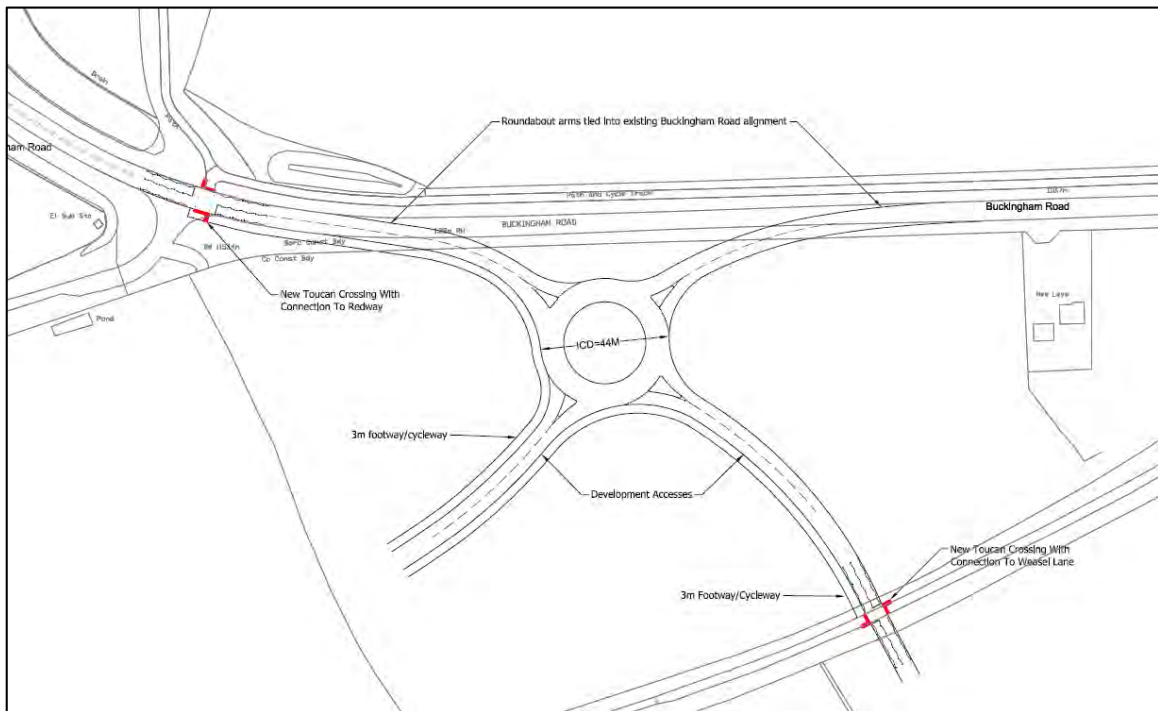
6.12 The design does not compromise the location of the existing underpass which connects pedestrian and cycle routes with the Redway on the northern side of A421.

## Buckingham Road

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<sup>5</sup> Highways Agency, 1995, TD 42/95 Geometric Design of Major/Minor Priority Junctions

- 6.13 The original TA proposed a signalised gyratory arrangement for a new access into the Site from Buckingham Road. That arrangement introduced a number of points of delay for vehicles travelling through the gyratory, and provided no facilities for pedestrians and cyclists. MKC expressed concerns regarding the introduction of traffic signals in the area, and BCC were concerned by the overly complicated arrangement which could potentially be confusing for drivers.
- 6.14 Therefore, a new arrangement for the junction is proposed in the form of an at grade roundabout, encompassing two new roads from within the Site, as shown on drawing D017A (**Appendix H**) and in **Figure 6.3**. The existing Redway on the northern side of Buckingham Road will remain, and a shared footway for pedestrians/cyclists<sup>6</sup> will be provided on the southern arms of the junction into the Site.



*Figure 6.3: Proposed Buckingham Road Access*

- 6.15 The roundabout solution ensures amendments to the alignment of Buckingham Road are minimised. The provision of a 'Toucan' Crossing facility for pedestrians and cyclists is included on the western arm between the new

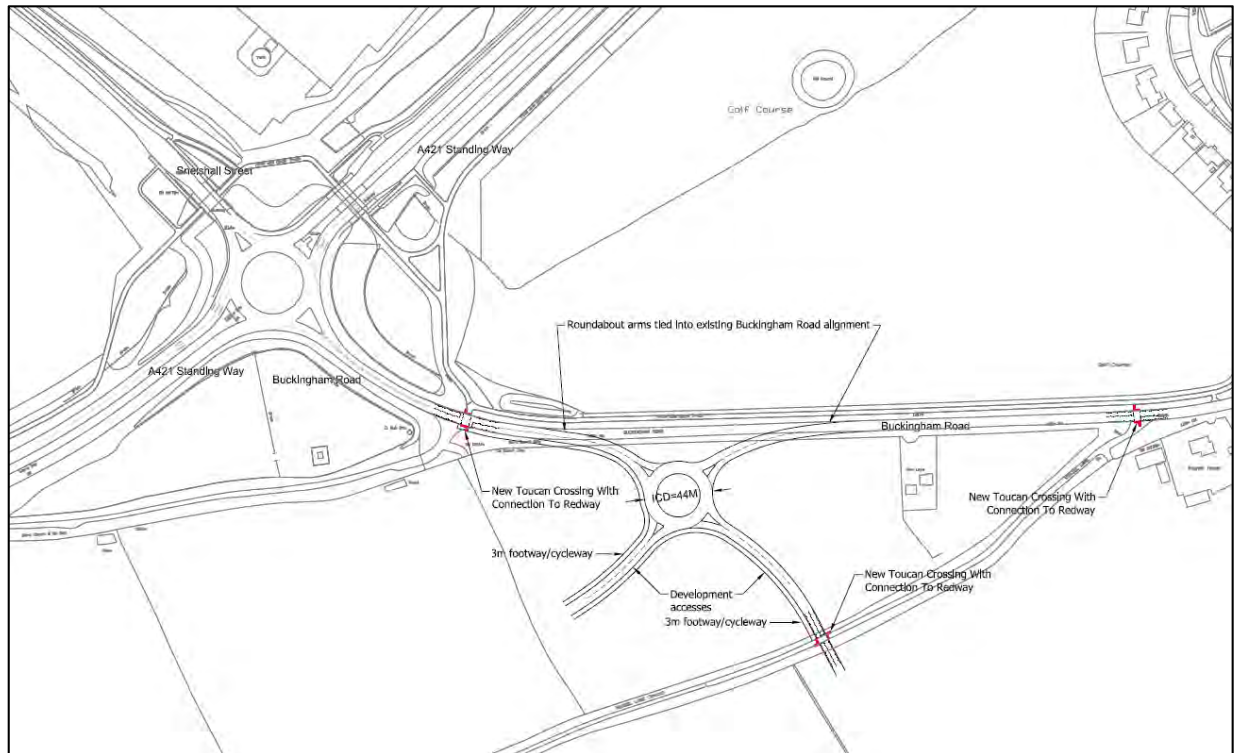
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<sup>6</sup> With an effective width of 3m



roundabout and Tattenhoe Roundabout, and also on the south-eastern arm where the new road crosses Weasel Lane.

- 6.16 The alignment of the roundabout solution interacts well with Tattenhoe Roundabout without the requirement for any geometric amendments to Tattenhoe Roundabout, as shown on drawing D016A (**Appendix H**) and in **Figure 6.4** below.



*Figure 6.4: Proposed Buckingham Road Access*

- 6.17 The design of the proposed roundabout access provides sufficient capacity at the junction to accommodate the development traffic. The analysis of the junction is included at Section 8.
- 6.18 Should the Grid Road reserve 'corridor' be called upon at some point in the future, an amended junction arrangement could be provided to accommodate additional lanes on the south-eastern and western arms of the roundabout. BCC has confirmed that there is currently no policy requirement to provide a junction arrangement to specifically accommodate a new Grid Road.



## Road Safety Audits

- 6.19 Stage 1 Road Safety Audits (S1 RSAs) have been completed on all of the access points, and including the proposed equestrian crossing to the south of Bottle Dump Roundabout. The S1 RSAs as submitted to BCC and MKC in December 2015, with Designer's Responses to each point raised, are provided in **Appendix I** of this TA. Following amendments to the designs to meet BCC and MKC requirements, a revised S1 RSA was completed in June/July 2016. That RSA and associated Designer's Response are also included in **Appendix I**.
- 6.20 The main comments within the June/July 2016 S1 RSA (auditing the current access proposals) relate to ensuring appropriate visibility splays are provided to the access on Whaddon Road given the undulating nature of the road, to the provision of vehicle restraint systems (safety barriers) around the bend at the A421 access, and to ensuring the provision for pedestrians and cyclists at the Buckingham Road junction is safe and suitable for all users.

## Summary

- 6.21 Access to the Site will be from three points; Buckingham Road (roundabout), A421 (left-in only), and Whaddon Road (priority Ghosted Right Turn). The junctions have been designed in accordance with the relevant design standard for the speed of the roads. Mouchel consider that the proposed access arrangements more than adequately accommodate the demands of the proposed development.

## 7 Assessment Methodology

### Milton Keynes / Highways England

- 7.1 CH2M Hill (formerly Halcrow), in association with RAND Europe, Stirling Maynard Transportation (SMT) and Count on Us, was appointed by MKC in 2009 to develop a comprehensive transport modelling capability for the Milton Keynes area. This involved the development of spatially detailed highway and public transport models with interaction to demand models to enable the assessment of planning and infrastructure schemes planned for the Milton Keynes area.
- 7.2 The model produced (the Milton Keynes Transport Model – MKTM) is a behaviourally based ‘four stage’ model developed in line with the current WebTAG guidance on model form and procedures. The model determines the travel demand from the underlying characteristics of the transport supply and the characteristics of travellers in the area. The demand models take population and employment data as an input and use trip rates to generate the travel demand across all modes of travel to all destinations based on the respective change in cost of travel by the different modes. A demand model is required as a result of the major changes in travel demand expected in and around Milton Keynes as a result of major land use and infrastructure changes over the next twenty years or so.
- 7.3 At the time of model completion, the Base Year 2009 Milton Keynes Transport Model was approved by the Highways Agency (now Highways England) as providing a robust representation of base year traffic flows for the strategic and local highway network. As a result, the Base Year 2009 model has provided a suitable platform for the development of a 2026 forecast model which MKC has used to assess proposed future development and infrastructure in Milton Keynes to 2026.

### Model Convergence and Stability

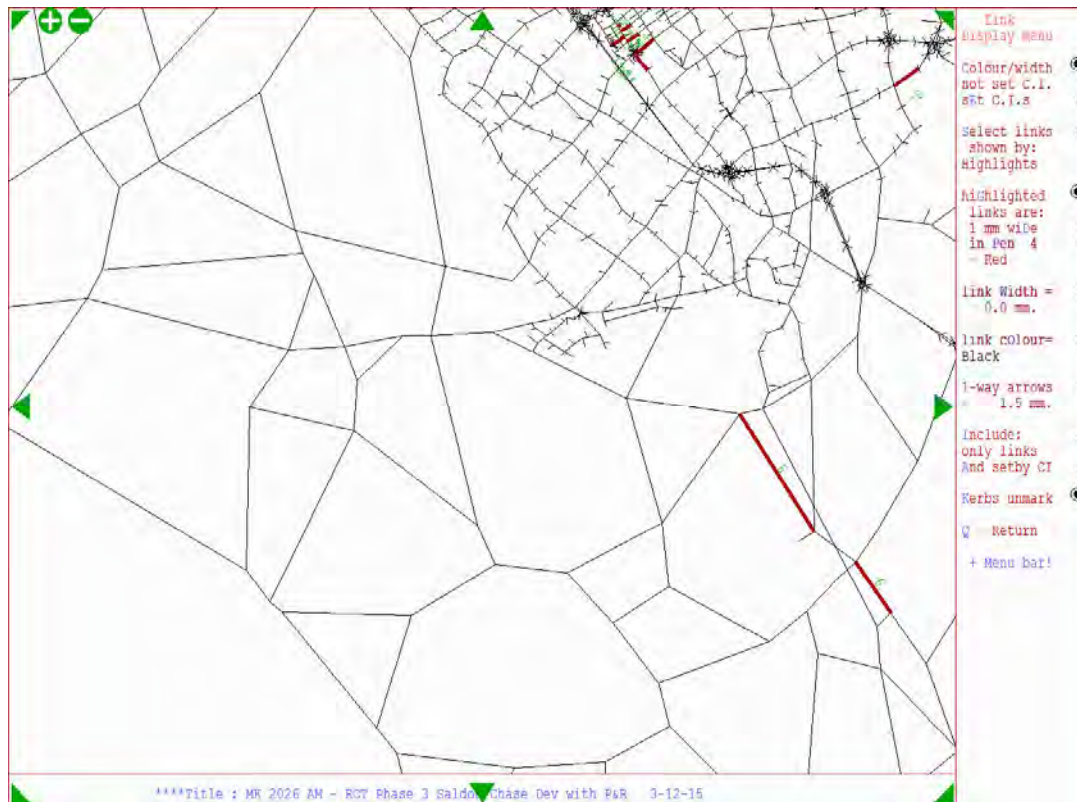
- 7.4 Model results indicate that some traffic reassigns away from A421 in both directions in the PM peak and in the eastbound direction only in AM peak, as a result of the SWMK development.

7.5 Forecast models for the Do Minimum (DM) and Do Something (DS) scenarios achieve the levels of convergence and stability as shown in **Table 7.1**.

	WebTAG	AM DM	PM DM	AM DS	PM DS
Convergence	<0.1%	0.031%	0.038%	0.027%	0.050%
Stability	>98.0%	97.4%	96.1%	97.0%	96.5%

*Table 7.1: MKTM Convergence and Stability*

- 7.6 The models converge well but they do not quite meet the WebTAG requirement for stability, with around 97% of the links in the AM and 96% of the links in the PM models having flow change of less than 1% between consecutive iterations. The WebTAG requirement is for flows to remain within 1% on more than 99% of the links.
- 7.7 Further checks were carried out to determine the impact of assignment instability on the forecast flows in the study area. **Figure 7.1** and **Figure 7.2** below highlight the links that do not meet the WebTAG criteria (i.e. flow change is greater than 1%). The Figures also display the flow differences greater than 5 pcus per hour for the AM and PM forecasts in 2026.
- 7.8 In the AM peak, there are only two links highlighted within the immediate study area, each showing 6 pcu change. These are Fenny Road and Leighton Road in Stoke Hammond, as shown in **Figure 7.1**. Modelled link flows within the study area in the PM peak are relatively stable, as illustrated by no links being highlighted on **Figure 7.2**.



*Figure 7.1: Link Stability in AM Peak Model*

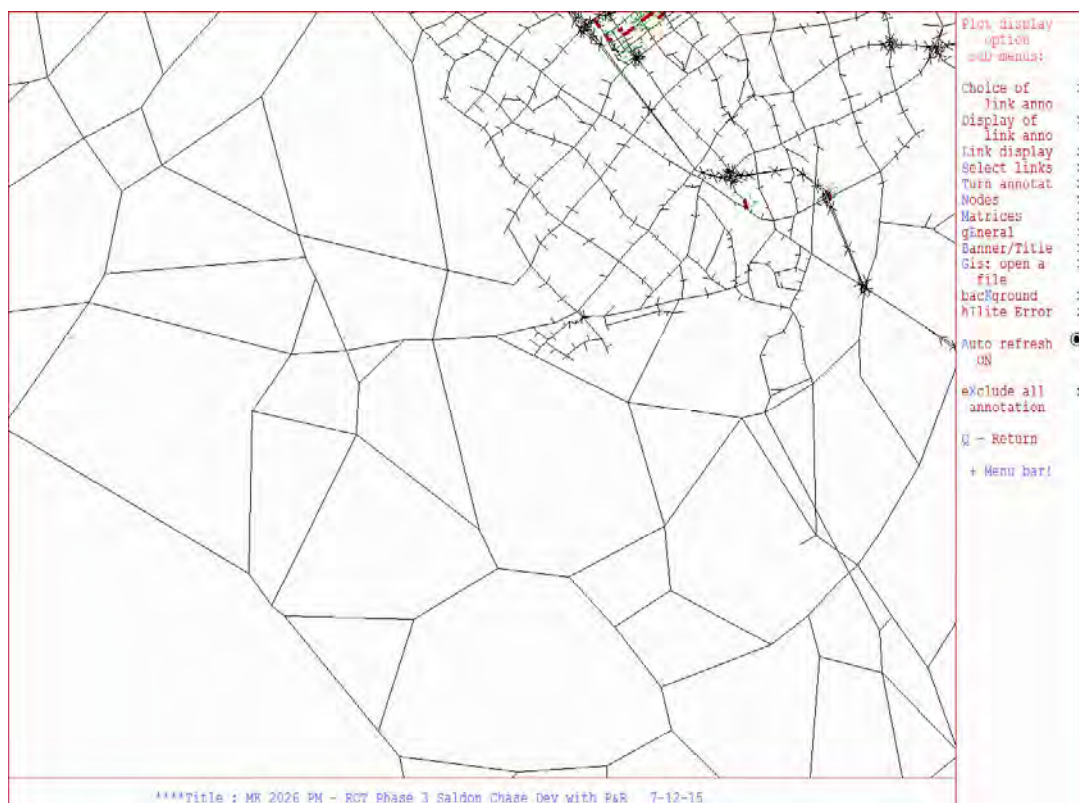


Figure 7.2: Link Stability in PM Peak Model

## Traffic Generation

- 7.9 Halcrow was commissioned to use the MKTM to assess the impact of the proposed development on the local and strategic highway network. In order to carry out this work, Halcrow was provided with information about the proposals in terms of land use and access.
- 7.10 Within the MKTM, the development has been modelled as ten distinct zones, with the land use and quantum of development in each zone as presented in **Table 7.2**.

			Development Quantum			
Zone	SATURN Zone	Land use	Jobs	Households	School places	Jobs
1	5361	Residential		450		
2	5362	Residential		325		
3	5363	Employment	1,160			
4	5364	Residential		150		
5	5368	School Primary			630	
6	5369	School Secondary			600	
7	5370	Residential		420		
8	5371	Residential		410		
9	5372	Residential		100		
10	5373	Commercial				200
		<b>TOTAL</b>	<b>1,160</b>	<b>1,855</b>	<b>1,230</b>	<b>200</b>
		Total Residential	1,855 households			
		Total Emp / Comm	1,360 jobs			
		Total Schools	1,230 school places			

Table 7.2: Land Use and Quantum of Development Assumed in MKTM

7.11 The planning data shown in **Table 7.2** was input into the Local Demand Model to establish trip generation and distribution of the development traffic.

7.12 No allowance was made within the modelling to demonstrate the benefits of implementing travel planning measures. The resulting highway trip generation in the MKTM is presented in **Table 7.3** below, for each land use. **Table 7.4** presents this information as trip rates per household, per job and per school place.

	Trips generated by the development (PCUs)					
Land use	AM		PM		IP	
	origins	destinations	origins	destinations	origins	destinations
Total Residential	1035	207	307	680	850	863
Total Emp / Comm	59	243	232	31	302	145
Total Schools	8	7	2	1	9	6
<b>TOTAL</b>	<b>1102</b>	<b>458</b>	<b>542</b>	<b>712</b>	<b>1162</b>	<b>1014</b>

Table 7.3: Trip Generation (PCUs) in MKTM



	Development trip rates					
Land use	AM		PM		IP	
	origins	destinations	origins	destinations	origins	destinations
Total Residential	0.56	0.11	0.17	0.37	0.46	0.47
Total Emp / Comm	0.04	0.18	0.17	0.02	0.22	0.11
Total Schools	0.01	0.01	0.00	0.00	0.01	0.00

Table 7.4: Trip Generation (Rates) in MKTM

### Internalisation of Trips

7.13 The MKTM 2026 highway matrices were interrogated to reveal internalisation and wider trip distribution assumptions relating to the proposed development. These are presented below in **Table 7.5** and **Table 7.6**. It should be noted that the 'MK' description is used to denote Milton Keynes and its immediate surroundings as defined for the Local Demand Model. All other zones are considered to be external.

PCUs (%)	devpt	MK	external	TOTAL
devpt	62 (4%)	806 (54%)	234 (16%)	<b>1,102 (74%)</b>
MK	396 (26%)	0 (0%)	0 (0%)	<b>396 (26%)</b>
external	0 (0%)	0 (0%)	0 (0%)	<b>0 (0%)</b>
<b>TOTAL</b>	<b>458 (31%)</b>	<b>806 (54%)</b>	<b>234 (16%)</b>	<b>1,498 (100%)</b>

Table 7.5: Internalisation and Trip Distribution of Development Traffic in AM Peak

PCUs (%)	devpt	MK	external	TOTAL
devpt	48 (3%)	451 (31%)	43 (3%)	<b>542 (38%)</b>
MK	664 (46%)	0 (0%)	0 (0%)	<b>664 (46%)</b>
external	234 (16%)	0 (0%)	0 (0%)	<b>234 (16%)</b>
<b>TOTAL</b>	<b>946 (66%)</b>	<b>451 (31%)</b>	<b>43 (3%)</b>	<b>1,440 (100%)</b>

Table 7.6: Internalisation and Trip Distribution of Development Traffic in PM Peak

7.14 **Table 7.5** and **Table 7.6** show that the level of internalisation within the development is between 3% and 4%. This means that between 3% and 4% of all highway trips generated by the development stay within the development in the modelled peak periods.

- 7.15 In the AM peak, a total of 1,498 PCUs are generated by the development. Of these, 4% stay within the Site, 54% go to destinations within Milton Keynes, 26% are drawn to the Site from origins within Milton Keynes and 16% go from the development to destinations further afield.
- 7.16 In the PM peak, a total of 1,440 PCUs are generated by the development. Of these, 3% stay within the Site, 46% are drawn to the Site from origins within Milton Keynes, 31% travel to destinations within Milton Keynes and only 3% travel from the development to destinations further afield.

### Model Scenarios

- 7.17 Halcrow provided SATURN model output data (UFS files) for the AM and PM peak time periods covering two assessment scenarios as follows:
- Scenario 1 - 'S1': 2026 forecast + committed development and infrastructure; and
  - Scenario 2 - 'S2': 2026 forecast + committed development and infrastructure + the proposed development.
- 7.18 The committed development and infrastructure that has been included within the modelling is described within the 'Milton Keynes Transport Model Traffic Forecast Report', May 2012, provided to MKC by Halcrow. The report provides details of 'committed' strategic infrastructure changes to road and rail and also local road network infrastructure schemes. Extracts from this report detailing the committed infrastructure are contained at **Appendix J**.
- 7.19 With regard to committed development, Halcrow's 2012 work for MKC considered growth rates within Milton Keynes as a result of both the South East Plan (SEP) (now revoked) and Milton Keynes' Revised Core Strategy (RCS). The Traffic Forecast Report acknowledges that the SEP has been revoked and this case is left in as a point of reference only. In Halcrow's work to consider the proposed development, the committed development assumed accords with the RCS scenario.

### Amendments to MKTM

- 7.20 Recent highway improvements have amended the Fenny Stratford roundabout on A5 from partially to fully signalised. The MKTM has been updated to reflect this change.

## Scope of Assessment

7.21 In November 2013, a Scoping Note was prepared for the purpose of completing the TA in support of the original outline planning application. The Scoping Note identified the use of the MKTM in order to obtain traffic data for the highway network in the vicinity of the proposed development. The Scoping Note (**Appendix K**), also identified various junctions that should be considered as indicated below and shown on **Figure 7.3**.

- Whaddon Crossroads (in Buckinghamshire)
- Bottle Dump Roundabout (in Buckinghamshire)
- Tattenhoe Roundabout
- Kingsmead Roundabout
- Westcroft Roundabout
- Windmill Hill Roundabout
- Emerson Roundabout
- Furzton Roundabout
- Elfield Park Roundabout
- Bleak Hall Roundabout
- A5 Bletcham and Caldecotte Roundabouts (Highways England)
- A5 Redmoor Roundabout (Highways England)
- A5 Portway Roundabout (Highways England)
- A5 Abbey Hill Roundabout (Highways England)

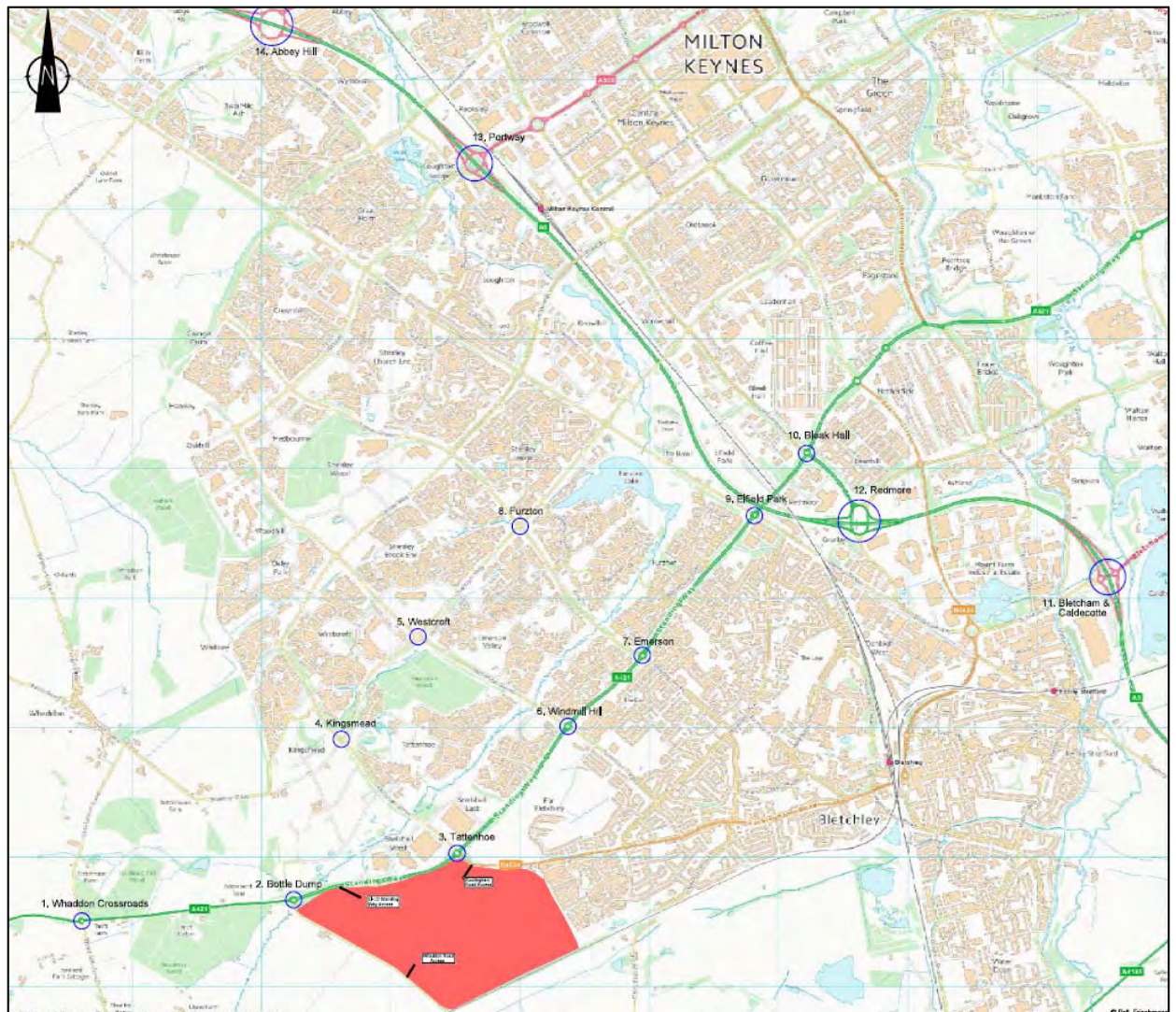


Figure 7.3: Milton Keynes Junction Assessment Locations

7.22 Using data from the 'S1' and 'S2' model scenarios, it has been possible to determine the percentage change in peak hour traffic at each of the offsite junctions in both the AM and PM peak hours. This information was then used to consider which junctions should be assessed further. The traffic turning flows at each junction for 'S1' and 'S2' scenarios are shown on the diagrams contained at **Appendix L**.

7.23 There will be a varying difference in peak hour flows at the local road junctions under consideration as a result of the proposed development and therefore further assessment work has been carried out to look at the capacity of each the junctions.

### Junction Capacity Assessment Methodology



7.24 The junction modelling software used for assessing the existing off-Site junctions in Milton Keynes is as follows:

- Priority roundabouts using JUNCTIONS;
- Priority junctions using JUNCTIONS; and
- Traffic signal controlled junctions using LINSIG.

#### *Roundabouts and Priority Junctions*

7.25 For roundabouts and priority junctions modelled in ARCADY and PICADY, the Ratio of Flow to Capacity (RFC) is commonly used as an indicator of the likely performance of each arm of a junction. An RFC value of 0.85 or less demonstrates that the arm is operating within its reserve capacity with minimal queuing and delay. An RFC value between 0.85 and 1.0 shows that the arm is nearing its theoretical capacity with queues beginning to form and minor delays occurring. An RFC value greater than 1.0 indicates that the arm is operating over theoretical capacity and queues and delays will increase.

7.26 It is also accepted by transportation professionals and backed by Transport Research Laboratory (TRL) recommendation and advice that capacity predictions become unreliable at junctions that are operating over capacity (i.e. when RFC values are greater than 1.0).

#### *Signalised Junctions*

7.27 For signalised junctions modelled in LINSIG, the Degree of Saturation (DOS) is the ratio of demand to capacity on each approach. A DOS greater than 90% is commonly accepted as the threshold above which the approach to the junction is reaching capacity and queues will start to form with subsequent delays occurring. The Practical Reserve Capacity (PRC) is a measure of capacity remaining in the junction; a value of 0% indicates that junction is operating at capacity, with a negative value indication that the junction is over capacity.

## **Buckinghamshire**

### **Introduction**

7.28 Following detailed discussions with BCC, a number of concerns were raised in regard to the validity of the forecast traffic assignment on roads within the

County Council's jurisdiction. It was therefore agreed that junction assessments using static models (Junctions 8) would be completed at locations within Buckinghamshire to determine the impact of the proposed development.

- 7.29 The junction assessments would use a 2015 base, created from traffic survey data collected in Autumn 2015 and described in Section 3, with traffic growth to 2026. By using such a methodology, the static assessments would overcome BCC's concerns regarding the reliability of the MKTM in the Buckinghamshire area.

### Traffic Growth

- 7.30 TEMPRO v6.2 (NTM dataset AF09) was used to establish an NTEM adjusted local traffic growth factor, between the base year 2015 and the proposed development opening year of 2026, for the geographical area of 'rural (Aylesbury Vale)'. The traffic growth factors (as agreed with BCC and Jacobs on 11<sup>th</sup> March 2016) used within the static junction models are presented in **Table 7.7**.

Area	Years	AM	PM
Rural (Aylesbury Vale)	2015-2026	1.2609	1.2781

*Table 7.7: TEMPRO Growth Factors*

### *Committed Developments*

- 7.31 The high growth rate, adjusted for local planning factors, is assumed to accommodate all future developments in the local area through to 2026. As a consequence, there was no requirement to explicitly include committed developments within the models.

### Development Trips

#### *Additional Education Trips*

- 7.32 It was agreed that the development trips within the MKTM are appropriate for the residential and commercial uses proposed on the Site. The primary education trips were agreed to be predominantly internal trips within the development, and would therefore not impact on the external road network. BCC considered that secondary education trips were not accurately



represented within the MKTM, and that further trips should be included within the models for completeness.

- 7.33 In order to establish robust vehicle trip generation for the secondary education, trips have been collated using a 'first principles' methodology as set out in TN6 and in Mouchel's subsequent email of 4<sup>th</sup> March 2016, Jacob's email of 11<sup>th</sup> March 2016, and Mouchel's email of 11<sup>th</sup> March 2016 (**Appendix M**).
- 7.34 The resulting secondary education trips are provided in **Table 7.8**, with the total development trips in **Table 7.9**.

	AM Peak (0800-0900)			PM Peak (1700-1800)		
	In	Out	Total	In	Out	Total
Secondary Pupil Car/Van Trips	73	73	146	0	0	0
Secondary Staff Car/Van Trips	24	0	24	0	15	15
School Bus Trips	3	3	6	0	0	0
<b>Total Secondary Trips</b>	<b>101</b>	<b>76</b>	<b>177</b>	<b>0</b>	<b>15</b>	<b>15</b>
MKTM Education Trips	7	8	15	1	2	3
<b>Additional Education Trips</b>	<b>94</b>	<b>68</b>	<b>162</b>	<b>-1</b>	<b>13</b>	<b>12</b>

Table 7.8: Secondary Education Trips<sup>7</sup>

<sup>7</sup> Columns may not total due to rounding.

	AM Peak (0800-0900)			PM Peak (1700-1800)		
	In	Out	Total	In	Out	Total
MKTM Development Trips (residential, commercial & some education)	394	1041	1435	903	498	1401
Additional Education Trips	94	68	162	-1	13	12
<b>Total Development Trips</b>	<b>488</b>	<b>1109</b>	<b>1597</b>	<b>902</b>	<b>511</b>	<b>1413</b>

Table 7.9: Total Development Trips

#### *Trip Distribution and Assignment*

7.35 The distribution of the development trips within the MKTM has been applied to the secondary education trips to ensure a consistent approach to trips originating outside the Site.

#### *Reassignment of Traffic*

7.36 The MKTM is a dynamic traffic model which assumes that reassignment of traffic occurs as a result of growth and development in the local area. The analysis completed for BCC assumes that no reassignment occurs, and therefore represents the 'worst-case' assessment.

7.37 The network diagrams for the '2026 Base' and '2026 Base + Development' scenario are provided in **Appendix N**.

#### *Junction Locations*

7.38 The locations agreed for static junction model assessments within Buckinghamshire are as shown on **Figure 7.4** and listed below:

- A421/Whaddon Road (Bottle Dump Roundabout)
- A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)
- A421/Warren Road
- A421/Shucklow Hill/Little Horwood Road

- A421/Nash Road/Winslow Road
- Stock Lane/Shenley Road/Coddimoor Lane (Whaddon)
- Whaddon Road/Westbrook End (Newton Longville)
- Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)

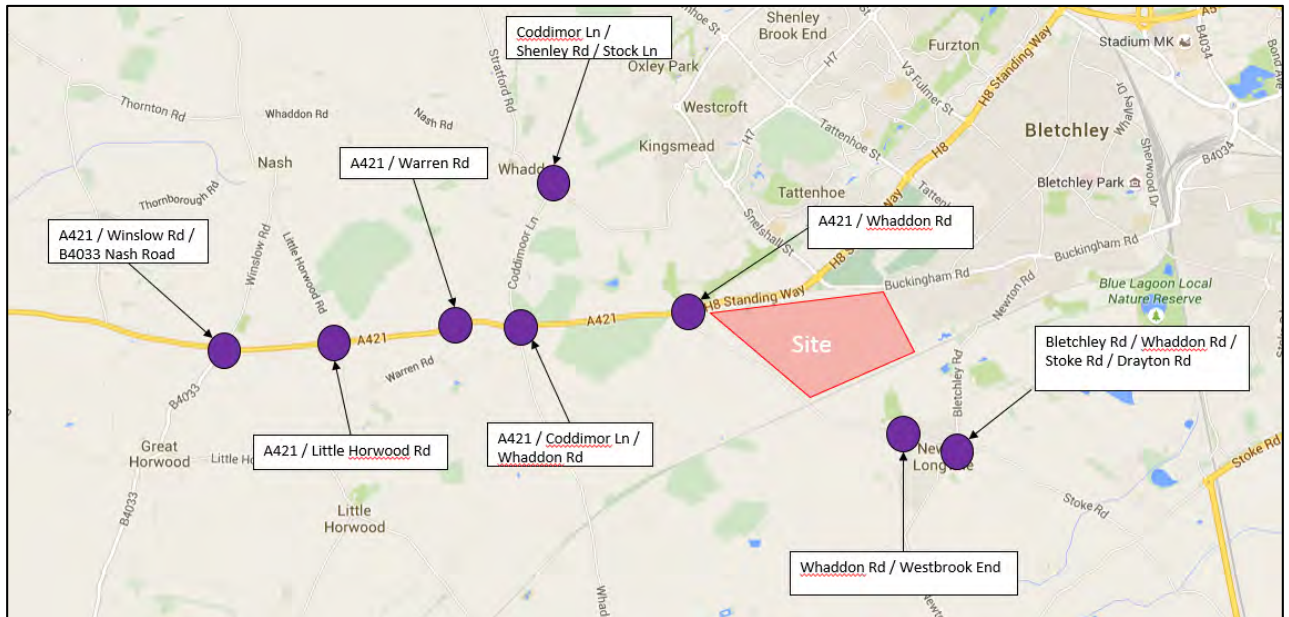


Figure 7.4: Junction Locations

### Geometric Parameters

7.39 The geometric parameters to be used within the static junction models were agreed with BCC and MKC on 22<sup>nd</sup> April 2016, and are provided in **Appendix O** for information.

### Validation

7.40 The junction models were checked/validated using screenshots taken from live 'Google Traffic' data at the time of the surveys. The comparisons of the modelled queue length results and Google Traffic screenshots are provided in **Appendix P**. All junction models validated well compared to the google screenshots with the exception of Whaddon Crossroads.

7.41 At Whaddon Crossroads there was a slow moving queue on the day of survey (orange on Google Traffic) which translated into a large queue within the modelling. The model was therefore calibrated by adjusting the input data to

ensure the junction was operating at just below an RFC of 1.0 in the 2015 base, i.e. just below the practical capacity. It is considered that the calibrated 2015 base model for Whaddon Crossroads validates well with the existing situation, as confirmed by BCC on 12<sup>th</sup> May 2016 following a peak hour Site visit.

## Scenarios

7.42 The scenarios to be assessed (as agreed with BCC/Jacobs) include:

- Base 2015;
- Base 2026; and
- Base 2026 + Development.

## Summary

7.43 Two separate methodologies were required to reach agreement that the impact of the proposed development on the local highway network had been adequately assessed for the different highway authorities.

7.44 For MKC and Highways England the MKTM has been used to determine junctions of importance, with local capacity models assessing the traffic flow data from the MKTM at a number of junctions.

7.45 For BCC, a series of static junction models built using 2015 traffic survey data have been used to assess the impact of the development on the local highway network.

## Buckingham Road Access

8.2 The proposed access junction was modelled using Junctions8 (ARCADY) to ensure the capacity of the access point would be suitable to meet the needs of the proposed development without causing undue delay to Buckingham Road. The results of the analysis are presented in **Table 8.1** and **Table 8.2**, and in **Appendix Q**.



Arm		2026 Base + Development	
		RFC	Queue
A	Buckingham Road (East)	0.09	0.10
B	Development Access SE (Connecting to Weasel Lane)	0.21	0.29
C	Development Access SW	0.21	0.30
D	Buckingham Road (West)	0.25	0.36

Table 8.1: Buckingham Road Access AM Peak

Arm		2026 Base + Development	
		RFC	Queue
A	Buckingham Road (East)	0.12	0.15
B	Development Access SE (Connecting to Weasel Lane)	0.08	0.10
C	Development Access SW	0.23	0.33
D	Buckingham Road (West)	0.14	0.17

Table 8.2: Buckingham Road Access PM Peak

8.3 The results of the assessment at Buckingham Road access roundabout shown in **Table 8.2** and **Table 8.3** show that the junction operates well within capacity in both the AM and PM peaks in the 2026 Base + Development scenario.

### Whaddon Road Access

8.4 The proposed access onto Whaddon Road will be via a new 'ghosted right turn' priority junction, broadly as shown Drawing D014B and in **Figure 8.2**.

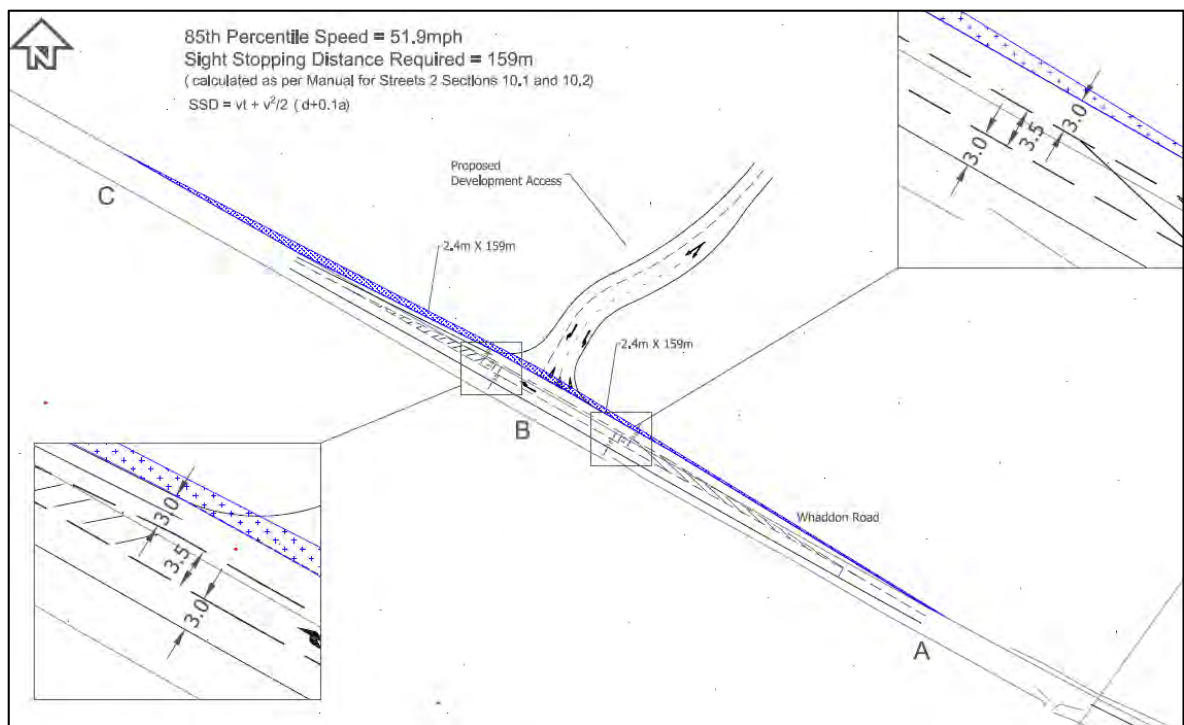


Figure 8.2: Whaddon Road Access

8.5 The proposed access junction was modelled using Junctions8 (PICADY) to ensure the capacity of the access point would be suitable to meet the needs of the proposed development without causing undue delay to Whaddon Road. The results of the analysis are presented in **Table 8.3** and **Table 8.4**, and in **Appendix Q**.

		2026 Base + Development	
		RFC	Queue
A	Whaddon Road (North)	-	-
B	Site Access	0.68	2.26
C	Whaddon Road (South)	0.04	0.05

Table 8.3: Whaddon Road Access AM Peak

		2026 Base + Development	
		RFC	Queue
A	Whaddon Road (North)	-	-
B	Site Access	0.15	0.19
C	Whaddon Road (South)	0.24	0.34

Table 8.4: Whaddon Road Access PM Peak

8.6 The results of the assessment at the Whaddon Road access shown in **Table 8.3** and **Table 8.4** show that the junction operates within capacity in both the AM and PM peaks in the 2026 Base + Development scenario.

#### A421 Left-In Access

8.7 The access into the proposed development from A421 Whaddon Road does not require capacity assessment as it comprises an 'access only' with a deceleration lane and there will be no constraint on A421 as a result of the access.

#### Summary

8.8 Junction assessments using Junctions 8 (ARCADY and PICADY) have been completed at the two main access/egress junctions. The junctions are forecast to operate well within capacity in the 2026 Base plus Development scenario – i.e. with the proposed development fully occupied.

## 9 Off-Site Impact Assessments

- 9.1 The capacity of roundabouts and priority junctions is expressed in terms of RFC (ratio of flow to capacity) and maximum queues. An RFC of 0.85 (85%) is considered to be a theoretical threshold above which queues would start to form and above which improvements could be considered to reduce congestion. An RFC of 1.0 (100%) is the limit of practical capacity at the junction, above which improvements should be considered to reduce congestion.
- 9.2 Each junction is considered in the following Sections, with the modelling results for each scenario shown. The full results outputs are provided in **Appendix Q**. A 'RAG' assessment technique is applied to indicate where mitigation may be required. In this regard, 'green' (0.85 RFC) is acceptable; 'amber' (0.85-1.0 RFC) may require further consideration; and 'red' (>1.0 RFC) indicates where mitigation is likely to be needed. The approach to modelling and the identification of suitable mitigation has been agreed with MKC and BCC and their consultants.

### Milton Keynes

#### Introduction

- 9.3 Each of the off-Site local road roundabouts as identified in Section 7 for capacity assessment has been analysed using the ARCADY software and traffic flows for the 'S1' and 'S2' scenarios. This section contains a summary of the results of each assessment with the full ARCADY outputs contained at **Appendix Q**.

#### Junction Modelling Results

- 9.4 The 'S1' and 'S2' scenario results for each roundabout (shown in **Figure 7.3**) are summarised in **Table 9.1** to **Table 9.8** below. The tables contain maximum RFC values for the 2026 AM and PM peak hours under consideration.

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Snelshall Street	0.47	0.89	0.63	1.69	0.25	0.33	0.41	0.70
A421 Standing Way (E)	0.60	1.50	0.72	2.62	0.61	1.58	0.81	4.15
B4034 Buckingham Rd	0.59	1.43	0.86	5.58	0.41	0.69	0.77	3.31
A421 Standing Way (W)	0.46	0.86	0.53	1.14	0.63	1.73	0.68	2.09

Table 9.1: ARCADY Results – Tattenhoe Roundabout

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Snellshall Street (N)	0.21	0.27	0.24	0.31	0.15	0.18	0.18	0.22
H7 Chaffron Way	0.31	0.45	0.32	0.48	0.46	0.86	0.50	1.02
Snellshall Street (S)	0.12	0.14	0.18	0.22	0.27	0.38	0.31	0.46
Hayton Way	0.58	1.38	0.59	1.42	0.36	0.56	0.37	0.60

Table 9.2: ARCADY Results – Kingsmead Roundabout



	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V2 Tattenhoe Street (N)	0.11	0.13	0.13	0.15	0.22	0.29	0.25	0.34
H7 Chaffron Way (E)	0.35	0.55	0.37	0.58	0.48	0.93	0.53	1.15
V2 Tattenhoe Street (S)	0.49	0.96	0.58	1.38	0.31	0.45	0.37	0.59
H7 Chaffron Way (W)	0.23	0.31	0.24	0.32	0.22	0.29	0.23	0.31

Table 9.3: ARCADY Results – Westcroft Roundabout

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V2 Tattenhoe Street (N)	0.55	1.24	0.66	1.91	0.55	1.23	0.72	2.50
H8 Standing Way (E)	0.54	1.17	0.60	1.52	0.66	1.94	0.78	3.53
V2 Tattenhoe Street (S)	0.56	1.29	0.70	2.32	0.35	0.53	0.58	1.38
H8 Standing Way (W)	0.43	0.75	0.57	1.32	0.47	0.90	0.56	1.31

Table 9.4: ARCADY Results – Windmill Hill Roundabout

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V3 Fulmer Street (N)	0.42	0.73	0.42	0.72	0.45	0.83	0.47	0.88
H7 Chaffron Way (E)	0.29	0.41	0.28	0.40	0.89	7.22	0.93	10.74
V3 Fulmer Street (S)	0.83	4.59	0.82	4.46	0.99	19.42	1.00	21.32
H7 Chaffron Way (W)	0.42	0.73	0.49	0.95	0.35	0.54	0.36	0.57

Table 9.5: ARCADY Results – Furzton Roundabout

9.5 The results tabulated above demonstrate that Tattenhoe, Kingsmead, Westcroft and Windmill Hill Roundabouts will continue to operate with maximum RFC values at or below 0.85 and only minimal queuing and delays are predicted. At Furzton Roundabout, the additional traffic from the proposed development has only a minimal impact and the junction is left within capacity with maximum RFC values remaining below 1.0. Therefore no mitigation works to these roundabouts are required and none are proposed.

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V3 Fulmer Street	0.79	3.48	0.84	4.56	0.77	3.19	0.80	3.84
H8 Standing Way (east)	0.59	1.43	0.64	1.77	0.93	11.55	1.00	34.82
Shenley Road	1.20	113.31	1.24	121.04	1.65	240.93	1.92	300.59
H8 Standing Way (west)	0.80	4.02	0.83	4.76	0.60	1.49	0.64	1.78

Table 9.6: ARCADY Results – Emerson Roundabout

9.6 The junction assessment results show that in the 2026 Base scenario Emerson Roundabout operates with an RFC over 1.0 in both the AM and PM peaks on Shenley Road. In the 2026 Base + Development scenarios, the junction operates over capacity, with queues increasing exponentially due to the unstable nature of the models over an RFC of 1.0.

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V4 Watling Street (north)	1.15	62.99	1.24	97.7	1.06	26.16	1.06	24.18
H8 Standing Way (east)	1.03	43.68	1.09	81.58	1.25	240.41	1.26	253.33
V4 Watling Street (south)	1.36	226.10	1.35	225.8	0.61	1.53	0.60	1.5
H8 Standing Way (west)	1.36	378.69	1.37	391.97	0.95	14.34	0.97	21.63

Table 9.7: ARCADY Results – Elfield Park Roundabout

9.7 The results of the assessment at Elfield Park Roundabout show that in the 2026 Base scenario the junction operates over capacity on all arms in the AM peak, and on V4 Watling Street (north) and H8 Standing Way (east) in the PM peak. In the 2026 Base plus Development scenario, the RFCs increase slightly as a result of the additional trips related to the proposed development.

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V6 Grafton Street (north)	0.61	1.57	0.67	2.02	1.26	174.53	1.27	183.6
H8 Standing Way (east)	1.09	72.46	1.11	83.00	1.14	79.19	1.14	79.61
V6 (south)	1.02	33.02	1.07	54.95	0.97	17.94	1.01	27.86
H8 Standing Way (west)	1.21	163.77	1.21	170.07	0.95	14.19	0.96	15.68

Table 9.8: ARCADY Results – Bleak Hall Roundabout

- 9.8 The results of the assessment at Bleak Hall Roundabout show that in the 2026 Base scenario the junction operates over capacity on most arms in the AM peak and the PM peak. In the 2026 Base plus Development scenario, the RFCs increase slightly as a result of the additional trips related to the proposed development.
- 9.9 The Scenario 'S1' results for Emerson, Elfield Park and Bleak Hall Roundabouts show that, even without the additional traffic generated by the proposed development, these junctions will be over-capacity in 2026 on one or more arms in both the AM and PM peak hours.

## Bletchley

- 9.10 MKC and their consultant Stirling Maynard Transportation (SMT) requested an assessment of the traffic on the existing road network through Bletchley, and the additional forecast vehicle trips as a result of the proposed development.
- 9.11 Traffic surveys obtained from MKC confirmed that the MKTM model flows for 2026 are broadly representative of the expected traffic through Bletchley (**Appendix R**) and SMT has confirmed that the MKTM model flows are appropriate for use within the assessment of the impact of the proposed development on Bletchley.

9.12 The MKTM Saturn model has been used to determine the level of traffic on the main routes through Bletchley as existing, using the 2026 Base scenario. The locations of the link flow data described in **Table 9.9** are shown in **Figure 9.1**.

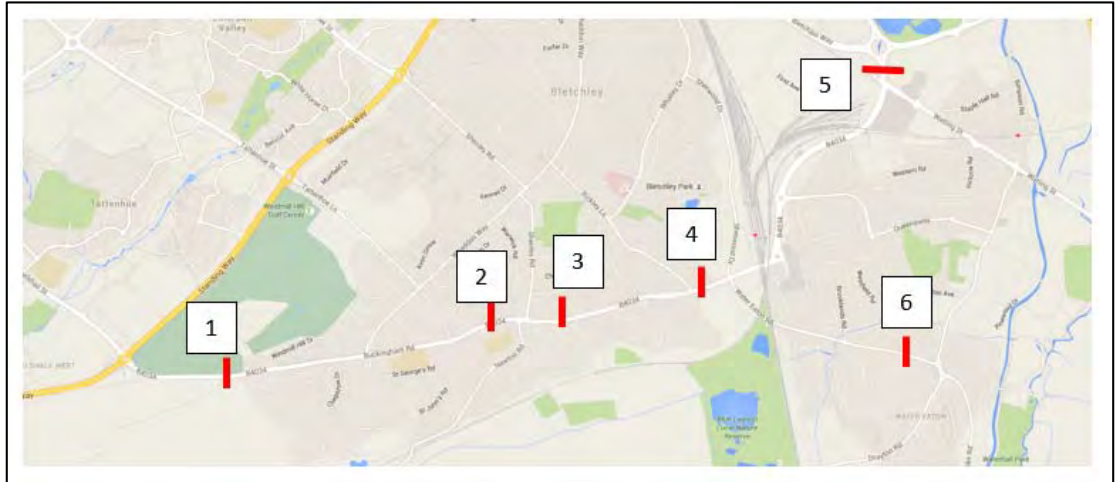


Figure 9.1: Location of Link Flows

Location		AM Peak			PM Peak		
		E/b	W/b	Total	E/b	W/b	Total
1.	B4034 east of Tattenhoe Roundabout	444	504	948	510	363	873
2.	B4034 west of Newton Road	607	342	949	383	541	924
3.	B4034 east of Shenley Road	862	522	1384	520	793	1313
4.	B4034 west of Sherwood Drive	1087	793	1880	889	1020	1909
5.	B4034 south of Bletcham Way Rbt	1890	1542	3432	1787	1808	3595
6.	West of Water Eaton double-mini rbt	539	783	1322	581	491	1072

Table 9.9: Traffic Flows Through Bletchley – 2026 Base

#### Traffic Generated by SWMK

9.13 Within the following tables, the traffic generated by the proposed SWMK development includes the traffic generated within the MKTM Saturn model and the additional education trips as agreed with BCC. **Table 9.10** details the total development trips generated and reaching each junction.



Location		AM Peak			PM Peak		
		E/b	W/b	Total	E/b	W/b	Total
1.	B4034 east of Tattenhoe Roundabout	197	93	290	74	142	216
2.	B4034 west of Newton Road	159	57	216	42	116	158
3.	B4034 east of Shenley Road	146	44	190	32	105	137
4.	B4034 west of Sherwood Drive	116	22	137	16	79	95
5.	B4034 south of Bletcham Way Rbt	60	9	68	2	25	27
6.	West of Water Eaton double-mini rbt	10	14	24	8	7	15

Table 9.10: Traffic Flows Through Bletchley – SWMK Development Traffic

#### Assessment of Impact – Link Flow

9.14 The MKTM is a dynamic assignment model which assumes that some trips will reassign to alternative routes as a result of the proposed development at SWMK. The 'Base 2026 + Development' flows shown in **Table 9.11** takes account of the benefit to the local area of the reassignment of traffic within the MKTM.

Location		AM Peak				PM Peak			
		E/b	W/b	Total	Inc.	E/b	W/b	Total	Inc.
1.	B4034 east of Tattenhoe Roundabout	602	543	1145	197	539	493	1032	159
2.	B4034 west of Newton Road	727	303	1031	82	380	476	856	-68
3.	B4034 east of Shenley Road	938	537	1475	91	507	818	1325	12
4.	B4034 west of Sherwood Drive	1155	828	1982	102	925	1084	2009	100
5.	B4034 south of Bletcham Way Rbt	1892	1558	3449	17	1812	1845	3657	62
6.	West of Water Eaton double-mini rbt	550	785	1335	13	633	524	1157	85

Table 9.11: Traffic Flows Through Bletchley – 2026 Base + Development

- 9.15 The increase in traffic flow is greatest on the western section of B4034 Buckingham Road to the east of Tattenhoe roundabout, which is to be expected given the location of the proposed development. The increase in traffic reduces further to the east as traffic disperses through the local road network.
- 9.16 Referring to the Design Manual for Roads and Bridges (DMRB) TA 79/99 'Traffic Capacity of Urban Roads', B4034 Buckingham Road would be categorised as an 'Urban All-Purpose 3 (UAP3)' road, described as a:

*"Variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade crossings. 30-40mph."*

- 9.17 The capacities in Table 2 of TA 79/99 are reproduced in **Figure 9.2**. The single carriageway capacities shown are the one-way flow, based on a 60/40 directional split, with the capacities shown representing 60% of the two-way link flow.

		Two-way Single Carriageway- Busiest direction flow (Assumes a 60/40 directional split)								Dual Carriageway				
		Total number of Lanes								Number of Lanes in each direction				
		2				2-3	3	3-4	4	4+	2		3	4
Carriageway width		6.1m	6.75m	7.3m	9.0m	10.0m	12.3m	13.5m	14.6m	18.0m	6.75m	7.3m	11.0m	14.6m
Road type	UM	Not applicable									4000	5600	7200	
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300	3350	3600	5200	*
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700	2950	3200	4800	*
	UAP3	900	1110	1300	1530	1620	*	*	*	*	2300	2600	3300	*
	UAP4	750	900	1140	1320	1410	*	*	*	*	*	*	*	*

**Table 2 Capacities of Urban Roads**  
**One-way hourly flows in each direction**

Figure 9.2: TA 79/99 Link Capacities

- 9.18 The width of Buckingham Road varies in width from approximately 6m to 10m. As a consequence, the theoretical capacity of B4034 Buckingham Road also varies, as shown in 2 below. The total 2026 flows are abstracted from **Table 9.11**.

Location	Road Width	Capacity per hour	AM Peak		PM Peak	
			Total Flow	Residual Capacity	Total Flow	Residual Capacity
1. B4034 east of Tattenhoe Rbt	6.6m	1850	1145	705	1032	818
2. B4034 west of Newton Road	6.2m	1500	1031	469	856	644
3. B4034 east of Shenley Road	6.1m	1500	1475	25	1325	175
4. B4034 west of Sherwood Drive	9.9m	2700	1982	718	2009	691
5. B4034 south of Bletcham Way Rbt	7.1m	5200	3449	1751	3657	1543
6. West of Water Eaton double-mini rbt	6.5m	1850	1335	515	1157	693

Table 9.12: Traffic Flows through Bletchley – Two-way Link Capacity

9.19 Even with the increase in traffic flows as a result of the proposed SWMK development, the link flows on B4034 Buckingham Road would be well within the theoretical capacity at most locations.

#### Assessment of Impact – Junction Flow

9.20 The additional traffic as a result of the proposed SWMK development increases traffic flows at a number of junctions within Bletchley has been reviewed. The location of the junctions is shown on **Figure 9.3**.



Figure 9.3: Location of Junctions in Bletchley

9.21 The total flow through the junctions in the '2026 Base' and '2026 Base+ Development', and the variance between the scenarios is shown in **Table 9.13**.

Location	AM Peak			PM Peak		
	2026 Base	2026 Base + Dev.	Inc.	2026 Base	2026 Base + Dev.	Inc.
B4034/Newton Road/Shenley Road	1894	1993	99	1863	1888	25
B4034/Sherwood Drive/Water Eaton Road	2764	2862	98	2644	2767	123
B4034 Bletcham Way Roundabout	4139	4134	-5	4152	4225	73
Water Eaton double-mini roundabout	2280	2333	53	2189	2245	56

*Table 9.13: Traffic Flow Increases at Bletchley Junctions – 2026 Base Vs 2026 Base + Development*

9.22 The increase in traffic at the key junctions in Bletchley is 'minimal' to 'moderate', with the highest increase in flows at B4034/Sherwood Drive/Water Eaton Road roundabout. The increase in flows are comparable to daily variations in traffic.

#### Junction Assessment – Sherwood Road/Water Eaton Road/B4034

9.23 Following a discussion with SMT (on behalf of MKC) at the meeting held on 21<sup>st</sup> April 2016, a junction assessment (using Junctions8) has been completed at the Sherwood Drive/Water Eaton Road/B4034 roundabout, which is forecast to have the highest increase in traffic as a result of the SWMK development. The results of the assessment are provided in **Table 9.14** and **Table 9.15**, with the full outputs in **Appendix Q**.

		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue
A	Sherwood Drive	0.41	0.69	0.48	0.91
B	B4034 Buckingham Road (East)	0.59	1.43	0.62	1.61
C	Water Eaton Road	0.38	0.6	0.37	0.59
D	B4034 Buckingham Road (West)	0.71	2.36	0.73	2.66

Table 9.14: Sherwood Drive/Water Eaton Road/B4034 roundabout, AM peak

		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue
A	Sherwood Drive	0.35	0.53	0.38	0.61
B	B4034 Buckingham Road (East)	0.75	2.89	0.80	3.92
C	Water Eaton Road	0.42	0.73	0.45	0.8
D	B4034 Buckingham Road (West)	0.50	0.98	0.52	1.07

Table 9.15: Sherwood Drive/Water Eaton Road/B4034 roundabout, PM peak

9.24 The junction assessment results show that there is an increase in the RFC upon the introduction of the additional trips, however the junction still operates under capacity in both peaks. B4034 Buckingham Road (east) is the busiest arm with an increase in RFC of 0.05 in the PM peak and an associated queue increases of 1 vehicle as a result of the SWMK development.

### Summary

9.25 The additional traffic generated by the proposed development increases traffic along the B4034 Buckingham Road corridor through Bletchley. The forecast increase in traffic flows are 'minimal' to 'moderate', with the link flows remaining within the theoretical capacity, and with junction flows comparable to daily variations in traffic.



## Buckinghamshire

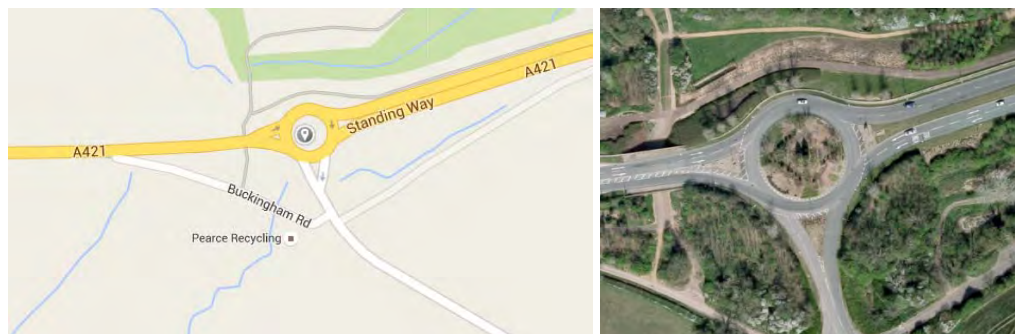
### Introduction

9.26 This section presents the results of the junction modelling assessments within Buckinghamshire, representing a 'worst-case' scenario, as the assessments do not benefit from the dynamic reassignment of traffic derived from the MKTM.

### Junction Modelling Results

#### *A421/Whaddon Road (Bottle Dump Roundabout)*

9.27 The junction of A421/Whaddon Road (Bottle Dump Roundabout) is a large three arm roundabout with two lane entries on all arms. A421 (east) is a dual carriageway, with flare lanes on A421 (west) and Whaddon Road. The exit from A421 (east) has two lanes onto the dual carriageway with single lane exits onto A421 (east) and Whaddon Road. The junction is controlled by the National Speed Limit, therefore A421 (west) is restricted to 70mph with A421 (east) and Whaddon Road restricted to 60mph. The junction arrangement is shown in **Figure 9.4**.



*Figure 9.4: Bottle Dump Roundabout*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	H8 Standing Way	0.55	1.19	0.69	2.19	0.72	2.49
B	Whaddon Road	0.33	0.49	0.48	0.92	0.93	9.42
C	A421	0.85	5.28	1.10	53.72	1.15	149.24

Table 9.16: Bottle Dump Roundabout AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	H8 Standing Way	0.61	1.53	0.75	2.94	0.84	5.02
B	Whaddon Road	0.16	0.18	0.24	0.31	0.31	0.44
C	A421	0.65	1.84	0.83	4.68	0.94	11.33

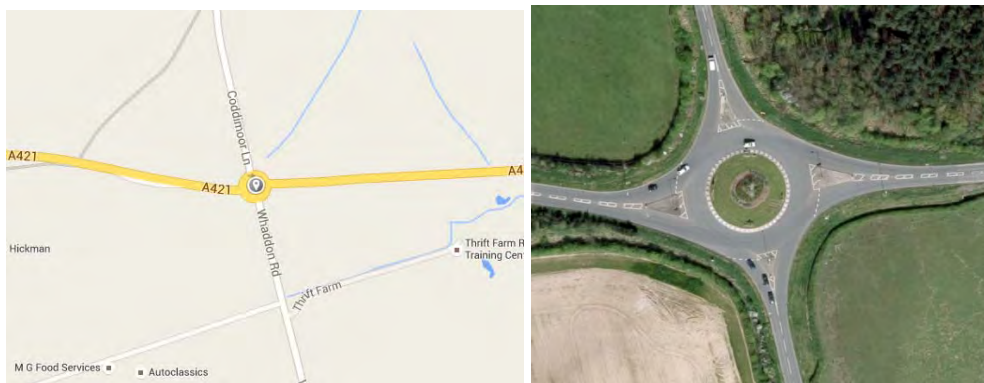
Table 9.17: Bottle Dump Roundabout PM Peak

- 9.28 The results of the assessment at Bottle Dump Roundabout shown in **Table 9.16** and **Table 9.17** show that in the 2015 Base scenario, the junction operates at or below 0.85 RFC with minimal queuing. With traffic growth applied, in the 2026 Base scenario the junction operates with an RFC over 1.0 in the AM, although is still operating well in the PM peak.
- 9.29 In the 2026 Base + Development AM peak scenario, the RFC on the Whaddon Road arm reaches 0.93 in the worst 15-minute period, with the A421 arm operating with an RFC over 1.0, as in the 2026 Base scenario. The queue on the A421 arm increases exponentially as a result of the model becoming unstable over an RFC of 1.0.
- 9.30 In the 2026 Base + Development PM peak scenario, the junction operates well, with RFCs below 0.85 on H8 Standing Way and on Whaddon Road. The A421 arm operates with an RFC of 0.94, with some queuing occurring in the worst 15-minute period.

- 9.31 The junction operates over capacity in the AM peak as a result of the traffic growth forecast to 2026, without the development.
- 9.32 With the development fully occupied, the impact at this junction is minor to moderate.

*A421/Coddimore Lane/Whaddon Road (Whaddon Crossroads)*

- 9.33 The junction of A421 with Coddimore Lane and Whaddon Road (Whaddon Crossroads) is a large four arm roundabout. All approach roads are single carriageway, with flared entries onto the roundabout. All arms have single lane exits. The roundabout is within the National Speed Limit, therefore all arms are restricted to 60mph.
- 9.34 Coddimore Lane is signed as a 'no through route' to Milton Keynes, in an attempt to reduce traffic using the village roads to access to western part of Milton Keynes, although a route is possible via Shenley Road. The junction arrangement is shown in **Figure 9.5**.



*Figure 9.5: Whaddon Crossroads*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Coddimoor Lane	0.24	0.30	0.32	0.47	0.40	0.65
B	A421 (East)	0.80	3.88	1.02	32.91	1.21	153.87
C	Whaddon Road	0.39	0.65	0.57	1.33	0.59	1.41
D	A421 (West)	0.96	14.50	1.24	185.05	1.28	208.90

Table 9.18: Whaddon Crossroads AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Coddimoor Lane	0.14	0.16	0.24	0.31	0.28	0.37
B	A421 (East)	0.86	6.03	1.12	96.4	1.14	119.35
C	Whaddon Road	0.25	0.34	0.37	0.58	0.43	0.75
D	A421 (West)	0.74	2.83	0.96	16.36	1.07	64.50

Table 9.19: Whaddon Crossroads PM Peak

- 9.35 The results of the assessment at Whaddon Crossroads shown in **Table 9.18** and **Table 9.19** show that that in the 2015 Base scenario, the junction operates at or below 0.85 RFC with minimal queuing on three arms. The A421 (west) arm operates with an RFC of 0.96 in the AM peak, and the A421 (east) arm operates with an RFC of 0.74 in the PM peak.
- 9.36 With traffic growth applied, in the 2026 Base scenario the junction operates with an RFC over 1.0 in the AM and PM peaks on A421 (east) and in the PM on A421 (East).
- 9.37 In the 2026 Base + Development AM and PM peak scenarios, the RFC on both of the A421 arms increases. The queuing on the A421 arms increases

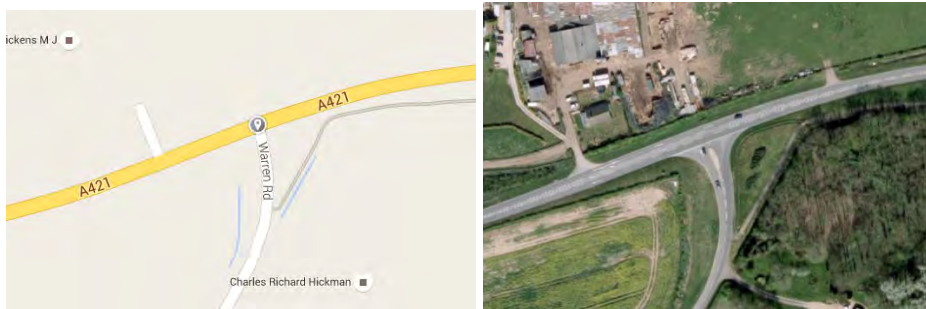
exponentially as a result of the model becoming unstable over an RFC of 1.0 in the worst 15-minute period.

9.38 The junction operates over capacity in the AM and PM peaks as a result of the traffic growth forecast to 2026, without the development.

9.39 With the development fully occupied, the impact at this junction is minor to moderate.

#### *A421/Warren Road*

9.40 The A421/Warren Road junction is a ghosted right turn priority junction for access towards Little Horwood and beyond. Warren Road is a rural has wide entry width to allow vehicles to turn in both directions without blocking. The junction is within the National Speed Limit, and is therefore traffic is restricted to 60mph. The junction is shown in **Figure 9.6**.



*Figure 9.6: A421/Warren Road*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	-	-	-	-	-	-
B	Warren Road	0.72	1.88	>1.5	42.13	>1.5	49.17
C	A421 (West)	0.00	0.00	0.01	0.01	0.01	0.01

Table 9.20: A421/Warren Road AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	-	-	-	-	-	-
B	Warren Road	0.23	0.28	>1.5	18.15	>1.5	26.79
C	A421 (West)	0.02	0.01	0.03	0.02	0.03	0.03

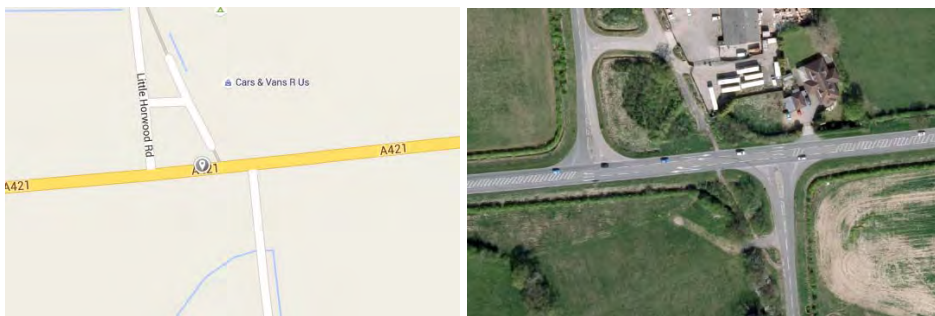
Table 9.21: A421 Warren Road PM Peak

- 9.41 The results of the assessment at the junction of A421/Warren Road shown in **Table 9.20** and **Table 9.21** show that the junction operates well within capacity in both the AM and PM peaks in the 2015 Base scenario.
- 9.42 With traffic growth applied to 2026, the Warren Road arm operates poorly with a high RFC and associated queuing in both peak periods. This is as a result of a high traffic flow on A421 preventing sufficient gaps for right turning traffic. The A421 itself does not see any queuing in the 2026 base scenario.
- 9.43 In the 2026 Base + Development scenario, the queuing on Warren Road increases marginally, as a result of additional traffic on A421 and the number of gaps reducing further. In the AM peak the queue increases by seven vehicles, and in the PM peak by eight vehicles.
- 9.44 With the development fully occupied, the impact at this junction is minor to moderate.



*A421/Shucklow Hill/Little Horwood Road*

9.45 The A421/Shucklow Hill and the A421/Little Horwood Road junctions are both ghosted right turn priority junctions, acting as a left-right stagger junction. Both Shucklow Hill and Little Horwood Road are minor rural routes with single lane flared entries. The junctions is within the National Speed Limit, and is therefore traffic is restricted to 60mph. The junction is shown in **Figure 9.7**.



*Figure 9.7: A421/Shucklow Hill/Little Horwood Road*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	0.08	0.09	0.19	0.23	0.16	0.19
B	Shucklow Hill	0.36	0.49	1.50	25.63	>1.5	25.15
C	A421 (West)	0.04	0.04	0.06	0.06	0.06	0.06
D	Little Horwood Road	0.14	0.15	>1.5	33.44	>1.5	51.19

Table 9.22: A421/Shucklow Hill/Little Horwood Road AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	0.08	0.09	0.09	0.10	0.09	0.10
B	Shucklow Hill	0.09	0.09	>1.5	12.60	>1.5	18.14
C	A421 (West)	0.04	0.05	0.02	0.02	0.02	0.02
D	Little Horwood Road	0.06	0.06	>1.5	16.94	>1.5	40.58

Table 9.23: A421/Shucklow Hill/Little Horwood Road PM Peak

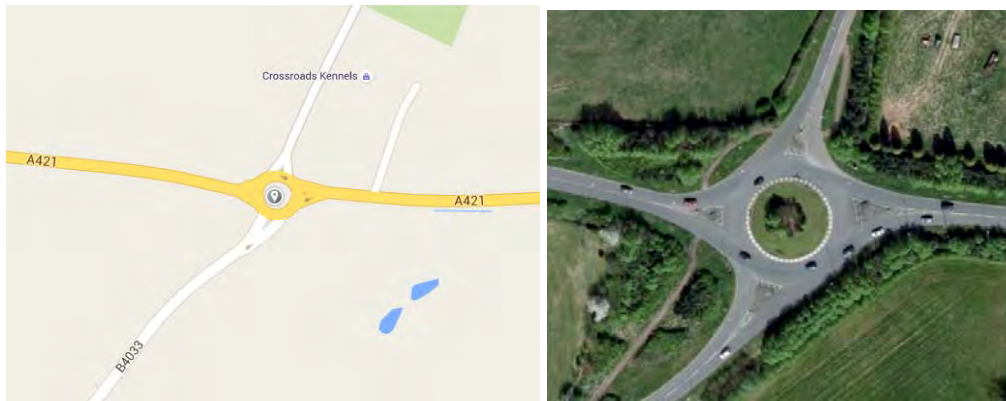
- 9.46 The results of the assessment at the junction of A421/Shucklow Hill/Little Horwood Road shown in **Table 9.22** and **Table 9.23** show that the junction operates well within capacity in both the AM and PM peaks in the 2015 Base scenario.
- 9.47 With traffic growth applied to 2026, the Shucklow Hill and Little Horwood Road arms operates poorly with a high RFC and associated queuing in both peak periods. As with the Warren Road junction, this is as a result of a high traffic flow on A421 preventing sufficient gaps for right turning traffic. The A421 itself does not see any queuing in the 2026 base scenario.
- 9.48 In the 2026 Base + Development scenario, the queuing on Shucklow Hill increases marginally, as a result of additional traffic on A421 and the number

of gaps reducing further with the queue in PM peak increasing by six vehicles. Queuing on the Little Horwood Road arm increases by 18 vehicles in the AM peak and by 24 vehicles in the worst 15-minute period of the PM peak.

- 9.49 With the development fully occupied, the impact at this junction is minor to moderate.

#### *A421/Nash Road/Winslow Road*

- 9.50 The junction of A421/Nash Road/Winslow Road is a four arm roundabout with single lane flared entries on all approaches. Nash Road and Winslow Road are minor rural roads providing access to local villages. The roundabout is subject to the National Speed Limit, therefore 60mph speed restrictions apply. The junction is shown in shown in **Figure 9.8**.



*Figure 9.8: A421/Nash Road/Winslow Road*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	0.66	1.88	0.84	4.85	0.93	10.43
B	B4033 Nash Road	0.44	0.78	0.65	1.77	0.72	2.38
C	A421 (West)	0.61	1.56	0.80	4.14	0.80	4.23
D	Winslow Road	0.18	0.22	0.29	0.41	0.29	0.41

Table 9.24: A421/Nash Road/Winslow Road AM Peak

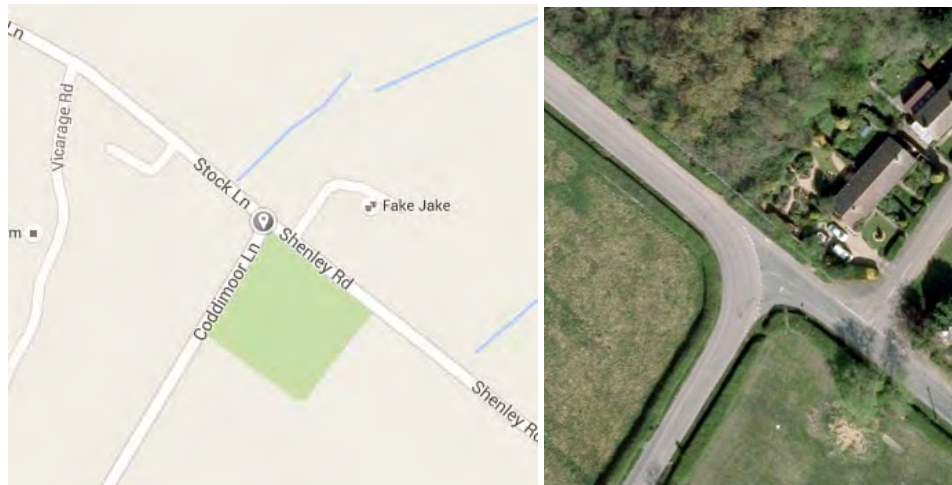
		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	0.67	1.95	0.86	5.60	0.87	6.00
B	B4033 Nash Road	0.28	0.38	0.42	0.70	0.44	0.76
C	A421 (West)	0.55	1.19	0.72	2.45	0.77	3.17
D	Winslow Road	0.11	0.12	0.17	0.20	0.14	0.17

Table 9.25: A421/Nash Road/Winslow Road PM Peak

- 9.51 The results of the assessment at the junction of A421/Nash Road/Winslow Road shown in **Table 9.24** and **Table 9.25** show that the junction operates well in both the AM and PM peaks in the 2015 Base scenario, on all arms.
- 9.52 In the 2026 Base scenario, the A421 (east) arm operates with an RFC of 0.84 in the AM peak and 0.86 in the PM peak, with some associated minor queuing.
- 9.53 In the 2026 Base + Development scenario, the A421 (east) arm operates with an increased RFC in the AM peak, but the RFC remains under 1.0. The associated queuing increases by six vehicles. In the PM peak, the operation of the A421 (east) arm of the junction changes marginally, with an increase in RFC from 0.86 to 0.87, and less than one additional vehicle in the queue.
- 9.54 With the development fully occupied, the impact is minimal.

*Stock Lane/Shenley Road/Coddimoor Lane (Whaddon)*

9.55 Stock Lane/Shenley Road/Coddimoor lane is a three arm priority junction, with Shenley Road as the minor arm. The junction is within the 30mph speed limit applied to Whaddon Village. The junction is shown in **Figure 9.9**.



*Figure 9.9: Stock lane/Shenley Road/Coddimoor Lane*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Stock Lane	-	-	-	-	-	-
B	Shenley Road	0.11	0.12	0.13	0.15	0.14	0.16
C	Coddimoor Lane	0.20	0.27	0.26	0.39	0.26	0.44

*Table 9.26: Stock lane/Shenley Road/Coddimoor Lane AM Peak*

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Stock Lane	-	-	-	-	-	-
B	Shenley Road	0.10	0.11	0.13	0.15	0.14	0.17
C	Coddimoor Lane	0.07	0.09	0.10	0.12	0.10	0.12

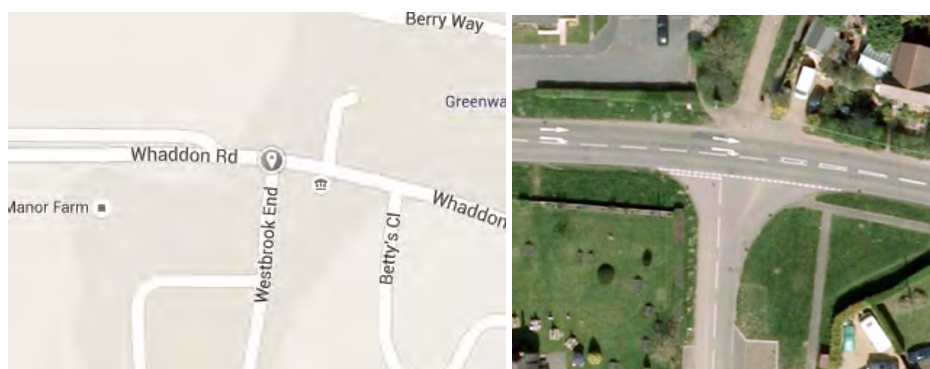
*Table 9.27: Stock lane/Shenley Road/Coddimoor Lane PM Peak*

9.56 The results of the assessment at the junction of Stock lane/Shenley Road/Coddimoor Lane shown in **Table 9.26** and **Table 9.27** show that the junction operates well within capacity in both the AM and PM peaks in all scenarios tested.

9.57 With the development fully occupied, the impact is minimal.

*Whaddon Road/Westbrook End (Newton Longville)*

9.58 The junction of Whaddon Road/Westbrook End in Newton Longville is a simple priority junction with Westbrook End as the minor arm. It is within the 30mph speed limit set for Newton Longville village, and has good visibility in both direction. The junction is shown in **Figure 9.10**.



*Figure 9.10: Whaddon Road/Westbrook End*



		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Whaddon Road (East)	-	-	-	-	-	-
B	Westbrook End	0.08	0.09	0.11	0.12	0.11	0.12
C	Whaddon Road (West)	0.05	0.05	0.07	0.07	0.07	0.07

Table 9.28: Whaddon Road/Westbrook End AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Whaddon Road (East)	-	-	-	-	-	-
B	Westbrook End	0.04	0.04	0.05	0.05	0.05	0.06
C	Whaddon Road (West)	0.06	0.06	0.07	0.08	0.08	0.09

Table 9.29: Whaddon Road/Westbrook End PM Peak

9.59 The results of the assessment at the junction of Whaddon Road/Westbrook End shown in **Table 9.28** and **Table 9.29** show that the junction operates well within capacity in both the AM and PM peaks in all scenarios tested.

9.60 With the development fully occupied, the impact is minimal.

#### *Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)*

9.61 The junction of Bletchley Road/Stoke Road/Drayton Road/Whaddon Road in Newton Longville is a priority crossroads, with the minor arms slightly offset, as shown in **Figure 9.11**. The junction is within the 30mph speed limit set for Newton Longville village.

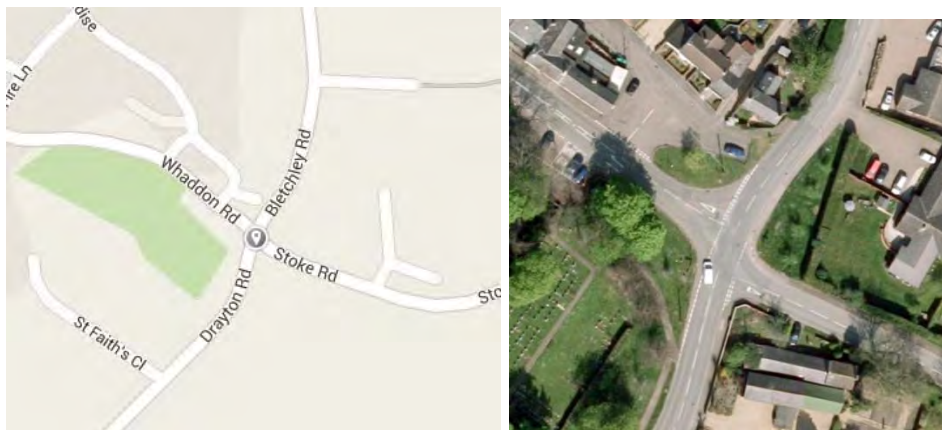


Figure 9.11: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Bletchley Road	0.08	0.09	0.10	0.12	0.10	0.12
B	Stoke Road	0.50	1.00	0.83	4.11	0.95	7.96
C	Drayton Road	0.07	0.08	0.09	0.10	0.09	0.10
D	Whaddon Road	0.30	0.42	0.43	0.73	0.75	2.72

Table 9.30: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road AM Peak

		2015 Base		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Bletchley Road	0.04	0.04	0.05	0.06	0.05	0.06
B	Stoke Road	0.19	0.24	0.25	0.34	0.33	0.48
C	Drayton Road	0.04	0.04	0.05	0.05	0.05	0.05
D	Whaddon Road	0.18	0.22	0.24	0.31	0.27	0.37

Table 9.31: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road PM Peak

9.62 The results of the assessment at the junction of Bletchley Road/Stoke Road/Drayton Road/Whaddon Road shown in **Table 9.30** and **Table 9.31**

show that the junction operates well within capacity in both the AM and PM peaks in the 2015 Base and 2026 Base scenarios.

- 9.63 In the 2026 Base + Development scenario, the Stoke Road arm operates with an RFC of 0.95 in the AM peak, with a queue of eight vehicles. This is an increase in queue of four vehicles compared to 2026 Base. The junction operates well within capacity in the PM peak on all arms.
- 9.64 With the development fully occupied, the impact is minimal and mitigation is not required.

## Buckinghamshire Villages

### Existing Traffic through Villages

- 9.65 An assessment of the traffic flow on the existing road network through the villages, and the additional traffic forecast as a result of the proposed development, was completed to ensure that the impact has been appropriately considered.
- 9.66 Traffic through the villages was taken from the Manual Classified Count (MCC) traffic surveys completed in October/November 2015 (**Table 9.32**). The location of the link flow data described in **Table 9.32** is shown in **Figure 9.12**. Traffic growth has been applied at the rate explained in Section 7 and as agreed with BCC to create the '2026 Base' scenario as shown in **Table 9.33**.

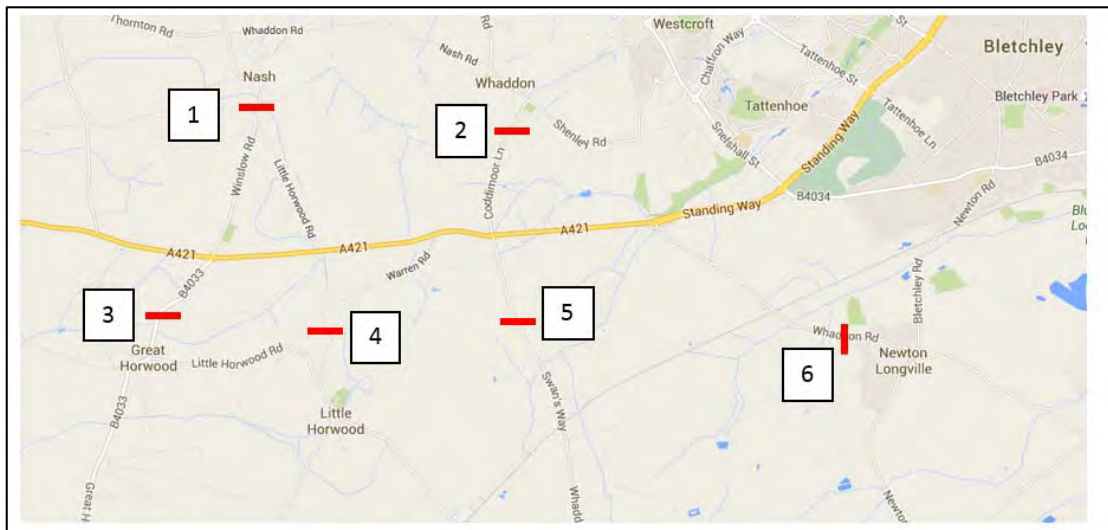


Figure 9.12: Locations of Link Flows

Location		AM Peak			PM Peak		
		N/b	S/b	Total	N/b	S/b	Total
1.	Nash	95	83	178	61	29	90
2.	Whaddon	161	110	271	87	105	192
3.	Great Horwood	345	202	547	216	263	479
4.	Little Horwood	152	88	240	88	113	201
5.	Mursley	265	229	493	216	214	430
		E/b	W/b	Total	E/b	W/b	Total
6.	Newton Longville	310	369	678	323	281	604

Table 9.32: Traffic Flows Through Villages - 2015

Location		AM Peak			PM Peak		
		N/b	S/b	Total	N/b	S/b	Total
1.	Nash	120	105	224	78	37	115
2.	Whaddon	203	139	342	111	134	245
3.	Great Horwood	435	255	690	276	336	612
4.	Little Horwood	192	110	302	112	144	257
5.	Mursley	334	288	622	276	273	549
		E/b	W/b	Total	E/b	W/b	Total
6.	Newton Longville	390	465	855	413	359	772

Table 9.33: Traffic Flows Through Villages - 2026 Base

### Traffic Generated by SWMK

9.67 Within the following tables, the traffic generated by the proposed SWMK development includes the traffic generated within the MKTM Saturn model and

the additional education trips as agreed with BCC. **Table 9.34** details the traffic generated through the villages by the proposed development.

Location		AM Peak			PM Peak		
		N/b	S/b	Total	N/b	S/b	Total
1.	Nash	0	0	0	0	0	0
2.	Whaddon	55	21	76	16	19	35
3.	Great Horwood	1	9	10	7	2	9
4.	Little Horwood	6	26	31	19	8	27
5.	Mursley	0	28	28	33	6	39
		E/b	W/b	Total	E/b	W/b	Total
6.	Newton Longville	198	21	219	51	137	188

*Table 9.34: Traffic Flows Through Villages - SWMK 2026 Development Traffic*

#### Assessment of Impact – Link Flow

9.68 The increase in link flows through the villages as a result of the proposed development at SWMK is shown in **Table 9.35** (i.e.: **Table 9.33** + **Table 9.34**). The data within this table does not take account of the dynamic reassignment predicted by the MKTM, and therefore presents a ‘worst-case’ assessment of traffic through the Buckinghamshire villages.

Location		AM Peak				PM Peak			
		N/b	S/b	Total	Diff.	N/b	S/b	Total	Diff.
1.	Nash	120	105	224	0	78	37	115	0
2.	Whaddon	258	160	418	76	128	153	281	35
3.	Great Horwood	436	263	699	10	283	338	621	9
4.	Little Horwood	198	136	333	31	131	153	284	27
5.	Mursley	334	316	649	28	309	279	588	39
		E/b	W/b	Total	Diff.	E/b	W/b	Total	Diff.
6.	Newton Longville	588	485	1074	219	464	496	960	188

Table 9.35: Traffic Flows Through Villages – 2026 Base + Development

9.69 The increase in traffic flow is greatest through Newton Longville, as expected given the location of the development. The increase in traffic reduces further to the north and west as traffic disperses through the local road network.

9.70 Referring to DMRB TA 79/99 'Traffic Capacity of Urban Roads' to provide an indication of link capacities through the villages, it is considered that all of the roads through the villages would be an 'Urban All-Purpose 3 (UAP3)' road, described as:

*"Variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade crossings. 30-40mph."*

9.71 The capacities in Table 2 of TA 79/99 are provided in **Figure 9.2**. The single carriageway capacities shown are the one-way flow, based on a 60/40 directional split, with the capacities shown representing 60% of the two-way link flow.

9.72 The width of the roads through the villages varies between 5.0m and 7.0m depending on location. To calculate the theoretical capacity of the roads



through the villages, a pessimistic 'average' width has been used. Analysis of the link capacities through the villages is shown in **Table 9.36**.

Location		Category	Road Width	Capacity	AM Peak		PM Peak	
					Total Flow	Residual Capacity	Total Flow	Residual Capacity
1	Nash	UAP3	5.5m	1500	224	1276	115	1385
2	Whaddon	UAP3	5.3m	1500	418	1082	281	1219
3	Great Horwood	UAP3	5.0m	1500	699	801	621	879
4	Little Horwood	UAP3	5.3m	1500	333	1167	284	1216
5	Mursley	UAP3	5.0m	1500	649	851	588	912
6	Newton Longville	UAP3	6.0m	1500	1074	426	960	540

Table 9.36: Traffic Flows Through Villages – Two-way Link Capacity (approx. average)

9.73 Even with the increase in traffic flow as a result of the proposed SWMK development, the link flows through the villages would be well within the theoretical capacities of the roads through all of the villages.

#### Traffic Speed

9.74 The ATC surveys completed in July 2015 and October/November 2015 captured speed data on the approaches to the villages at locations show on **Figure 9.13**.

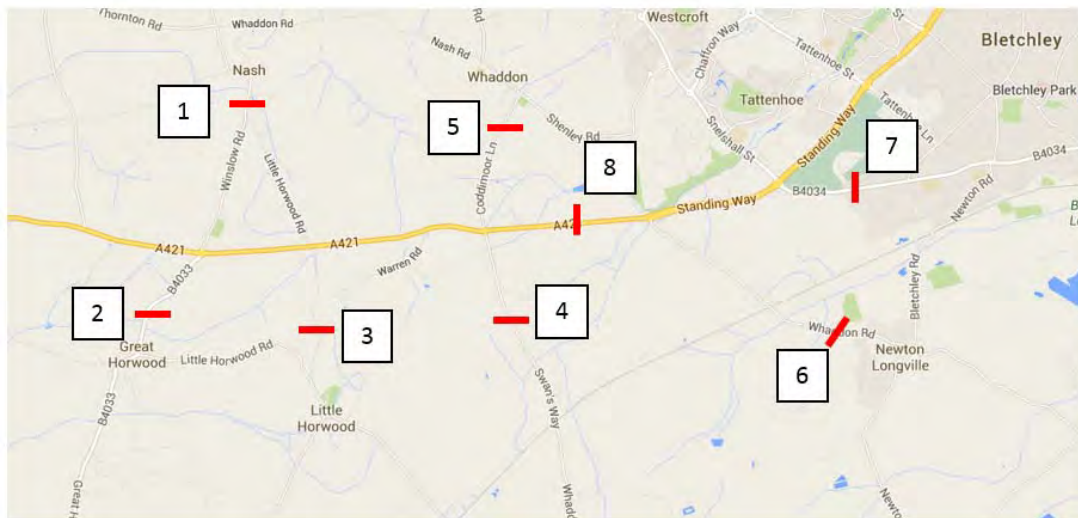


Figure 9.13: Location of ATC Speed Data

9.75 The average speed across the weekday (0700-1900) is provided in **Table 9.37**, along with the speed limit on each road.

Location		N/b	S/b	Speed Limit
1.	Winslow Road	33.9	33.5	60
2.	Nash Road	37.5	39.5	60
3.	Warren Road	34.0	35.5	60
4.	Whaddon Road (Mursley)	47.8	45.9	60
5.	Coddimoor Ln	39.5	42.2	60
6.	Whaddon Road (Newton Longville)	32.9	27.7	30
		E/b	W/b	Speed Limit
7.	Buckingham Rd	39.4	41.5	60
8.	A421 Standing Way	39.4	39.1	60

Table 9.37: Traffic Speeds Through Villages (mph)

- 9.76 In all locations with the exception of Whaddon Road (Newton Longville) N/b, the average speed of traffic is within the posted speed limit set. The data at Whaddon Road (Newton Longville) N/b represents traffic travelling away from the village, and shows the average speed to be marginally above the posted speed limit of 30mph. However it should be noted that the ATC was positioned close to the boundary between 30mph and 40mph, and vehicles were likely to have been accelerating out of the village towards the 40mph speed limit.
- 9.77 Based on the speed data identified in **Table 9.37** above, with the exception of Newton Longville, Mouchel consider that the existing speed of traffic through the local villages is acceptable given the posted speed limits.

### Collisions

- 9.78 Analysis of traffic flows through the villages in the '2026 Base' and '2026 Base + Development' scenarios allows the impact of the development on the occurrence of collisions to be estimated. **Table 9.38** provides a summary of the predicted collisions for both scenarios.

	2026 Base	2026 Base + Dev	Increase
Little Horwood	0.8	0.9	0.09
Nash	0.6	0.6	-
Newton Longville	1.8	2.3	0.45
Whaddon	1.4	1.7	0.27
Mursley	1.6	1.7	0.09
Great Horwood	0.8	0.8	0.01
Total	7.0	7.9	0.9

*Table 9.38: Predicted Collisions (number per annum)*

- 9.79 The analysis in **Table 9.38** shows that there is estimated to be less than one additional collision between all six villages per year in 2026.

## Summary

- 9.80 The additional traffic generated by the proposed development increases traffic through the Buckinghamshire villages to varying degrees. Traffic through Newton Longville increases 'moderately', with 'minimal to moderate' increases through Whaddon, Mursley, and Little Horwood. There is a 'minimal' increase in traffic through Great Horwood, and no increase in traffic through Nash.
- 9.81 In discussing matters with BCC, they agreed that further analysis is not required in regard to considering the impact of the proposed development related traffic on Mursley, Little Horwood, Great Horwood and Nash. Notwithstanding this, it is recognised that the highest forecast increase in traffic through the villages is likely to occur in Newton Longville. Following detailed discussions with BCC, a strategy for implementing traffic calming measures has therefore been proposed for Newton Longville and this is explained in Section 10 of this TA.

## Impact on the Strategic Highway Network

- 9.82 The SWMK development trips included within the MKTM were reviewed with regard to the impact on the Strategic Highway Network, i.e. A5 (operated by Highways England). No development traffic is forecast to use the M1 motorway. The additional trips on A5 on the links between the junctions through Milton Keynes are shown in **Figure 9.14**.

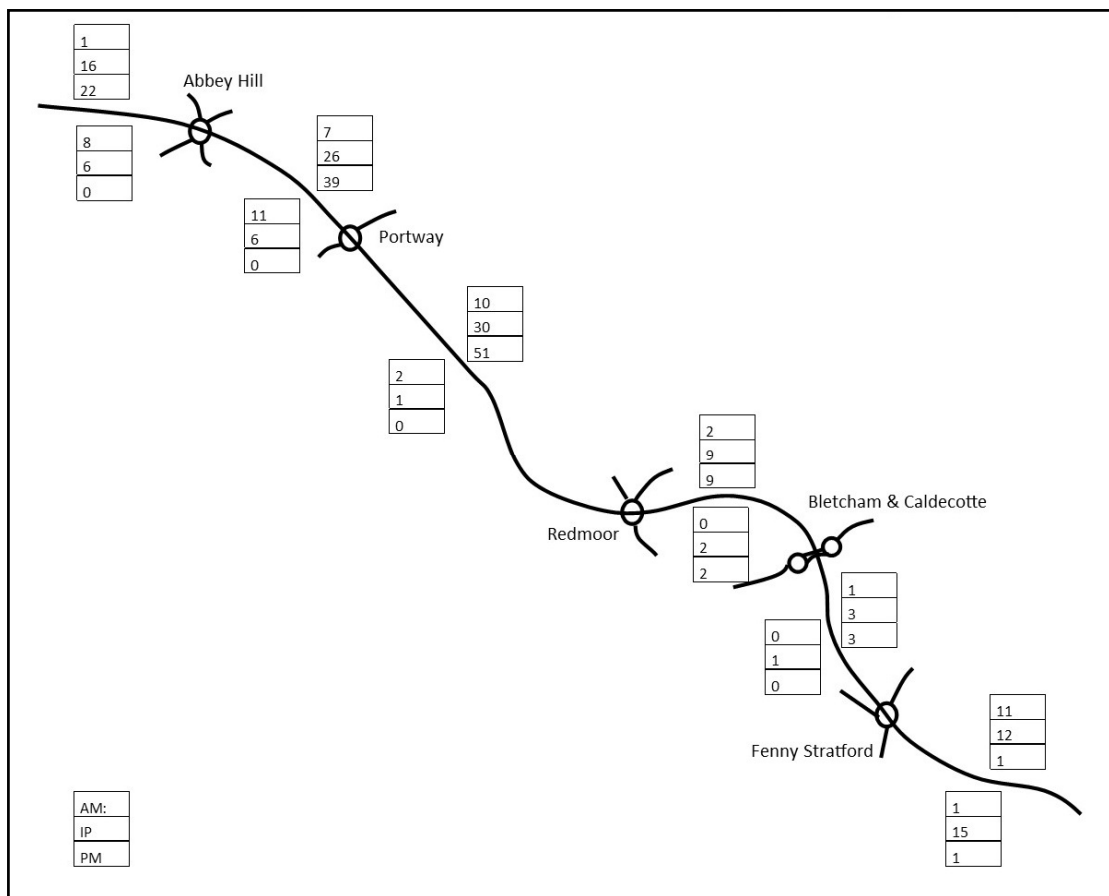


Figure 9.14: SWMK Development Trips on A5 in 2026 (pcus)

### AM Peak

9.83 **Figure 9.14** shows that at most around 11 PCUs associated with the proposed development would use the northbound A5 in the AM peak, with the highest flows forecast on the section between Portway and Abbey Hill. Southbound in the AM peak, around 11 PCUs associated with the development use A5, on the section south of the Fenny Stratford junction.

9.84 In terms of development traffic demands passing through the A5 junctions in the AM peak hour in 2026:

- At Fenny Stratford roundabout, around 18 PCUs of development traffic are forecast to route on the circulatory link past the southbound A5 approach to the roundabout. Most of these trips access the roundabout from Watling Street and 11 join the southbound A5. There are no other significant movements made by development traffic at this junction;

- At Bletcham and Caldecotte junctions, 38 PCUs associated with the development route eastbound straight through the junctions from Bletcham Way to A4146, with less than 10 PCUs making any other movement through these junctions;
- At Redmoor roundabout, around 10 PCUs of development traffic approach the roundabout on the southbound A5 off-slip and take the first exit onto V6 to access the southbound A421 Standing Way. All other movements made by the development traffic at this roundabout are insignificant;
- At Portway roundabout, 24 PCUs of development traffic approach the roundabout from northbound Portway, with approximately 10 of these then accessing the northbound A5. The remainder go straight through to Portway North; and
- At Abbey Hill junction, development traffic flows are less than 10 PCUs on all approaches and all circulatory links.

#### PM Peak

9.85 **Figure 9.14** shows that northbound in the PM peak, forecast development traffic flows on the A5 are very low, with less than 10 PCUs of development traffic using any section of the northbound A5. Southbound, up to around 51 PCUs of development traffic use the A5 as far as Redmoor, with development traffic volume then decreasing to less than 10 PCUs on the A5 sections south of the Redmoor roundabout.

9.86 In terms of development traffic demands passing through the A5 junctions in the PM peak in 2026:

- No significant development traffic volumes route through the Fenny Stratford roundabout, with the greatest development traffic demand of around 8 PCUs forecast for the movement from Brickhill Street to Watling Street;
- At Bletcham and Caldecotte roundabouts, the dominant development traffic movement is straight ahead from the A4146 to Bletcham Way, made by around 14 PCUs;



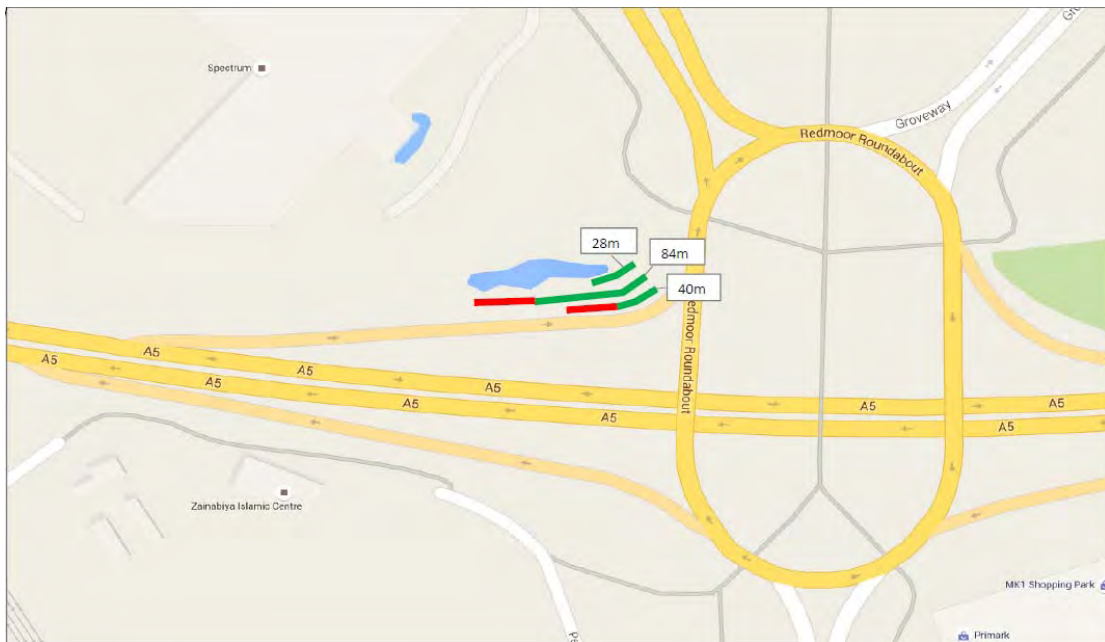
- At Redmoor roundabout, around 51 PCUs of development traffic approach the roundabout from the southbound A5 off-slip and take the first exit onto V6 to access the southbound A421 Standing Way. Around 25 PCUs of development traffic approach the roundabout from V6, 16 of which then take the first exit to Groveway and 9 PCUs access the southbound A5. All other movements at this roundabout made by the development traffic have demands less than 10 PCUs.
- At Portway roundabout, around 12 PCUs of development traffic approach the roundabout from Portway North, with the majority (11 PCUs) going to the A5 southbound. All other movements made by the development traffic at this roundabout are insignificant.
- At Abbey Hill roundabout, around 18 PCUs of development traffic access the A5 southbound, with around 12 PCUs of these come from Monks Way and the remainder come from Great Monks Street. Demands for other movements made by the development traffic are insignificant.

#### Redmoor Roundabout – Queue Lengths

- 9.87 Given the increase of 51 trips in the PM peak on the southbound off-slip at the Redmoor Roundabout, further analysis regarding queue lengths in the PM peak only was completed. Queue length surveys were completed 23<sup>rd</sup> October 2015 to determine the extent of queuing in the 'base' scenario.
- 9.88 The queue lengths recorded for the PM peak were compared to Google Traffic 'typical' conditions for validation purposes. The recorded queue length compares well to the Google typical traffic screen shot.
- 9.89 A traffic growth rate from TEMPRO for 2015-2026 using 'Milton Keynes 00MG1' adjusted using NTM for 'Urban Trunk' roads was used to provide an estimate of the queue length in the opening year of 2026. The growth rate agreed with Highways England was 1.2272.
- 9.90 The additional 51 pcus on the southbound off-slip in the PM peak, as calculated by the MKTM, have been added to the base 2026 queue length to determine whether the proposed development would cause any queuing back onto the

mainline of the A5. The additional pcu's are assigned to the slip road based on the arrival profile of traffic, and the lane usage of Lanes 2 and 3 (for right turning traffic towards the development) from the queue length survey. It is assumed that all 51 additional pcus arrive on a red traffic light and join the back of the queue – therefore the analysis shows a very robust assessment. In reality, some vehicles would arrive on a green traffic signal and would not join a queue.

- 9.91 The base level of queuing in 2026 is included in green in the analysis in **Figure 9.15** (with full details included in **Appendix S**). The development queue lengths are shown in red. All queue lengths are based on 5.75m per PCU.



*Figure 9.15: 2026 Base + Development Queues at Redmoor Roundabout on A5*

- 9.92 The queues for the '2026 with development' scenario extend a maximum of 84m along the 270m long slip road, at approximately 17:20 in the peak hour. The development traffic can therefore be easily accommodated within the existing slip road without causing any queuing back onto the main A5 carriageway.
- 9.93 The analysis shows that the additional traffic generated by the proposed development at SWMK would not cause queueing back onto the A5 mainline during the PM peak. The impact of the proposed development can be

accommodated on the existing network, and is therefore not severe in the context of NPPF.

- 9.94 Following the analysis using MKTM and regarding queuing at Redmoor Roundabout, it was determined that the difference in the traffic with and without the proposed development on the Strategic Highway Network is unlikely to be discernible over and above the usual daily fluctuations in traffic flows (+/-5%). Highways England agree that there are no overall concerns regarding the proposed development and have reported to AVDC that they have no reasons to object to the original planning application.

### Summary

- 9.95 Within Milton Keynes, the impact of the proposed development was assessed at a number of junctions for the Base 2026 and Base 2026 + development scenarios. The majority of junctions assessed operate with an RFC below 1.0 in all scenarios, indicating that junction improvements are not required. Three junctions within the study area require some minor mitigation to ensure that the residual cumulative impact of development is not severe in the context of NPPF.
- 9.96 The impact on Bletchley has been assessed, and whilst there is an increase in traffic through the area, the impact of the development does not require any mitigation to be provided.
- 9.97 Within Buckinghamshire, a number of scenarios have been analysed including Base 2015, Base 2026 and Base 2026 + proposed development. Most of the junctions analysed operate with an RFC below 1.0 in all scenarios indicating that junction improvements at those locations should not be required.
- 9.98 The traffic growth to 2026 in the Base scenario increases traffic along A421, with fewer gaps for right turning traffic at the priority junctions of Shucklow Hill, Little Horwood Road and Warren Road. The roundabouts at Winslow Road/Nash Road, Whaddon Crossroads, and Bottle Dump are all impacted by increased traffic in the 2026 Base scenario, and the operation of the junctions is marginally worse with the proposed development. Should the high level of growth included within these assessments not materialise, the impact along A421 would be considerably less.

- 9.99 The impact of the development on the villages in Buckinghamshire surrounding the Site has been assessed, and BCC has agreed that with exception of Newton Longville mitigation is not required.
- 9.100 Highways England has agreed that the impact of the proposed development on the strategic highway network is negligible and mitigation is not required.

## 10 Mitigation

### Milton Keynes

- 10.1 Following submission of the original TA of January 2015, it was agreed with MKC that mitigation of the impact of the proposed development at SWMK was required at four junctions on the local highway network.
- 10.2 The junctions requiring mitigation are forecasted to operate over capacity in the 'Base 2026' scenario, but will see a further reduction in the operation of the junctions as a result of the proposed development at SWMK.
- 10.3 It has therefore been agreed that mitigation is required to ensure the cumulative residual impact of the development is not severe in the context of paragraph 32 of the National Planning Policy Framework (NPPF). Improvement schemes will be required at the four junctions to provide a 'nil detriment' solution. MKC has subsequently indicated that the cost of implementing the 'nil detriment' improvement schemes will be commuted into a single contribution secured under S106 of the Town and Country Planning Act 1990.
- 10.4 'Nil detriment' mitigation schemes are therefore proposed as necessary, with the junction assessment results provided for the post-mitigation scenario.

### Junction Modelling

- 10.5 As detailed in the original TA, to satisfy MKC, the impact of the proposed development requires mitigation at a number of locations as shown on **Figure 10.1** and listed below:
- Whaddon Crossroads;
  - Emerson Roundabout;
  - Elfield Park Roundabout; and
  - Bleak Hall Roundabout.
- 10.6 The full results outputs are provided in **Appendix T**.

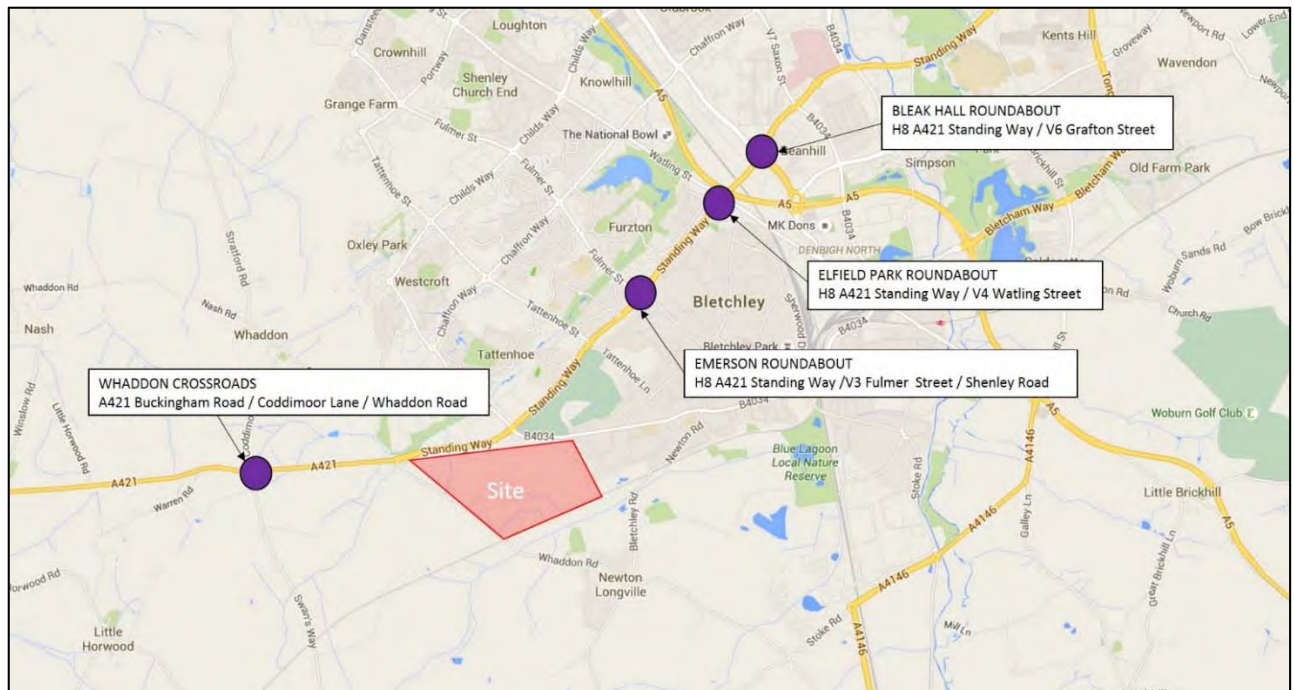


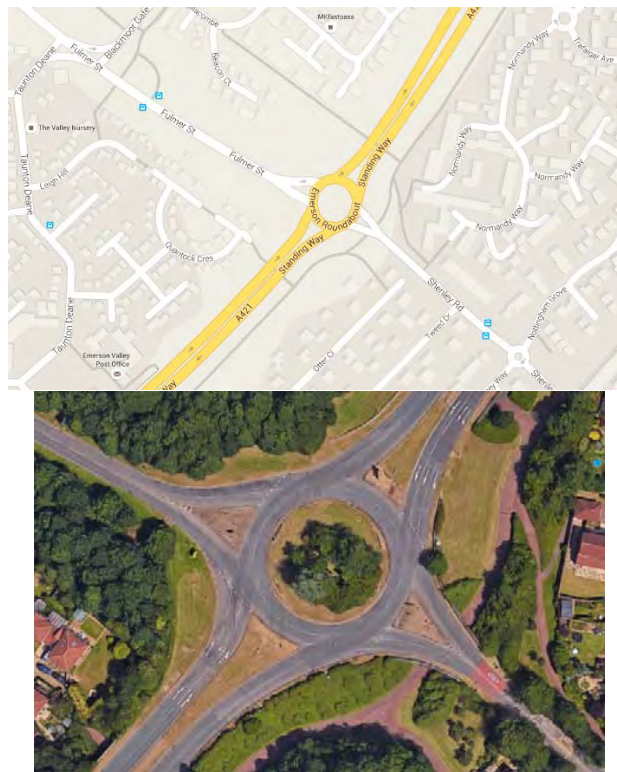
Figure 10.1: MK Mitigation Locations

10.7 The junction of Whaddon Crossroads falls within the jurisdiction of Buckinghamshire County Council (BCC), and was included by SMT within the list of junctions requiring mitigation for information only. The impact of the proposed development at Whaddon Crossroads is discussed later within this TA.

#### H8 A421 Standing Way/V3 Fulmer Street/Shenley Road (Emerson Roundabout)

10.8 The junction of H8 A421 Standing Way/V3 Fulmer Street/Shenley Road (Emerson Roundabout) is a large four arm roundabout with three lane entries on H8 Standing Way and two lane entries on the minor arms. H8 Standing Way is a dual carriageway, with flares to provide three lanes at the entry. The exits from H8 Standing Way have two lanes onto the dual carriageway. Both V3 Fulmer Street and Shenley Road are single carriageways with flares to provide two lane entries to the roundabout, with single lane exits. The existing junction arrangement is shown in **Figure 10.2**.





*Figure 10.2: Emerson Roundabout*

10.9 With the proposed development fully occupied, the impact at this junction is 'moderate'. To improve the capacity at the junction, the centre islands on Shenley Road, V3 Fulmer Street, and H8 Standing Way (west) could be realigned to allow wider entry lanes and longer flare lengths. The new proposed layout of the junction is shown in **Figure 10.3** below and in **Appendix U**.

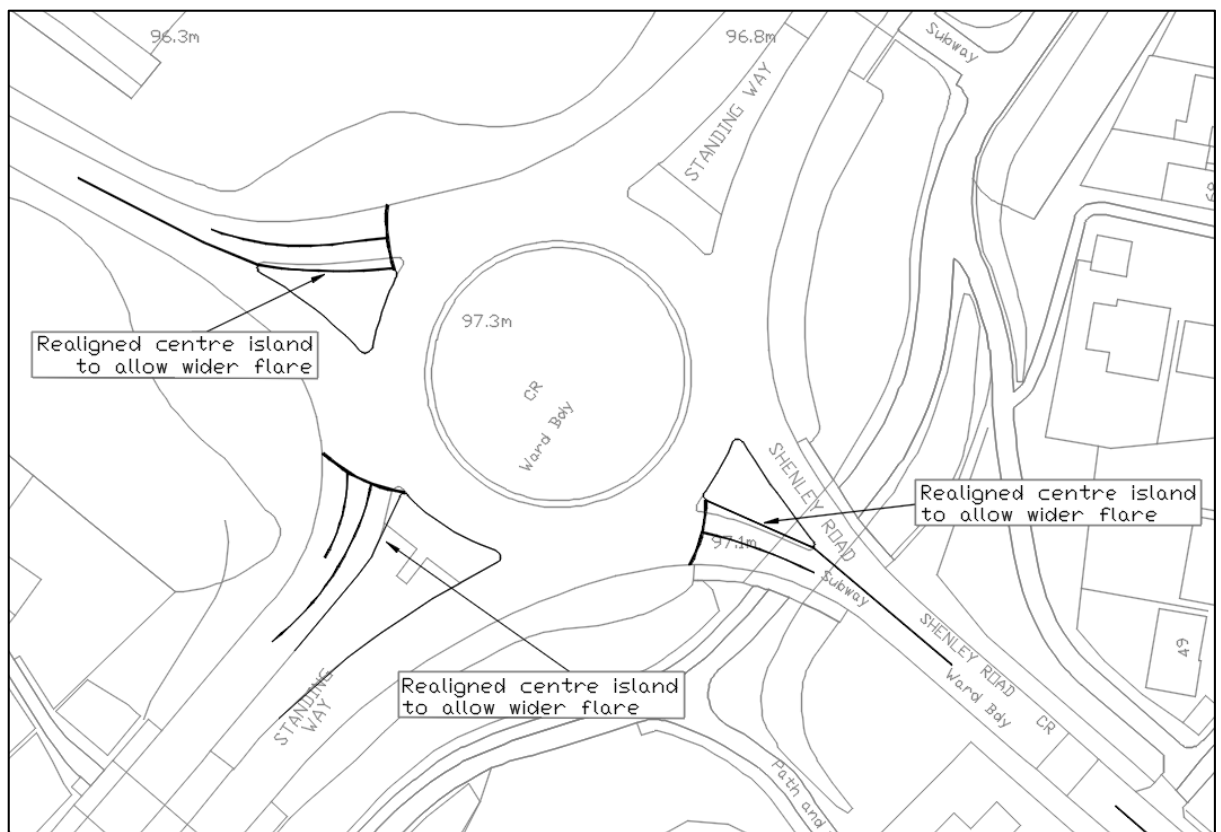


Figure 10.3: Emerson Roundabout – Proposed Mitigation

10.10 The junction assessment results following the proposed improvement are provided in **Table 10.1**.

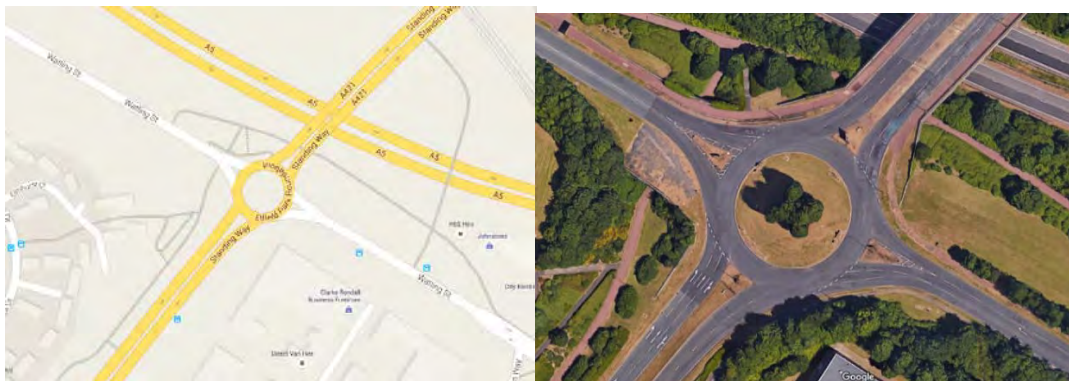
	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V3 Fulmer Street	0.80	3.69	0.85	4.75	0.75	2.92	0.79	3.59
H8 Standing Way (east)	0.60	1.48	0.65	1.84	0.94	13.60	1.02	44.18
Shenley Road	1.06	48.00	1.08	55.77	1.40	166.89	1.58	214.37
H8 Standing Way (west)	0.81	4.22	0.84	4.96	0.60	1.53	0.64	1.81

Table 10.1: Emerson Roundabout - After Mitigation

- 10.11 Following implementation of the improvement, in the 2026 Base scenario the RFC on the Shenley Road arm reduces to just over 1.0 in the AM peak and reduces to 1.4 in the PM peak. The RFC on H8 Standing Way (east) is 0.94 in the PM peak.
- 10.12 In the 2026 Base plus Development scenario, the RFC on Shenley Road remains just over 1.0 in the AM peak, but increases to 1.58 in the PM peak, however this is a reduction on the unmitigated 2026 Base scenario of 0.07, with an associated reduction in queuing (although the queues are not representative given that the RFC is over 1.0).
- 10.13 The proposed mitigation therefore presents a 'nil detriment' solution.

#### H8 A421 Standing Way/V4 Watling Street (Elfield Park Roundabout)

- 10.14 The junction of H8 Standing Way with V4 Watling Street (Elfield Park Roundabout) is a large four arm roundabout. H8 Standing Way is a dual carriageway which flares to a three lane entry on the western arm only. V4 Watling Street is a single carriageway which flares to provide a two lane entry on the northern arm, and a three lane entry on the southern arm. The existing junction arrangement is shown in **Figure 10.4**.



*Figure 10.4: Elfield Park Roundabout*

- 10.15 With the development fully occupied, the impact at this junction is 'minor to moderate'. To increase capacity at the junction, realignment of the central island on all approaches would allow for additional entry width and longer flare lengths, as shown in **Figure 10.5** and in **Appendix U**.

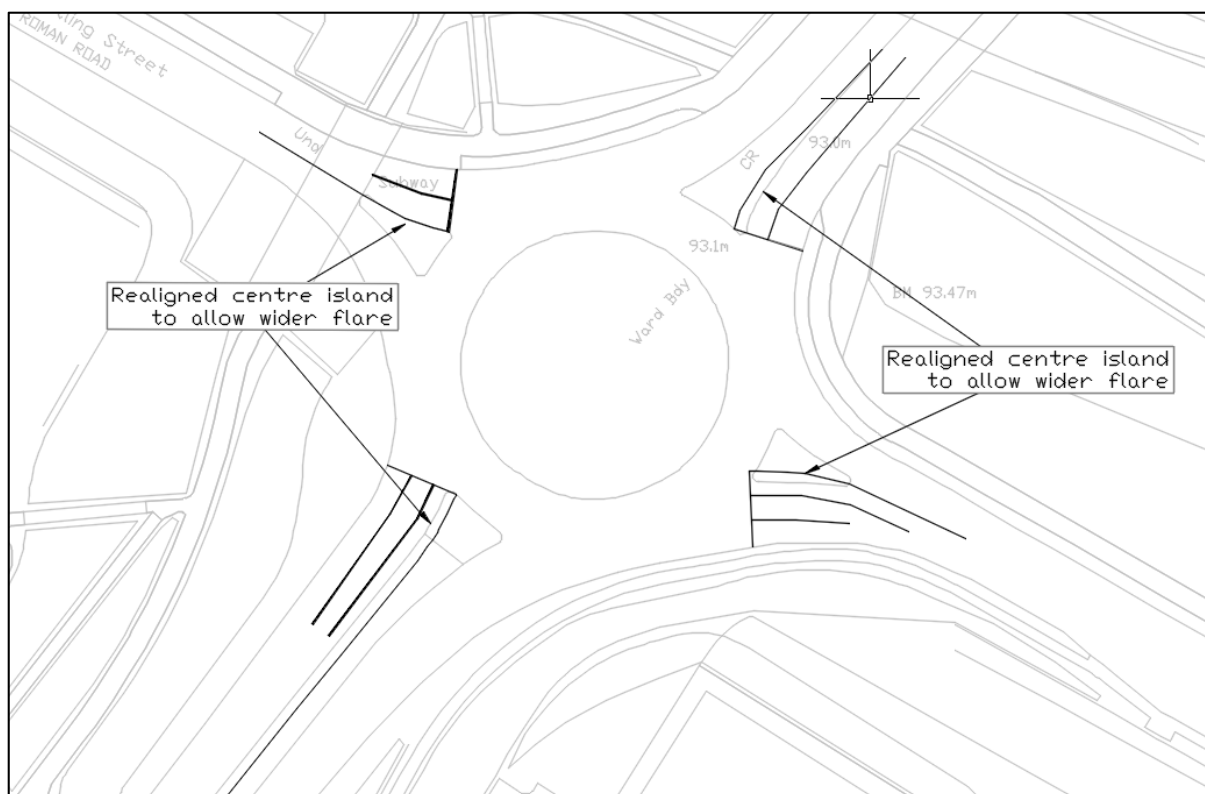


Figure 10.5: Elfield Park Roundabout – Proposed Mitigation

10.16 The results of the junction assessment following mitigation are shown in **Table 10.2**.

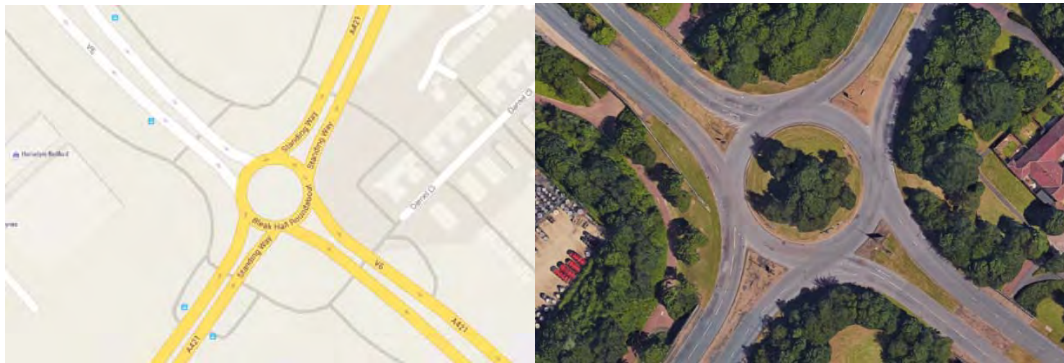
	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V4 Watling Street (north)	1.11	48.46	1.20	80.72	0.89	6.76	0.89	6.71
H8 Standing Way (east)	0.97	17.96	1.02	39.51	1.15	159.41	1.17	171.88
V4 Watling Street (south)	1.33	207.86	1.35	217.76	0.64	1.77	0.64	1.76
H8 Standing Way (west)	1.25	271.14	1.25	278.43	0.88	6.75	0.90	8.50

Table 10.2: Elfield Park Roundabout - After Mitigation

10.17 Upon introduction of the improved junction layout, in the Base 2026 scenario, the RFCs reduce, although remain over 1.0 therefore queue lengths increase at an exponential rate. In the 2026 Base + Development scenario, the RFCs remain the same or lower than the unmitigated Base 2026 scenario. The proposed mitigation therefore presents a 'nil detriment' solution.

#### H8 A421 Standing Way/V6 Grafton Street (Bleak Hall Roundabout)

10.18 The junction of H8 Standing Way/V6 Grafton Street is a four arm roundabout with dual carriageway approaches on all arms. The approach arms on V6 Grafton Street flare to three lanes at the roundabout entry. The existing junction arrangement is shown in **Figure 10.6**.



*Figure 10.6: Bleak Hall Roundabout*

10.19 With the development fully occupied, the impact at this junction is 'minor'. Realignment to the kerb on the central islands and removal of white hatch markings can be made to allow for a slightly wider flares at the entry to the roundabout, thereby increasing capacity. The improvement is shown in **Figure 10.7** and in **Appendix U**.



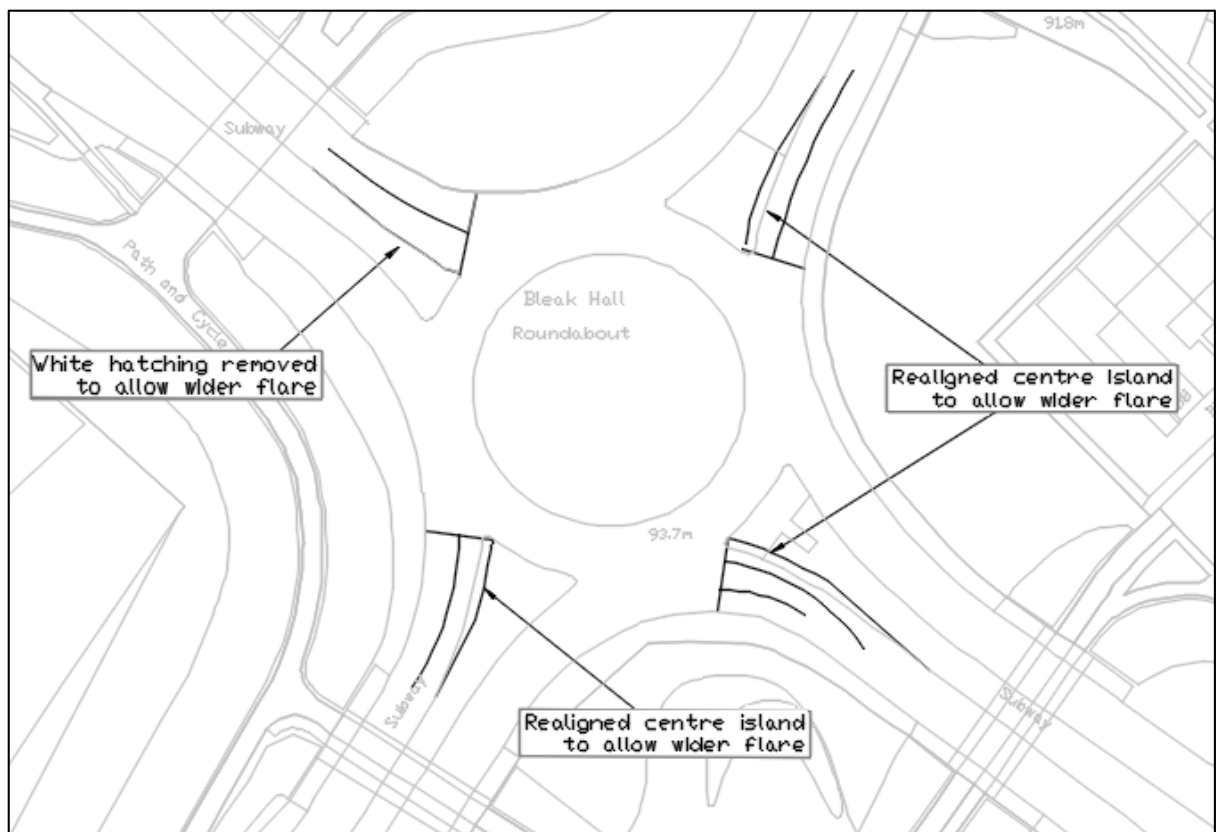


Figure 10.7: Bleak Hall Roundabout – Proposed Mitigation

10.20 The results of the junction assessment following mitigation are shown in **Table 10.3**.

	AM Peak				PM Peak			
	2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
V6 Grafton Street (north)	0.62	1.62	0.68	2.07	1.21	149.33	1.22	159.30
H8 Standing Way (east)	0.91	9.37	0.93	10.65	0.95	12.47	0.944	12.23
V6 (south)	0.92	9.80	0.98	17.94	0.90	7.82	0.93	10.38
H8 Standing Way (west)	1.08	78.89	1.10	90.90	0.84	5.25	0.85	5.63

Table 10.3: Bleak Hall Roundabout - After Mitigation



- 10.21 In the 2026 Base scenario, improvements made to the junction reduce the RFC to below 1.0 on all arms except H8 Standing Way (west) in the AM peak and v6 Grafton Street (north) in the PM peak, with associated reduced queuing.
- 10.22 In the 2026 Base + Development scenario the RFCs increase slightly on all arms compared to the mitigated 2026 Base scenario, but the RFCs remain the same or lower than the unmitigated Base 2026 scenario. The proposed mitigation therefore presents a 'nil detriment' solution.

### Summary

- 10.23 In summary, mitigation schemes can be provided for the A421 junctions within Milton Keynes where there is an adverse impact as a result of the proposed development at SWMK. A 'nil detriment' approach is assumed (as previously agreed with SMT) to establish appropriate highway improvements to ensure that the Milton Keynes highway network is left 'no worse off' with the proposed development fully occupied in 2026.
- 10.24 Minor junction amendments to central islands would provide increased entry widths and longer flare lengths to increase the capacity at Emerson, Elfield Park and Bleak Hall Roundabouts on A421. The increased capacity through the junctions is sufficient to provide the 'nil detriment' solution to mitigate the impact of the proposed development.
- 10.25 It is agreed with SMT (on behalf of MKC) that it would be more appropriate to commute the cost of the suggested junction improvements to a single financial contribution secured as a S106 planning obligation. That contribution would then be put towards a more specific improvement as part of Milton Keynes' wider corridor transport strategy to accommodate future growth.

### Bletchley

- 10.26 Following discussions with SMT acting on behalf of MKC, it is considered that the narrowest section of B4034 Buckingham Road between Shenley Road and Sherwood Drive would approach theoretical link capacity with the proposed SWMK development fully occupied. As such, a review of the potential for widening through this narrow section of road has been completed (**Figure 10.8**).

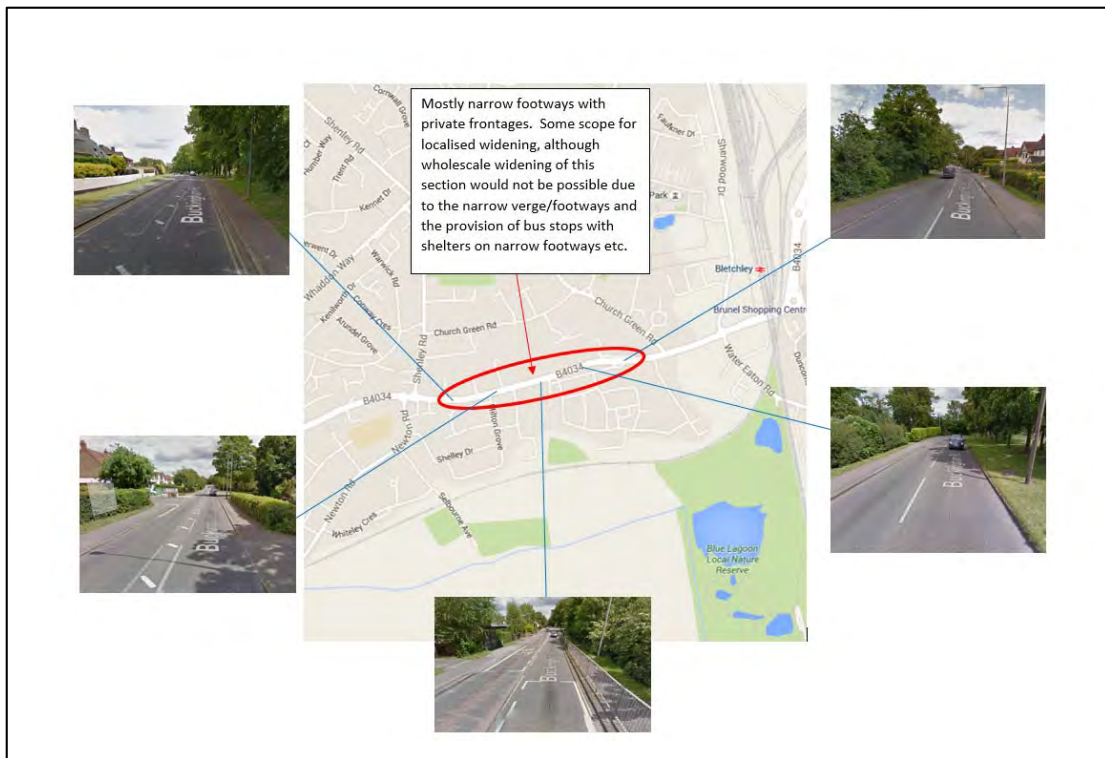


Figure 10.8: B4034 Buckingham Road between Shenley Road and Sherwood Drive

- 10.27 The narrowest section of road begins immediately west of Orchard Close and continues for approximately 750m to a point just west of Cottingham Grove. The width along this section varies between 5.6m and 6.2m.
- 10.28 The narrow section of B4034 Buckingham Road has footways approximately 1.5m wide, with private frontages along the majority of its length. In some locations there is a grass verge, which if part of the publicly maintained highway, could be reduced in width to accommodate some localised widening of the carriageway if deemed absolutely necessary.
- 10.29 There are several bus stops along the existing carriageway which need to be taken into account when considering any widening. A few bus stops include shelters that extend from the kerb to the back of footway. In those locations, widening of the carriageway would not be possible due to the need to retain the existing bus infrastructure provision.
- 10.30 Given the constraints along this stretch of the road, comprehensive widening along the 750m length would not be possible, although some limited carriageway widening may be feasible. In reality, such a proposal is unlikely

to positively influence the capacity of the link, and would not benefit the local community.

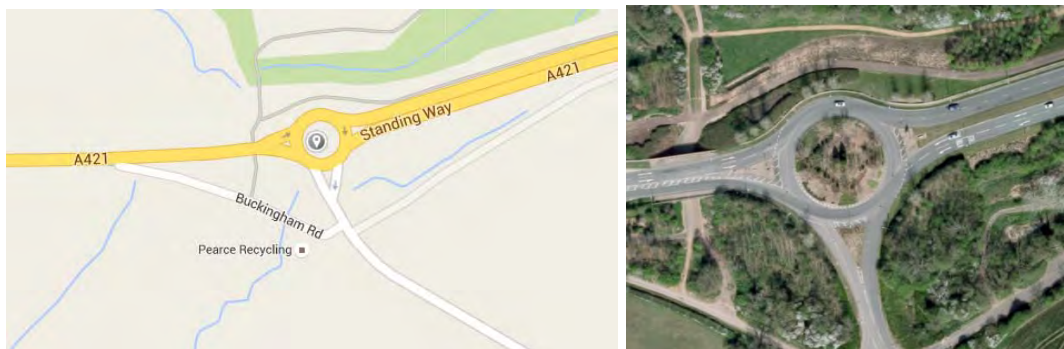
- 10.31 Mouchel consider that the provision of enhanced bus services will have a greater impact in positively influencing travel behaviour and reducing the demand for car use than localised road widening to increase the theoretical link capacity. SMT has agreed with this approach.
- 10.32 In regard to mitigation related to the impact of the proposed development, a contribution to public transport will be provided which will include an extension local bus route 8 between the Site and Milton Keynes Station.
- 10.33 With the proposed extension of bus route 8 into the Site, the travel time to Milton Keynes Station would have the same bus journey time as to Bletchley Station (inclusive of walk times to/from bus stops). As Milton Keynes Station offers a greater variety and frequency of rail services than Bletchley Station, it is considered to be more appropriate to provide the enhancement of bus services to Milton Keynes Station rather than to Bletchley Station.

## **Buckinghamshire**

- 10.34 The suggested mitigation has been assessed by updating the geometric parameters within the junction models. This section presents the results of the junction modelling assessments for the mitigation schemes within Buckinghamshire. The assessments represent a 'worst-case' scenario, as they do not benefit from the dynamic assignments derived from the MKTM.
- 10.35 The impact of the SWMK development requires mitigation at a number of locations as listed below:
- A421/Whaddon Road (Bottle Dump Roundabout)
  - A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)
  - A421/Warren Road
  - A421/Shucklow Hill/Little Horwood Road
  - A421/Nash Road/Winslow Road
  - Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)

### A421/Whaddon Road (Bottle Dump Roundabout)

10.36 The junction of A421/Whaddon Road (Bottle Dump Roundabout) is a large three arm roundabout with two lane entries on all arms. A421 (east) is a dual carriageway, with flare lanes on A421 (west) and Whaddon Road. The exit from A421 (east) has two lanes onto the dual carriageway with single lane exits onto A421 (west) and Whaddon Road. The junction is subject to the National Speed Limit, therefore A421 (east) is restricted to 70mph with A421 (west) and Whaddon Road restricted to 60mph. The existing junction arrangement is shown in **Figure 10.9**.



*Figure 10.9: Bottle Dump Roundabout*

10.37 With the proposed development fully occupied, the impact at this junction is 'minor' to 'moderate'. To improve the capacity at the junction, the centre line could be realigned on A421 Buckingham Road (west) to allow for a wider flare lane at the roundabout entry. A new crossing will also be provided to the south of the junction to facilitate crossing for pedestrians, cyclists and equestrians. The new proposed layout of the junction can be found in **Appendix U** and is shown in **Figure 10.10**.

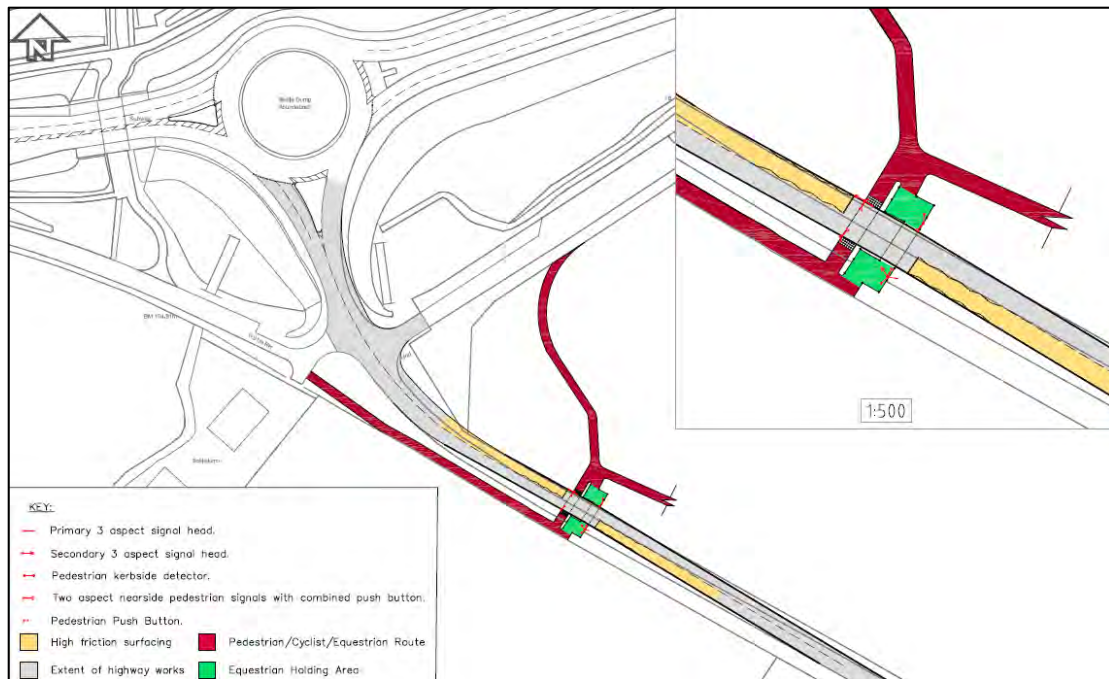


Figure 10.10: Bottle Dump Roundabout – Proposed Mitigation

10.38 The junction assessments results post mitigation are shown in **Table 10.4** below.

		AM Peak				PM Peak			
		2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
A	H8 Standing Way	0.69	2.21	0.73	2.63	0.75	2.95	0.85	5.13
B	Whaddon Road	0.49	0.93	0.94	9.98	0.24	0.31	0.31	0.45
C	A421	0.97	15.82	1.01	46.19	0.73	2.73	0.84	4.74

Table 10.4: Bottle Dump Roundabout - After Mitigation

10.39 In the unmitigated 2026 Base + Development scenario, the RFC on the A421 arm is over 1.15 during the AM peak; following mitigation the RFC reduces to 0.97. Following implementation of the improvement, in the AM peak 2026 Base + Development scenario the RFC on the Whaddon Road arm increases to 0.94, but on the A421 arm reduces to 1.01.



- 10.40 In the unmitigated 2026 Base + Development PM peak scenario, the junction operates well, with RFCs below 0.85 on H8 Standing Way and on Whaddon Road. A421 operates with an RFC of 0.94, with some limited queuing occurring in the worst 15-minute period.
- 10.41 Following mitigation, the RFC on the A421 arm reduces to 0.84, with the queues also decreasing by seven vehicles.

#### A421/Coddimore Lane/Whaddon Road (Whaddon Crossroads)

- 10.42 The junction of A421 with Coddimore Lane and Whaddon Road (Whaddon Crossroads) is a large four arm roundabout. All approach roads are single carriageway, with flared entries onto the roundabout. All arms have single lane exits. The roundabout is within the National Speed Limit (i.e: derestricted), therefore all arms are restricted to 60mph.
- 10.43 Coddimore Lane is signed as a 'no through route' to Milton Keynes, in an attempt to reduce traffic using the village roads to access to western part of Milton Keynes, although a route is possible via Shenley Road. The existing junction arrangement is shown in **Figure 10.11**.



*Figure 10.11: Whaddon Crossroads*

- 10.44 With the development fully occupied, the impact at this junction is 'minor' to 'moderate'. To increase capacity at the junction, realignment of the kerbs on the approaches from A421 (east) and A421 (west) (with associated amendments to the kerbs/islands to provide appropriate exit widths) would allow for two lane roundabout entry as shown in **Figure 10.12** and **Appendix U**.



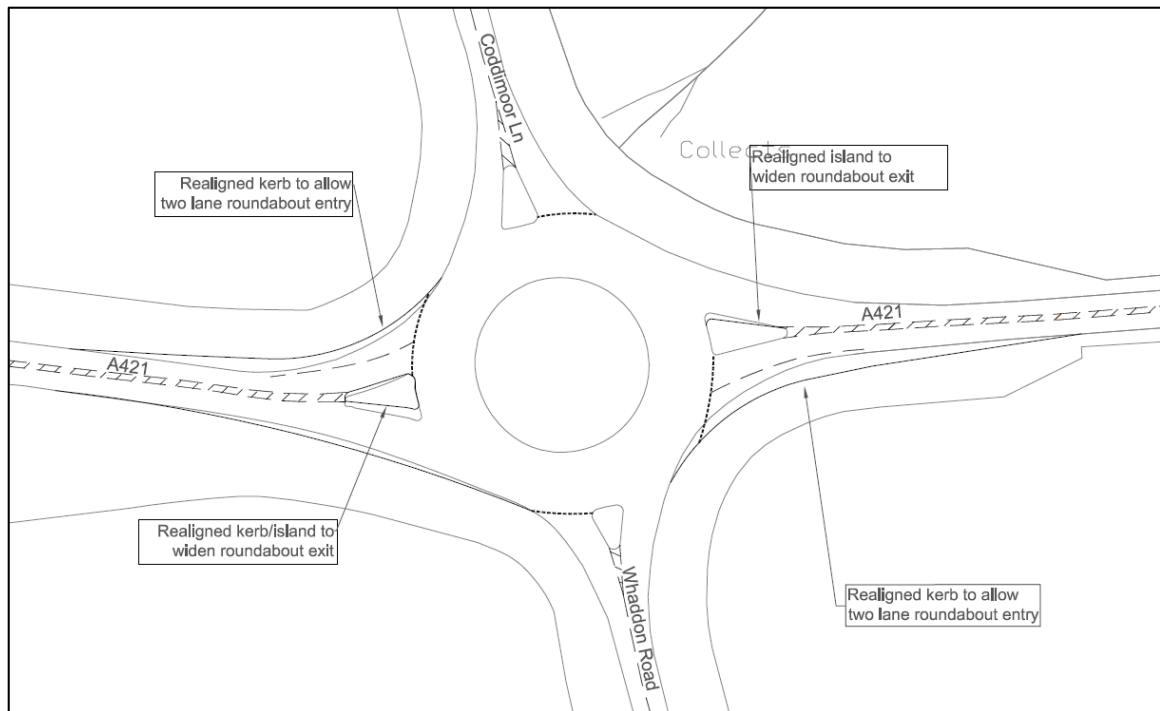


Figure 10.12: Whaddon Crossroads – Proposed Mitigation

10.45 The results of the junction assessment following mitigation are shown in **Table 10.5**.

		AM Peak				PM Peak			
		2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
A	Coddimore Lane	0.42	0.72	0.51	1.01	0.24	0.31	0.32	0.45
B	A421 (East)	0.78	3.54	0.93	11.28	0.86	5.85	0.88	7.12
C	Whaddon Road	0.59	1.45	0.72	2.46	0.41	0.69	0.49	0.98
D	A421 (West)	1.08	74.52	1.11	96.38	0.84	5.12	0.93	11.45

Table 10.5: Whaddon Crossroads - After Mitigation

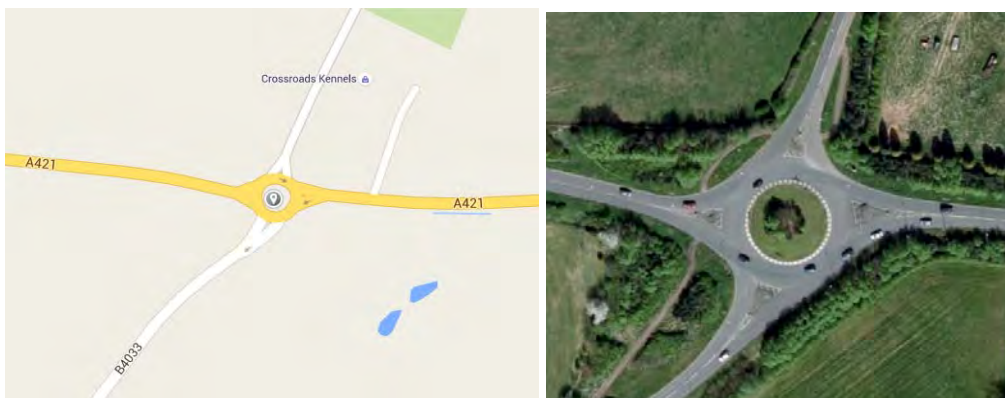
10.46 The results of the assessment at Whaddon Crossroads show that in the 2026 Base scenario before mitigation the junction operates with an RFC over 1.0 in the AM and PM peaks, on both of the A421 arms. Upon introduction of the

improved junction layout, the RFC on the A421 (East) arm reduces below 1.0, while the RFC on the A421 (West) arm improves considerably but still remains above 1.0 in the AM Peak. In the PM peak, RFCs on both A421 arms improve to below 1.0 and queues are significantly reduced.

- 10.47 In the 2026 Base + Development AM peak scenario prior to mitigation, the RFC on A421 (east) arm increases, whilst on A421 (west) arm the RFC decreases as a result of more balanced traffic flows around the roundabout. Following mitigation, the RFC on these two arms decreases significantly to below 2026 Base levels, but is still above 1.0 on A421 (west). Queuing is also significantly reduced.
- 10.48 In the 2026 Base + Development PM peak scenario prior to mitigation the junction operates over capacity on both arms of A421. The queuing increases by 13 vehicles (A421 east) and 2 vehicles (A421 west) as a result of the development in the worst 15-minute period. Following mitigation, the RFC reduces below 1.0 on both arms of the A421 and the queuing reduces on A421 east and A421 west significantly.

#### A421/Nash Road/Winslow Road

- 10.49 The junction of A421/Nash Road/Winslow Road is a four arm roundabout with single lane flared entries on all approaches. Nash Road and Winslow Road are minor rural roads providing access to local villages. The roundabout is subject to the National Speed Limit, therefore 60mph speed restrictions apply. The existing junction arrangement is shown in **Figure 10.13**.

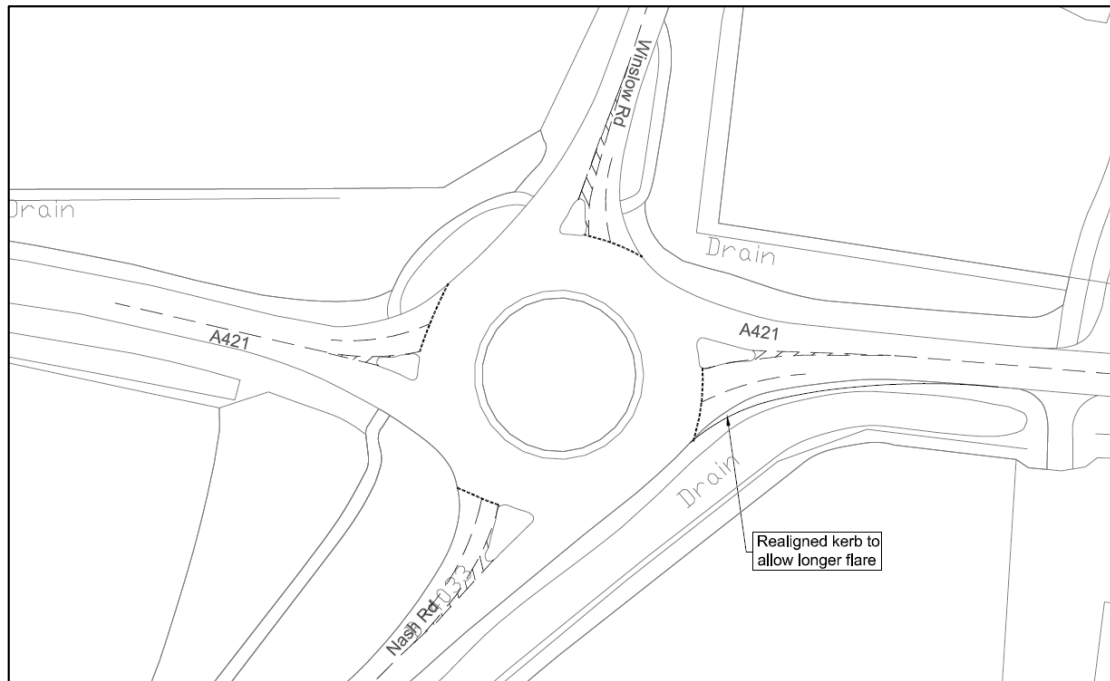


*Figure 10.13: A421/Nash Road/Winslow Road*

#### *Mitigation*

10.50 With the development fully occupied, the impact at this junction is 'minimal'. However, the operation of the junction is very close to reaching full capacity on the A421 (east) arm.

10.51 A realignment to the kerb on the A421 (east) can be made to allow for a longer flare at the entry to the roundabout, thereby increasing capacity. The improvement is shown in **Figure 10.14** and in **Appendix U**.



*Figure 10.14: A421/Nash Road/Winslow Road – Proposed Mitigation*

10.52 The results of the junction assessment following mitigation are shown in **Table 10.6**.

		AM Peak				PM Peak			
		2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
A	A421 (East)	0.72	2.51	0.77	3.19	0.74	2.75	0.75	2.87
B	B4033 Nash Road	0.65	1.78	0.69	2.07	0.42	0.71	0.44	0.76
C	A421 (West)	0.80	4.14	0.83	4.54	0.72	2.45	0.77	3.17
D	Winslow Road	0.29	0.41	0.28	0.39	0.20	0.25	0.14	0.17

Table 10.6: A421/Nash Road/Winslow Road - After Mitigation

10.53 The results of the assessment at the existing junction of A421/Nash Road/Winslow Road show that in the 2026 Base scenario, A421 (east) arm operates with an RFC of 0.93 in the AM peak, with some associated minor queuing. Proposed improvements to this junction reduce the RFC to 0.72 in the AM peak with reduced queuing.

10.54 In the 2026 Base + Development scenario, A421 (east) arm operates with an increased RFC in the AM and PM peak, and is approaching capacity with an RFC of 0.86 in the AM peak. Following mitigation, A421 (east) arm operates with an RFC under 0.85 in both peaks, The RFC on A421 (east) arm reduces to 0.77 in the AM and 0.75 in the PM. Queuing is also significantly reduced.

#### Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)

10.55 The junction of Bletchley Road/Stoke Road/Drayton Road/Whaddon Road in Newton Longville is a priority crossroads, with the minor arms slightly offset, as shown in **Figure 10.15**. The junction is within the 30mph speed limit set for Newton Longville village.

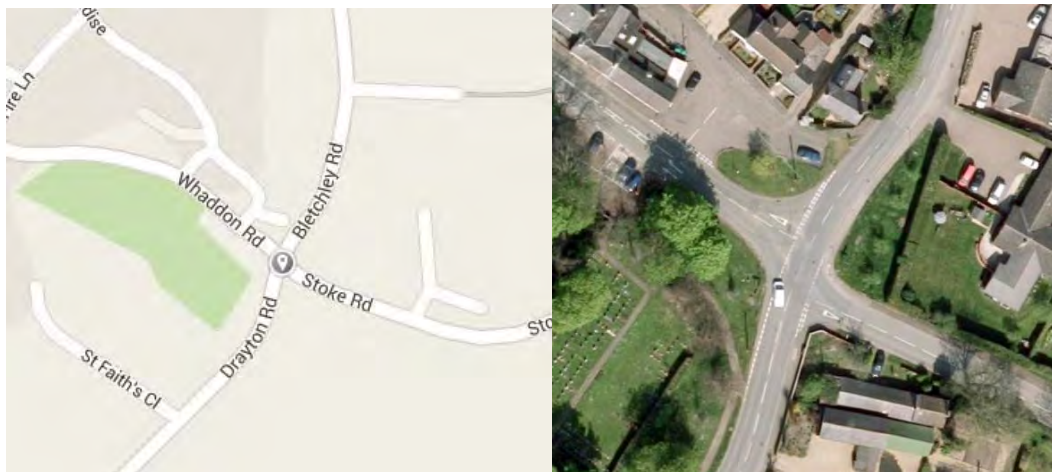


Figure 10.15: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road

10.56 With the proposed development fully occupied, the impact is 'minimal', however Stoke Road would be close to full capacity following the introduction of development trips. Changing the form of the junction into a mini roundabout would provide benefits not only for capacity but also for safety. The proposed layout is as shown in **Figure 10.16** and in **Appendix U**.

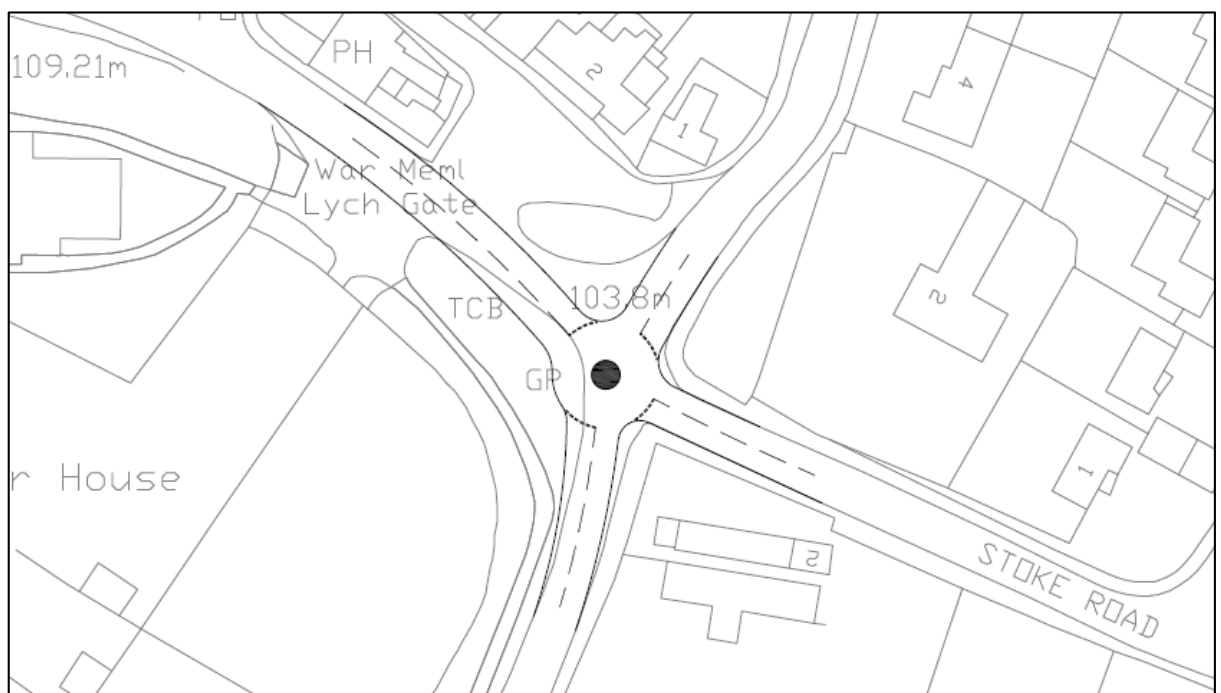


Figure 10.16: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road – Proposed Mitigation

10.57 The results of the junction assessment post-mitigation are shown from **Table 10.7**.

		AM Peak				PM Peak			
		2026 Base		2026 Base + Development		2026 Base		2026 Base + Development	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
A	Bletchley Road	0.44	0.84	0.49	1.02	0.15	0.18	0.15	0.18
B	Stoke Road	0.72	2.48	0.79	3.39	0.33	0.51	0.42	0.74
C	Drayton Road	0.40	0.68	0.41	0.71	0.17	0.21	0.18	0.23
D	Whaddon Road	0.45	0.83	0.64	1.74	0.30	0.43	0.33	0.49

*Table 10.7: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road - After Mitigation*

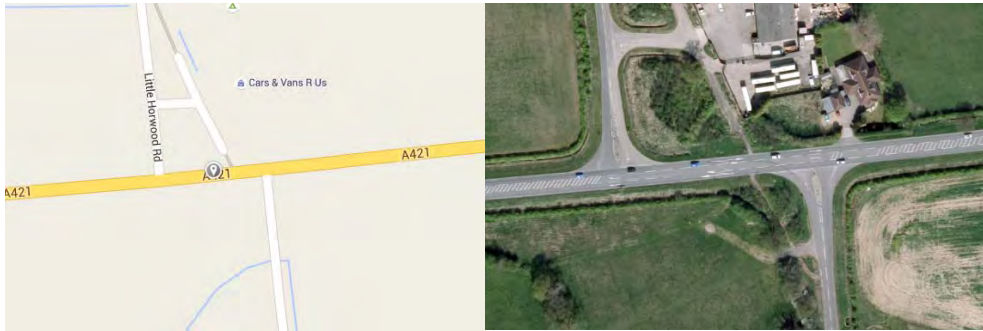
10.58 The results of the assessment at the junction of Bletchley Road/Stoke Road/Drayton Road/Whaddon Road show that the junction operates well within capacity in both the AM and PM peaks in the 2026 Base scenarios.

10.59 In the unmitigated 2026 Base + Development scenario, the Stoke Road arm operates with an RFC of 0.95 in the AM peak, with a queue of eight vehicles. Following the change in junction form to a mini roundabout, the RFC reduces to 0.79, with a queue of three vehicles on Stoke Road in the AM peak. The junction operates well within capacity in the PM peak on all arms.

#### A421/Shucklow Hill/Little Horwood Road

10.60 The A421/Shucklow Hill and the A421/Little Horwood Road junctions are both ghosted right turn priority junctions, acting as a left-right stagger junction. Both Shucklow Hill and Little Horwood Road are minor rural routes with single lane flared entries. The junctions are within the National Speed Limit, and therefore traffic is restricted to 60mph. The existing junction arrangement is shown in **Figure 10.17**.





*Figure 10.17: A421/Shucklow Hill/Little Horwood Road*

10.61 With the development fully occupied, the impact at this junction is 'minor' to 'moderate'. An improvement to increase capacity could be to signalise the junctions, as shown in **Figure 10.18** and in **Appendix U**. Any signalisation schemes would need to include street lighting, MOVA controls, CCTV and ANPR cameras.



*Figure 10.18: A421/Shucklow Hill/Little Horwood Road – Proposed Mitigation*

10.62 Modelling results following the proposed change in junction arrangement can be seen below from **Table 10.8**.

	AM Peak		PM Peak	
	2026 Base	2026 Base + Development	2026 Base	2026 Base + Development
	PRC	PRC	PRC	PRC
A421/ Little Horwood Road	7.3%	7.0%	16.7%	12.3%
A421/ Shucklow Hill	6.1%	5.6%	16.0%	10.3%

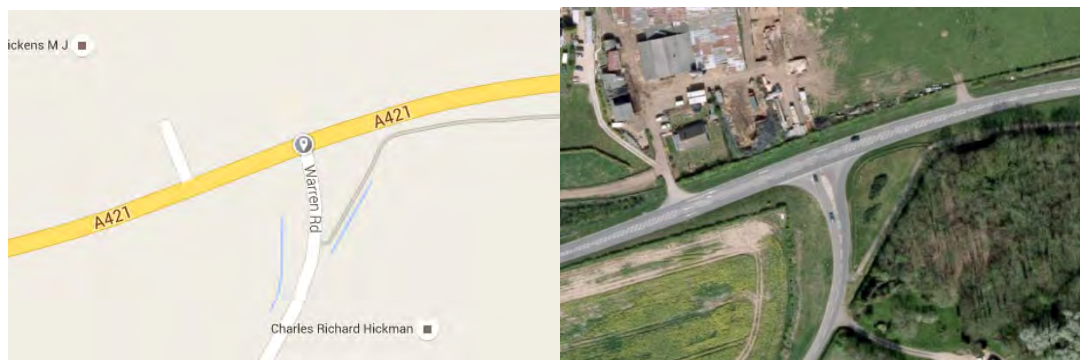
*Table 10.8: A421/Shucklow Hill/Little Horwood Road - After Mitigation*

- 10.63 The results of the assessment at the junctions of A421/Shucklow Hill and A421 Little Horwood Road show that the junctions are significantly over capacity in the 2026 Base scenario, and also in the 2026 Base plus development scenario. This is as a result of a high traffic flow on A421 preventing sufficient gaps for right turning traffic from the minor arms. A421 itself does not have any queuing in the 2026 base scenario.
- 10.64 With a mitigation scheme to signalise the junctions, the junction at Little Horwood Road would operate with a Practical Reserve Capacity (PRC) of 7.3% in the AM peak and 16.7% in the PM peak. At Shucklow Hill the junction would operate with a PRC of 6.1% in the AM peak and 16.0% in the PM peak.
- 10.65 With the introduction of the development traffic in the 2026 Base + Development scenario, the PRC for the Little Horwood junction decreases to 7.0% in the AM peak and 12.3% in the PM peak. At Shucklow Hill, the junction would operate with a PRC of 5.6% in the AM peak and 10.3% in the PM peak.
- 10.66 At both junctions in the Base 2026 and 2026 Base plus development scenarios, a signalisation option would ensure sufficient capacity to allow the minor roads access to the A421, but would introduce delays to the currently unimpeded A421 traffic.
- 10.67 Further to previous discussions with Bucks County Council (BCC) it is evident that there is no current strategy for improving A421 to the west of the Site. BCC has previously indicated that they would be averse to introducing traffic signals along A421 to the detriment of journey times. In this regard, the

principle of commencing an equivalent construction cost of the proposed traffic signal junction improvement secured as a Section 106 contribution has been agreed 'in principle' with BCC. The agreed contribution would be used to address local traffic management issues within the villages north and south of A421.

#### A421/Warren Road

10.68 The junction of A421/Warren Road is a 'Ghosted Right Turn' priority junction for access towards Little Horwood. Warren Road has a wide entry width to allow vehicles to turn in both directions without blocking. The junction is within the National Speed Limit, and therefore traffic is restricted to 60mph. The existing junction arrangement is shown in **Figure 10.19**. Any signalisation schemes would need to include street lighting, MOVA controls, CCTV and ANPR cameras.



*Figure 10.19: A421/Warren Road*

10.69 With the development fully occupied, the impact at this junction is 'minor' to 'moderate'. As with Shucklow Hill and Little Horwood Road, an improvement option to increase capacity could be to signalise the junctions, as shown in **Figure 10.20** and in **Appendix U**.

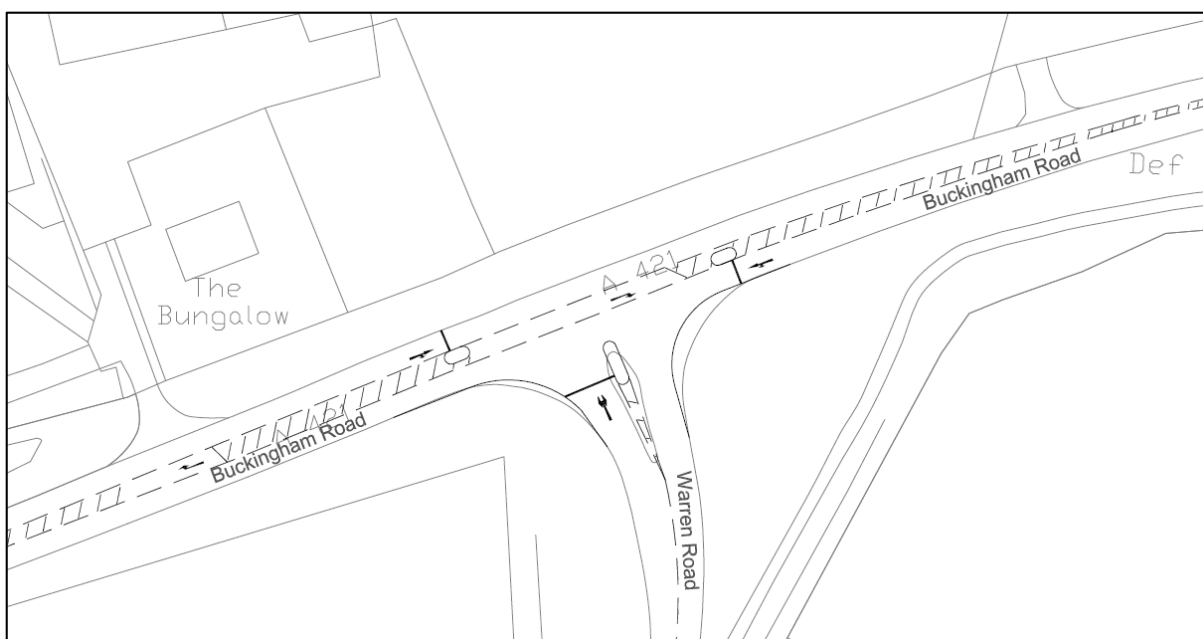


Figure 10.20: A421/Warren Road – Proposed Mitigation

10.70 Results of the modelling assessment for a signalised junction are shown in **Table 10.9**.

	AM Peak		PM Peak	
	2026 Base	2026 Base + Development	2026 Base	2026 Base + Development
	PRC	PRC	PRC	PRC
A421/ Warren Road	4.5%	4.0%	8.4%	6.6%

Table 10.9: A421/Warren Road - After Mitigation

10.71 The results of the assessment at the junction of A421/Warren Road show that in the 2026 Base and 2026 Base plus development scenarios, Warren Road operates poorly with a high RFC and associated queuing during both peak periods. This is as a result of the high traffic flow on A421 preventing sufficient gaps for right turning traffic. The A421 itself does not see any queuing in the 2026 base scenario.

10.72 With a mitigation scheme to signalise the junction, the PRC in the 2026 Base scenario is 4.5% and 8.4% in the AM and PM peak respectively. In the 2026

Base + Development scenario, the PRC is 4.0% and 6.6% in the AM and PM peak respectively.

- 10.73 Whilst the signalisation of the junction would operate with a capacity over 90% (i.e. PRC of 0%), the junction would be within 100% of theoretical capacity in both scenarios.
- 10.74 Further to earlier discussions with Bucks County Council (BCC) it is evident that there is no current strategy for improving A421 to the west of the Site. BCC has indicated that they would be averse to introducing traffic signals along A421 to the detriment of journey times. In this regard, the principle of commencing an equivalent construction cost of the proposed traffic signal junction improvement secured as a Section 106 contribution has been agreed 'in principle' with BCC. The agreed contribution would be used to address local traffic management issues within the villages north and south of A421.

### Summary

- 10.75 In summary, mitigation schemes are proposed for all junctions where there is an adverse impact as a result of the proposed development at SWMK. A 'nil detriment' approach is assumed to establish appropriate highway improvements to ensure that the network is left 'no worse off' with the proposed development fully occupied in 2026.
- 10.76 Minor junction improvements such as increased entry flares would increase capacity at the larger roundabouts on A421, with more significant improvements proposed in Newton Longville and along A421 to the west of the Site.
- 10.77 The improvements to Bottle Dump roundabout would be completed by the Applicant under a Section 278 Agreement. BCC has agreed that it would be more appropriate to commute the equivalent cost of the proposed junction improvements along A421 to a single contribution secured under Section 106 of the Town and Country Planning Act 1990. The agreed contribution would be used by BCC towards the wider strategy for increasing capacity along A421 between Whaddon Crossroads and A421/Nash Road/Winslow Road junction.

## Buckinghamshire Villages

- 10.78 The speed of traffic travelling towards the villages is within the posted speed limits set. It is therefore considered that speed control measures are not required as a result of the proposed development.
- 10.79 Notwithstanding this, it is acknowledged there would be an increase in traffic volume through Newton Longville which may marginally increase in the risk of PICs along Whaddon Road. To mitigate the potential impact, a financial contribution towards further traffic calming features within Newton Longville would be secured as a Section 106 planning obligation.
- 10.80 The proposed Newton Longville traffic calming strategy to reduce speeds and deter traffic routing through the village would include enhanced 'gateway' features on the four roads into the village with additional pinch points along Whaddon Road and vehicle activated signs (VAS) showing excess speed at appropriate locations. The illustrative strategy is shown on Drawing D027, with further detail on Drawings D028-D033, included in **Appendix V** from which the value of an appropriate financial contribution can be agreed.
- 10.81 In conjunction with the comprehensive mitigation package which is intended to support the proposed development (i.e.: this includes travel planning, new public transport services, and extensive highway improvements), the residual cumulative impact of the proposed development on the Buckinghamshire villages cannot be considered to be 'severe' in the context of Paragraph 32 of the National Planning Policy Framework (NPPF).

## Travel Plan

- 10.82 The Applicant is fully committed to the implementation of the Transport Strategy for the proposed development. At the heart of this strategy is the implementation, maintenance and monitoring of Travel Plans for all significant generators of traffic, which are aimed at reducing generated traffic from the proposed development to below that predicted by the Milton Keynes Transport Model.
- 10.83 The Framework Travel Plan submitted as part of the planning application includes details of the initial targets that will be set with regard to modal shift



and details of the measures that will be put into place to achieve this modal shift. The Plan has been agreed with MKC, BCC and Highways England.

## **PROW**

10.84 A number of improvements to the surfacing of the local footpaths will be provided by the Applicant. Those within the Site will be completed as part of the development, and a financial contribution secured as a Section 106 obligation will be provided for those routes outwith the Site. The improvements agreed are:

- Footway/cycleway/bridleway along Grid Road reserve to be provided and constructed to 'Redway' standard; Existing PROW Order to be amended;
- Upgrade of footpath 19 Newton Longville Parish, resurfaced to a sealed carriageway standard to a width of 3m between Weasel Lane and the railway underpass; route to be dedicated as a public bridleway;
- Restricted byways 20 and 25 Newton Longville Parish and Restricted Byway 15 Mursley Parish, locally known as Weasel Lane, to be resurfaced to a width of 3m, between Dagnell House, Buckingham Road to the adopted highway adjacent to Lower Salden farm entrance; and
- Dedicate as a PROW with public bridleway status alongside Whaddon Road from Weasel Lane to Bottle Dump roundabout and provide a sealed surface 3m wide. This would form part of the Milton Keynes boundary walk and would be contained within the Site behind a landscaped buffer.

## **Public Transport**

10.85 The proposal to enhance public transport is a key element of the mitigation strategy as is the focus on providing excellent linkages for pedestrians and cyclists. The public transport strategy as previously described in Section 5 of this TA includes the extension of bus route 8 from Oxley Park into the Site (via Tattenhoe Roundabout and the proposed access off Buckingham Road). The

bus would then complete a loop around the site before exiting at the Buckingham Road access, travelling along Snelshall Street towards Oxley Park and back onto the current route. The additional funding for this provided in part by the proposed development and partially by the Oxley Park development to the northwest of Milton Keynes. A Section 106 Agreement contribution equivalent to the cost of 1.5 additional buses for Route 8 will be funded by the development and secured as a Section 106 planning obligation.

- 10.86 Additional cycle parking at Bletchley Station will be provided to ensure ease of access to train services without the need for the use of a car to reach the station. An appropriate financial contribution will be agreed to cover the cost of some additional the cycle parking.

### **Section 106 and Section 278 Obligations**

- 10.87 In summary, the mitigation proposed as part of the development is listed below, and shown on the 'Highway Improvements Masterplan' Drawing D035 in **Appendix W**.

#### **Section 106**

- 10.88 Obligations under Section 106 of the Town and Country Planning Act include financial contributions towards:

- Improvements along A421 Corridor into Buckinghamshire;
- Improvements along A421 Corridor into Milton Keynes;
- Newton Longville traffic restraint strategy;
- PROW improvements;
- Public transport improvements to Milton Keynes Station;
- Cycle parking at Bletchley Station; and
- Site Travel Plans.

#### **Section 278**

- 10.89 Improvements to be completed under s278 of the Highways Act include:

- Whaddon Road Access Junction;
- Buckingham Road Access Junction;

- A421 Access Junction; and
- Bottle Dump Roundabout improvements and Pegasus crossing.

## 11 Cumulative Residual Impact

- 11.1 On the basis of this assessment, it is acknowledged that the proposed development will have an impact on the local highway network. Notwithstanding this, the provision of a comprehensive package of highway improvements and sustainable travel initiatives as previously described will serve to comprehensively mitigate those impacts and achieve in most cases 'nil detriment'.
- 11.2 As a result, the residual cumulative impacts of the proposed development post mitigation would be indiscernible and would not be severe in the context of paragraph 32 of the NPPF. Mouchel consider that with the implementation of a comprehensive package of improvements to local infrastructure and measures to influence travel behaviour, the proposed development would be acceptable.

## 12 Summary and Conclusions

- 12.1 This Transport Assessment (TA) has been prepared on behalf of the South West Milton Keynes Consortium to accompany a revised outline planning application for a mixed use sustainable urban extension.
- 12.2 This TA sets out the planning policy context against which the proposed development is to be considered, insofar as it relates to transport and highway matters. It sets out the relevant statements of planning policy within the statutory development plan, the NPPF and NPPG that relate to the scheme. In conclusion, it has been demonstrated that the proposed development:
- Complies with extant Development Plan Policy;
  - Complies with Government Policy contained in the NPPF and the NPPG; and
  - Positively responds to the aspirations of AVDC and MKC.
- 12.3 Use has been made of the MKTM to obtain 2026 AM and PM peak hour traffic data for two scenarios; 'S1' which does not include traffic from the proposed development and 'S2' which does. 'S1' and 'S2' AM and PM peak hour traffic data have been extracted for the off-Site junctions under consideration in Milton Keynes.
- 12.4 Static junction assessments using Junctions8 have been used to determine the impact on the local junctions within Buckinghamshire for the 2015 Base, 2026 Base and 2026 Base plus Development scenarios.
- 12.5 The assessment work contained in this TA indicates that the additional traffic from the proposed development gives rise to minor to moderate additional impacts at the junctions assessed over and above the 2026 Base scenario, without the proposed development.
- 12.6 A comprehensive package of junction improvements and other measures to influence travel behaviour is proposed to mitigate the various traffic and highway related impacts.
- 12.7 The FTP submitted with this application is agreed by BCC, MKC and Highways England. It includes details of the initial targets that will be set in regard to

modal shift and details of the measures that will be put into place to achieve this modal shift, along with appropriate monitoring procedures.

- 12.8 The Public Transport Strategy is also a key element of the mitigation strategy as is the focus on providing excellent linkages and provision for pedestrians and cyclists. A new bus service will extend from Milton Keynes to serve the proposed development.
- 12.9 Further discussions have been held with MKC and BCC regarding how the proposed development might assist in funding improvements to the local highway network that will be a benefit to all users. Those improvements coupled with the strategy to encourage a shift in travel mode are designed to ensure that the residual cumulative impact would be acceptable. Under these circumstances, the impact of the proposed development cannot be considered severe in the context of paragraph 32 of the NPPF.
- 12.10 As such, there are no highway, traffic or transport reasons for the revised planning application to be refused.



## 13 Appendices