CALDECOTE FARM

NEWPORT PAGNELL · MILTON KEYNES

APPENDIX 12

ENVIRONMENTAL STATEMENT

TRANSPORT

APPENDIX 12.1
TRANSPORT ASSESSMENT

newlands developments

SEGRO (NEWPORT PAGNELL) LTD

PROPOSED EMPLOYMENT DEVELOPMENT ON LAND AT CALDECOTE FARM,

WILLEN ROAD, NEWPORT PAGNELL, MILTON KEYNES

TRANSPORT ASSESSMENT

ADC Infrastructure Limited
Western House
Western Street
Nottingham
NG1 3AZ

www.ADCinfrastructure.com

project number: ADC1392			report reference: ADC1392 C
version	date	author	comments
1		R Leconte/M Tatler	internal draft
2	22.06.18	S Dunhill	draft issued to Client
3	03.07.18	S Dunhill	issued for planning
4	28.02.19	M Talter/S Dunhill	updated to reflect amended development proposals
5	22.05.19	S Dunhill	issued for planning

EXECUTIVE SUMMARY

This Transport Assessment (TA) has been prepared by ADC Infrastructure Limited to support a detailed planning application for new employment development on land at Caldecote Farm, to the west of Willen Road, in Newport Pagnell. This TA is based on the outcomes of a Scoping Report and pre-application discussions with the local highway authority, MKC Highways, and Highways England. It is also informed by the agreements reached with the both highway authorities with regard to a recent (but now withdrawn) planning application for the site.

The planning application comprises a full application for two storage and distribution units (Class B8) with a total GFA of 81,361sqm, with associated car parking, servicing, landscaping, earth bunding, and on and off-site drainage on the site.

The site forms part of a much larger area of land allocated within the adopted Plan:MK for a mixed residential and employment strategic urban extension. The type of development proposed under the planning application therefore falls within the employment aspects of the adopted Plan:MK.

Access to the development is proposed via a new signal-controlled junction on Willen Road. The site location provides excellent opportunities to access both the local road network within Newport Pagnell and Milton Keynes, and the strategic road network via the M1 Junction 14. There are opportunities for pedestrian and cycle travel, with a number of residential areas within walking and cycling distance. The development would provide a new Redway (footway/cycleway), connecting to Newport Pagnell to the north, and the existing H4 Redway Super Route in Milton Keynes to the south. The new Redway would facilitate safe pedestrian and cycle travel to the site, providing a new facility for existing pedestrians and cyclists wishing to walk and cycle between Newport Pagnell and Milton Keynes, where there is currently no infrastructure provided along the Willen Road corridor. This includes the provision of an appropriate pedestrian and cyclist crossing of the A422.

There are opportunities for public transport travel, including both bus and rail, the latter as part of multi-modal journeys also including cycle, bus or taxi. Route C10 provides a regular bus service running past the site at an hourly frequency throughout the day, and Route 1 provides an hourly bus service passed the site in the evenings and on Sundays. As part of the proposed development new bus stops would be provided on Willen Road.

The proposed development is forecast to generate up to 14 pedestrian trips, 5 cycle trips, and 5 public transport trips during the highway peak hours. Over the day, it is forecast to generate 164 pedestrian trips, 60 cycle trips, and 73 public transport trips. The actual travel patterns would be influenced and monitored as part of the Travel Plan process at the development, with the aim to increase the proportion of trips by sustainable modes and reduce the proportion of trips by single occupancy car travel. The existing and proposed infrastructure has the capacity to accommodate the additional trips made on foot, by cycle and public transport. The Travel Plan for the development is presented in a separate document.

In total, the proposed development is forecast to generate 145 two-way vehicle movements during the morning peak hour and 180 two-way vehicle movements during the evening peak hour. Of these, 37 two-way trips in the morning peak hour and 33 two-way trips in the evening peak hour would be HGVs. Capacity assessments have been undertaken for the junctions within the agreed study area.

It is concluded that the highway network in the vicinity of the site is busy, resulting in the study area junctions being forecast to operate with some congestion and delays in the future assessment years. The increase in traffic due to the development is modest when distributed across the network, and on an individual junction basis does not result in a severe impact at any of the study area junctions. However, improvements are required at the Marsh End Roundabout to ensure safe and satisfactory vehicle access to the development site. It is also recognised by the Applicant that when the individual

impacts at the study area junctions are considered cumulatively, there is a case for intervention to improve the operation of the local highway network as part of the development proposals.

It was agreed with MKC Highways that the approach to the assessment of the development traffic impact, and providing highway mitigation, should be to provide a single comprehensive mitigation package at the Marsh End Roundabout, where the Applicant has control of land to provide a meaningful highway improvement, instead of providing a series of minor junction improvements.

As a result, a comprehensive mitigation scheme is proposed at Marsh End Roundabout. The improved junction will operate in conjunction with the proposed signal-controlled site access junction to improve traffic flows and journey times through the area and along Willen Road. MKC Highways confirmed that the principle of traffic signal control at the Marsh End Roundabout was acceptable and in keeping with the findings of an earlier study of the A422 corridor undertaken on their behalf.

Overall, it is concluded that: the opportunities to access the site by sustainable modes have been taken up; improvements can be undertaken within the transport network that mitigate the impacts of the development; and the proposed development would not result in a severe traffic impact on the surrounding highway network. The proposals therefore accord with the principles of the National Planning Policy Framework, and it would be unreasonable to object to the planning application on transport grounds.

CONTENTS

TRAFFIC FLOW DIAGRAMS

APPENDICES

1.0 INTRODUCTION

1.1 SEGRO (Newport Pagnell) Ltd commissioned ADC Infrastructure Ltd to produce a Transport Assessment (TA) and Travel Plan to support a detailed planning application for new employment development on land at Caldecote Farm, to the west of Willen Road, in Newport Pagnell (see **Figure 1**).

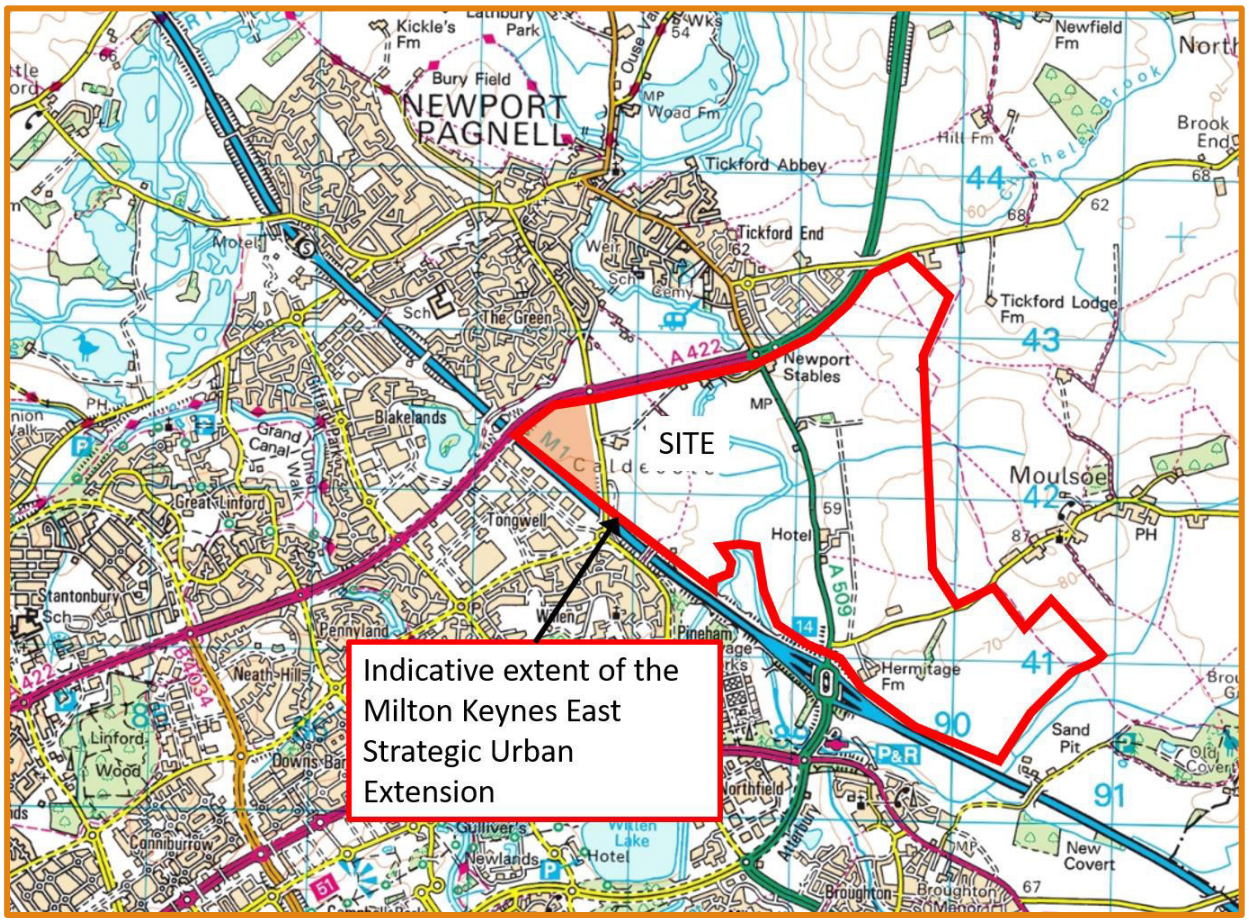


Figure 1: General site location

1.2 The application site relates to part of 'Milton Keynes East', an allocation for a strategic urban extension within the adopted Plan:MK. Milton Keynes Council's (MKC) aspirations for the allocation is set out within policy SD12 and relates to land at the east of the M1, south of Newport Pagnell. Policy SD12 envisages a comprehensive new residential and employment development to meet the long-term needs of Milton Keynes.

1.3 ADC Infrastructure have been in consultation with MKC, as the local highway authority, and Highways England regarding this site for a number of years. This included the submission of a previous TA and Framework Travel Plan for the site in July 2018. The previous TA and Framework Travel Plan supported a hybrid planning application (Ref 18/01719/FUL) for one large B8 warehouse unit (46,530sqm) with ancillary office use and an enterprise park comprising 28,520sqm of B1(b) research and development and B1(c)/B2 industrial uses, with some ancillary use. The B8 use was a full application and the enterprise park was an outline application.

1.4 The TA for the hybrid planning application was based on feedback to the Scoping Report that was submitted to MKC Highways and Highways England in 2017. A Technical Note setting out the agreed position was prepared and agreed with MKC Highways in November 2017. This is included at **Appendix A**, along with the Scoping Report itself and pre-application correspondence with Highways England. In short, it was agreed with MKC Highways that the

development would provide a comprehensive improvement of the Marsh End roundabout, which would become signalised and work in combination with a new signal-controlled site access junction on Willen Road. The development would also provide new bus stops on Willen Road and a new Redway connecting from the Tongwell Roundabout to the south of the site, through to Newport Pagnell to the north of the site.

1.5 The design of the proposed highway improvements that supported the hybrid planning application were informed by correspondence and a meeting with MKC Highways in June 2018. That resulted in amendments to the proposed Redway to remove a pinch point on Willen Road to the north of the Marsh End roundabout, and amendments to the proposed site access layout to reduce the number of crossing points on the Redway. MKC Highways also confirmed that there was no requirement for the existing laybys on the A422 on the eastern and western approaches to the Marsh End Roundabout and accordingly these were removed as part of the proposed improvement works.

1.6 MKC Highways provided their observations on the hybrid planning application on 10 August 2018. This confirmed that MKC Highways had no objection to the hybrid planning application subject to conditions. A copy of MKC Highways observations are provided at **Appendix A**. Highways England also provided their response to the hybrid planning application in their recommendations to the planning authority dated 28 September 2018. This confirmed that Highways England also had no objection to the hybrid planning application subject to conditions. A copy of Highways England's recommendations is also provided at **Appendix A**.

1.7 Notwithstanding the above, the hybrid planning application was withdrawn in September 2018 as the then occupier for the B8 unit was no longer in a position to progress with the unit, and also following discussions with the planning authority regarding the timing of the planning application in the context of their strategic planning work.

1.8 There continues however to be significant interest in the site from operators and therefore, in consultation with the planning authority, a revised detailed planning application is to be made. The detailed development proposals comprise the construction of two storage and distribution units (Class B8) with associated car parking, servicing, landscaping, earth bunding and off-site drainage. The two B8 warehouse units would have a total GFA of 81,361sqm (875,763sqft), including 4,583sqm of ancillary office space. The development masterplan showing the proposed layout is contained in **Appendix B**.

1.9 This report presents the TA for the revised scheme. It has been prepared to support the planning application. This TA is presented as a standalone document, although given the similarity to the previous application, it retains the same study area, B8 trip rates, trip distribution, and highway mitigation strategy as previously agreed with MKC Highways and Highway England. It should be noted however that the position of the proposed signal-controlled site access junction on Willen Road has been amended in response to concerns expressed by the residents of the properties of Caldecote Farm with regard to the formation of a new crossroads junction, with regard to potential noise and lighting impacts.

1.10 This TA is structured as follows:

- Section 2 describes the existing conditions in the vicinity of the site. The site location is detailed in relation to the wider area of land that is allocated for new residential and employment development in Policy SD12 of MKC's Plan:MK. The local highway network is described, including the results of traffic counts and an accident analysis at the agreed study area junctions. The existing opportunities for travel to the site by foot, cycle, and bus are also examined.
- Section 3 describes the development proposals, including the vehicular access proposals, the parking and servicing provision, and the sustainable travel infrastructure that would be provided to encourage the use of sustainable modes. This includes the provision of a new

Redway (footway/cycleway) along Willen Road, new crossing facilities on Willen Road, and new bus stops on Willen Road.

- Section 4 summarises the forecast light vehicle and HGV trip generation using the previously agreed B8 trip rates. The modal split is also used to calculate the likely person trip generation.
- Section 5 details the agreed distribution pattern and assignment of development traffic on the highway network. Separate distribution patterns are provided for the light vehicles and HGVs, as agreed with MKC Highways and Highways England.
- Section 6 presents the assessment year traffic flows, including growth rates that take into account committed development traffic for the highway network.
- Section 7 assesses the impact of the development on the operation and safety of the agreed study area junctions on the highway network and proposes mitigation measures where necessary.
- Section 8 presents the summary and conclusions.

1.11 This TA has been produced in accordance with *Guidance on Transport Assessment*[1], and *Travel plans, transport assessments and statements in decision-taking*[2]. Assessment of the development impacts on the strategic road network, has been undertaken in accordance with DfT Circular 02/2013[3]. It examines the transport implications of the proposed development taking into account the following objectives from the National Planning Policy Framework (NPPF):

> "108. *In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:*
> *a) Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location.*
> *b) safe and suitable access to the site can be achieved for all users; and*
> *c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.*
>
> *109. Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on the highway safety, or the residual cumulative impacts on the road network would be severe."*

1.12 A separate Travel Plan has also been produced by ADC Infrastructure Limited to support the planning application. The overall objective of the Travel Plan is to minimise the number of new car trips generated by staff and visitors travelling to and from the proposed development, by promoting and supporting the use of alternative modes of travel (walking, cycling, public transport and car sharing). It includes a target to achieve a 10% reduction in peak hour single occupancy vehicle movements. It also includes measures and incentives to achieve the targets, and methods for implementing the measures and monitoring the travel patterns at the site.

[1] Guidance on Transport Assessment, Department for Transport, March 2007
[2] Travel plans, transport assessments and statements in decision-taking, National Planning Practice Guidance, March 2014
[3] DfT Circular 02/2013 'Strategic Road Network and the Delivery of Sustainable Development'

2.0 EXISTING CONDITIONS

Site location

2.1 The development site is located to the south of Newport Pagnell and east of Milton Keynes (**Figures 1 and 2**). It is a triangular piece of land bound to the north by the A422 Monks Way, to the east by Willen Road, and to the west by the M1. An aerial photo is shown in **Figure 3**.

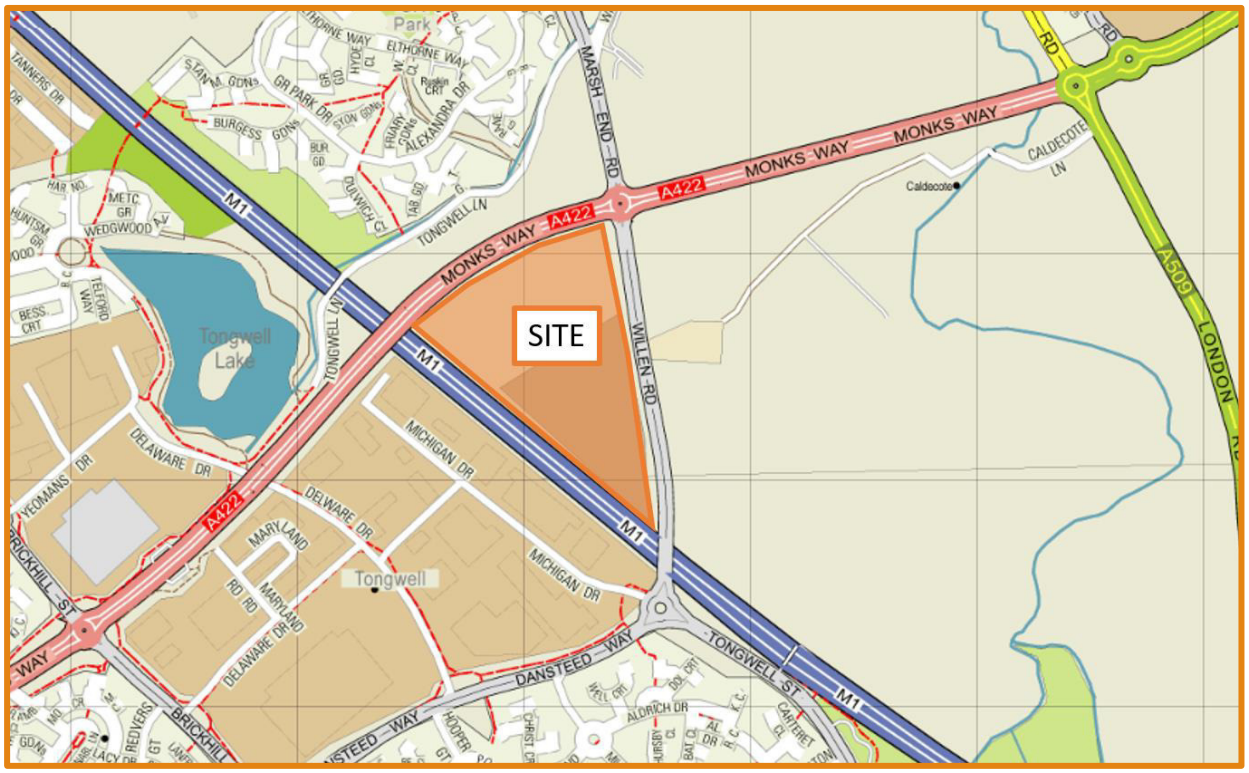


Figure 2: detailed site location

Figure 3: aerial photograph

Wider development

2.2 The site forms part of a much larger area of land allocated within the adopted Plan:MK for a mixed residential and employment strategic urban extension (**Figure 4**). Policy SD12 – Milton Keynes East Strategic Urban Extension allocates the land for residential development and employment uses. The development proposals therefore fall within the employment aspects of this policy.

2.3 Plan:MK states that key infrastructure improvements are required over the M1 *"to support the connectivity of this strategic urban extension to the existing Milton Keynes urban area".* Policy SD12 specifically states that the development will comprise *"The phased introduction of a comprehensive network of transport infrastructure in line with the Local Investment Plan, to include grid road connections to H4/V11 to the west and improved highway connections to Newport Pagnell and Central Milton Keynes (CMK), including new and/or enhanced vehicular crossings of the M1, involving highway works on and off-site,* as well as *"A network of segregated, and where appropriate grade-separated, new and enhanced footpaths, cycleways and bridleways (including redways) to connect to existing routes beyond the site, including provision of appropriate pedestrian and cyclist crossings of the A422 and suitable safe and attractive crossings of the M1 as appropriate".*

2.4 Later sections of this TA demonstrate how the development proposals will improve vehicle, pedestrian, cycle and public transport connectivity over the A422 and M1 between the site, Newport Pagnell and Milton Keynes and therefore demonstrates that the development will accord with Policy SD12.

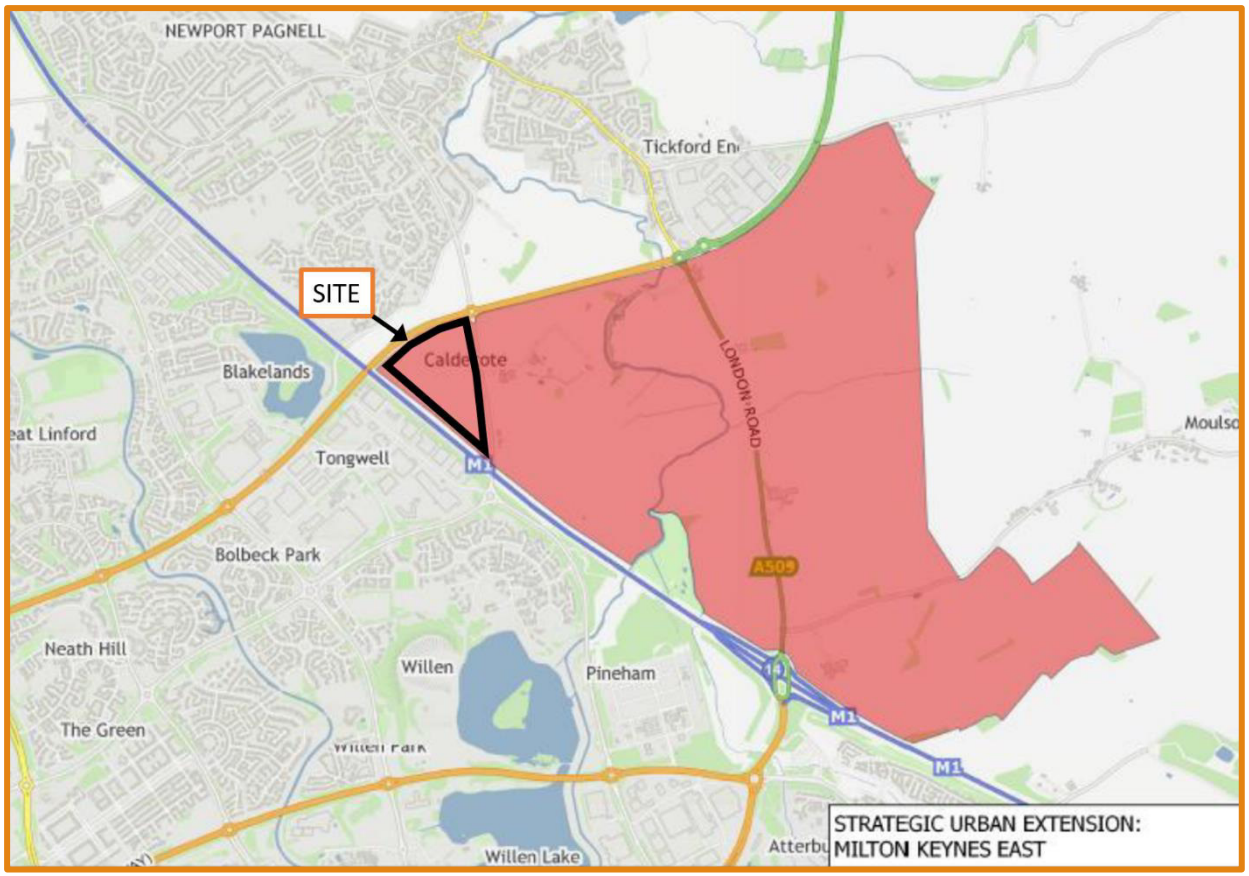


Figure 4: Plan:MK Policy SD12 – Milton Keynes East

Highway network

2.5 Along the site frontage, Willen Road is a single carriageway road subject to the national speed limit. There are no parking restrictions, but no on-street parking is observed to occur. Willen Road is classed as a district distributor road in accordance with MKC's 'A Highway Guide for Milton Keynes'.

2.6 To the north of the site, Willen Road (S) joins the A422 and Willen Road (N) at a four-arm roundabout, known as the Marsh End Roundabout. All approach arms have three entry lanes. The junction is subject to the national speed limit. From the roundabout, Willen Road (N) provides one of the main routes into central Newport Pagnell. To the north of the roundabout, Willen Road is subject to the national speed limit between the Marsh End Roundabout and the entrance to Newport Pagnell, where it becomes Marsh End Road and is subject to a 30mph speed limit.

2.7 To the east, the A422 dual carriageway joins the A509 and London Road at a four-arm roundabout, known as the Tickford Roundabout. All approach arms have three entry lanes with the exception of the A422 which has two entry lanes. The Tickford Roundabout joins the adjacent Renny Lodge Roundabout in a dumbbell junction arrangement connected by dual carriageway. From that roundabout, Renny Park Road forms a second access into Newport Pagnell, but primarily serves the Interchange Park employment area.

2.8 To the north, the A509 leads toward Kettering, and to the south the A509 connects to the M1 Junction 14 at a grade separated signal controlled gyratory.

2.9 Highways England are currently improving the M1 between Junction 13 and Junction 16 to provide an all-lane running Smart Motorway Project (SMP). This will upgrade the mainline to provide four lanes running with no hard shoulder. The aim of this scheme is to:

- reduce congestion and smooth the flow of traffic to improve travel times to make journeys more reliable;
- support the economy and facilitate economic growth within the region by providing much needed capacity on the motorway reducing the cost of economic delay to commuters and business traffic;
- maximise motorway capacity while maintaining safety on motorways;
- minimise environmental impacts.

2.10 The draft SMP plans have been reviewed, and the scheme will alter the layout of the merge and diverge slip roads at M1 Junction 14, as summarised in the table below. It is noted that the northbound diverge slip road will be increased in length as part of the SMP scheme. The scheme does not however include any changes to M1 Junction 14 itself.

Smart Motorway proposals for M1 Junction 14 slip roads (draft)			
		Current arrangement	Proposed arrangement
Northbound	Diverge	Type A	Type B
	Merge	Type A	Type B
Southbound	Diverge	Type A	Type A
	Merge	Type A	Type C

2.11 To the south-west of the M1 Junction 14, the A509 routes onwards into Milton Keynes, and connects to the H6 Childs Way at a four-arm signal controlled gyratory known as the Northfield Roundabout. The A509 (N) approach to the Northfield Roundabout (leading south from M1 Junction 14) has four entry lanes. All other arms have three entry lanes. Despite this infrastructure, the junction operates with congestion and delay.

2.12 Further west, the A509 dual carriageway joins the V11 Tongwell Street at a four-arm roundabout with part time traffic signal controls, known as the Pineham Roundabout. The traffic signal controls are on the A509 (E) westbound approach only. All approach arms have three entry lanes.

2.13 From the junction, the V11 is a single carriageway road, and routes north to join Willen Road and Dansteed Way at a four-arm roundabout, known as the Tongwell Roundabout.

2.14 Traffic travelling between the M1 and the site can therefore either route clockwise via the A509, A422 and Willen Road (N), or anti-clockwise via the A509, V11 Tongwell Street and Willen Road (S).

2.15 Overall, the site is well connected to the local road network within Milton Keynes and Newport Pagnell, and to the strategic road network via the M1 Junction 14.

2.16 The junctions described above form the agreed study area, and are listed north to south below, and shown on **Figure 5**.

1) A422/A509 (Tickford Roundabout)
2) A422/Willen Road (Marsh End Roundabout)
3) Willen Road/Dansteed Way (Tongwell Roundabout)
4) A509/Tongwell Street/V11 (Pineham Roundabout)
5) A509/H6 Childs Way/A5130 Fen Street (Northfield Roundabout)
6) M1 Junction 14.

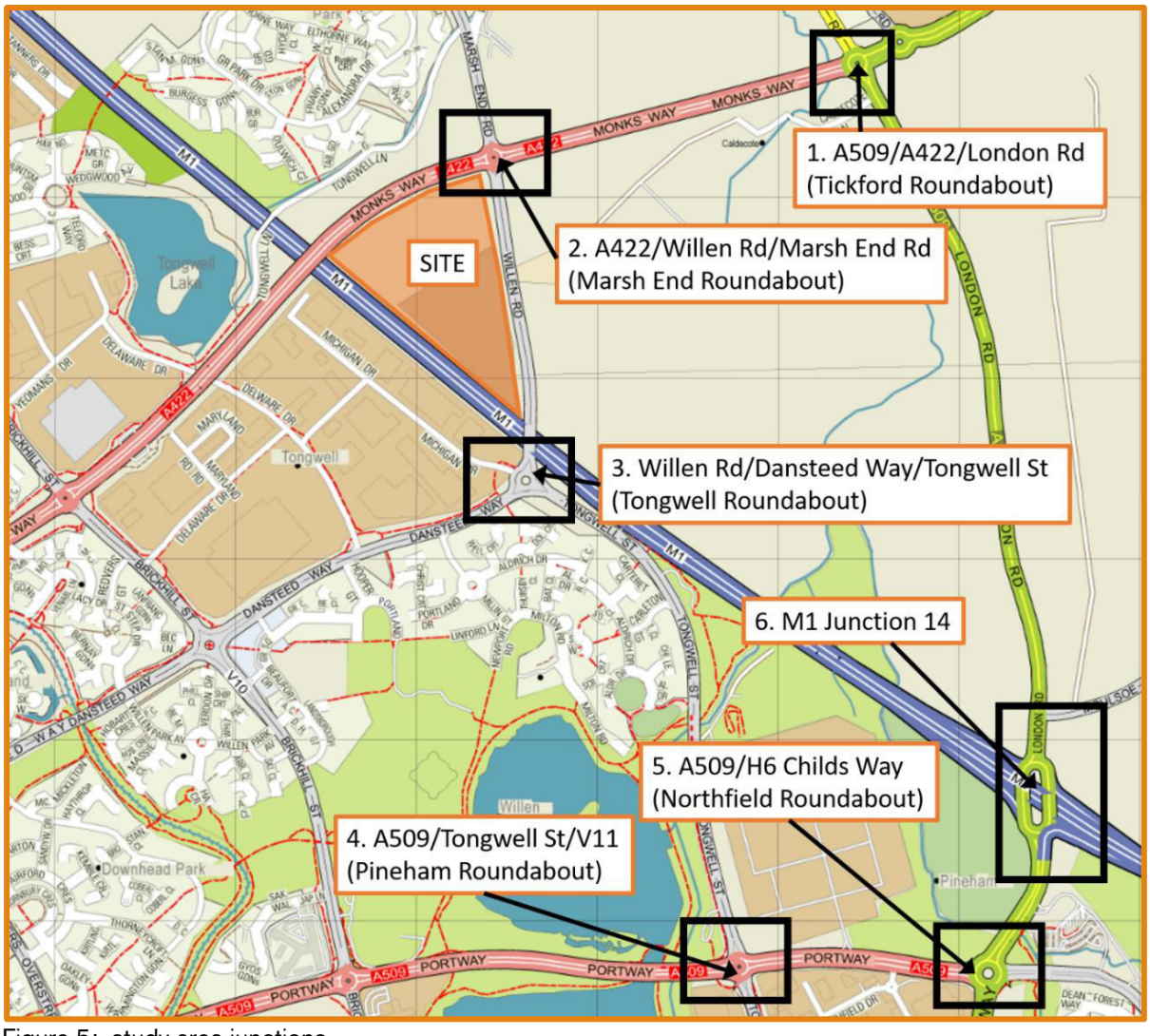


Figure 5: study area junctions

Traffic flows

2.17 Traffic counts were undertaken at study area junctions 1 to 4 on Tuesday 18 October 2016. All vehicle movements turning at and travelling through the junctions were recorded in 15-minute intervals between 0730-0930 hours and 1600-1830 hours. The results are contained in Appendix F of the Scoping Report (included at **Appendix B** of this TA).

2.18 The highway network peak hours were found to be 0745-0845 hours and 1700-1800 hours, and the observed 2016 morning and evening peak hour traffic flows are shown in **Diagrams 1 and 2**. Traffic flows past the site access junction have been replicated from the traffic flows recorded on the Willen Road (S) arm at the Marsh End Roundabout.

2.19 A traffic count was undertaken at the Northfield Roundabout (study area junction 5) and at the M1 Junction 14 (study area junction 6) on Tuesday 15 May 2018. The morning and evening peak hours at that junction were 0730-0830 hours and 1700-1800 hours. The observed 2018 morning and evening peak hour traffic flows are also shown in **Diagrams 1 and 2.** The 2018 traffic count results are provided **Appendix C**.

2.20 In addition to these peak period traffic counts, seven-day automatic traffic counts (ATCs) were undertaken from 31 October 2017 on:

- Willen Road (north) approx halfway between the Willen Road/Marsh End Road junction and the existing Marsh End Roundabout;
- Willen Road (south), approx. 300m south of the existing Marsh End Roundabout;
- A422 (east), approx. 300m east of Marsh End Roundabout;
- A509, approx halfway between M1 Junction 14 and the Tickford Roundabout;
- Tongwell Street, approx. 200m east of Tongwell Roundabout.

2.21 The daily traffic profile on Willen Road is shown at **Figure 6** below. As shown, traffic starts to build from 0500 hours, but peaks between 0800 and 0900 hours. In the afternoon, traffic steadily builds from 1400 hours, but peaks between 1600 and 1800 hours. Note that the 4th and 5th of November 2017 was a weekend and therefore there is a different traffic flow profile, with traffic flows much reduced.

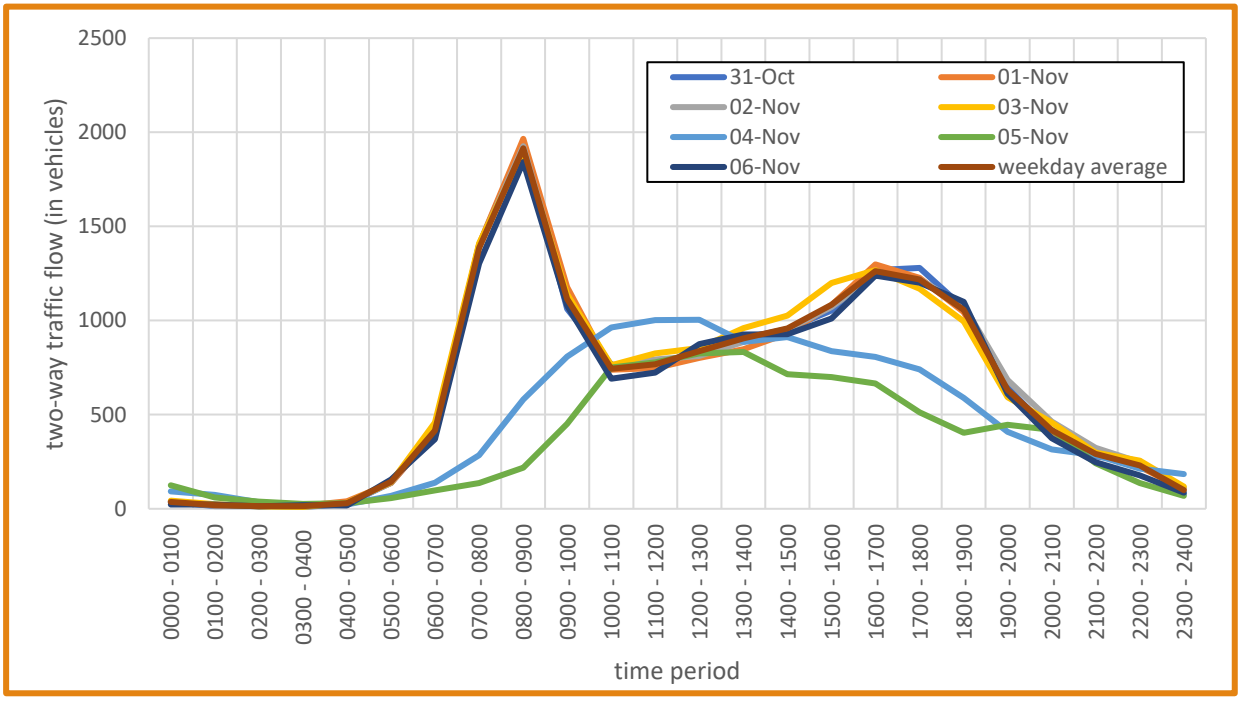


Figure 6: Observed daily traffic profile on Willen Road (2017 two-way flows)

2.22 The observed average and 85th percentile vehicles speeds recorded by the ATCs are summarised in the table below.

Recorded vehicle speeds				
ATC site		mean average speed	85th percentile speed	speed limit
Willen Road (north)	Northbound	36	41	National speed limit (60mph)
	Southbound	33	41	
Willen Road (south)	Northbound	40	49	National speed limit (60mph)
	Southbound	41	49.5	
A422 (east)	Eastbound	47	54	National speed limit (70mph)
	Westbound	52	64	
A509	Northbound	48	55	National speed limit (60mph)
	Southbound	44	53	
Tongwell Street	Northbound	47	54	National speed limit (60mph)
	Southbound	48	54	

Accident analysis

2.23 As part of the Scoping Report, accident records for the local highway network in the vicinity of the site, and study area junctions 1 to 4, were obtained from MKC Highways for the five-year period between 1 July 2011 and 30 June 2016. The raw accident data and a plan showing the location of the accidents is contained in **Appendix D**.

2.24 In addition, following the inclusion of junctions 5 and 6 in the study area, separate accident data covering these locations (Northfield Roundabout and M1 Junction 14) was obtained from MKC Highways for the five-year period between 1 August 2012 and 31 July 2017. The raw accident data and a plan showing the location of the accidents is also contained in **Appendix D**.

2.25 With regards to the study area junctions:

- three accidents were recorded at the Tickford Roundabout, all three were slight accidents involving vehicles;
- seven accidents were recorded at the Marsh End Roundabout, with one serious and six slight accidents;
- five accidents were recorded at the Tongwell Roundabout, with two serious and three slight accident;
- seven accidents were recorded at the Pineham Roundabout, with three serious and four slight accidents;
- 14 accidents were recorded at, or on the approaches to, the Northfield Roundabout, including one serious accident; none of the PIAs involved non-motorised users;
- 25 accidents were recorded at, or on the approaches to, the M1 Junction 14. This included three serious accidents, and 21 slight accidents.

2.26 Of the three accidents recorded at the Tickford Roundabout, two involved a rear end shunt and one involved a vehicle changing lanes and colliding.

2.27 Of the seven accidents recorded at the Marsh End Roundabout, there were two loss of control accidents, three accidents involving a car entering the roundabout into the path of a circulatory vehicle, one rear end shunt and one side-swipe accident. Two of the PIAs involving vehicles entering the roundabout into the path of a circulatory vehicle involved cyclists, including the one resulting in a serious injury. In both cases the cyclist was travelling south through the roundabout and was hit by a vehicle entering the roundabout from the A422 (east).

2.28 Of the five accidents recorded at the Tongwell Roundabout, three involved rear end shunts, one involved a car driver losing control and one involved a car driver entering the roundabout across the path of a circulating motorcyclist. None of the PIAs involved non-motorised users (pedestrians, cyclists or equestrians). It is concluded that there are no trends in the location or type of accidents recorded and all seven are attributed to driver error.

2.29 Of the seven accidents recorded at the Pineham Roundabout, three involved motorcyclists losing control. The first involved a rider, aged 20 years, travelling at excessive speed. In another, the motorcyclist lost control on a slippery road surface/debris. In the third accident, the rider emerged into the path of a circulating vehicle and lost control whilst taking evasive action. There are therefore no trends in the cause of these accidents. Three further accidents involved car drivers losing control and colliding with the central island at the Pineham Roundabout. However, in two of these accidents, the driver was under the influence of alcohol, and in the third accident, the driver was aged 22 years and was travelling at excessive speed. The final accident involved a car entering the roundabout across the path of a circulating cyclist. All seven accidents are therefore attributed to driver error.

2.30 Of the 14 accidents recorded at the Northfield Roundabout, three involved rear end shunts on the approach to the junction, two involved collisions on the roundabout as drivers failed to obey the traffic signals, one involved a vehicle changing lanes to exit across the path of a motorcycle, three involved rear end shunts as vehicles exited the roundabout, and five involved a side swipe accident on the approach to the roundabout or on the circulating carriageway. Of the five side swipe accidents, two involved young/inexperienced drivers (aged 21 and 22 years respectively), one involved a foreign (left-hand drive) HGV colliding with a vehicle in the blind spot, one involved a car and a motorcycle, and one involved a van and a coach. None of the PIAs involved non-motorised users. It is concluded that there are no trends in the location or type of accidents recorded at the junction, and all 14 accidents are attributed to the busy conditions at the junctions and driver error, rather than deficiencies in the junction layout.

2.31 Of the accidents recorded at the M1 Junction 14:

- five involved rear end shunts on the approach to the junction (including one serious)
- three involved collisions as vehicles changed lanes on the circulatory carriageway
- one involved a side swipe accident on the northbound exit slip
- one involved a driver losing control on the northbound exit slip
- one involved a collision on the northbound entry slip
- one involved a rear end shunt on the southbound exit slip when the vehicle brakes failed (serious)
- one involved a car entering the roundabout and colliding with a motorcycle when the signals were not working
- one involved a car colliding with a cyclist
- four involved drivers losing control or suffering a medical episode and losing control. One of these was serious in nature.

There are no trends in the number, location or type of accidents recorded across the junction, and all accidents are attributed to driver error.

2.32 Five accidents were recorded on the M1 southbound mainline carriageway in the vicinity of the junction, including three rear end shunts, one driver losing control after a tyre blowout (serious), and one collision involving a vehicle changing lanes. Two accidents were recorded on the M1 northbound mainline carriageway in the vicinity of the junction, including one rear end shunt and one collision involving a vehicle changing lanes.

2.33 No accidents have been recorded on Willen Road along the site frontage.

Updated accident analysis

2.34 Given the passage of time since the above PIA assessment, updated accident records for the local highway network in the vicinity of the site were obtained from MKC Highways, showing all accidents from the end periods examined above, until the most recent period (30 September 2018). The updated accident data and location plans of the respective junctions are contained in **Appendix D**.

2.35 With regards to the study area junctions:

- two further accidents were recorded at the Tickford Roundabout, both of which were slight accident;
- three further accidents were recorded at the Marsh End Roundabout, with one serious and two slight accidents;
- no accidents were recorded at the Tongwell Roundabout;
- four further accidents were recorded at the Pineham Roundabout, all of which were slight accidents;
- three further accidents were recorded at the Northfield Roundabout study area, all of which were slight accidents;
- eight further accidents were recorded at the M1 Junction 14 study area. This included two serious accidents, and six slight accidents.

2.36 Of the two accidents recorded at Tickford Roundabout, one involved an HGV (with trailer) travelling northbound along the A509 and approaching the roundabout with intentions of continuing along A509. However, whilst negotiating the exit of the roundabout, the trailer mounts the central island, resulting in the HGV overturning. The other accident involved a car (C2) exiting the roundabout in lane two, with intentions of continuing along the A509. A second car (C1) is also travelling in same direction but in lane one. A nearside collision between the cars occur when C1 attempts to change lanes. Both accidents are therefore attributed to driver error.

2.37 Of the three accidents recorded at the Marsh End Roundabout, the accident of serious severity involved two motorcycles (MC1 and MC2) travelling westbound along the A422 on approach to the roundabout, in high winds and wet/damp road conditions. MC1 attempts to brake but in doing so, lost control causing the rider to fall. MC2 which was following, subsequently lost control and fell. A further accident (slight severity) also occurred in wet/damp road conditions and involved a rear end shunt between two cars which were travelling eastbound along the A422. Given the type of vehicles involved it is likely that these PIAs were influenced by the wet/damp road conditions which were present and driver error.

2.38 The remaining accident at the Marsh End Roundabout involved a pedal cycle travelling southbound along Willen Road and proceeds to negotiate roundabout. A car travelling southbound along the A422 also proceeds to negotiate roundabout, but a collision occurs when the car cut across the path of the pedal cycle. It is noted that this is the third PIA involving a cyclist travelling south through the roundabout being struck by motorists entering the roundabout from the A422 east.

2.39 The updated accidents records for the Tongwell Roundabout showed no further accidents were recorded at this location.

2.40 Of the four accidents recorded at the Pineham Roundabout, one involved a bus/coach which was stationary at the roundabout and proceeded to move off onto the circulatory carriageway (direction unknown). A car also enters the roundabout but changes direction, causing the bus/coach to brake and a passenger to slip off seat. One accident involved an HGV travelling

eastbound on the A509 and entering roundabout in middle lane. A car travelling in same direction also enters the roundabout but in offside lane. The goods vehicle cuts across roundabout, resulting in a collision with the car which caused the car to collide with the central island. One accident involved a car travelling westbound exiting the roundabout. The car lost control on the exit, skidded and collided with the barrier on the nearside of the carriageway. The remaining accident involved a pedal cycle travelling eastbound (lane one) on the A509 in icy road conditions and in darkness (street lights present and lit). A collision occurred when the pedal cycle cut across the path of a car which was travelling in the same direction, in lane two. It is concluded that there are no trends in the location or type of accidents recorded, and of which are attributed to driver error.

2.41 Of the three accidents recorded at the Northfield Roundabout, one involved a car suddenly changing direction whilst entering the roundabout, resulting in a rear end shunt with another car. One accident involved a car travelling eastbound along the A5130 on approach to junction with Milton Keynes Coachway. Another car travelling in the opposite direction turns right at the junction, resulting in a head on collision. The remaining accident involved a car (direction of travel unknown) travelling in the nearside lane. The car drifted into the offside lane and collided with the nearside of a car travelling in the same direction. All accidents are therefore attributed to driver error.

2.42 Of the eight accidents recorded at the M1 Junction 14 study area:

- four accidents (all slight) occurred northbound of the M1, on the approach to Junction 14. However, there are no trends regarding the type of accidents recorded;
- one accident involved a foreign driver travelling southbound of the M1 after entering from slip road. The driver cut across the path of another car travelling southbound of the M1, causing a nearside collision;
- one accident involved rear end collisions between three cars and a van, all of which were travelling southbound of the M1, after one of the cars was forced to brake due to debris on the carriageway;
- one accident, of serious severity involved a car travelling southbound along Newport Road losing control in wet/damp road conditions. A frontal collision subsequently occurred with a bus/coach after the car had crossed onto the opposite side of the carriageway;
- one accident, of serious severity involved a driver of van failing to react to a stationary car at Junction 14 roundabout. The van subsequently collided into the rear of the car which careered across southbound slip road, causing further collisions with traffic signals and two cars.

There are therefore no trends in the type of accidents recorded across the M1 Junction 14 study area.

Opportunities for pedestrian travel

2.43 *Guidelines for Providing for Journeys on Foot*[4] describe acceptable walking distances for commuters, where up to 500 metres is the desirable walking distance, up to 1,000 metres is an acceptable walking distance, and up to 2,000 metres is the preferred maximum walking distance. **Figure 7** shows the potential pedestrian catchment area based on a 2,000 metres walking distance from the centre of the site. The catchment area covers the residential areas in the southern part of Newport Pagnell, including Tickford, and the residential areas in eastern Milton Keynes, including Willen, Pennyland and Blakelands. Once completed, the new residential dwellings within the allocated sustainable urban extension would also be within walking distance.

[4] Guidelines for Providing for Journeys on Foot, Institution of Highways and Transportation, 2000

2.44 With regards to pedestrian infrastructure, there are currently no footways along Willen Road, or along the A422 to the north of the site. The footway on Willen Road (N) does not start until the edge of the existing built up area, approximately 375 metres to the north of the Marsh End Roundabout.

2.45 To the south of the site, there is a footway-cycleway (known locally as a Redway) on the northern side of Willen Road from the Tongwell Roundabout, approximately 100 metres from the southern site boundary. This connects to the footways on Michigan Drive through the employment area in Tongwell to the west of the site and continues parallel to the H4 Dansteed Way to connect to the residential area of Pennyland further west. It also crosses under Dansteed Way to connect to the residential area of Willen and Willen Park.

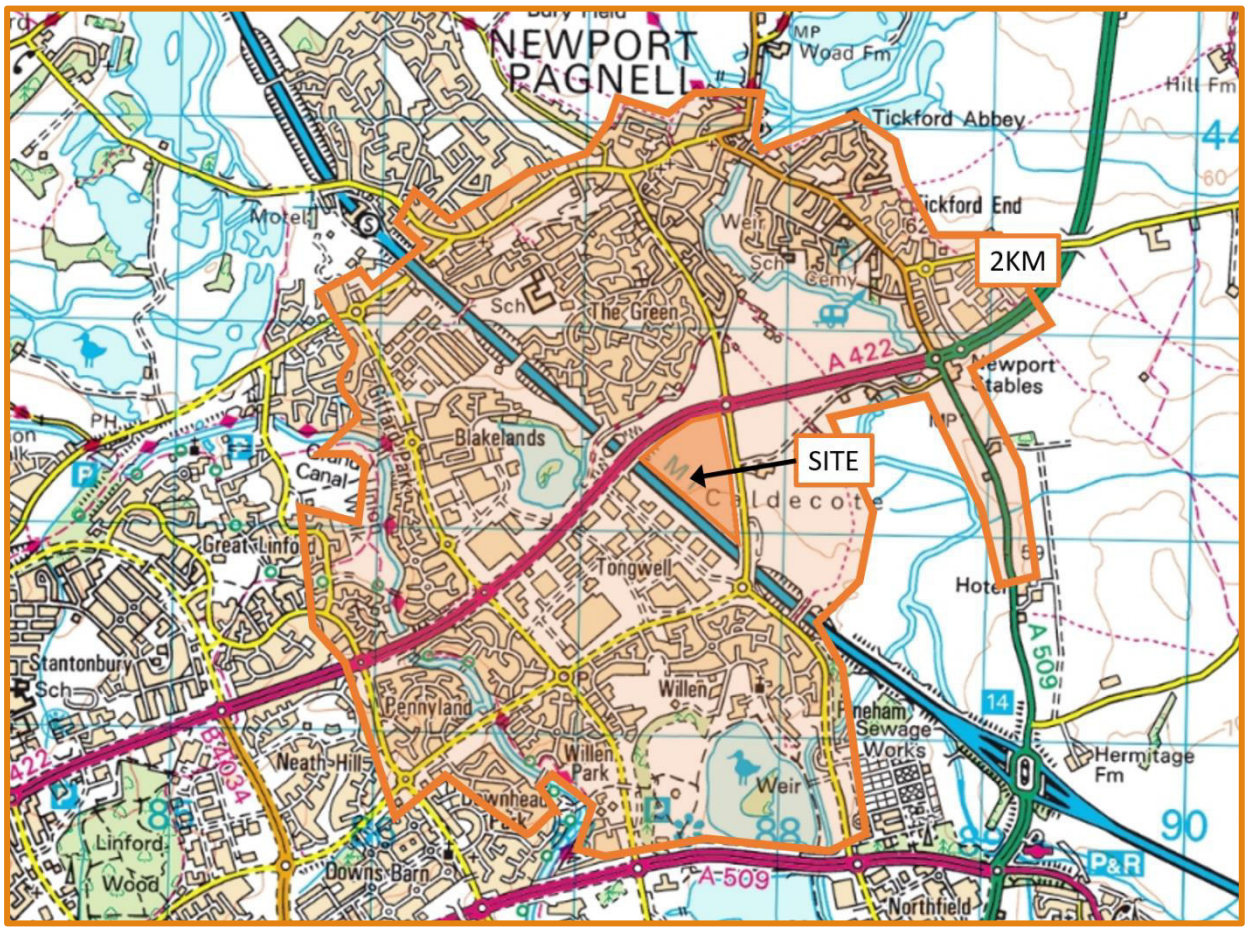


Figure 7: 2km pedestrian catchment area

Opportunities for cycle travel

2.46 Cyclists are typically prepared to cycle up to 5km for non-leisure journeys, such as those to work. **Figure 8** shows the cycle catchment area based on a 5km distance from the centre of the site. It covers all of Newport Pagnell and the central and eastern parts of Milton Keynes.

2.47 **Figure 9** shows an extract of MKC's 2018 Redway map. This shows the Redways in the vicinity of the site, including the Redway Super Route H4 footway/cycleway alongside Dansteed Way directly south of the site, and the Redways and leisure routes from Marsh End Road to the north of the site. MKC Highways has advised that there are proposals to provide a new Redway route alongside the western side of Marsh End Road, within Newport Pagnell. However, there are no current proposals to extend that Redway facility south along Willen Road to connect Newport Pagnell with Redway Super Route H4.

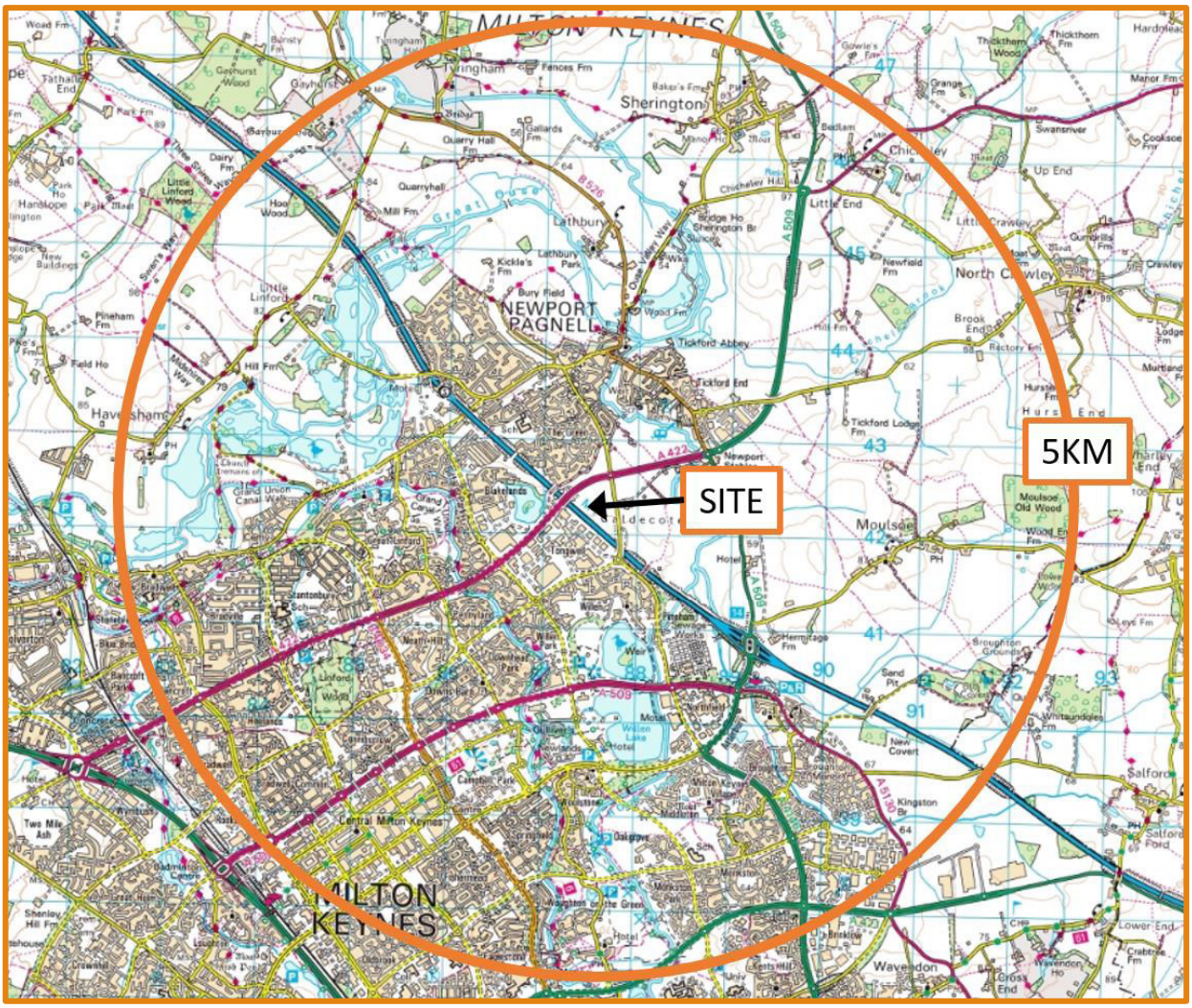


Figure 8: 5km cycle catchment area

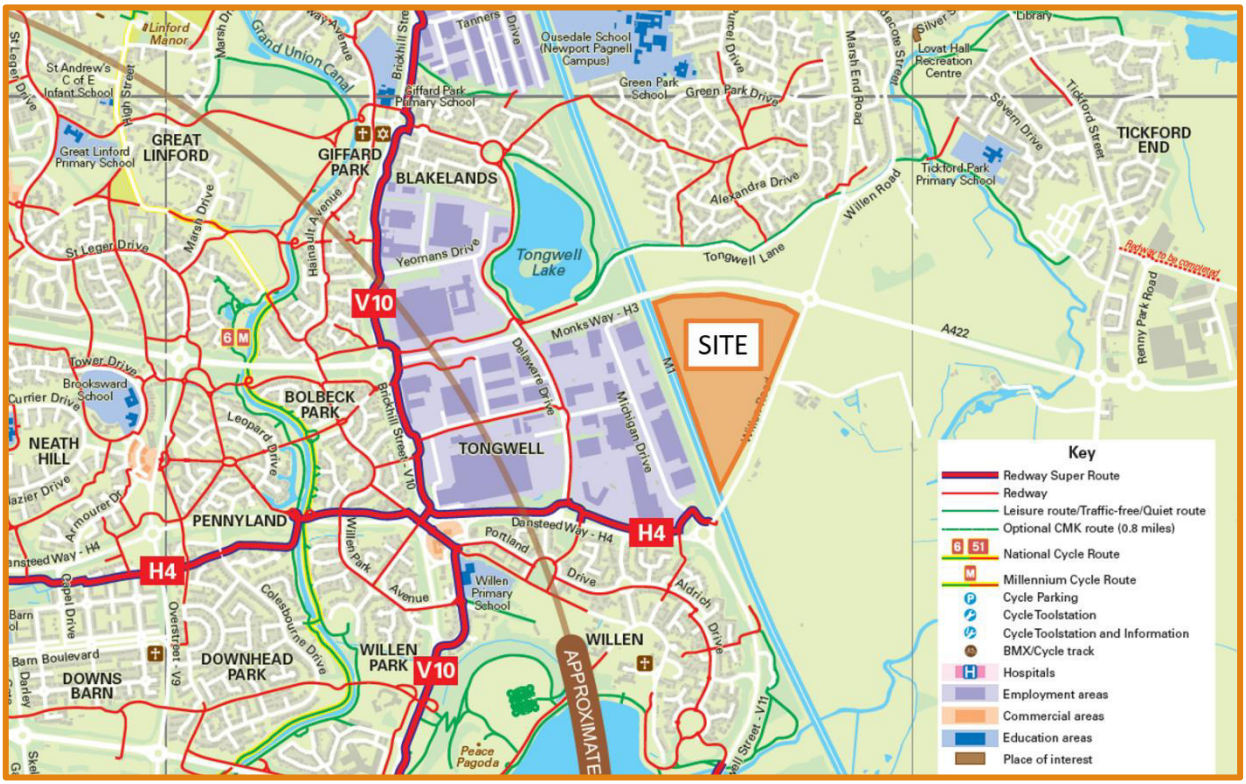


Figure 9: extract of MKC's Redway map (2018)

Opportunities for bus travel

2.48 As shown in **Figure 10**, the nearest bus stops to the site are on Willen Road within the site frontage. These comprise flag and pole bus stops, and provide access to Route 1, running between Newton Leys and Newport Pagnell, via Bletchley and Milton Keynes. Until 1 November 2017, Route 1 ran past the site every 30 minutes from Monday to Saturday, and hourly on Sundays. However, since the 1 November 2017, Route 1 only runs past the site in the evenings (between 2000 hours and midnight) Monday to Saturday, and on Sundays (between 0900 hours and midnight), at an hourly frequency. Arriva, who operate the Route 1, stated that the service was withdrawn due to low passenger usage.

2.49 The bus stops also provide access to Route C10, running between Milton Keynes Central rail station and Bedford, via Newport Pagnell. Route C10 runs at an hourly frequency from Monday to Friday, but there are no services on Saturdays and Sundays. The service routes along Willen Road between approximately 0630 hours and 1900 hours. The northbound service stops on Willen Road at 22 minutes past the hour from Milton Keynes, and the southbound service stops at 11 minutes past the hour from Newport Pagnell.

2.50 There is therefore one bus service per hour running past the site in each direction from 0630 hours to midnight during the weekdays, from 2000 hours to midnight on Saturdays, and one bus service per hour in each direction from 0900 hours to midnight on Sundays.

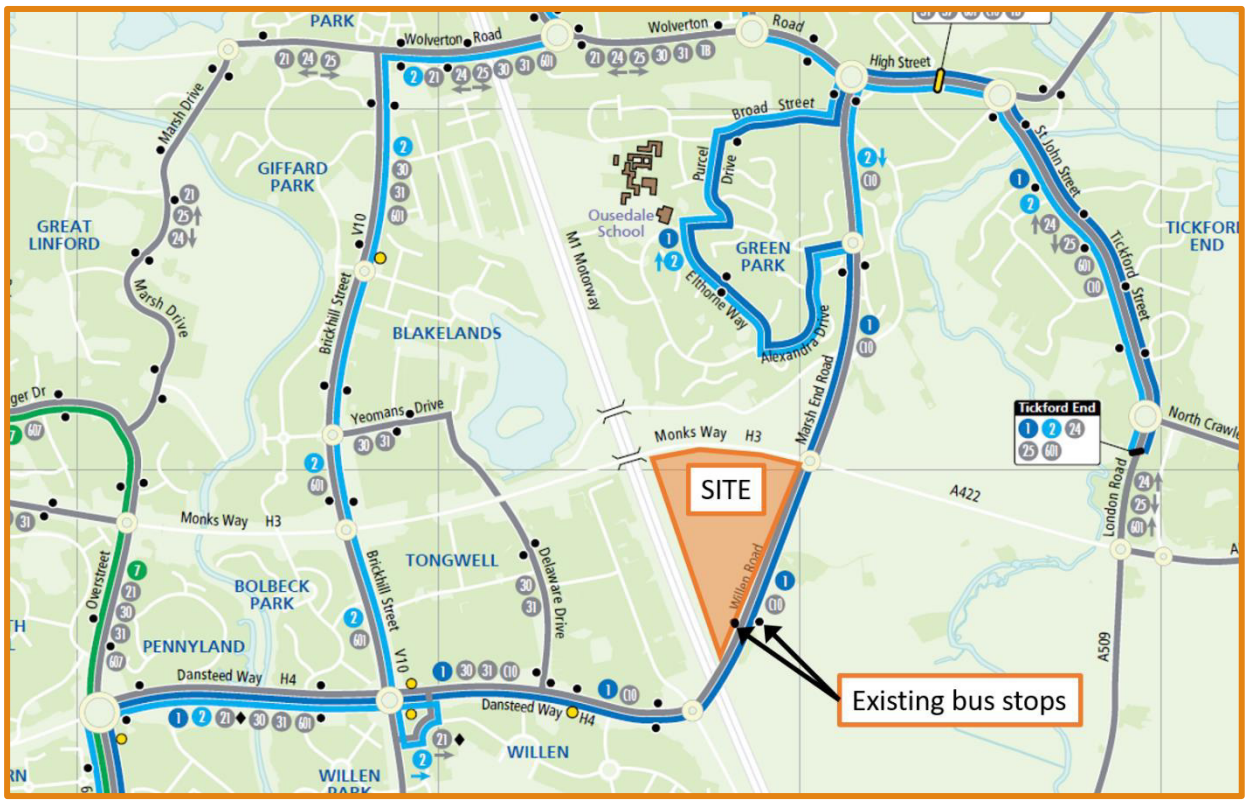


Figure 10: local bus services (May 2018)

Opportunities for train travel

2.51 There are five train stations within the Milton Keynes area, with Milton Keynes Central being the main station. Milton Keynes Central is just beyond a 5km cycling distance of the proposed development site. However, both bus services Route 1 and C10 travel via the train station. Therefore, there are opportunities for rail travel as part of a multi-modal journey by cycle, bus or taxi.

2.52 From the station, there are regular London Midland trains between London Euston and Northampton, Crewe and Birmingham. There are also regular Virgin Trains between London Euston and Scotland.

Summary

2.53 There are excellent opportunities to access both the local road network within Newport Pagnell and Milton Keynes, and the strategic road network via the M1 Junction 14.

2.54 There are opportunities for pedestrian and cycle travel, with a number of residential areas within walking and cycling distance. However, a new footway/cycleway (Redway) would need to be installed on Willen Road as part of the development proposals to facilitate travel along the desire lines to both Newport Pagnell to the north and Milton Keynes to the south. The new Redway would need to extend over the Marsh End Roundabout (A422) and along Willen Road (N) to improve the connectivity of the site to Newport Pagnell to the north. The Redway would need to extend over the M1 bridge to the south to connect to the H4 Redway Super Route and Milton Keynes. This provision would provide a significant benefit both to employees and visitors at the proposed development, but also to existing pedestrians and cyclists wishing to walk and cycle between Newport Pagnell and Milton Keynes, where there is currently no infrastructure provided along the Willen Road corridor.

2.55 There are opportunities for public transport travel, including both bus and rail. Route C10 provides a regular bus service running past the site at an hourly frequency throughout the day, and Route 1 provides an hourly service passed the site in the evenings and on Sundays. As part of the proposed development it would be necessary to provide improvements to the bus stops on Willen Road. This is detailed further in Section 3.

2.56 There are five train stations within the Milton Keynes area, with Milton Keynes Central being the main station. Milton Keynes Central is just beyond a 5km cycling distance of the proposed development site. However, both bus services Route 1 and C10 travel via the train station and could therefore provide opportunities for rail travel as part of a multi-modal journey by cycle, bus or taxi.

2.57 Overall, there are opportunities for sustainable travel, but the development would need to provide further infrastructure to improve the accessibility of the site by sustainable modes. This is detailed further in Section 3. The Travel Plan also includes measures and incentives to encourage travel by sustainable modes.

3.0 PROPOSED DEVELOPMENT

Development proposals

3.1 The development proposals comprise a detailed planning application for two warehouse and distribution units (Class B8) with associated car parking, servicing, landscaping, earth bunding, and on and off-site drainage on the site.

3.2 Unit 1 comprises a single B8 warehouse with a total GFA of 47,075sqm (506,711sqft). This includes 44,594sqm of B8 warehouse and 2,447sqm of ancillary B1 office use. A separate 34sqm gatehouse is also proposed. Unit 2 comprises 34,286sqm (368,366sqft) of B8 use. This includes 32,116sqm of B8 warehouse and 2,136sqm of B1 office use. A separate 34sqm gatehouse is also proposed at Unit 2. The masterplan is provided at **Appendix B**.

Parking and servicing provision

3.3 MKC's car parking standard[5] for B8 uses in Zone 4, within which the site is located, is one space per 100sqm GFA. In addition, car parking for the ancillary office use, which should be provided in accordance with the B1 parking standard, is one space per 30sqm. Spaces for disable parking should be 5% of the total car parking.

3.4 MKC's electric vehicles charging space standards are 2 spaces for developments with 51 to 100 car parking spaces, and then 1 electric vehicle charging space per 100 car parking spaces thereafter.

3.5 MKC's powered two wheelers standards are 1 space per 70 total car spaces.

3.6 The cycle parking standard for B8 uses in Zone 4 is one per 700sqm or 1 per 10 full time employees, plus a minimum of two for visitors and one per 1000sqm thereafter.

3.7 The guideline figure for HGV parking for B8 uses in Zone 4 is one per 300sqm or a minimum of one space.

3.8 The table below shows the proposed provision for a development with a total of 81,361sqm of B8 Use (as shown in the masterplan in **Appendix B**) compared with the standards.

Parking Type	Unit 1 – 47,075sqm			Unit 2 – 34,286sqm		
	Total Allowance	Proposed	% of Req	Total Allowance	Proposed	% of Req
Car*	528	528	100%	393	393	100%
Disabled	26	26	100%	20	20	100%
Electric Vehicle Charging	7	7	100%	5	5	100%
Powered Two Wheelers	8	8	100%	6	6	100%
Cycle Parking	116	90	78%	85	70	82%
HGV	157	127	81%	114	90	79%

* includes 1 additional parking space per 30sqm of ancillary office use

3.9 Based on the anticipated cycle modal share set out in Section 4.0 the proposed cycle parking provision of 90 spaces at Unit 1 and 70 spaces at Unit 2 is considered acceptable. This is 78% and 825, respectively, of the number of spaces specified by the standards. Cycle parking will be monitored as part of the Travel Plan, and additional spaces would be provided should demand dictate the need.

[5] Milton Keynes Council Supplementary Planning Document (January 2016)

3.10 Based on the 47,075sqm at Unit 1 and 34,286sqm at Unit 2, Unit 1 should provide 157 HGV spaces and Unit 2 should provide 114 HGV spaces. The masterplan in **Appendix B** includes 127 spaces at Unit 1, including 24 dock accesses and two-level access doors. Unit 2 provides 90 HGV spaces, including 20 dock accesses and two-level access doors. This is 81% and 79% of the number of spaces specified by the standards and is considered acceptable as an end occupier would not occupy a unit if it did not provide enough dock access points and hence there is no risk to the highway associated with the proposed level of provision.

Vehicular access

3.11 It was agreed as part of the previous planning application for the site (see paragraphs 1.3 to 1.6) that access to the site be taken from Willen Road via a new signal-controlled crossroads junction with the Caldecote Farm access. That arrangement was agreed by MKC Highways (see observations at **Appendix A**). Whilst it is still proposed to access the site via a new signal-controlled junction on Willen Road, as part of this revised application the location of the access has been amended in response to concerns that were raised with the previously application by Caldecote Farm residents. Their concerns related to the formation of a crossroads junction with their access road.

3.12 Caldecotre Farm residents were concerned that the formation of a crossroads junction would adversely impact their properties with regard to noise and light from the development. The amended access proposals are shown on PBA Drawing 38748-100-007 Rev A provided at **Appendix E**, along with an accompanying Design Statement. As shown, it is proposed that the site is accessed via a new signal-controlled T-junction on Willen Road, located approximately 65m north of the Caldecote Farm access. As part of the amended access proposals Caldecote Farm access is formalised to provide a left-in, left-out arrangement, with its own dedicated ghost island facility to accommodate right turning traffic into the Caldecote Farm access. As before, the signal-controlled site access junction would be linked with the proposed improvements at the Marsh End roundabout (see Section 7 of this TA). The junction is designed in accordance with DMRB TD50/04 and based on the proposed 40mph speed limit, as requested by MKC.

3.13 The site access and off-site highway works at the Marsh End roundabout have been subject to a Stage 1 Road Safety Audit (RSA). The Stage 1 RSA and Stage 1 RSA Response Report, prepared by PBA, is included at **Appendix E**.

3.14 As part of the access design, a Traffic Regulation Order would be made to reduce the speed limit on Willen Road between Tongwell Roundabout to the south and the entrance to Newport Pagnell (Marsh End Road) to the north, from national to 40mph. In response to the recommendation 2.11 arising from the Stage 1 RSA, it is also proposed that the 30mph on March End Road should start further south, coinciding with the “Welcome to Newport Pagnell” sign.

3.15 The proposed access strategy provides safe and suitable access to the development by all modes of transport, whilst also facilitating the provision of a new Redway on Willen Road. As discussed with MKC Highways, various access options were examined, but subsequently dismissed on the basis that they were less suitable for pedestrians, cyclists and bus users accessing the site and travelling along the new Redway on Willen Road that is proposed as part of the development. The previous access options that were considered are summarised in Scoping Report and TN with MKC Highways (**Appendix A**).

3.16 It is concluded that a signal-controlled access arrangement could be designed to the relevant standards, and would safely cater for pedestrians, cyclists and public transport users walking to and from the southbound bus stop. It would therefore provide a safe and suitable access for the development.

3.17 Furthermore, the proposed traffic signal-controlled access would provide opportunity for development traffic to safely enter and exit the site and could be co-ordinated with the proposed signal-controlled improvement to the Marsh End Roundabout, as shown in PBA Drawing 38748-100-008 Rev 8 and accompanying Design Statement in **Appendix E**, as described at Section 7 of this TA.

3.18 So, whilst the installation of traffic signals would introduce delay to vehicles travelling northbound and southbound on Willen Road where currently they do not have to stop, the benefit is that the signal-controlled layout would be designed to work in conjunction with the improved Marsh End Roundabout, providing dualling between the junctions, which overall would reduce queue lengths and journey times.

3.19 The internal layout would include a two-lane approach to the Unit 1 gatehouse for arriving HGVs, and a right turn lane for the car park, thereby providing storage for right turners into the car park, without blocking HGVs accessing the main site. Along the internal road, access to the service yard would take priority, and vehicles travelling from the car park would give-way. Access to Unit 2 and the overflow car park for Unit 1 is proposed via a priority-controlled junction off the internal road.

Sustainable travel infrastructure and public transport strategy

3.20 For safety and security reasons, the development would have a single point of access for pedestrians and cyclists, adjacent to the proposed vehicular access junction from Willen Road.

Proposed Redway

3.21 To facilitate pedestrian and cycle travel, a new 3m wide Redway (footway/cycleway) would be provided along Willen Road, connecting to the existing facilities in Newport Pagnell to the north, and the existing facilities at the Tongwell Roundabout to the south (part of Super Redway Route H4). The proposed new Redway route would run along the western side of Willen Road from the Tongwell Roundabout, over the bridge over the M1, and along the site frontage, providing access to the development site before continuing north to connect with the facilities in Newport Pagnell. However, due to third party land constraints at Marsh End Roundabout and along Willen Road (N), the Redway would need to cross over to the eastern side of Willen Road before crossing over the A422(east) at the Marsh End Roundabout and running along the eastern side of Willen Road (N).

3.22 The proposed Redway is shown in PBA Drawing 38748-100-007 RevA and PBA Drawing 38748-100-108 RevA in **Appendix E.** It is noted that the proposed speed limit reduction from national speed limit (60mph) to 40mph will generally present a safer environment for pedestrians and cyclists using the proposed Redway. The Toucan crossing on the A442 (east) will also remove the potential conflict between vehicles and cyclists crossing the Marsh End Roundabout that is evident in the accident history for the A422 (east) arm of the roundabout, as summarised at Section 2 of this TA.

3.23 To ensure pedestrians and cyclists can safely and conveniently cross Willen Road, traffic signal-controlled Toucan crossings would be provided on Willen Road north and south arms as part of the proposed site access junction, as shown in PBA Drawing 38748-100-007 RevA in **Appendix E.** A traffic signal-controlled crossing is required because there are insufficient gaps for pedestrians/cyclists to cross at an informal crossing during gaps in the traffic (see **Appendix F**). A Toucan crossing would also be provided on the site access arm.

3.24 An all-red stage is proposed at the junction. Whilst this does reduce the efficiency of the arrangement for vehicle drivers, the junction would operate with spare capacity (as demonstrated at Section 7 of this TA) and hence this reallocation of vehicle capacity in favour

of reducing delay to pedestrians and cyclists using the Redway is in accordance with MKC's user hierarchy, which places the needs of pedestrians and cyclists above those of vehicle drivers. During the all-red stage, the Willen Road Toucan crossings would be green (note that the Willen Road Toucans would also get green periods during other stages in the sequence), therefore providing additional opportunity for cyclists and pedestrians to cross Willen Road and further minimising the delay to these users.

3.25 MKC Highway also confirmed that road capacity at the proposed signal-controlled Marsh End Roundabout could be reduced in order to avoid the need to reduce the width of the proposed Redway below 3 metres on Willen Road to the north of the roundabout. This reallocation of road space to the Redway has been incorporated into the proposed design. The capacity assessment work presented in Section 7 of this TA demonstrates that the reduction to the length of the 3-lane section on the Willen Road (north) approach to the junction (that is required to provide the 3 metres wide Redway) has a relatively small impact on junction capacity, increasing the degree of saturation on this approach to circa. 95% in the morning peak hour. It is considered that this is an acceptable trade-off to achieve the improved Redway facility. However, any further reduction to the 3-lane section would result in this arm operating above 100% at which point the queue would significantly increase.

3.26 3m wide footways/cycleway would be provided on both sides of the site access carriageway, extending from the new Redway to provide access into the development. This is shown in the layout in **Appendix B.**

3.27 Secure, covered cycle parking would be provided in convenient locations close to the building entrances, as detailed above.

Public transport strategy

3.28 In order to promote bus travel, new bus stops would be provided on Willen Road. The bus stops would include raised kerbs, shelters with seating and real-time information display screens. Following discussions with MKC Highways the alignment of the new Redway has been taken around the back of the bus shelters, in order to reduce the potential for conflict between cyclists and pedestrians using the bus stops.

3.29 Public transport users would be able to safely cross Willen Road to reach the southbound bus stop, using the new footways through the development, the new Redway and Toucan crossings on Willen Road.

3.30 The forecast number of bus passengers is detailed in Section 4. It is shown that the proposed development would generate low numbers of bus passengers throughout the day, that could be accommodated by the existing hourly service. Therefore, the demand for travel by bus would not be sufficient to warrant service frequency improvements. However, additional bus services may be required to accommodate demand during shift changes, and therefore a requirement on each occupier to examine the feasibility of providing a bus service during key shift changes times is included within the Framework Work Travel Plan.

Walking, Cycling and Horse Riding Assessment Review

3.31 The proposed highway scheme, including the Redway and bus stop provisions has been subject to a Walking, Cycling and Horse Riding Assessment Review (WCHAR), undertaken by PBA. A copy of the WCHAR Assessment Report is provided at **Appendix G**.

4.0 TRIP GENERATION

Proposed Traffic generation

4.1 The table below details the proposed peak hour and daily trip rates for the proposed development comprising two B8 Units. These trip rates were previously agreed with MKC Highways and Highways England for the B8 use at the site as part of Scoping Study and the hybrid planning application. The daily profile of vehicle trips for the B8 unit based on the revised GFA are is provided at **Appendix H**.

proposed assessment B8 use peak hour and daily vehicle trip rates/100sqm GFA									
	AM Peak (0800 to 0900 hrs)			PM Peak (1700 to 1800 hrs)			Daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Light	0.121	0.013	0.135	0.040*	0.140*	0.180*	1.060	1.043	2.103
HGV	0.024	0.022	0.046	0.021	0.019	0.040	0.326	0.326	0.652
Total	0.145	0.035	0.181	0.061	0.159	0.220	1.386	1.369	2.755

**shoulder peak of 1600 to 1700hrs light vehicle trip rates used as this is higher than 1700 to 1800hrs*

4.2 Based on these agreed trip rates, the proposed development with a total GFA of 81,361sqm would generate the following traffic flows for the morning and evening peak hours and daily.

proposed B8 development traffic flows									
	AM Peak (0800 to 0900 hrs)			PM Peak (1700 to 1800 hrs)			Daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Unit 1 (47,075sqn)									
Light	57	6	63	19*	66*	85*	497	491	988
HGV	11	10	21	10	9	19	155	151	306
Total	68	16	84	29	75	104	652	642	1,294
Unit 2 (34,286sqm)									
Light	41	4	45	14*	48*	62*	363	355	718
HGV	8	8	16	7	7	14	109	111	220
Total	49	12	61	21	55	76	472	466	938

**based on shoulder peak of 1600 to 1700hrs light vehicle trip rates as this is higher than 1700 to 1800hrs*

Total traffic generation

4.3 The total traffic generation, with two B8 Units is shown below.

proposed B8 development traffic flows									
	AM Peak (0800 to 0900 hrs)			PM Peak (1700 to 1800 hrs)			Daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Light	98	10	108	33	114	147	860	846	1,706
HGV	19	18	37	17	16	33	264	262	526
Total	117	28	145	50	130	180	1,124	1,108	2,232

Modal split and person trip generation

4.4 In order to determine a modal split for the trips generated by the proposed development, reference was made to the 2011 National Census 'location of usual residence and place of work by method of travel to work' dataset (reference WU03EW). The data provides information

on the in moves and out moves, by each travel mode, to and from each middle layer super output area (MSOA), associated with journeys to work.

4.5 As shown in **Figure 10,** the site is located in the Milton Keynes 002 MSOA. This is a large MSOA, that covers several villages, including Moulsoe, North Crawley, Sherrington, Emberton, Stoke Goldington, Hanslope, and Castlethorpe. It has limited employment opportunities, and the opportunities for sustainable travel are not reflective of those available at the proposed development site once the proposed Redway and bus service improvements are in place. The use of the travel to work data for this MSOA would therefore not provide a realistic modal split for the proposed development.

4.6 The site borders the Milton Keynes 007 MSOA, which includes the employment estate adjacent to the proposed development site on the western side of the M1, as shown in **Figure 3**. In addition, the site borders the Milton Keynes 004 MSOA, which includes the Interchange Park employment estate directly north-west of the proposed development site. It is reasonable to assume that staff would adopt similar travel patterns to existing employees within the Milton Keynes 007 or 004 MSOAs.

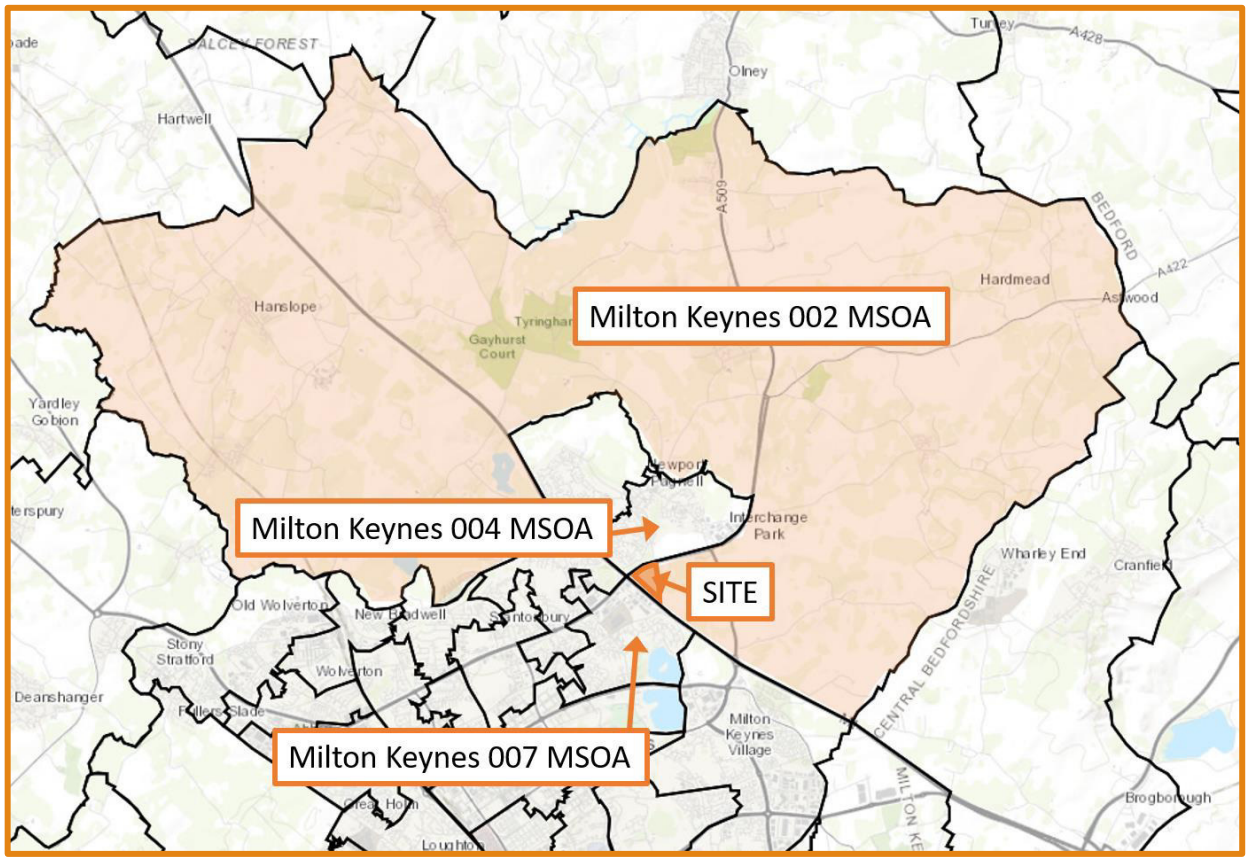


Figure 10: Location of the site in relation to the MSOAs

4.7 Therefore, the data for all three MSOAs was examined to identify how people working in the MSOA travel to/within it. A copy of the Census data is contained in **Appendix I**, and the modal splits are summarised below.

Trip type	MSOA 002	MSOA 004	MSOA 007	Proposed *
on foot	5.23%	12.29%	3.00%	7.64%
bicycle	1.83%	2.95%	2.64%	2.80%
bus	2.36%	2.83%	2.85%	2.84%
train	1.25%	0.48%	0.67%	0.57%
motorcycle/moped	1.22%	0.76%	0.61%	0.69%
car driver	81.58%	74.98%	84.36%	79.67%
passenger	5.80%	5.34%	5.43%	5.38%
taxi	0.72%	0.38%	0.38%	0.41%
total	100.0%	100.0%	100.0%	100.0%

**average of MSOA 004 and 007*

4.8 Given the location of the site, it is considered appropriate to use the modal split date for MSOA 007 or 004. Therefore, an average of these two MSOAs has been adopted for the proposed modal split. This gives a good indication of the likely travel patterns at the development. The actual travel patterns would be influenced and monitored as part of the Travel Plan process at the development, with the aim to increase the proportion of trips by sustainable modes and reduce the proportion of trips by single occupancy car travel.

4.9 The resultant person trip generation of the proposed employment development is shown in the table below and is based on the light vehicle traffic generation from the table at paragraph 4.3, on the basis that the HGV mode cannot be changed as the transportation of its cargo is the primary purpose of an HGV trip. The daily person trip generation for the development is provided at **Appendix H**.

person trips – total development								
	on foot	bicycle	bus	train	motorcycle	car driver	passenger	taxi
	7.64%	2.80%	2.84%	0.57%	0.69%	79.67%	5.38%	0.41%
AM peak	10	4	4	1	1	108	7	1
PM peak	14	5	5	1	1	147	10	1
Daily	164	60	61	12	15	1,706	115	9

Impact of additional person trips on the sustainable travel infrastructure

4.10 The proposed development is forecast to generate up to 14 pedestrian trips, 5 cycle trips, and 5 public transport trips during the highway peak hours. Over the day, it is forecast to generate 164 pedestrian trips, 60 cycle trips, and 73 public transport trips.

4.11 Section 2 details the existing accessibility of the site, including a description of the existing pedestrian, cycle and public transport infrastructure. Section 3 details the sustainable travel infrastructure that will be provided as part of the development, including internal footways and cycle parking, the provision of a new Redway along Willen Road between Newport Pagnell and Milton Keynes, and new bus stops with real time information on Willen Road with signal-controlled crossings at the site access junction providing safe and direct access them.

4.12 **Figure 11** summarises the forecast development person trip demand for travel by bus throughout the day based on the forecast modal split. The demand for travel by bus is greatest during the day, when the existing C10 service provides an hourly frequency service between Milton Keynes and Newport Pagnell. During this period the proposed development is forecast to generate a maximum hourly demand of between 2 and 5 two-way person trips by bus. This is insufficient additional demand to trigger an enhanced bus service frequency as the demand could be accommodated by the existing hourly service. In the evening, the existing 2000 hours to midnight hourly frequency Route 1 service would accommodate the forecast 1 to 2 two-way person trips demand for travel by bus.

4.13 This would leave just the early morning shifts at the development that would not be covered by a bus service. The future operating times and shift change times of the end occupiers of the proposed development are not yet known. Therefore, it is a requirement of the Framework Travel Plan that each occupier investigate the feasibility of providing a private bus service to cover the early morning shift change, should it be demonstrated that there is sufficient demand.

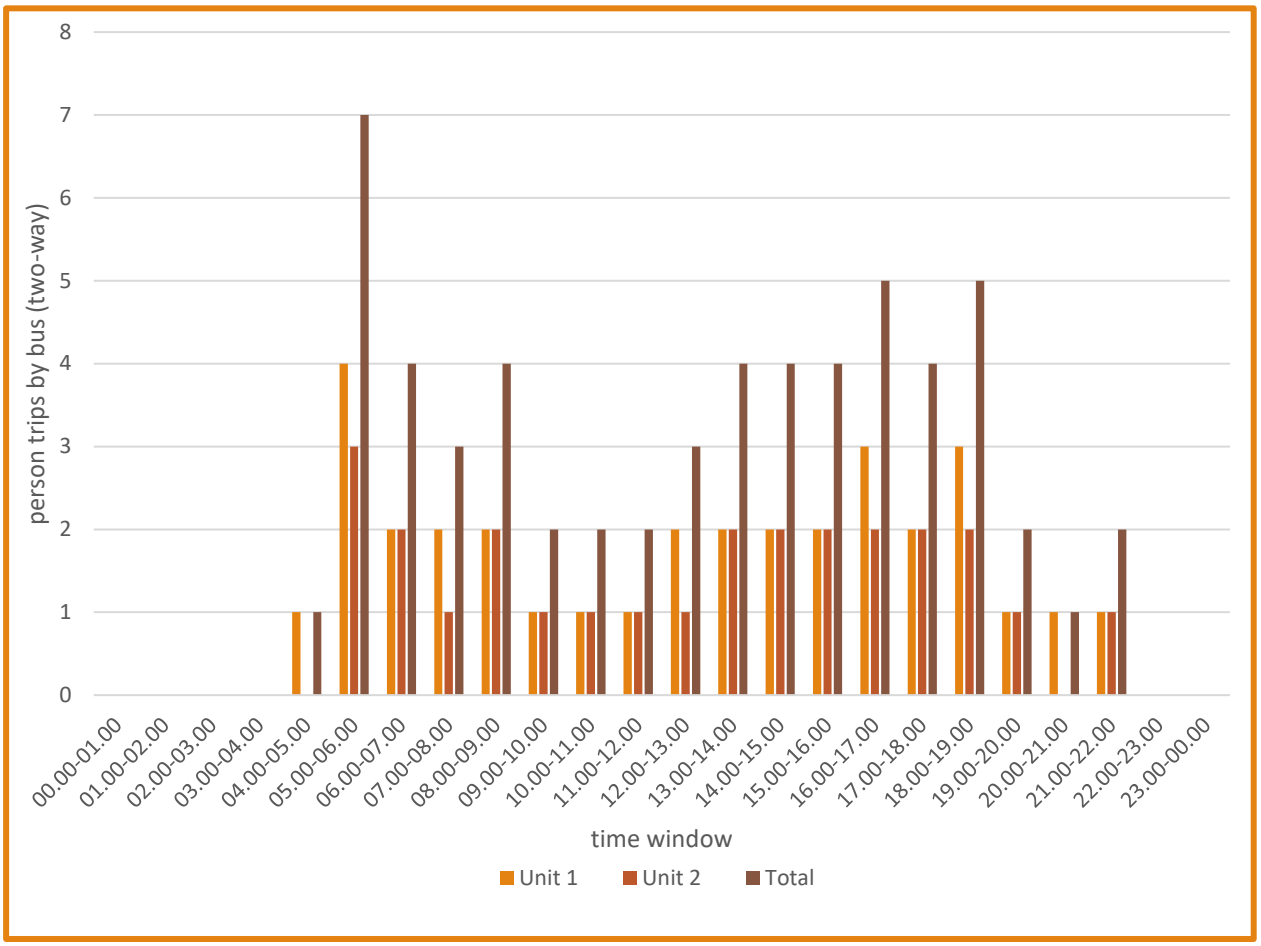


Figure 11: person trips by bus

4.14 It is therefore concluded that the existing and proposed infrastructure has the capacity to accommodate the additional trips made on foot, by cycle and public transport, and no further infrastructure is required as part of the development proposals.

5.0 VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

Light vehicles (staff and visitors)

5.1 As detailed in the Scoping Report, the forecast light vehicle distribution pattern is based on 2011 Census data for the Milton Keynes 007 MSOA. This approach is appropriate given that new employees within the development would display similar travel patterns to existing employees in the area. This methodology was agreed by both MKC Highways and Highways England.

5.2 However, whilst both MKC Highways and Highways England approved the distribution of traffic that was presented in the Scoping Report, both commented on the likely assignment of traffic travelling to and from the M1 at Junction 14. It is forecast that 29.9% of the development light vehicles would route to and from the M1. Both MKC Highways and Highways England noted that it would be reasonable to assume that northbound drivers on the M1 travelling to the site would turn left at the M1 Junction 14 and approach the development via Northfield Roundabout and Tongwell Street, whilst southbound drivers on the M1 would turn left onto the A509 and A422, i.e. they would not turn right and circulate around the M1 Junction 14. Similarly, vehicles departing the site and wishing to travel northbound on the M1 would route via Tongwell Street and the Northfield Roundabout, whilst vehicles departing and wishing to travel southbound on the M1 would use the A422 and A509, i.e. they would not circulate around the M1 Junction 14 and would take the first left-turn. Therefore, the distribution of traffic to and from the M1 used reflects this.

5.3 **Diagram 3** shows the resultant distribution pattern of the traffic generated by the proposed development. The development light vehicle traffic was assigned to the highway network in accordance with the distribution pattern shown in **Diagram 3**. The resultant morning and evening peak hour development light vehicle traffic assignment is shown in **Diagrams 4 and 5** respectively.

HGVs

5.4 As agreed with both MKC Highways and Highways England as part of the Scoping Report, the distribution pattern for HGV assumes 40% routing to/from the M1(N), 40% routing to/from the M1(S), 10% routing along the A509 (E) and 10% routing along the A422(W). The route taken to and from the M1 is consistent with MKC Highways and Highways England comments, as detailed in Section 5.2 above.

5.5 The HGV distribution pattern is also shown in **Diagram 3**. The resultant morning and evening peak hour development HGV assignment is shown in **Diagrams 4 and 5** respectively.

6.0 ASSESSMENT TRAFFIC FLOWS

6.1 As detailed in Section 2, and **Figure 5**, the agreed study area junctions comprise:

1. A422/A509 (Tickford Roundabout)
2. A422/Willen Road (Marsh End Roundabout)
3. Willen Road/Dansteed Way (Tongwell Roundabout)
4. A509/Tongwell Street/V11 (Pineham Roundabout)
5. A509/H6 Childs Way/A5130 Fen Street (Northfield Roundabout)
6. M1 Junction 14.

Study area

6.2 As detailed in Section 2, traffic counts were undertaken at study area junctions 1 to 4 on Tuesday 18 October 2016. A traffic count was undertaken at study area junctions 5 and 6 on 15 May 2018. The observed 2016 and 2018 morning and evening peak hour traffic flows are shown in **Diagrams 1 and 2**.

Assessment periods

6.3 This TA uses the observed highway network peak hours of 0745 to 0845 hours and 1700 to 1800 hours for junction 1 to 4 and 0730 to 0830 hours and 1700 to 1800 hours for junctions 5 and 6, as detailed in Section 2.

6.4 MKC Highways previously raised concerns that the development traffic associated with a B8 unit may generate a peak traffic generation around 0600 hours, at the start and end of a shift. The proposed development would generate a peak traffic generation between 0500 and 0600 hours. However, as **Figure 12** demonstrates, the background traffic flows on Willen Road are significantly lower during those hours at the start and end of a morning shift and hence the local highway network would have the capacity to accommodate the development traffic at its peak generation with ease. Hence, the development peak hour periods of 0800 to 0900 hours and 1700 to 1800 hours will be used in the capacity assessments to understand the capacity of the local highway network during the busiest periods.

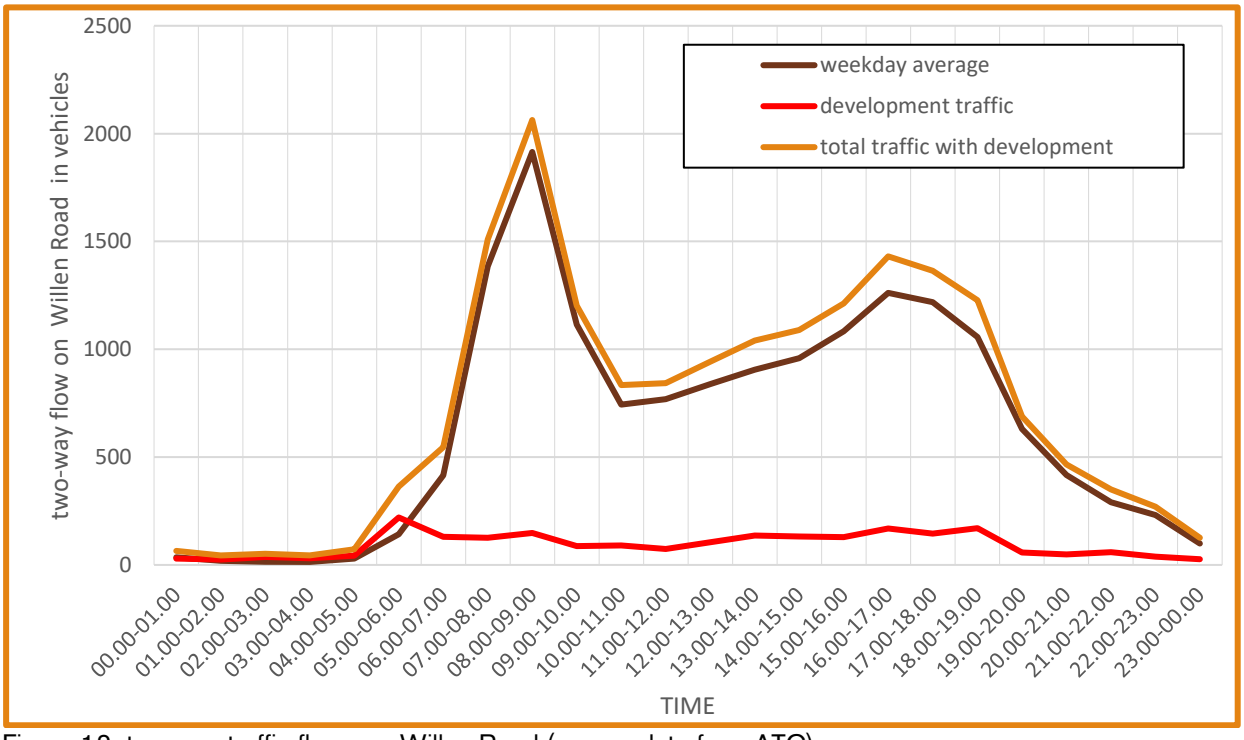


Figure 12: two-way traffic flows on Willen Road (source date from ATC)

Assessment years

6.5 It was agreed with MKC Highways as part of the Scoping Report to use 2026 as the assessment year within the TA for assessment of the local road network.

6.6 In their response to the Scoping Report, and in accordance with DfT Circular 02/2013, Highways England requested an assessment of the impact of the development traffic in the opening year and noted that *"any mitigation measures that are identified for the SRN should be based on this opening year assessment."* Due to the interactions between M1 Junction 14 and the Northfield Roundabout (study area junctions 5 and 6), it is necessary to model the operation of these junctions in a single network.

6.7 In addition, Highways England requested an assessment in 2031 as their forward planning year, to coincide with the end of the Local Plan period.

Committed development

6.8 As part of the Scoping Report, MKC Highways agreed that it is not necessary to add in additional traffic associated with specific committed developments, and that the use of the TEMPRO growth to the future assessment year was acceptable.

6.9 As part of their response to the Scoping Report, Highways England requested that the TA clarifies how much of the identified committed development at the Northern Expansion Area (Redhouse Park) and the Eastern Expansion Area was built out prior to the traffic surveys and how much is still to be built out. HE noted that *"depending on the remainder to be built out, further consideration of the point of impact of the committed developments on individual junctions may need to be undertaken."*

6.10 The Planning Officer at MKC was therefore contacted to gain information on the housing and employment trajectories for the sites within the Northern and Eastern Expansion Areas, and the information provided is summarised in the table below.

	planning application	outline consented development	quantum completed and occupied by 2017 traffic surveys	amount remaining
Redhouse Park	04/01174/MKPCO	• 435 dwellings • 3000sqm C3/B1 live-work units • 150sqm D1 community building	Completed	0%
Broughton	04/01069/MKPCO	• approx. 1400 dwellings	2676 (incl Atterbury)	n/a
Brooklands	06/00220/MKPCO	• up to 2501 dwellings, commercial centre, hotel, three schools	1129	55%
Magna Park	04/01072/MKPCO	• 236000sqm B8 • 79,000sqm B2 Total 315,000sqm	• 14,255sqm B1a, • 9,814sqm B2, • 275,038sqm B8 and 3,711sqm plant Total 302,818sqm	3.8%

6.11 As shown, Redhouse Park within the Northern Expansion Area, was complete by the time of the 2017 traffic counts. The Broughton Gate and Magna Park developments were largely complete by the time of the 2017 traffic counts. Only the Brooklands development has a substantial amount of incomplete development.

6.12 The TA for the Brookland scheme identified that the Brookland development would add 79 and 95 morning and evening peak hour traffic movements through M1 Junction 14. Applying a conversion factor to reflect the remaining 55% of development still to be built out, and thus not already included in the background traffic flows, equates to 43 and 52 trips through the junction in each of the peak hours. There is no information available on the distribution of these trips within the Brookland TA, but assuming that they distribute to the north (A509) and the east (M1 south) and west (M1 north), there would be a minimal increase (around 14 to 17 trips in the morning and evening peak) in traffic on the individual arms of the junction. Therefore, it is considered that the use of TEMPRO growth rates is sufficient to represent the committed development traffic growth and there is no need to include site specific traffic flows. This approach was agreed by Highways England in their response to the hybrid planning application.

2026 assessment year traffic flows

6.13 The observed 2016 and 2018 traffic flows at the study area junctions were factored to 2026 levels using growth factors from TEMPRO (version 7.2, dataset 72), which includes links to the National Traffic Model. The growth rates for 'all roads' in the Milton Keynes 002 MSOA are shown in **Appendix J** and are as follows:

- 2016 to 2026 (AM) 1.1721
- 2016 to 2026 (PM) 1.1796
- 2018 to 2026 (AM) 1.1344
- 2018 to 2026 (PM) 1.1411

6.14 These growth rates were applied to the observed traffic flows, and the resultant '2026 background' traffic flows are shown in **Diagrams 6 and 7**.

6.15 The proposed development traffic flows, shown in **Diagrams 4 and 5** for the morning and evening peak hours, were added to the 2026 background traffic flows shown in **Diagrams 6 and 7**. The resultant '2026 with development' traffic flows are shown in **Diagrams 8 and 9** for the morning and evening peak hours respectively.

2020 and 2031 assessment year traffic flows

6.16 The observed 2016 and 2018 traffic flows were factored to the opening year of 2020, using the following TEMPRO growth rates for all roads in the Milton Keynes 002 MSOA:

- 2016 to 2020 (AM) 1.0665
- 2016 to 2020 (PM) 1.0674
- 2018 to 2020 (AM) 1.0322
- 2018 to 2020 (PM) 1.0326

6.17 The resultant '2020 background' traffic flows are shown in **Diagrams 10 and 11**.

6.18 The observed 2018 traffic flows for M1 Junction 14 and the Northfield Roundabout were also factored to the forward planning year of 2031, using the following TEMPRO growth rates for all roads in the Milton Keynes 002 MSOA:

- 2018 to 2031 (AM) 1.1867
- 2018 to 2031 (PM) 1.1999

6.19 The resultant 2031 background traffic flows at M1 Junction 14 and the Northfield Roundabout are shown in **Diagrams 12 and 13**.

6.20 The above growth rates are provided in **Appendix J**. As shown the growth rates for 'all roads' are higher than the growth rates for 'urban trunk' and 'urban principle' roads. Hence the resultant traffic flows are robust.

6.21 The proposed development traffic flows shown in Diagrams 4 and 5 for the morning and evening peak hours, were added to the 2020 background traffic flows shown in Diagrams 10 and 11 for M1 Junction 14 and the Northfield Roundabout. The resultant morning and evening '2020 with development' traffic flows at M1 Junction 14 and the Northfield Roundabout are shown in **Diagrams 14 and 15**.

6.22 The proposed development traffic flows shown in Diagrams 4 and 5 for the morning and evening peak hours, were added to the 2031 background traffic flows shown in Diagrams 12 and 13 for M1 Junction 14 and the Northfield Roundabout. The resultant morning and evening '2031 with development' traffic flows at M1 Junction 14 and the Northfield Roundabout are shown in **Diagrams 16 and 17**.

7.0 HIGHWAY IMPACT

Introduction

7.1 This Section details the results of capacity assessments undertaken at the agreed study area junctions. Study area junctions 1 to 4 and the site access are assessed using the '2026 background' and the '2026 with development' scenario traffic flows. The M1 Junction 14 and Northfield Roundabout are assessed as a network, using the opening year '2020 background', '2020 with development' and forward planning year '2031 background' and '2031 with development' scenario traffic flows.

Traffic increases

7.2 As part of the Scoping Report MKC Highways requested that the impact of the development traffic on the highway network be quantified in the opening year. The table below therefore presents a comparison of the two-way traffic flows on the arms of each of the study area junctions in the 2020 background scenario, together with the development traffic forecast to use each arm, and the resultant percentage change on each arm.

		AM peak hour			PM peak hour		
		2020 background	development traffic	% increase	2020 background	development traffic	% increase
J1 Tickford Roundabout	A422 (W)	3195	44	1.4%	3195	52	1.6%
	B526 (N)	1322	1	0.1%	1221	2	0.2%
	A509 (E)	2654	12	0.5%	2779	14	0.5%
	A509 (S)	1336	31	2.3%	1961	36	1.8%
	TOTAL	**4248**	**44**	**1.0%**	**4578**	**52**	**1.1%**
J2 Marsh End Roundabout	A422 (W)	2527	25	1.0%	2895	33	1.1%
	Willen Rd (N)	1546	6	0.4%	1668	7	0.4%
	A422 (E)	3106	44	1.4%	3166	52	1.6%
	Willen Rd (S)	2087	75	3.6%	1421	92	6.5%
	TOTAL	**4633**	**75**	**1.6%**	**4575**	**92**	**2.0%**
J3 Tongwell Roundabout	Willen Rd (N)	2129	71	3.3%	1395	88	6.3%
	Willen Rd (S)	1722	46	2.7%	1377	54	3.9%
	Dansteed Way	2075	25	1.2%	1210	34	2.8%
	Michigan Drive	286	0	0.0%	676	0	0.0%
	TOTAL	**3106**	**71**	**2.3%**	**2329**	**88**	**3.8%**
J4 Pineham Roundabout	A509 (W)	2530	3	0.1%	2367	5	0.2%
	Tongwell St (N)	1826	46	2.5%	1509	54	3.6%
	A509 (E)	2680	32	1.2%	2428	35	1.4%
	V11 (S)	1780	11	0.6%	1608	14	0.9%
	TOTAL	**4408**	**46**	**1.0%**	**7912**	**54**	**0.7%**
J5 Northfield Roundabout	A509 (W)	2755	32	1.2%	2445	35	1.4%
	A509 (N)	5156	32	0.6%	4695	35	0.7%
	Fen St	1208	0	0.0%	1240	0	0.0%
	Childs Way	2709	0	0.0%	2300	0	0.0%
	TOTAL	**5914**	**32**	**0.5%**	**5340**	**35**	**0.7%**
J6 M1 Junction 14 Roundabout	M1N (SB diverge)	1618	23	1.4%	996	12	1.2%
	M1N (NB merge)	971	9	0.9%	1491	23	1.5%
	A509 (N)	1922	31	1.6%	2263	35	1.5%
	M1S (NB diverge)	1751	23	1.3%	1039	12	1.2%
	M1S (SB merge)	860	8	0.9%	1354	23	1.7%
	A509 (S)	5182	32	0.6%	3716	35	0.9%
	Total	**6152**	**63**	**1.0%**	**5921**	**70**	**1.2%**

7.3 As shown, the increase in traffic as a result of the development at study area junctions is relatively low, and well within the typical day to day variation of traffic flows. Only Willen Road, to the north and south of the site access, and therefore junction 2 (Marsh End Roundabout) and junction 3 (Tongwell Roundabout) would experience what could be considered more material increases in traffic compared to the background traffic flow.

7.4 It is recognised that the local road network currently experiences peak hour congestion, which will be exacerbated by future traffic growth. Therefore, whilst the development traffic is shown to have only a small impact at the study area junctions, and on an individual basis does not result in a severe impact, a number of these junctions are already congested, and it is recognised by the Applicant that when the individual impacts are considered cumulatively there is a more compelling case for intervention to improve the operation of the local highway network as part of the development proposals.

7.5 As part of the Scoping Report it was agreed with MKC Highways that the approach to the assessment of the development traffic impact, and providing highway mitigation, should be to provide a single comprehensive mitigation package at the Marsh End Roundabout, where the Applicant has control of land to provide a meaningful highway improvement, instead of providing a series of minor junction improvements at each of the study area junctions.

7.6 MKC Highways confirmed that the principle of traffic signal control at the Marsh End roundabout was acceptable and in keeping with the findings of an earlier study of the A422 corridor undertaken on their behalf.

7.7 In accordance with the above strategy this section of the TA therefore presents the capacity assessment of each of the study area junctions, to allow the development impacts to be quantified. The proposed improvement to the Marsh End Roundabout, in combination with the proposed site access signal junction is also presented.

Junction 1: Tickford Roundabout

7.8 The existing junction layout is shown in **Figure 13** below.

Figure 13: existing Tickford Roundabout

7.9 A model of the junction was created using Junctions 8 ARCADY and tested with the '2026 background' and '2026 with development' traffic flows using the 'one hour' traffic profile function. The results are summarised in the table below, and the ARCADY measurements and outputs are contained in **Appendix K**.

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)
	Existing layout - 2026 background							
Arm A	1.54	4.31	0.61	83.13	251.55	461.39	1.27	202.07
Arm B	3.31	13.23	0.77		3.90	27.00	0.81	
Arm C	14.95	26.94	0.95		1.41	3.53	0.59	
Arm D	101.03	434.40	1.36		15.69	45.79	0.96	
	Existing layout - 2026 with dev							
Arm A	1.58	4.37	0.62	98.88	277.01	518.27	1.29	229.31
Arm B	3.41	13.66	0.78		4.02	27.85	0.81	
Arm C	17.59	31.36	0.96		1.45	3.63	0.59	
Arm D	118.65	509.07	1.43		20.04	56.49	0.98	

Arm A = A422 (W), Arm B = B526 (N), Arm C = A509 (E), Arm D = A509 (S)

7.10 In the 2026 background scenario, the junction is forecast to operate above the 85% RFC in both the morning and evening peak hours. In the morning peak hour, the A509 (E) is overcapacity with slight queueing (15 vehicles) and delay (27 seconds), although given the distance between the roundabouts (three lanes of 77 metres), the queue would not block back to the A509/Renny Park Road roundabout. The A509 (S) arm is also forecast to operate above the 85% RFC, with long queues (101 vehicles) and delays. In the evening peak hour, the A422 (W) is significantly overcapacity, with long queues (252 vehicles) and delay, whilst the A509(S) also has slight queues (16 vehicles) and delay.

7.11 The proposed development adds traffic through the junction, which exacerbates the queue lengths and delay on the sensitive arms.

7.12 However, as shown in the table below, the increase on each entry arm is minor. In the morning peak hour, the main impact is on the A509 (S) where the development would add 23 vehicles. Due to the existing congestion, this would join the existing queue, which would increase by 18 vehicles, to 124 vehicles. In the evening peak hour, the main impact is on the A422 (W) where the development would add 35 vehicles. This is an average increase of approximately 1 vehicle every two minutes. However, due to the existing congestion at the junction, the development traffic would join the existing queue, which would increase by 26 vehicles with the delay increasing by 57 seconds.

		traffic flow on arm entry in vehicles			
		A422 (W)	B526 (N)	A509 (E)	A509 (S)
AM	2026 background	1177	837	1931	704
	Total development	11	1	9	23
PM	2026 background	2073	496	1307	1177
	Total development	35	0	5	12

7.13 These relatively modest traffic increases do not cause a severe impact in the context of the existing congestion at the junction, and therefore in accordance with NPPF and the highway mitigation strategy agreed with MKC Highways, no mitigation measures are proposed at this location.

Junction 2: Marsh End Roundabout and site access

7.14 The existing Marsh End Roundabout layout is shown in **Figure 14** below.

Figure 14: existing Marsh End Roundabout

7.15 The junction is a four-arm priority-controlled roundabout. A model of the junction was created using Junctions 8 ARCADY and tested with the '2026 background' and '2026 with development' traffic flows the 'one hour' traffic profile function. The results are summarised in the table below, and the ARCADY measurements and outputs are contained in **Appendix L**.

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)
	Existing layout - 2026 background							
Arm A	1.66	4.52	0.63	438.73	169.39	339.34	1.17	259.68
Arm B	181.57	653.66	1.42		94.20	617.15	1.28	
Arm C	348.13	695.33	1.27		2.59	5.89	0.72	
Arm D	2.01	11.14	0.67		81.38	245.19	1.16	
	Existing layout - 2026 with dev							
Arm A	1.77	4.75	0.64	497.36	168.70	341.70	1.17	290.71
Arm B	202.68	744.28	1.47		105.70	692.69	1.31	
Arm C	389.70	791.50	1.30		2.76	6.19	0.74	
Arm D	2.16	11.69	0.69		120.66	353.17	1.25	

Arm A = A422 (W), Arm B = Willen Rd (N), Arm C = A422 (E), Arm D = Willen Rd (S)

7.16 In the 2026 background scenario, in the morning peak hour Willen Road (N) and the A422 (E) arms are operating above 100% of their capacity, largely due to traffic travelling towards Milton Keynes. In the evening peak hour, the A422 (W), Willen Road (S), and Willen Road (N) are all forecast to operate above 100% of capacity.

7.17 The proposed development would add an additional 75 two-way vehicle movements through the junction in the morning peak hour and 92 two-way vehicle movements through the junction in the evening peak hour. Whilst the impact on the queue length and delay on all arms in the morning peak hour is not severe in the context of the existing congestion, the impact on Willen Road (S) approach to the junction in the evening peak hour would result in an increase in the queue length, increasing from 81 to 121 vehicles, and the delay increasing by 108 seconds to 353 seconds. This would also impact on the operation of proposed development site access junction. Therefore, improvements are required at the Marsh End Roundabout to ensure safe and satisfactory vehicle access to the development site.

Proposed mitigation at Marsh End Roundabout

7.18 Whilst impacts at the Marsh End Roundabout are relatively modest, it was agreed with MKC Highways that since the developer has control over land to the south of the junction which could be used to assist in the delivery of a substantive improvement, works to mitigate the wider impact of the proposed development should be focused at the Marsh End Roundabout in lieu of a series of minor improvement schemes at other study area junctions.

7.19 Therefore, a comprehensive improvement scheme has been designed to provide a better than nil detriment improvement in junction performance. The mitigation proposals include the following:

- significant enlargement of the junction to the south;
- the introduction of traffic signal control on all four arms;
- widening on the A442 eastbound and westbound approaches to increase the length of the three-lane sections;
- provision of Toucan crossings on the A442 arm to the east of the junction as part of the proposed new Redway;
- significant widening on the Willen Road (N) arm, including the provision of the new Redway on the eastern side; and
- significant widening of the Willen Road (S) arm to provide two full lanes northbound and southbound between the Marsh End Roundabout and the proposed site access junction, along with provision of the new Redway route.

7.20 The proposed improvement scheme is shown on PBA Drawing 38748-100-008 Rev A provided at **Appendix E**. The junction would operate a MOVA (microprocessor optimised vehicle actuation) control system.

Site access

7.21 As discussed in Section 3, the proposed development would be accessed via a traffic signal-controlled T-junction on Willen Road, with the site access forming the minor arm. The proposed access arrangement is shown on PBA Drawing 38748-100-007 Rev A in **Appendix E.**

7.22 The junction is designed in accordance with DMRB TD50/04 and includes two northbound and two southbound lanes on Willen Road, along with an appropriate right-turn lane into the development. Toucan crossing facilities would be provided across the site access arm and Willen Road to facilitate trips across along the new Redway and provided access to the new bus stops. A demand for the Toucan crossing at the site access (phase I) or Willen Road south (phase G) would call an all-red stage for traffic during which the Willen Road north Toucan crossing would also be green.).

7.23 The junction would operate with six stages described as follows:

- Stage 1 – Willen Road northbound and southbound.
- Stage 2 – Willen Road southbound and right turn into the proposed development.

- Stage 3 – All-red (site access and Willen Road Toucan crossings).
- Stage 4 – Site access.

7.24 The proposed site access junction would operate a MOVA control system which would be linked to the Marsh End Roundabout so that queueing between the two junctions could be controlled such that 'blocking back' does not occur.

Modelling and Results

7.25 The site access junction would be located approximately 200 metres south of the Marsh End Roundabout. Such a separation distance would normally be considered sufficient to assess these junctions in isolation, as platoons would have sufficient time to disperse. However, in this case the junctions have been considered together as a network so that the interactions can be understood and any issues due to queueing between the junctions can be identified.

7.26 The proposed site access junction and the proposed Marsh End Roundabout have been modelled as a network using LinSig version 3.2.40. The LinSig model is intended for use as an assessment tool and is based upon the design geometry and traffic flows for the '2026 with development' morning and evening peak hour scenarios given at **Diagrams 8 and 9**. For convenience, these flows are shown represented as the 'site access and Marsh End Roundabout LinSig network' in **Appendix M**.

7.27 The LinSig results, provided at **Appendix M** and summarised in the table below, show that proposed site access junction would operate acceptably in all modelled scenarios. Practical reserve capacity (PRC) values are positive indicating that all links are operating below 90% of their capacity.

Site access and Marsh End Roundabout LinSig results					
Scenario		Practical Reserve Capacity (%)		Total Delay (pcuHr)	
		Site access	Marsh End	Site access	Marsh End
2026 with development	AM	15.6%	-2.9%	10.3	54.4
	PM	33.6%	-7.4%	11.3	74.1

7.28 The above table shows that the Marsh End Roundabout would operate above capacity in both the 2026 morning and 2026 evening peak hours with the development in place (PRC values are negative indicating that one or more links are operating above 90% of their capacity). However, in the morning peak hour the junction is only marginally above the 90% threshold, with the Willen Road (S) and both A442 approaches to the junction operating acceptably. Only the Willen Road (N) arm would operate with a degree of saturation above 90%. This arm was originally designed to also operate within 90% capacity, but this resulted in a pinch point in the width of the proposed Redway that could be provided alongside the eastern side of the carriageway. The final junction design as proposed has been amended to remove this pinch point, leading to the slight loss in vehicular capacity. Nevertheless, the resulting operation represents a significant improvement in performance when compared to the results for the '2026 background' assessment of the existing junction (reported at paragraph 7.15), with significant performance improvements on the A442 east and Willen Road (N) approaches.

7.29 In the evening peak hour, the proposed improvement scheme would deliver significant improvements to the Willen Road (N), A442 west and Willen Road (S) arms of the junction. There would be little change to the operation of the A442 east arm, which operates acceptably in both the '2026 background and '2026 with development' scenarios in the evening peak hour. Therefore, whilst the A442 west and Willen Road arms would operate above 90% of their

capacity with the proposed scheme in place, traffic on these approaches would experience a reduction in queueing and overall the improvements at the junction would be significant.

7.30 The table below provides a comparison of the forecast queuing at the Marsh End Roundabout between the '2026 background' scenario (with development traffic and the proposed highway mitigation) and the '2026 with development' scenario (with the proposed development traffic and the proposed highway mitigation).

Marsh End Roundabout Queue Comparison							
			Willen Rd (N)	A442 east	Willen Rd (S)	A442 west	Total
2026	AM	Background (in vehs)	181.6	348.1	2.0	1.7	533.4
		With Development (in pcus)	14.6	18.7	9.8	13.8	56.9
2026	PM	Background (in vehs)	94.2	2.6	81.4	169.4	347.6
		With Development (in pcus)	12.3	18.0	18.0	28.6	76.9

7.31 Clearly, the proposed improvement scheme provides significant improvements over the existing arrangement, with total queueing at the junction reducing from 533 vehicles to 57 pcus in the morning peak hour and from 348 vehicles to 77 pcus in the evening peak hour.

7.32 Therefore, the results summarised above show that the proposed improvement scheme at the Marsh End Roundabout would deliver a better than nil detriment improvement to junction performance, mitigating the impact of the development and providing additional capacity back into the network.

Junction 3: Tongwell Roundabout

7.33 The existing junction layout is shown in **Figure 15** below. A model of the junction was created using Junctions 8 ARCADY and tested with the 2026 background' and '2026 with development' traffic flows. Given that the morning peak hour traffic flows on Willen Road already exhibit a significant spike in comparison to the daily flows (**Figure 6**), the direct entry traffic profile function on ARCADY was used. The corresponding direct entry traffic flows are provided are given at **Appendix N**. The results are summarised in the table below, and the ARCADY measurements and outputs are contained in **Appendix N**.

Figure 15: existing Tongwell Roundabout

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)
	Existing layout - 2026 background							
Arm A	27.13	57.17	1.00	38.43	0.83	4.73	0.46	8.15
Arm B	9.50	29.43	0.93		0.94	4.02	0.48	
Arm C	0.74	3.85	0.42		0.99	4.26	0.50	
Arm D	0.08	3.73	0.08		5.39	20.80	0.87	
	Existing layout - 2026 with dev							
Arm A	44.32	87.03	1.03	57.39	1.11	5.50	0.53	8.71
Arm B	15.24	43.62	0.97		1.03	4.31	0.51	
Arm C	0.83	4.12	0.45		1.04	4.40	0.51	
Arm D	0.09	3.89	0.08		5.98	22.77	0.88	

Arm A = Willen Road, Arm B = Tongwell Street, Arm C = Dansteed Way, Arm D = Michigan Drive

7.34 In the morning peak hour in the 2026 background scenario, the Willen Road arm of the junction is forecast to operate above the 85% design threshold RFC, with a queue length of 27 vehicles and a delay of 57 seconds. The Tongwell Street arm of the junction is also forecast to operate above the design capacity, with a ratio of flow to capacity of 93%, and a queue of 10 vehicles and a delay of 29 seconds. This is associated with the high southbound flow into Milton Keynes. In the evening peak hour, these arms and the Dansteed Way arm are forecast to operate acceptable. Although the Michigan Drive arm is forecast to operate slightly over design capacity, at 87% of capacity, the queuing and delay are small.

7.35 With the addition of the development traffic, the operation of Willen Road and Tongwell Street worsens. The development would add 12 vehicles to the Willen Road approach in the morning peak hour, leading to the queue length increasing by 17 vehicles, from 27 to 44 vehicles. The delay increases by 30 seconds, from 57 to 87. The development would add 36 vehicles to

Tongwell Street approach, but the queue length would only increase by 5 vehicles, to 15 vehicles, and the delay would increase by 15 seconds.

7.36 Junction modelling suggests that the impact on Willen Road could be mitigated with minor kerb widening to increase the flare length on the Willen Road approach to the roundabout, thereby allow more traffic through to the give way line. A potential scheme is shown at **Drawing ADC1392-DR-006 Rev P2** provided at **Appendix N**. The proposed minor works increase the flare length on the approach to the roundabout by 2.3 metres and alter the entry radius. The effect of the proposed mitigation scheme has been modelled using Junctions 8 ARCADY and tested with the '2026 with development' traffic flows. The results are summarised in the table below, and the ARCADY measurements and outputs are also contained in **Appendix N.**

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)
	Mitigation Layout - 2026 with dev							
Arm A	22.38	46.93	0.98	39.11	1.02	5.04	0.51	8.60
Arm B	16.93	47.85	0.98		1.03	4.31	0.51	
Arm C	0.83	4.12	0.45		1.04	4.40	0.51	
Arm D	0.09	3.89	0.08		5.98	22.77	0.88	

Arm A = Willen Road, Arm B = Tongwell Street, Arm C = Dansteed Way, Arm D = Michigan Drive

7.37 As shown, the proposed minor works would mitigate the development traffic impact on Willen Road. Nevertheless, it is recognised that the existing roundabout is only forecast to operate overcapacity during the morning peak hour because the high southbound flow on Willen Road during this period. Therefore, it is concluded that, with this context, the development would not generate a severe impact and no mitigation measures should be required. This is also in keeping with the approach agreed with MKC Highways that the development should provide a comprehensive mitigation scheme at the Marsh End Roundabout, rather than a package of minor junction improvements across the study area junctions.

Junction 4: Pineham Roundabout

7.38 The existing junction layout is shown in **Figure 16** below. The junction includes part time traffic signals on the A509 (E) approach arm and the circulatory carriageway. It is not known when the part time signals are in operation and hence the roundabout has been modelled without the benefit of the part time signals, and therefore the assessment represents a robust assessment. The results are summarised in the table below, and the ARCADY measurements and outputs are contained in **Appendix O**.

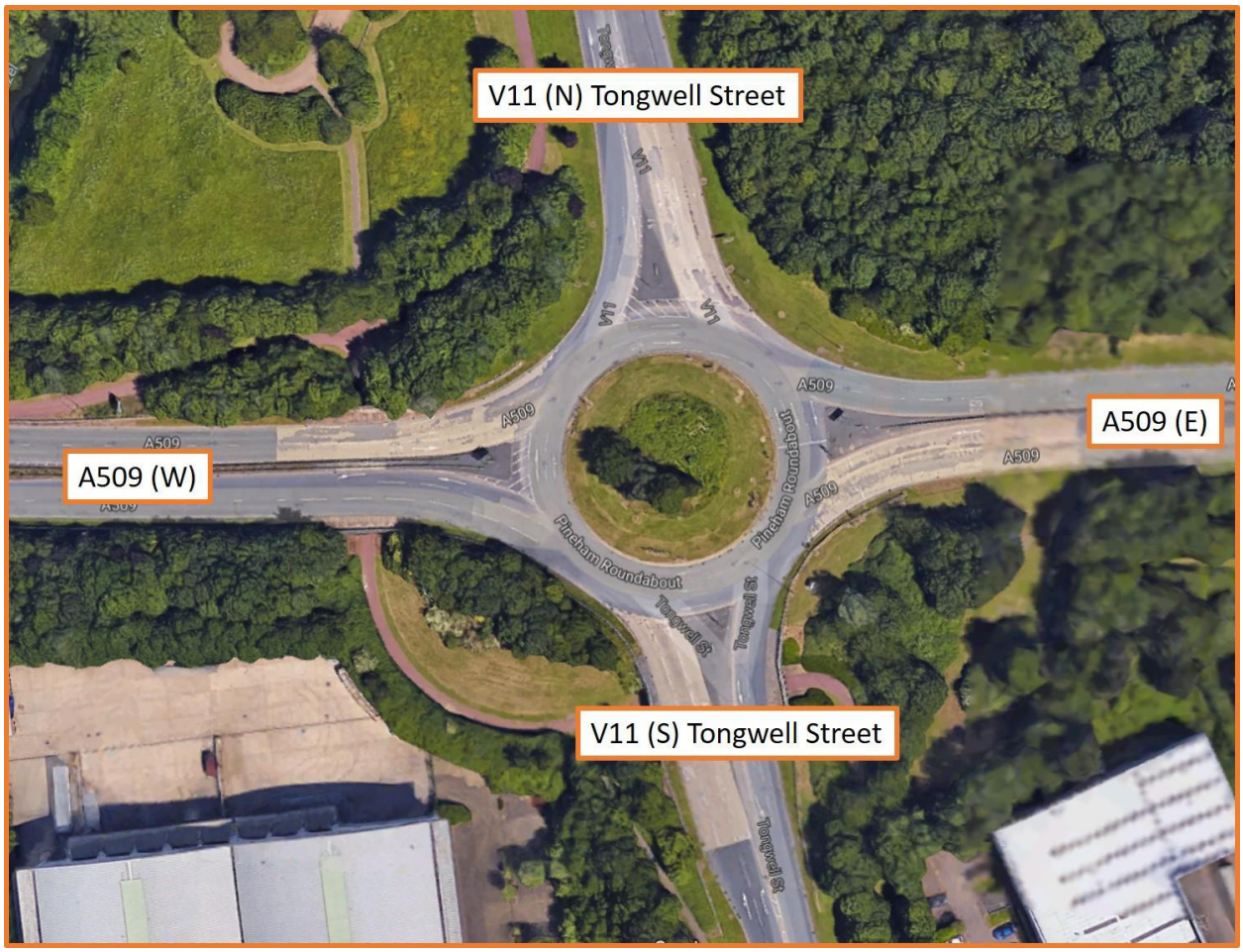


Figure 16: existing Pineham Roundabout

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)	Queue (Veh)	Delay (s)	RFC	Junction Delay (s)
	Existing layout - 2026 background							
Arm A	1.20	3.88	0.55	19.68	1.93	4.68	0.66	3.88
Arm B	0.91	3.22	0.48		0.98	3.79	0.50	
Arm C	23.37	39.75	0.98		0.90	2.72	0.47	
Arm D	2.83	10.61	0.75		1.35	4.14	0.58	
	Existing layout - 2026 with dev							
Arm A	1.25	4.03	0.56	23.78	1.98	4.80	0.67	4.01
Arm B	0.94	3.29	0.48		1.09	4.01	0.52	
Arm C	30.17	49.13	0.99		0.93	2.80	0.48	
Arm D	3.08	11.49	0.76		1.39	4.25	0.58	

Arm A = A509 (W), Arm B = V11 Tongwell St (N), Arm C = A509 (E), Arm D = V11 Tongwell St (S)

7.39 In the 2026 background scenario, all arms for forecast to operate within the 85% design threshold ratio of flow to capacity, with the exception of the A509 (E) in the morning peak hour, which would operate at 98% RFC with a queue of 23 vehicles and a delay of 40 seconds.

7.40 The addition of the development traffic has a minimal impact on the operation of the junction, which continues to operate satisfactorily in both peak hours, with the exception of the A509(E). The queue length on the A509 (E) is forecast to increase by 7 vehicles to 30 vehicles, and the delay would increase by 9 seconds. This is not a severe impact, and no mitigation measures

are required. This is particularly the case given that there are already part-time traffic signals at the junction, which could be used to manage traffic flows during the peak hours.

Junctions 5 and 6: M1 Junction 14 and Northfield Roundabout

7.41 The existing M1 Junction 14 is a grade-separated gyratory over the M1 motorway, as shown on **Figure 17**. M1 Junction 14 provides access from the M1 motorway to both Newport Pagnell to the northwest and Milton Keynes to the south and west.

7.42 Approximately 390 metres to the south of M1 Junction 14, the A509 meets the A5130 and the A4146 Childs Way at the Northfields Roundabout, which is a four-arm signalised gyratory.

7.43 A separation distance of 390 metres would normally be considered sufficient to assess these junctions in isolation, as platoons would have sufficient time to disperse. However, in this case, given the strategic importance of the junctions to both Newport Pagnell and Milton Keynes and also considering the high volumes of peak hour traffic using both junctions, they have been considered together as a network so that the interactions can be captured and understood.

7.44 At M1 Junction 14, the M1 southbound offslip, M1 northbound offslip and the A509 entries are subject to traffic signal control. The A509 London Road approach is priority controlled. The M1 northbound offslip has a segregated left-turn lane allowing traffic to travel south on the A509 towards the Northfields Roundabout unopposed. The junction operates a MOVA control system and therefore the cycle time and green splits are likely to vary. At peak times the junction is acknowledged to suffer from congestion

7.45 To the east of the A509 between M1 Junction 14 and the Northfields Roundabout is a park and ride facility, accessed via a left-in, left-out priority-controlled T-junction.

7.46 Immediately to the southwest of the Northfields Roundabout is a large industrial/commercial estate. Further afield, the Northfields Roundabout provides access to/from Milton Keynes to the south and west via the A4146 Childs Way, and residential and industrial areas to the southwest via the A5130.

7.47 The Northfields Roundabout has an ICD of 80 metres and all four of the approaches are subject to traffic signal control. There are no pedestrian/cycle facilities at the junction, which also operates a MOVA control system. Peak hour traffic volumes at the Northfields Roundabout are very high and as such the junction suffers from congestion, with the A4146 Childs Way particularly effected.

Figure 17: M1 Junction 14 and Northfields Roundabout

7.48 M1 Junction 14 and the Northfields Roundabout have been modelled as a network using LinSig version 3.2.40. The LinSig model is intended for use as an assessment tool and is based upon traffic flows for the '2020 background', '2020 with development', '2031 background' and '2031 with development' scenarios given at **Diagrams 10 to 17**. For convenience, these flows are shown represented as the LinSig model network in **Appendix P**.

7.49 It should be noted that LinSig provides average results based on uniform traffic flows and fixed signal timings and, therefore, does not take into account the advantages afforded by the demand responsive MOVA control system at these junctions. However, the purpose of this

modelling exercise is to demonstrate the impact of the proposed development and therefore, LinSig is an adequate tool in this instance.

7.50 The LinSig results, provided at **Appendix P** and summarised in the table below, show that both M1 Junction 14 and the Northfields Roundabout would operate above their maximum capacity in all modelled scenarios (PRC values are negative indicating that one or more links are operating above 90% of their capacity).

7.51 However, the results show that the development would not have a significant impact on performance of the network and that in terms of PRC, there would be no impact at M1 Junction 14 due to the proposed development in any of the modelled scenarios. The table below also shows that there would only be minor deteriorations to the PRC and total delay at the Northfields Roundabout in the evening peak hour due to the development, with no impact in the morning peak. In the evening peak the PRC deteriorates by 1.3% in 2031 (-46.2% vs -47.5%).

M1 Junction 14 and Northfields Roundabout LinSig results						
Scenario			Practical Reserve Capacity (%)		Total Delay (pcuHr)	
			M1 Junction 14	Northfields	M1 Junction 14	Northfields
2020	AM	Background	-14.4%	-37.8%	50.2	146.9
		With Development	-14.4%	-37.8%	50.8	149.9
	PM	Background	-14.1%	-22.5%	73.9	125.2
		With Development	-7.0%	-25.1%	60.9	140.0
2031	AM	Background	-46.5%	-75.2%	155.7	364.3
		With Development	-46.5%	-76.3%	145.7	370.9
	PM	Background	-14.5%	-46.2%	95.7	352.1
		With Development	-15.2%	-47.5%	106.5	365.0

7.52 To demonstrate that queueing on the slip roads at M1 Junction 14 would not be adversely affected by the proposed development, a comparison between the '2031 background' and 2031 with development' scenarios is provided at the table below.

M1 Junction 14 Queue Comparison (mean max queue)				
			Northbound offslip	Southbound offslip
2020	AM	Background	16.6	15.6
		With Development	16.6	15.7
2020	PM	Background	7.5	9.7
		With Development	7.5	9.7
2031	AM	Background	52.7	33.5
		With Development	52.7	27.1
2031	PM	Background	10.5	19.1
		With Development	10.5	21.9

7.53 The development traffic does not impact on the performance of the slip roads, with no change in queue length on the northbound offslip in either the morning or evening peak hour, and a worst case increase of just 3 PCUs in 2031 on the southbound offslip in the evening peak. Further, all forecast mean max queueing on both the northbound and southbound offslips could be accommodated on the existing and/or the proposed slip roads with the SMP scheme in place.

7.54 Therefore, the results summarised above show that there would be not be a severe impact due to the proposed development and therefore no mitigation is proposed at M1 Junction 14 or the Northfields Roundabout.

Summary

7.55 Overall, the highway network in the vicinity of the site is busy, resulting in the study area junctions being forecast to operate with some congestion and delays in the assessment years. This is particularly the case in the morning peak hour, associated with inbound traffic travelling into Milton Keynes. The increase in traffic due to the development is modest when distributed across the network, and on an individual junction basis does not result in a severe impact at any of the study area junctions. However, improvements are required at the Marsh End Roundabout to ensure safe and satisfactory vehicle access to the development site. It is also recognised by the Applicant that when the individual impacts at the study area junctions are considered cumulatively, there is a case for intervention to improve the operation of the local highway network as part of the development proposals.

7.56 It was therefore agreed with MKC Highways that the approach to the assessment of the development traffic impact, and providing highway mitigation, should be to provide a single comprehensive mitigation package at the Marsh End Roundabout, where the Applicant has control of land to provide a meaningful highway improvement, instead of providing a series of minor junction improvements.

7.57 As a result, a comprehensive mitigation scheme is proposed at the Marsh End Roundabout. The improved junction will operate in conjunction with the proposed site access junction, to improve traffic flows and journey times through the area and along Willen Road. MKC Highways confirmed that the principle of traffic signal control at the Marsh End Roundabout was acceptable and in keeping with the findings of an earlier study of the A422 corridor undertaken on their behalf.

7.58 In accordance with the above strategy this section of the TA has therefore presented the capacity assessment of each of the study area junctions, to allow the development impacts to be quantified.

8.0 SUMMARY AND CONCLUSIONS

8.1 This Transport Assessment (TA) has been prepared by ADC Infrastructure Limited on behalf of SEGRO (Newport Pagnell) Ltd to support their detailed planning application for new employment development on land at Caldecote Farm, to the west of Willen Road, in Newport Pagnell.

8.2 The site forms part of a much larger area of land proposed to be allocated within the adopted Plan:MK for a mixed residential and employment strategic urban extension. Policy SD12 – Milton Keynes East allocates the land for residential development and employment uses. The type of development proposed under the planning application therefore falls within the employment aspects of this adopted policy.

8.3 ADC Infrastructure have been in consultation with MKC, as the local highway authority, and Highways England regarding this site for a number of years. This included the submission of a previous TA and Framework Travel Plan for the site in July 2018. The previous TA and Framework Travel Plan supported a hybrid planning application (Ref 18/01719/FUL) for one large B8 warehouse unit (46,530sqm) with ancillary office use and an enterprise park comprising 28,520sqm of B1(b) research and development and B1(c)/B2 industrial uses, with some ancillary use. The B8 use was a full application and the enterprise park was an outline application.

8.4 MKC Highways provided their observations on the hybrid planning application on 10 August 2018. That confirmed that MKC Highways had no objection to the hybrid planning application subject to conditions. Highways England also provided their response to the hybrid planning application in their recommendations to the planning authority dated 28 September 2018. This confirmed that Highways England also had no objection to the hybrid planning application subject to conditions.

1.13 Notwithstanding the above, the hybrid planning application was withdrawn in September 2018. There continues however to be significant interest in the site from operators and therefore, in consultation with the planning authority, a revised detailed planning application is to be made. The detailed development proposals comprise the construction of two storage and distribution units (Class B8) with associated car parking, servicing, landscaping, earth bunding and off-site drainage. The two B8 warehouse units would have a total GFA of 81,361sqm (875,763sqft), including 4,583sqm of ancillary office space.

1.14 This report presents the TA for the revised scheme. It has been prepared to support the planning application. This TA is presented as a standalone document, although given the similarity to the previous application, it retains the same study area, B8 trip rates, trip distribution, and highway mitigation strategy as previously agreed with MKC Highways and Highway England.

8.5 Access to the development would be via a new signal-controlled junction on Willen Road. It should be noted however that the position of the proposed signal-controlled site access junction on Willen Road has been amended in comparison to the hybrid planning application in response to concerns expressed by the residents of the properties of Caldecote Farm with regard to the formation of a new crossroads junction, with regard to potential noise and lighting impacts.

8.6 The site location provides excellent opportunities to access both the local road network within Newport Pagnell and Milton Keynes, and the strategic road network via the M1 Junction 14. There are opportunities for pedestrian and cycle travel, with a number of residential areas within walking and cycling distance. The development would provide a new Redway (footway/cycleway), connecting to Newport Pagnell to the north, and the existing H4 Redway

Super Route in Milton Keynes to the south. The new Redway would facilitate safe pedestrian and cycle travel to the site, providing a new facility for existing pedestrians and cyclists wishing to walk and cycle between Newport Pagnell and Milton Keynes, where there is currently no infrastructure provided along the Willen Road corridor.

8.7 There are opportunities for public transport travel, including both bus and rail. Route C10 provides a regular bus service running past the site at an hourly frequency throughout the day, and Route 1 provides an hourly service passed the site in the evenings and on Sundays. As part of the proposed development new bus stops would be provided on Willen Road.

8.8 There are five train stations within the Milton Keynes area, with Milton Keynes Central being the main station. Milton Keynes Central is just beyond a 5km cycling distance of the proposed development site. However, both bus services Route 1 and C10 travel via the train station. Therefore, there are opportunities for rail travel as part of a multi-modal journey by cycle, bus or taxi.

8.9 The proposed development is forecast to generate up to 14 pedestrian trips, 5 cycle trips, and 5 public transport trips during the highway peak hours. Over the day, it is forecast to generate 164 pedestrian trips, 60 cycle trips, and 73 public transport trips. The actual travel patterns would be influenced and monitored as part of the Travel Plan process at the development, with the aim to increase the proportion of trips by sustainable modes and reduce the proportion of trips by single occupancy car travel. However, it is concluded that the existing and proposed infrastructure has the capacity to accommodate the additional trips made on foot, by cycle and public transport, and no further infrastructure is required as part of the development proposals. A Travel Plan for the development is presented in a separate document.

8.10 In total, the proposed development is forecast to generate 145 two-way vehicle movements during the morning peak hour and 180 two-way vehicle movements during the evening peak hour. Of these, 37 two-way trips in the morning peak hour and 33 two-way trips in the evening peak hour would be HGVs.

8.11 Capacity assessments have been undertaken for the junctions within the agreed study area and future assessment years. The study area comprises the following junctions:

1. A422/A509 (Tickford Roundabout)
2. A422/Willen Road (Marsh End Roundabout)
3. Willen Road/Dansteed Way (Tongwell Roundabout)
4. A509/Tongwell Street/V11 (Pineham Roundabout)
5. A509/H6 Childs Way/A5130 Fen Street (Northfield Roundabout)
6. M1 Junction 14.

8.12 It is concluded that the highway network in the vicinity of the site is busy, resulting in the study area junctions being forecast to operate with some congestion and delays in the assessment years. This is particularly the case in the morning peak hour due to traffic associated with inbound movements to Milton Keynes. The increase in traffic due to the development is modest when distributed across the network, and on an individual junction basis does not result in a severe impact at any of the study area junctions. However, improvements are required at the Marsh End Roundabout to ensure safe and satisfactory vehicle access to the development site. It is also recognised by the Applicant that when the individual impacts at the study area junctions are considered cumulatively, there is a case for intervention to improve the operation of the local highway network as part of the development proposals.

8.13 It was agreed with MKC Highways that the approach to the assessment of the development traffic impact, and providing highway mitigation, should be to provide a single comprehensive mitigation package at the Marsh End Roundabout, where the Applicant has control of land to

provide a meaningful highway improvement, instead of providing a series of minor junction improvements.

8.14 As a result, a comprehensive mitigation scheme is proposed at Marsh End Roundabout. The improved junction will operate in conjunction with the proposed signal-controlled site access junction, to improve traffic flows and journey times through the area and along Willen Road. MKC Highways confirmed that the principle of traffic signal control at the Marsh End Roundabout was acceptable and in keeping with the findings of an earlier study of the A422 corridor undertaken on their behalf.

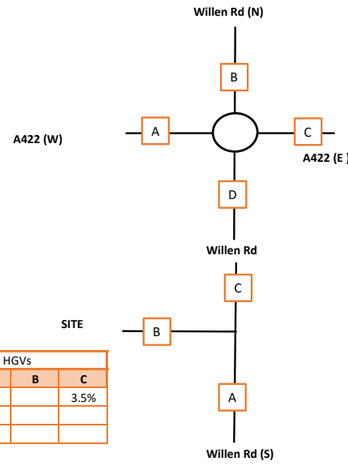
8.15 Overall, it is concluded that: the opportunities to access the site by sustainable modes have been taken up; improvements can be undertaken within the transport network that mitigate the impacts of the development; and the proposed development would not result in a severe traffic impact on the surrounding highway network. The proposals therefore accord with the principles of the National Planning Policy Framework (NPPF), and it would be unreasonably to object to the planning application on transport grounds.

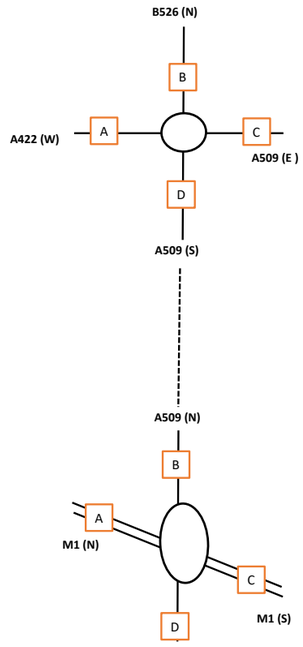
DIAGRAMS

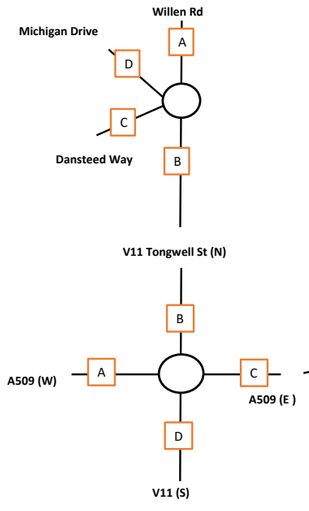
Total vehicles					
	A	B	C	D	
A	14	257	715	44	**1030**
B	252	0	35	605	**892**
C	1051	52	1	788	**1892**
D	12	243	257	0	**512**
	1329	**552**	**1008**	**1437**	**4326**

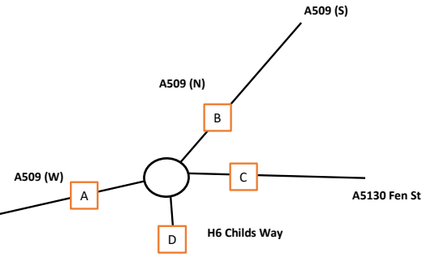
HGVs					
	A	B	C	D	
A	1	2	43	2	**48**
B	8	0	2	10	**20**
C	38	1	0	10	**49**
D	0	8	10	0	**18**
	47	**11**	**55**	**22**	**135**

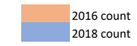
% HGVs				
	A	B	C	D
A	7.1%	0.8%	6.0%	4.5%
B	3.2%	0.0%	5.7%	1.7%
C	3.6%	1.9%	0.0%	1.3%
D	0.0%	3.3%	3.9%	0.0%











Total vehicles					
	A	B	C	D	
A	1	294	593	116	**1004**
B	525	1	26	163	**715**
C	1264	23	0	360	**1647**
D	190	201	208	1	**600**
	1980	**519**	**827**	**640**	**3966**

HGVs					
	A	B	C	D	
A	0	3	29	23	**55**
B	8	1	2	6	**17**
C	30	1	0	32	**63**
D	19	19	19	0	**57**
	57	**24**	**50**	**61**	**192**

% HGVs				
	A	B	C	D
A	0.0%	1.0%	4.9%	19.8%
B	1.5%	100%	7.7%	3.7%
C	2.4%	4.3%	0.0%	8.9%
D	10.0%	9.5%	9.1%	0.0%

Total vehicles				
	A	B	C	
A			512	**512**
B				**0**
C	1437			**1437**
	1437	**0**	**512**	**1949**

HGVs				
	A	B	C	
A			18	**18**
B				**0**
C	22			**22**
	22	**0**	**18**	**40**

% HGVs			
	A	B	C
A			3.5%
B			
C	1.5%		

Total vehicles					
	A	B	C	D	
A	3	215	0	1347	**1565**
B	129	10	297	580	**1016**
C	2	277	7	1408	**1694**
D	805	342	528	0	**1675**
	939	**844**	**832**	**3335**	**5950**

HGVs					
	A	B	C	D	
A	1	17	0	96	**114**
B	12	1	31	20	**64**
C	0	14	0	35	**49**
D	79	21	30	0	**130**
	92	**53**	**61**	**151**	**357**

PCUs					
	A	B	C	D	
A	4	232	0	1443	**1679**
B	141	11	328	600	**1080**
C	2	291	7	1443	**1743**
D	884	363	558	0	**1805**
	1031	**897**	**893**	**3486**	**6307**

Total vehicles					
	A	B	C	D	
A	1	519	901	34	**1455**
B	234	7	547	131	**919**
C	281	135	8	36	**460**
D	17	28	20	1	**66**
	533	**689**	**1476**	**202**	**2900**

PCUs					
	A	B	C	D	
A	1	529	915	34	**1479**
B	239	7	562	136	**944**
C	293	145	9	37	**484**
D	18	30	22	1	**71**
	551	**711**	**1508**	**208**	**2978**

HGVs					
	A	B	C	D	
A	0	10	14	0	**24**
B	5	0	15	5	**25**
C	12	10	1	1	**24**
D	1	2	2	0	**5**
	18	**22**	**32**	**6**	**78**

% HGVs				
	A	B	C	D
A	0.0%	1.9%	1.6%	0.0%
B	2.1%	0.0%	2.7%	3.8%
C	4.3%	7.4%	12.5%	2.8%
D	5.9%	7.1%	10.0%	0.0%

Total vehicles					
	A	B	C	D	
A	1	22	576	268	**867**
B	32	2	176	578	**788**
C	1268	375	5	50	**1698**
D	194	518	48	3	**763**
	1495	**917**	**805**	**899**	**4116**

HGVs					
	A	B	C	D	
A	0	5	27	3	**35**
B	3	0	10	27	**40**
C	25	11	2	6	**44**
D	2	11	7	0	**20**
	30	**27**	**46**	**36**	**139**

% HGVs				
	A	B	C	D
A	0.0%	22.7%	4.7%	1.1%
B	9.4%	0.0%	5.7%	4.7%
C	2.0%	2.9%	40.0%	12.0%
D	1.0%	2.1%	14.6%	0.0%

Total vehicles					
	A	B	C	D	
A	4	699	165	16	**884**
B	1384	4	208	1698	**3294**
C	388	249	2	112	**751**
D	4	740	42	4	**790**
	1780	**1692**	**417**	**1830**	**5719**

HGVs					
	A	B	C	D	
A	1	48	8	0	**57**
B	44	0	17	90	**151**
C	8	12	0	1	**21**
D	0	68	1	0	**69**
	53	**128**	**26**	**91**	**298**

PCUs					
	A	B	C	D	
A	5	747	173	16	**941**
B	1428	4	225	1788	**3445**
C	396	261	2	113	**772**
D	4	808	43	4	**859**
	1833	**1820**	**443**	**1921**	**6017**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 1: 2016/2018 OBSERVED TRAFFIC FLOWS - AM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	11	423	1221	18	**1673**
B	189	0	106	250	**545**
C	824	179	0	231	**1234**
D	13	415	403	0	**831**
	1037	**1017**	**1730**	**499**	**4283**

HGVs					
	A	B	C	D	
A	1	3	21	0	**25**
B	3	0	2	3	**8**
C	26	0	0	5	**31**
D	1	3	2	0	**6**
	31	**6**	**25**	**8**	**70**

% HGVs				
	A	B	C	D
A	9.1%	0.7%	1.7%	0.0%
B	1.6%	0.0%	1.9%	1.2%
C	3.2%	0.0%	0.0%	2.2%
D	7.7%	0.7%	0.5%	0.0%

Total vehicles				
	A	B	C	
A			831	**831**
B				**0**
C	499			**499**
	499	**0**	**831**	**1330**

HGVs				
	A	B	C	
A			6	**6**
B				**0**
C	8			**8**
	8	**0**	**6**	**14**

% HGVs			
	A	B	C
A			0.7%
B			
C	1.6%		

Total vehicles					
	A	B	C	D	
A	0	182	296	15	**493**
B	321	7	254	99	**681**
C	328	149	12	7	**496**
D	165	271	76	0	**512**
	814	**609**	**638**	**121**	**2182**

PCUs					
	A	B	C	D	
A	0	184	299	17	**500**
B	322	7	263	104	**696**
C	330	153	12	7	**502**
D	166	274	76	0	**516**
	818	**618**	**650**	**128**	**2214**

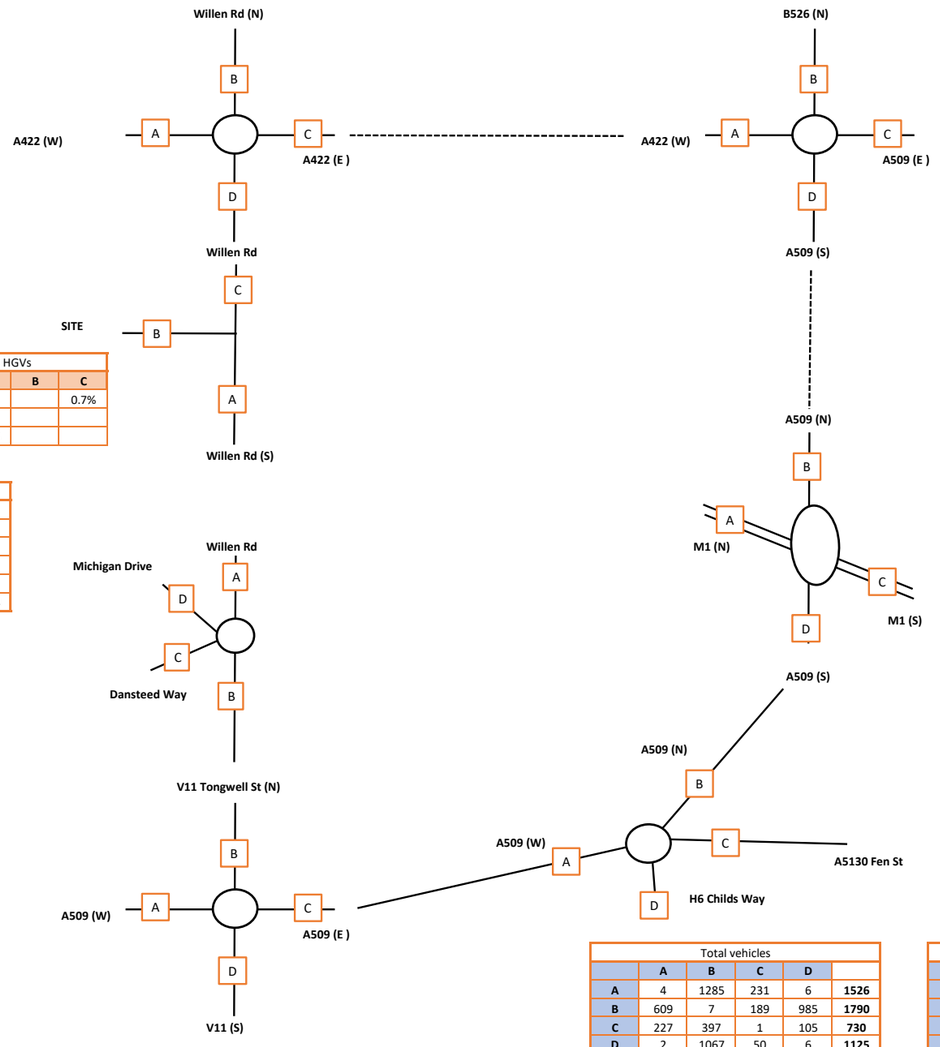
HGVs					
	A	B	C	D	
A	0	2	3	2	**7**
B	1	0	9	5	**15**
C	2	4	0	0	**6**
D	1	3	0	0	**4**
	4	**9**	**12**	**7**	**32**

% HGVs				
	A	B	C	D
A	0.0%	1.1%	1.0%	13.3%
B	0.3%	0.0%	3.5%	5.1%
C	0.6%	2.7%	0.0%	0.0%
D	0.6%	1.1%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	4	25	965	155	**1149**
B	22	1	287	414	**724**
C	733	155	7	22	**917**
D	307	506	96	2	**911**
	1066	**687**	**1355**	**593**	**3701**

HGVs					
	A	B	C	D	
A	0	0	22	7	**29**
B	0	0	6	3	**9**
C	20	10	0	2	**32**
D	2	6	2	0	**10**
	22	**16**	**30**	**12**	**80**

% HGVs				
	A	B	C	D
A	0.0%	0.0%	2.3%	4.5%
B	0.0%	0.0%	2.1%	0.7%
C	2.7%	6.5%	0.0%	9.1%
D	0.7%	1.2%	2.1%	0.0%



Total vehicles					
	A	B	C	D	
A	1	401	1026	330	**1758**
B	229	0	25	167	**421**
C	721	47	0	341	**1109**
D	282	274	442	0	**998**
	1233	**722**	**1493**	**838**	**4286**

HGVs					
	A	B	C	D	
A	0	3	7	16	**26**
B	1	0	0	4	**5**
C	7	0	0	16	**23**
D	21	6	22	0	**49**
	29	**9**	**29**	**36**	**103**

% HGVs				
	A	B	C	D
A	0.0%	0.7%	0.7%	4.8%
B	0.4%	0%	0.0%	2.4%
C	1.0%	0.0%	0.0%	4.7%
D	7.4%	2.2%	5.0%	0.0%

Total vehicles					
	A	B	C	D	
A	2	230	0	732	**964**
B	219	30	335	428	**1012**
C	0	354	13	639	**1006**
D	1223	564	963	0	**2750**
	1444	**1178**	**1311**	**1799**	**5732**

HGVs					
	A	B	C	D	
A	0	17	0	50	**67**
B	8	0	11	4	**23**
C	0	23	2	24	**49**
D	66	8	11	0	**85**
	74	**48**	**24**	**78**	**224**

PCUs					
	A	B	C	D	
A	2	247	0	782	**1031**
B	227	30	346	432	**1035**
C	0	377	15	663	**1055**
D	1289	572	974	0	**2835**
	1518	**1226**	**1335**	**1877**	**5956**

Total vehicles					
	A	B	C	D	
A	4	1285	231	6	**1526**
B	609	7	189	985	**1790**
C	227	397	1	105	**730**
D	2	1067	50	6	**1125**
	842	**2756**	**471**	**1102**	**5171**

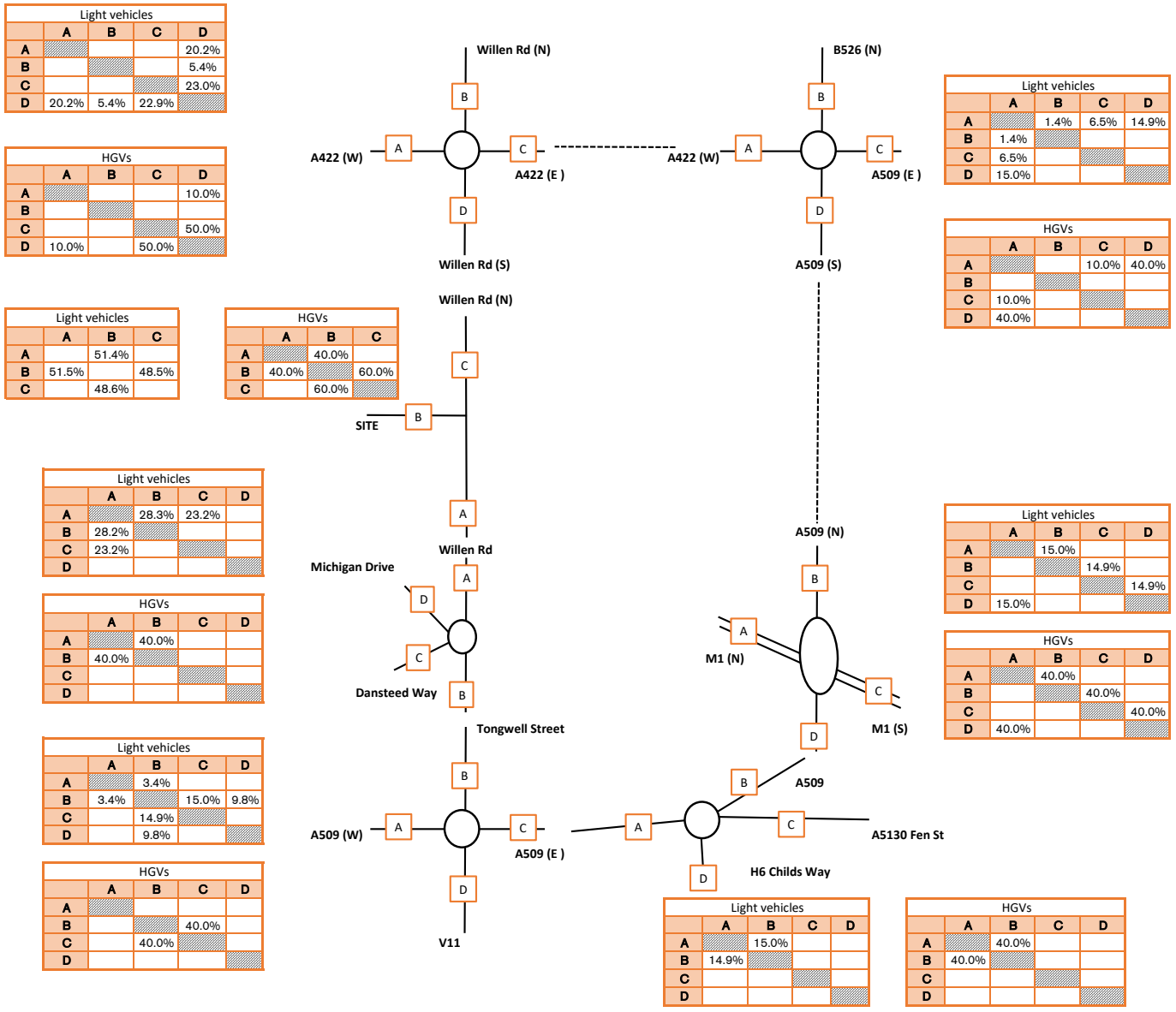
HGVs					
	A	B	C	D	
A	0	17	6	1	**24**
B	18	0	2	53	**73**
C	7	13	0	2	**22**
D	0	55	0	0	**55**
	25	**85**	**8**	**56**	**174**

PCUs					
	A	B	C	D	
A	4	1302	237	7	**1550**
B	627	7	191	1038	**1863**
C	234	410	1	107	**752**
D	2	1122	50	6	**1180**
	867	**2841**	**479**	**1158**	**5345**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 2: 2016/2018 OBSERVED TRAFFIC FLOWS - PM PEAK HOUR



ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

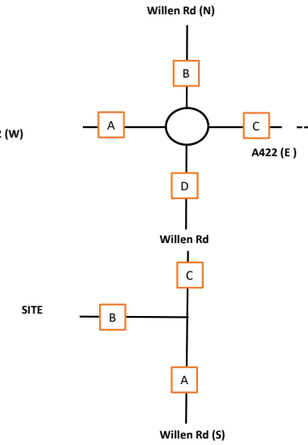
DIAGRAM 3: DISTRIBUTION PATTERNS

Light Vehicles					
	A	B	C	D	
A				20	20
B				5	5
C				23	23
D	2	1	2		5
	2	1	2	48	53

Total Vehicles					
	A	B	C	D	
A	0	0	0	21	21
B	0	0	0	5	5
C	0	0	0	33	33
D	4	1	11	0	16
	4	1	11	59	75

HGVs					
	A	B	C	D	
A				1	1
B					0
C				10	10
D	2		9		11
	2	0	9	11	22

PCUs					
	A	B	C	D	
A				22	22
B				5	5
C				43	43
D	6	1	20		27
	6	1	20	70	97



Light Vehicles				
	A	B	C	
A		50		50
B	5		5	10
C		48		48
	5	98	5	108

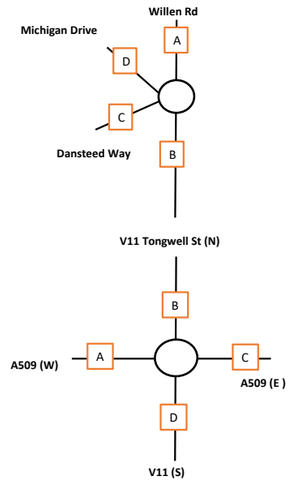
HGVs				
	A	B	C	
A		8		8
B	7		11	18
C		11		11
	7	19	11	37

Light Vehicles					
	A	B	C	D	
A		3	2		5
B	28				28
C	23				23
D					0
	51	3	2	0	56

PCUs					
	A	B	C	D	
A		10	2		12
B	36				36
C	23				23
D					0
	59	10	2	0	71

HGVs					
	A	B	C	D	
A		7			7
B	8				8
C					0
D					0
	8	7	0	0	15

% HGVs				
	A	B	C	D
A		70.0%		
B	22.2%			
C				
D				



Light Vehicles					
	A	B	C	D	
A		3			3
B	0		2	1	3
C		15			15
D		10			10
	0	28	2	1	31

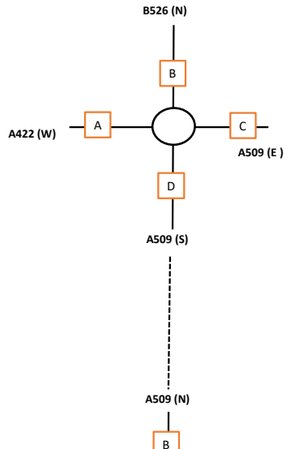
Total Vehicles					
	A	B	C	D	
A		3			3
B	0		9	1	10
C		23			23
D		10			10
	0	36	9	1	46

HGVs					
	A	B	C	D	
A					0
B			7		7
C		8			8
D					0
	0	8	7	0	15

% HGVs				
	A	B	C	D
A				
B			77.8%	
C		34.8%		
D				

Light Vehicles					
	A	B	C	D	
A		0	1	1	2
B	1				1
C	7				7
D	15				15
	23	0	1	1	25

Total Vehicles					
	A	B	C	D	
A	0	0	3	8	11
B	1	0	0	0	1
C	9	0	0	0	9
D	23	0	0	0	23
	33	0	3	8	44



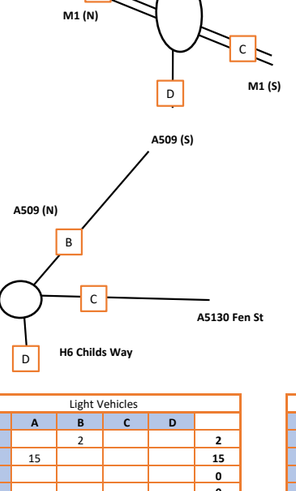
HGVs					
	A	B	C	D	
A			2	7	9
B					0
C	2				2
D	8				8
	10	0	2	7	19

% HGVs				
	A	B	C	D
A			66.7%	87.5%
B				
C	22.2%			
D	34.8%			

Light Vehicles					
	A	B	C	D	
A		15			15
B			1		1
C				15	15
D	2				2
	2	15	1	15	33

HGVs					
	A	B	C	D	
A		8			8
B			7		7
C				8	8
D	7				7
	7	8	7	8	30

PCUs					
	A	B	C	D	
A		31			31
B			15		15
C				31	31
D	16				16
	16	31	15	31	93



Light Vehicles					
	A	B	C	D	
A		2			2
B	15				15
C					0
D					0
	15	2	0	0	17

HGVs					
	A	B	C	D	
A		7			7
B	8				8
C					0
D					0
	8	7	0	0	15

PCUs					
	A	B	C	D	
A		16			16
B	31				31
C					0
D					0
	31	16	0	0	47

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 4: DEVELOPMENT TRAFFIC ASSIGNMENT - AM PEAK HOUR

Light Vehicles					
	A	B	C	D	
A				7	7
B				1	1
C				8	8
D	23	6	27		56
	23	6	27	16	72

Total Vehicles					
	A	B	C	D	
A				8	8
B				1	1
C				17	17
D	25	6	35		66
	25	6	35	26	92

HGVs					
	A	B	C	D	
A				1	1
B					0
C				9	9
D	2		8		10
	2	0	8	10	20

PCUs					
	A	B	C	D	
A	0	0	0	9	9
B	0	0	0	1	1
C	0	0	0	26	26
D	27	6	43	0	76
	27	6	43	36	112

Light Vehicles				
	A	B	C	
A		17		17
B	59		55	114
C		16		16
	59	33	55	147

HGVs				
	A	B	C	
A		7		7
B	6		10	16
C		10		10
	6	17	10	33

Light Vehicles					
	A	B	C	D	
A		32	26		58
B	9				9
C	8				8
D					0
	17	32	26	0	75

PCUs					
	A	B	C	D	
A		44	26		70
B	23				23
C	8				8
D					0
	31	44	26	0	101

HGVs					
	A	B	C	D	
A		6			6
B	7				7
C					0
D					0
	7	6	0	0	13

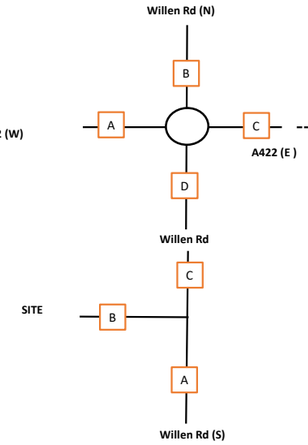
% HGVs				
	A	B	C	D
A		13.6%		
B	30.4%			
C				
D				

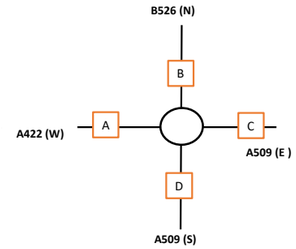
Light Vehicles					
	A	B	C	D	
A		1			1
B	4		17	11	32
C		5			5
D		3			3
	4	9	17	11	41

Total Vehicles					
	A	B	C	D	
A		1			1
B	4		23	11	38
C		12			12
D		3			3
	4	16	23	11	54

HGVs					
	A	B	C	D	
A					0
B			6		6
C		7			7
D					0
	0	7	6	0	13

% HGVs				
	A	B	C	D
A				
B			26.1%	
C		58.3%		
D				



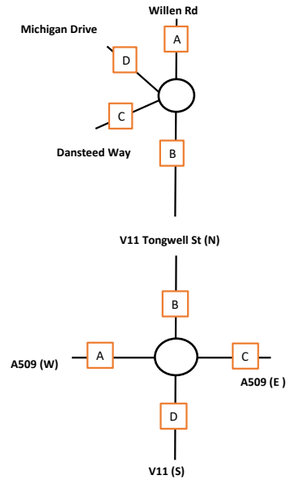


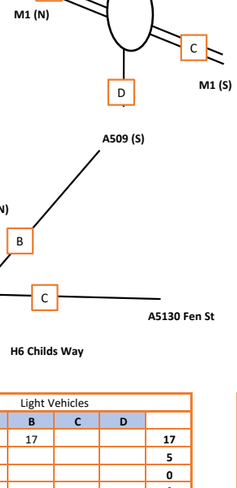
Light Vehicles					
	A	B	C	D	
A		2	7	17	26
B	0				0
C	3				3
D	5				5
	8	2	7	17	34

Total Vehicles					
	A	B	C	D	
A	0	2	9	24	35
B	0	0	0	0	0
C	5	0	0	0	5
D	12	0	0	0	12
	17	2	9	24	52

HGVs					
	A	B	C	D	
A			2	7	9
B					0
C	2				2
D	7				7
	9	0	2	7	18

% HGVs				
	A	B	C	D
A			22.2%	29.2%
B				
C	40.0%			
D	58.3%			





Light Vehicles					
	A	B	C	D	
A		5			5
B			17		17
C				5	5
D	17				17
	17	5	17	5	44

HGVs					
	A	B	C	D	
A		7			7
B			6		6
C				7	7
D	6				6
	6	7	6	7	26

PCUs					
	A	B	C	D	
A		19			19
B			29		29
C				19	19
D	29				29
	29	19	29	19	96

Light Vehicles					
	A	B	C	D	
A		17			17
B	5				5
C					0
D					0
	5	17	0	0	22

HGVs					
	A	B	C	D	
A		6			6
B	7				7
C					0
D					0
	7	6	0	0	13

PCUs					
	A	B	C	D	
A		29			29
B	19				19
C					0
D					0
	19	29	0	0	48

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 5: DEVELOPMENT TRAFFIC ASSIGNMENT - PM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	16	301	838	52	**1207**
B	295	0	41	709	**1045**
C	1232	61	1	924	**2218**
D	14	285	301	0	**600**
	1557	**647**	**1181**	**1685**	**5070**

HGVs					
	A	B	C	D	
A	1	2	50	2	**55**
B	9	0	2	12	**23**
C	45	1	0	12	**58**
D	0	9	12	0	**21**
	55	**12**	**64**	**26**	**157**

% HGVs				
	A	B	C	D
A	6.3%	0.7%	6.0%	3.8%
B	3.1%	0.0%	4.9%	1.7%
C	3.7%	1.6%	0.0%	1.3%
D	0.0%	3.2%	4.0%	0.0%

Total vehicles				
	A	B	C	
A			600	**600**
B				**0**
C	1685			**1685**
	1685	**0**	**600**	**2285**

HGVs				
	A	B	C	
A			21	**21**
B				**0**
C	26			**26**
	26	**0**	**21**	**47**

% HGVs			
	A	B	C
A			3.5%
B			
C	1.5%		

Total vehicles					
	A	B	C	D	
A	1	608	1056	40	**1705**
B	274	8	641	154	**1077**
C	329	158	9	42	**538**
D	20	33	23	1	**77**
	624	**807**	**1729**	**237**	**3397**

PCUs					
	A	B	C	D	
A	1	620	1072	40	**1733**
B	280	8	659	160	**1107**
C	343	170	10	43	**566**
D	21	35	25	1	**82**
	645	**833**	**1766**	**244**	**3488**

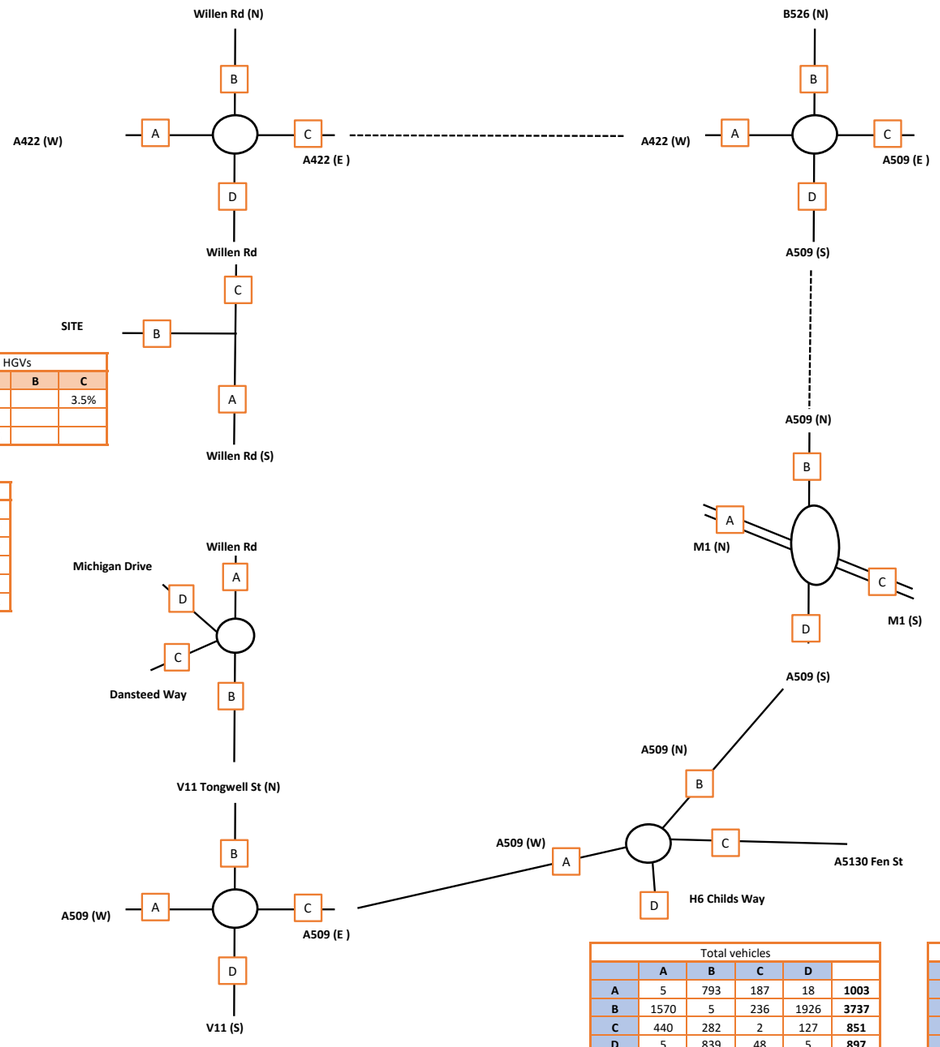
HGVs					
	A	B	C	D	
A	0	12	16	0	**28**
B	6	0	18	6	**30**
C	14	12	1	1	**28**
D	1	2	2	0	**5**
	21	**26**	**37**	**7**	**91**

% HGVs				
	A	B	C	D
A	0.0%	2.0%	1.5%	0.0%
B	2.2%	0.0%	2.8%	3.9%
C	4.3%	7.6%	11.1%	2.4%
D	5.0%	6.1%	8.7%	0.0%

Total vehicles					
	A	B	C	D	
A	1	26	675	314	**1016**
B	38	2	206	677	**923**
C	1486	440	6	59	**1991**
D	227	607	56	4	**894**
	1752	**1075**	**943**	**1054**	**4824**

HGVs					
	A	B	C	D	
A	0	6	32	4	**42**
B	4	0	12	32	**48**
C	29	13	2	7	**51**
D	2	13	8	0	**23**
	35	**32**	**54**	**43**	**164**

% HGVs				
	A	B	C	D
A	0.0%	23.1%	4.7%	1.3%
B	10.5%	0.0%	5.8%	4.7%
C	2.0%	3.0%	33.3%	11.9%
D	0.9%	2.1%	14.3%	0.0%



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	1	345	695	136	**1177**
B	615	1	30	191	**837**
C	1482	27	0	422	**1931**
D	223	236	244	1	**704**
	2321	**609**	**969**	**750**	**4649**

HGVs					
	A	B	C	D	
A	0	4	34	27	**65**
B	9	1	2	7	**19**
C	35	1	0	38	**74**
D	22	22	22	0	**66**
	66	**28**	**58**	**72**	**224**

% HGVs				
	A	B	C	D
A	0.0%	1.2%	4.9%	19.9%
B	1.5%	100.0%	6.7%	3.7%
C	2.4%	3.7%	0.0%	9.0%
D	9.9%	9.3%	9.0%	0.0%

Total vehicles					
	A	B	C	D	
A	3	244	0	1528	**1775**
B	146	11	337	658	**1152**
C	2	314	8	1597	**1921**
D	913	388	599	0	**1900**
	1064	**957**	**944**	**3783**	**6748**

HGVs					
	A	B	C	D	
A	1	19	0	109	**129**
B	14	1	35	23	**73**
C	0	16	0	40	**56**
D	90	24	34	0	**148**
	105	**60**	**69**	**172**	**406**

PCUs					
	A	B	C	D	
A	4	263	0	1637	**1904**
B	160	12	372	681	**1225**
C	2	330	8	1637	**1977**
D	1003	412	633	0	**2048**
	1169	**1017**	**1013**	**3955**	**7154**

Total vehicles					
	A	B	C	D	
A	5	793	187	18	**1003**
B	1570	5	236	1926	**3737**
C	440	282	2	127	**851**
D	5	839	48	5	**897**
	2020	**1919**	**473**	**2076**	**6488**

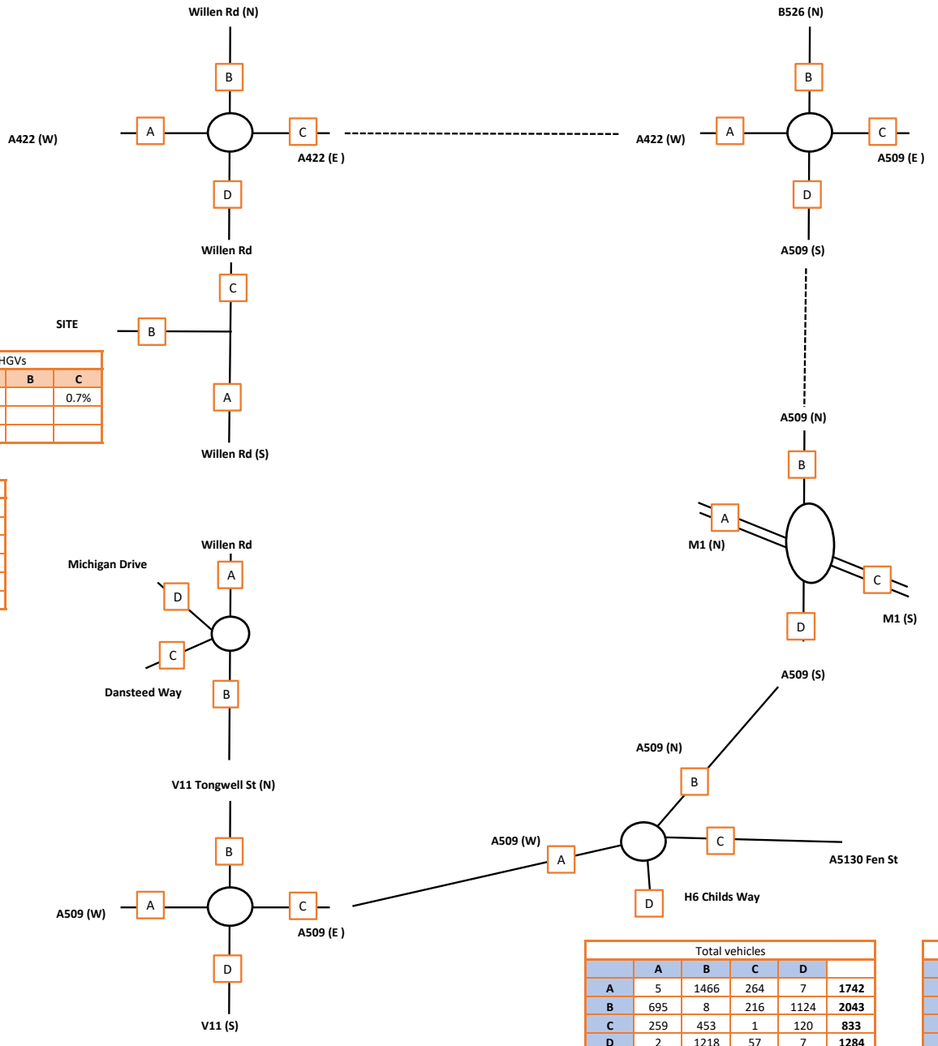
HGVs					
	A	B	C	D	
A	1	54	9	0	**64**
B	50	0	19	102	**171**
C	9	14	0	1	**24**
D	0	77	1	0	**78**
	60	**145**	**29**	**103**	**337**

PCUs					
	A	B	C	D	
A	6	847	196	18	**1067**
B	1620	5	255	2028	**3908**
C	449	296	2	128	**875**
D	5	916	49	5	**975**
	2080	**2064**	**502**	**2179**	**6825**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 6: 2026 BACKGROUND TRAFFIC FLOWS - AM PEAK HOUR



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	13	499	1440	21	**1973**
B	223	0	125	295	**643**
C	972	211	0	272	**1455**
D	15	490	475	0	**980**
	1223	**1200**	**2040**	**588**	**5051**

HGVs					
	A	B	C	D	
A	1	4	25	0	**30**
B	4	0	2	4	**10**
C	31	0	0	6	**37**
D	1	4	2	0	**7**
	37	**8**	**29**	**10**	**84**

% HGVs				
	A	B	C	D
A	7.7%	0.8%	1.7%	0.0%
B	1.8%	0.0%	1.6%	1.4%
C	3.2%	0.0%	0.0%	2.2%
D	6.7%	0.8%	0.4%	0.0%

Total vehicles					
	A	B	C	D	
A	1	473	1210	389	**2073**
B	270	0	29	197	**496**
C	850	55	0	402	**1307**
D	333	323	521	0	**1177**
	1454	**851**	**1760**	**988**	**5053**

HGVs					
	A	B	C	D	
A	0	4	8	19	**31**
B	1	0	0	5	**6**
C	8	0	0	19	**27**
D	25	7	26	0	**58**
	34	**11**	**34**	**43**	**122**

% HGVs				
	A	B	C	D
A	0.0%	0.8%	0.7%	4.9%
B	0.4%	0.0%	0.0%	2.5%
C	0.9%	0.0%	0.0%	4.7%
D	7.5%	2.2%	5.0%	0.0%

Total vehicles				
	A	B	C	
A			980	**980**
B				**0**
C	588			**588**
	588	**0**	**980**	**1568**

HGVs				
	A	B	C	
A			7	**7**
B				**0**
C	10			**10**
	10	**0**	**7**	**17**

% HGVs			
	A	B	C
A			0.7%
B			
C	1.7%		

Total vehicles					
	A	B	C	D	
A	2	262	0	835	**1099**
B	250	34	382	488	**1154**
C	0	404	15	729	**1148**
D	1396	644	1099	0	**3139**
	1648	**1344**	**1496**	**2052**	**6540**

HGVs					
	A	B	C	D	
A	0	19	0	57	**76**
B	9	0	13	5	**27**
C	0	26	2	27	**55**
D	75	9	13	0	**97**
	84	**54**	**28**	**89**	**255**

PCUs					
	A	B	C	D	
A	2	281	0	892	**1175**
B	259	34	395	493	**1181**
C	0	430	17	756	**1203**
D	1471	653	1112	0	**3236**
	1732	**1398**	**1524**	**2141**	**6795**

Total vehicles					
	A	B	C	D	
A	0	215	349	18	**582**
B	379	8	300	117	**804**
C	387	176	14	8	**585**
D	195	320	90	0	**605**
	961	**719**	**753**	**143**	**2576**

PCUs					
	A	B	C	D	
A	0	217	353	20	**590**
B	380	8	311	123	**822**
C	389	181	14	8	**592**
D	196	324	90	0	**610**
	965	**730**	**768**	**151**	**2614**

HGVs					
	A	B	C	D	
A	0	2	4	2	**8**
B	1	0	11	6	**18**
C	2	5	0	0	**7**
D	1	4	0	0	**5**
	4	**11**	**15**	**8**	**38**

% HGVs				
	A	B	C	D
A	0.0%	0.9%	1.1%	11.1%
B	0.3%	0.0%	3.7%	5.1%
C	0.5%	2.8%	0.0%	0.0%
D	0.5%	1.3%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	5	29	1138	183	**1355**
B	26	1	339	488	**854**
C	865	183	8	26	**1082**
D	362	597	113	2	**1074**
	1258	**810**	**1598**	**699**	**4365**

HGVs					
	A	B	C	D	
A	0	0	26	8	**34**
B	0	0	7	4	**11**
C	24	12	0	2	**38**
D	2	7	2	0	**11**
	26	**19**	**35**	**14**	**94**

% HGVs				
	A	B	C	D
A	0.0%	0.0%	2.3%	4.4%
B	0.0%	0.0%	2.1%	0.8%
C	2.8%	6.6%	0.0%	7.7%
D	0.6%	1.2%	1.8%	0.0%

Total vehicles					
	A	B	C	D	
A	5	1466	264	7	**1742**
B	695	8	216	1124	**2043**
C	259	453	1	120	**833**
D	2	1218	57	7	**1284**
	961	**3145**	**538**	**1258**	**5902**

HGVs					
	A	B	C	D	
A	0	19	7	1	**27**
B	21	0	2	60	**83**
C	8	15	0	2	**25**
D	0	63	0	0	**63**
	29	**97**	**9**	**63**	**198**

PCUs					
	A	B	C	D	
A	5	1485	271	8	**1769**
B	716	8	218	1184	**2126**
C	267	468	1	122	**858**
D	2	1281	57	7	**1347**
	990	**3242**	**547**	**1321**	**6100**

ADC INFRASTRUCTURE

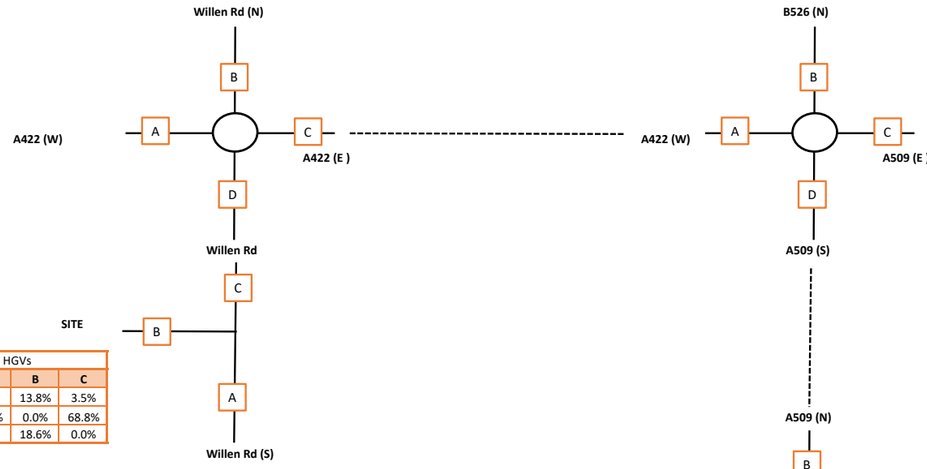
WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 7: 2026 BACKGROUND TRAFFIC FLOWS - PM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	16	301	838	73	**1228**
B	295	0	41	714	**1050**
C	1232	61	1	957	**2251**
D	18	286	312	0	**616**
	1561	**648**	**1192**	**1744**	**5145**

HGVs					
	A	B	C	D	
A	1	2	50	3	**56**
B	9	0	2	12	**23**
C	45	1	0	22	**68**
D	2	9	21	0	**32**
	57	**12**	**73**	**37**	**179**

% HGVs				
	A	B	C	D
A	6.3%	0.7%	6.0%	4.1%
B	3.1%	0.0%	4.9%	1.7%
C	3.7%	1.6%	0.0%	2.3%
D	11.1%	3.1%	6.7%	0.0%



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	1	345	698	144	**1188**
B	616	1	30	191	**838**
C	1491	27	0	422	**1940**
D	246	236	244	1	**727**
	2354	**609**	**972**	**758**	**4693**

HGVs					
	A	B	C	D	
A	0	4	36	34	**74**
B	9	1	2	7	**19**
C	37	1	0	38	**76**
D	30	22	22	0	**74**
	76	**28**	**60**	**79**	**243**

% HGVs				
	A	B	C	D
A	0.0%	1.2%	5.2%	23.6%
B	1.5%	100.0%	6.7%	3.7%
C	2.5%	3.7%	0.0%	9.0%
D	12.2%	9.3%	9.0%	0.0%

Total vehicles				
	A	B	C	
A	0	58	600	**658**
B	12	0	16	**28**
C	1685	59	0	**1744**
	1697	**117**	**616**	**2430**

HGVs				
	A	B	C	
A	0	8	21	**29**
B	7	0	11	**18**
C	26	11	0	**37**
	33	**19**	**32**	**84**

% HGVs			
	A	B	C
A	0.0%	13.8%	3.5%
B	58.3%	0.0%	68.8%
C	1.5%	18.6%	0.0%

Total vehicles					
	A	B	C	D	
A	3	267	0	1528	**1798**
B	146	11	345	658	**1160**
C	2	314	8	1620	**1944**
D	922	388	599	0	**1909**
	1073	**980**	**952**	**3806**	**6811**

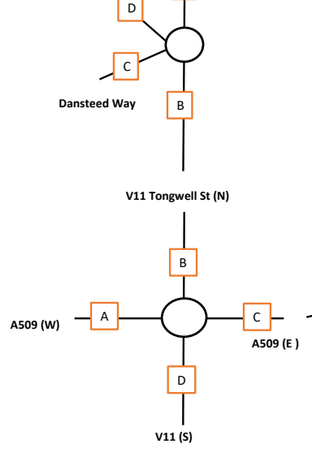
HGVs					
	A	B	C	D	
A	1	27	0	109	**137**
B	14	1	42	23	**80**
C	0	16	0	48	**64**
D	97	24	34	0	**155**
	112	**68**	**76**	**180**	**436**

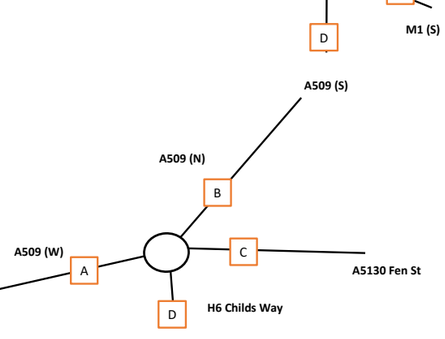
Total vehicles					
	A	B	C	D	
A	1	618	1058	40	**1717**
B	310	8	641	154	**1113**
C	352	158	9	42	**561**
D	20	33	23	1	**77**
	683	**817**	**1731**	**237**	**3468**

PCUs					
	A	B	C	D	
A	1	637	1074	40	**1752**
B	324	8	659	160	**1151**
C	366	170	10	43	**589**
D	21	35	25	1	**82**
	712	**850**	**1768**	**244**	**3574**

HGVs					
	A	B	C	D	
A	0	19	16	0	**35**
B	14	0	18	6	**38**
C	14	12	1	1	**28**
D	1	2	2	0	**5**
	29	**33**	**37**	**7**	**106**

% HGVs				
	A	B	C	D
A	0.0%	3.1%	1.5%	0.0%
B	4.5%	0.0%	2.8%	3.9%
C	4.0%	7.6%	11.1%	2.4%
D	5.0%	6.1%	8.7%	0.0%





Total vehicles					
	A	B	C	D	
A	1	29	675	314	**1019**
B	38	2	215	678	**933**
C	1486	463	6	59	**2014**
D	227	617	56	4	**904**
	1752	**1111**	**952**	**1055**	**4870**

HGVs					
	A	B	C	D	
A	0	6	32	4	**42**
B	4	0	19	32	**55**
C	29	21	2	7	**59**
D	2	13	8	0	**23**
	35	**40**	**61**	**43**	**179**

% HGVs				
	A	B	C	D
A	0.0%	20.7%	4.7%	1.3%
B	10.5%	0.0%	8.8%	4.7%
C	2.0%	4.5%	33.3%	11.9%
D	0.9%	2.1%	14.3%	0.0%

Total vehicles					
	A	B	C	D	
A	5	802	187	18	**1012**
B	1593	5	236	1926	**3760**
C	440	282	2	127	**851**
D	5	839	48	5	**897**
	2043	**1928**	**473**	**2076**	**6520**

HGVs					
	A	B	C	D	
A	0	25	6	1	**32**
B	27	0	2	55	**84**
C	7	13	0	2	**22**
D	0	57	0	0	**57**
	34	**95**	**8**	**58**	**195**

PCUs					
	A	B	C	D	
A	5	827	193	19	**1044**
B	1620	5	238	1981	**3844**
C	447	295	2	129	**873**
D	5	896	48	5	**954**
	2077	**2023**	**481**	**2134**	**6715**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

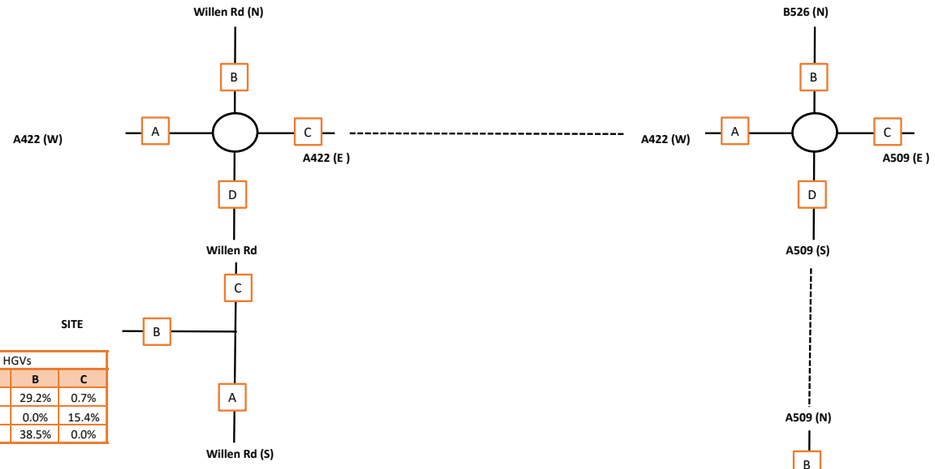
DIAGRAM 8: 2026 WITH DEVELOPMENT TRAFFIC FLOWS - AM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	13	499	1440	29	**1981**
B	223	0	125	296	**644**
C	972	211	0	289	**1472**
D	40	496	510	0	**1046**
	1248	**1206**	**2075**	**614**	**5143**

	0.0472
	0.4821
	0.4707
	0

HGVs					
	A	B	C	D	
A	1	4	25	1	**31**
B	4	0	2	4	**10**
C	31	0	0	15	**46**
D	3	4	10	0	**17**
	39	**8**	**37**	**20**	**104**

% HGVs				
	A	B	C	D
A	7.7%	0.8%	1.7%	3.4%
B	1.8%	0.0%	1.6%	1.4%
C	3.2%	0.0%	0.0%	5.2%
D	7.5%	0.8%	2.0%	0.0%



Total vehicles					
	A	B	C	D	
A	1	475	1219	413	**2108**
B	270	0	29	197	**496**
C	855	55	0	402	**1312**
D	345	323	521	0	**1189**
	1471	**853**	**1769**	**1012**	**5105**

HGVs					
	A	B	C	D	
A	0	4	10	26	**40**
B	1	0	0	5	**6**
C	10	0	0	19	**29**
D	32	7	26	0	**65**
	43	**11**	**36**	**50**	**140**

% HGVs				
	A	B	C	D
A	0.0%	0.8%	0.8%	6.3%
B	0.4%	0.0%	0.0%	2.5%
C	1.2%	0.0%	0.0%	4.7%
D	9.3%	2.2%	5.0%	0.0%

Total vehicles				
	A	B	C	
A	0	24	980	**1004**
B	65	0	65	**130**
C	588	26	0	**614**
	653	**50**	**1045**	**1748**

HGVs				
	A	B	C	
A	0	7	7	**14**
B	6	0	10	**16**
C	10	10	0	**20**
	16	**17**	**17**	**50**

% HGVs			
	A	B	C
A	0.0%	29.2%	0.7%
B	9.2%	0.0%	15.4%
C	1.7%	38.5%	0.0%

Total vehicles					
	A	B	C	D	
A	2	274	0	835	**1111**
B	250	34	405	488	**1177**
C	0	404	15	741	**1160**
D	1419	644	1099	0	**3162**
	1671	**1356**	**1519**	**2064**	**6610**

HGVs					
	A	B	C	D	
A	0	26	0	57	**83**
B	9	0	19	5	**33**
C	0	26	2	34	**62**
D	81	9	13	0	**103**
	90	**61**	**34**	**96**	**281**

PCUs					
	A	B	C	D	
A	2	300	0	892	**1194**
B	259	34	424	493	**1210**
C	0	430	17	775	**1222**
D	1500	653	1112	0	**3265**
	1761	**1417**	**1553**	**2160**	**6891**

Total vehicles					
	A	B	C	D	
A	0	253	375	18	**646**
B	395	8	300	117	**820**
C	395	176	14	8	**593**
D	195	320	90	0	**605**
	985	**757**	**779**	**143**	**2664**

PCUs					
	A	B	C	D	
A	0	261	379	20	**660**
B	403	8	311	123	**845**
C	397	181	14	8	**600**
D	196	324	90	0	**610**
	996	**774**	**794**	**151**	**2715**

HGVs					
	A	B	C	D	
A	0	8	4	2	**14**
B	8	0	11	6	**25**
C	2	5	0	0	**7**
D	1	4	0	0	**5**
	11	**17**	**15**	**8**	**51**

% HGVs				
	A	B	C	D
A	0.0%	3.2%	1.1%	11.1%
B	2.0%	0.0%	3.7%	5.1%
C	0.5%	2.8%	0.0%	0.0%
D	0.5%	1.3%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	5	30	1138	183	**1356**
B	30	1	362	499	**892**
C	865	195	8	26	**1094**
D	362	600	113	2	**1077**
	1262	**826**	**1621**	**710**	**4419**

HGVs					
	A	B	C	D	
A	0	0	26	8	**34**
B	0	0	13	4	**17**
C	24	19	0	2	**45**
D	2	7	2	0	**11**
	26	**26**	**41**	**14**	**107**

% HGVs				
	A	B	C	D
A	0.0%	0.0%	2.3%	4.4%
B	0.0%	0.0%	3.6%	0.8%
C	2.8%	9.7%	0.0%	7.7%
D	0.6%	1.2%	1.8%	0.0%

Total vehicles					
	A	B	C	D	
A	5	1489	264	7	**1765**
B	707	8	216	1124	**2055**
C	259	453	1	120	**833**
D	2	1218	57	7	**1284**
	973	**3168**	**538**	**1258**	**5937**

HGVs					
	A	B	C	D	
A	0	25	7	1	**33**
B	28	0	2	60	**90**
C	8	15	0	2	**25**
D	0	63	0	0	**63**
	36	**103**	**9**	**63**	**211**

PCUs					
	A	B	C	D	
A	5	1514	271	8	**1798**
B	735	8	218	1184	**2145**
C	267	468	1	122	**858**
D	2	1281	57	7	**1347**
	1009	**3271**	**547**	**1321**	**6148**

2016 count
2018 count

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 9: 2026 WITH DEVELOPMENT TRAFFIC FLOWS - PM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	15	274	763	47	**1099**
B	269	0	37	645	**951**
C	1121	55	1	840	**2017**
D	13	259	274	0	**546**
	1418	**588**	**1075**	**1532**	**4613**

HGVs					
	A	B	C	D	
A	1	2	46	2	**51**
B	9	0	2	11	**22**
C	41	1	0	11	**53**
D	0	9	11	0	**20**
	51	**12**	**59**	**24**	**146**

% HGVs				
	A	B	C	D
A	6.7%	0.7%	6.0%	4.3%
B	3.3%	0.0%	5.4%	1.7%
C	3.7%	1.8%	0.0%	1.3%
D	0.0%	3.5%	4.0%	0.0%

Total vehicles				
	A	B	C	
A			546	**546**
B				**0**
C	1532			**1532**
	1532	**0**	**546**	**2078**

HGVs				
	A	B	C	
A			20	**20**
B				**0**
C	24			**24**
	24	**0**	**20**	**44**

% HGVs			
	A	B	C
A			3.7%
B			
C	1.6%		

Total vehicles					
	A	B	C	D	
A	1	554	961	36	**1552**
B	250	7	583	140	**980**
C	300	144	9	38	**491**
D	18	30	21	1	**70**
	569	**735**	**1574**	**215**	**3093**

PCUs					
	A	B	C	D	
A	1	565	976	36	**1578**
B	255	7	599	145	**1006**
C	313	155	10	39	**517**
D	19	32	23	1	**75**
	588	**759**	**1608**	**221**	**3176**

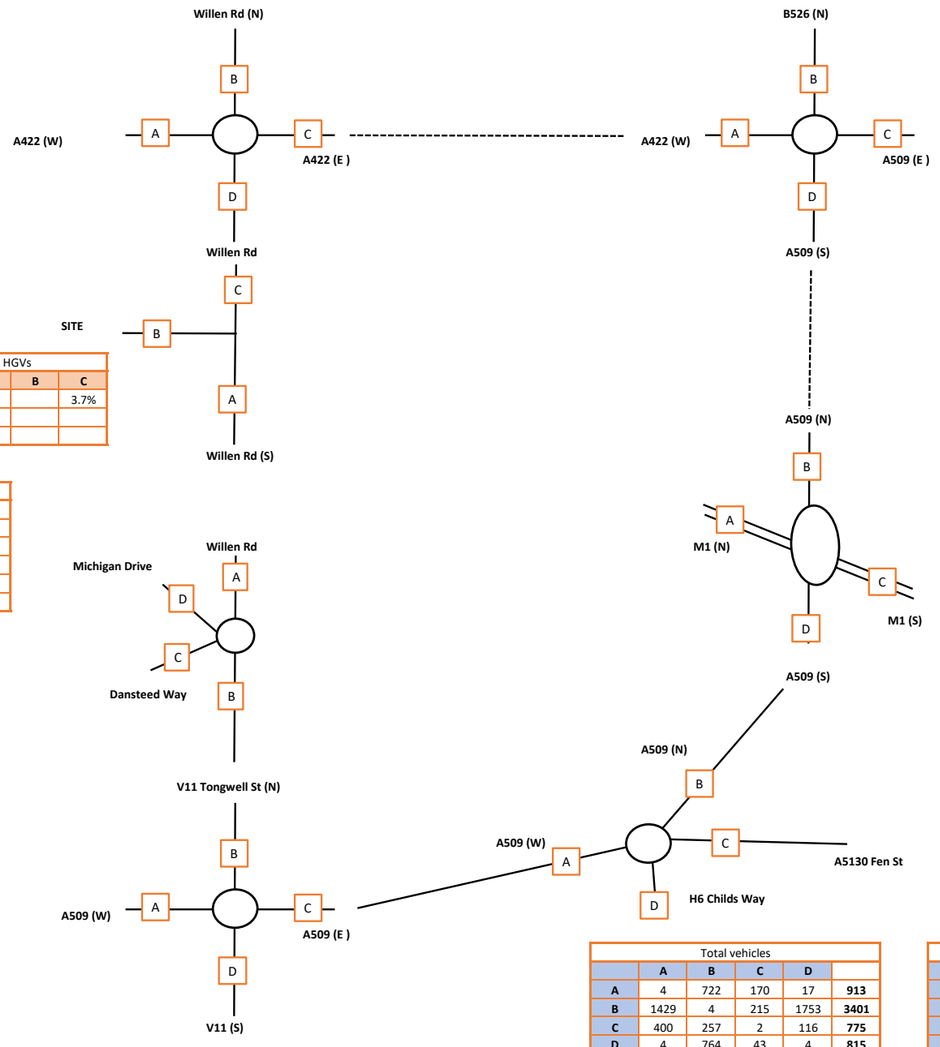
HGVs					
	A	B	C	D	
A	0	11	15	0	**26**
B	5	0	16	5	**26**
C	13	11	1	1	**26**
D	1	2	2	0	**5**
	19	**24**	**34**	**6**	**83**

% HGVs				
	A	B	C	D
A	0.0%	2.0%	1.6%	0.0%
B	2.0%	0.0%	2.7%	3.6%
C	4.3%	7.6%	11.1%	2.6%
D	5.6%	6.7%	9.5%	0.0%

Total vehicles					
	A	B	C	D	
A	1	23	614	286	**924**
B	34	2	188	616	**840**
C	1352	400	5	53	**1810**
D	207	552	51	3	**813**
	1594	**977**	**858**	**958**	**4387**

HGVs					
	A	B	C	D	
A	0	5	29	3	**37**
B	3	0	11	29	**43**
C	27	12	2	6	**47**
D	2	12	7	0	**21**
	32	**29**	**49**	**38**	**148**

% HGVs				
	A	B	C	D
A	0.0%	21.7%	4.7%	1.0%
B	8.8%	0.0%	5.9%	4.7%
C	2.0%	3.0%	40.0%	11.3%
D	1.0%	2.2%	13.7%	0.0%



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	1	314	632	124	**1071**
B	560	1	28	174	**763**
C	1348	25	0	384	**1757**
D	203	214	222	1	**640**
	2112	**554**	**882**	**683**	**4231**

HGVs					
	A	B	C	D	
A	0	3	31	25	**59**
B	9	1	2	6	**18**
C	32	1	0	34	**67**
D	20	20	20	0	**60**
	61	**25**	**53**	**65**	**204**

% HGVs				
	A	B	C	D
A	0.0%	1.0%	4.9%	20.2%
B	1.6%	100.0%	7.1%	3.4%
C	2.4%	4.0%	0.0%	8.9%
D	9.9%	9.3%	9.0%	0.0%

Total vehicles					
	A	B	C	D	
A	3	222	0	1390	**1615**
B	133	10	307	599	**1049**
C	2	286	7	1453	**1748**
D	831	353	545	0	**1729**
	969	**871**	**859**	**3442**	**6141**

HGVs					
	A	B	C	D	
A	1	18	0	99	**118**
B	12	1	32	21	**66**
C	0	14	0	36	**50**
D	82	22	31	0	**135**
	95	**55**	**63**	**156**	**369**

PCUs					
	A	B	C	D	
A	4	240	0	1489	**1733**
B	145	11	339	620	**1115**
C	2	300	7	1489	**1798**
D	913	375	576	0	**1864**
	1064	**926**	**922**	**3598**	**6510**

Total vehicles					
	A	B	C	D	
A	4	722	170	17	**913**
B	1429	4	215	1753	**3401**
C	400	257	2	116	**775**
D	4	764	43	4	**815**
	1837	**1747**	**430**	**1890**	**5904**

HGVs					
	A	B	C	D	
A	1	50	8	0	**59**
B	45	0	18	93	**156**
C	8	12	0	1	**21**
D	0	70	1	0	**71**
	54	**132**	**27**	**94**	**307**

PCUs					
	A	B	C	D	
A	5	772	178	17	**972**
B	1474	4	233	1846	**3557**
C	408	269	2	117	**796**
D	4	834	44	4	**886**
	1891	**1879**	**457**	**1984**	**6211**

ADC INFRASTRUCTURE

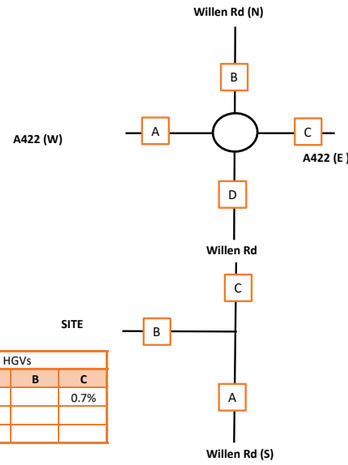
WILLEN ROAD, NEWPORT PAGNELL

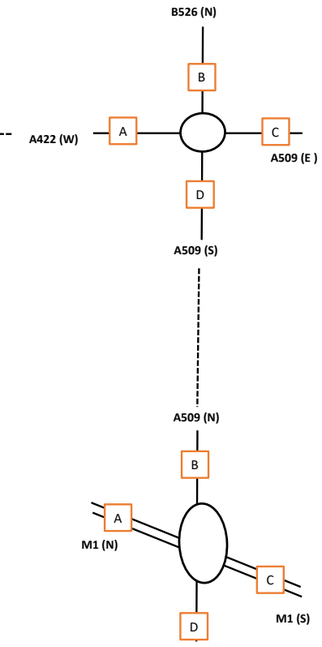
DIAGRAM 10: 2020 BACKGROUND TRAFFIC FLOWS - AM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	12	452	1303	19	**1786**
B	202	0	113	267	**582**
C	880	191	0	247	**1318**
D	14	443	430	0	**887**
	1108	**1086**	**1846**	**533**	**4573**

HGVs					
	A	B	C	D	
A	1	3	22	0	**26**
B	3	0	2	3	**8**
C	28	0	0	5	**33**
D	1	3	2	0	**6**
	33	**6**	**26**	**8**	**73**

% HGVs				
	A	B	C	D
A	8.3%	0.7%	1.7%	0.0%
B	1.5%	0.0%	1.8%	1.1%
C	3.2%	0.0%	0.0%	2.0%
D	7.1%	0.7%	0.5%	0.0%





2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	1	428	1095	352	**1876**
B	244	0	27	178	**449**
C	770	50	0	364	**1184**
D	301	292	472	0	**1065**
	1316	**770**	**1594**	**894**	**4574**

HGVs					
	A	B	C	D	
A	0	3	7	17	**27**
B	1	0	0	4	**5**
C	7	0	0	17	**24**
D	22	6	23	0	**51**
	30	**9**	**30**	**38**	**107**

% HGVs				
	A	B	C	D
A	0.0%	0.7%	0.6%	4.8%
B	0.4%	0.0%	0.0%	2.2%
C	0.9%	0.0%	0.0%	4.7%
D	7.3%	2.1%	4.9%	0.0%

Total vehicles				
	A	B	C	
A			887	**887**
B				**0**
C	533			**533**
	533	**0**	**887**	**1420**

HGVs				
	A	B	C	
A			6	**6**
B				**0**
C	8			**8**
	8	**0**	**6**	**14**

% HGVs			
	A	B	C
A			0.7%
B			
C	1.5%		

Total vehicles					
	A	B	C	D	
A	2	238	0	756	**996**
B	226	31	346	442	**1045**
C	0	366	13	660	**1039**
D	1263	582	994	0	**2839**
	1491	**1217**	**1353**	**1858**	**5919**

HGVs					
	A	B	C	D	
A	0	18	0	52	**70**
B	8	0	11	4	**23**
C	0	24	2	25	**51**
D	68	8	11	0	**87**
	76	**50**	**24**	**81**	**231**

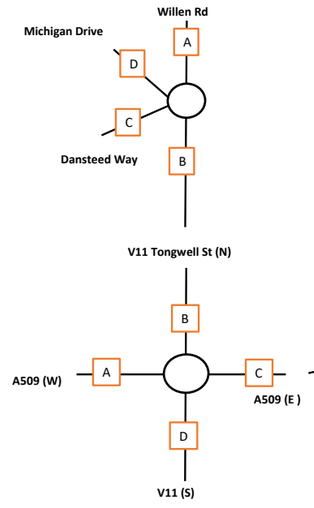
PCUs					
	A	B	C	D	
A	2	256	0	808	**1066**
B	234	31	357	446	**1068**
C	0	390	15	685	**1090**
D	1331	590	1005	0	**2926**
	1567	**1267**	**1377**	**1939**	**6150**

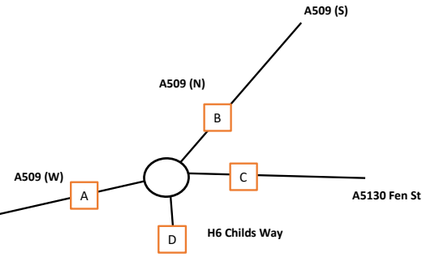
Total vehicles					
	A	B	C	D	
A	0	194	316	16	**526**
B	343	7	271	106	**727**
C	350	159	13	7	**529**
D	176	289	81	0	**546**
	869	**649**	**681**	**129**	**2328**

PCUs					
	A	B	C	D	
A	0	196	319	18	**533**
B	344	7	281	111	**743**
C	352	163	13	7	**535**
D	177	292	81	0	**550**
	873	**658**	**694**	**136**	**2361**

HGVs					
	A	B	C	D	
A	0	2	3	2	**7**
B	1	0	10	5	**16**
C	2	4	0	0	**6**
D	1	3	0	0	**4**
	4	**9**	**13**	**7**	**33**

% HGVs				
	A	B	C	D
A	0.0%	1.0%	0.9%	12.5%
B	0.3%	0.0%	3.7%	4.7%
C	0.6%	2.5%	0.0%	0.0%
D	0.6%	1.0%	0.0%	0.0%





Total vehicles					
	A	B	C	D	
A	4	1327	239	6	**1576**
B	629	7	195	1017	**1848**
C	234	410	1	108	**753**
D	2	1102	52	6	**1162**
	869	**2846**	**487**	**1137**	**5339**

HGVs					
	A	B	C	D	
A	0	0	23	7	**30**
B	0	0	6	3	**9**
C	21	11	0	2	**34**
D	2	6	2	0	**10**
	23	**17**	**31**	**12**	**83**

% HGVs				
	A	B	C	D
A	0.0%	0.0%	2.2%	4.2%
B	0.0%	0.0%	2.0%	0.7%
C	2.7%	6.7%	0.0%	8.7%
D	0.6%	1.1%	2.0%	0.0%

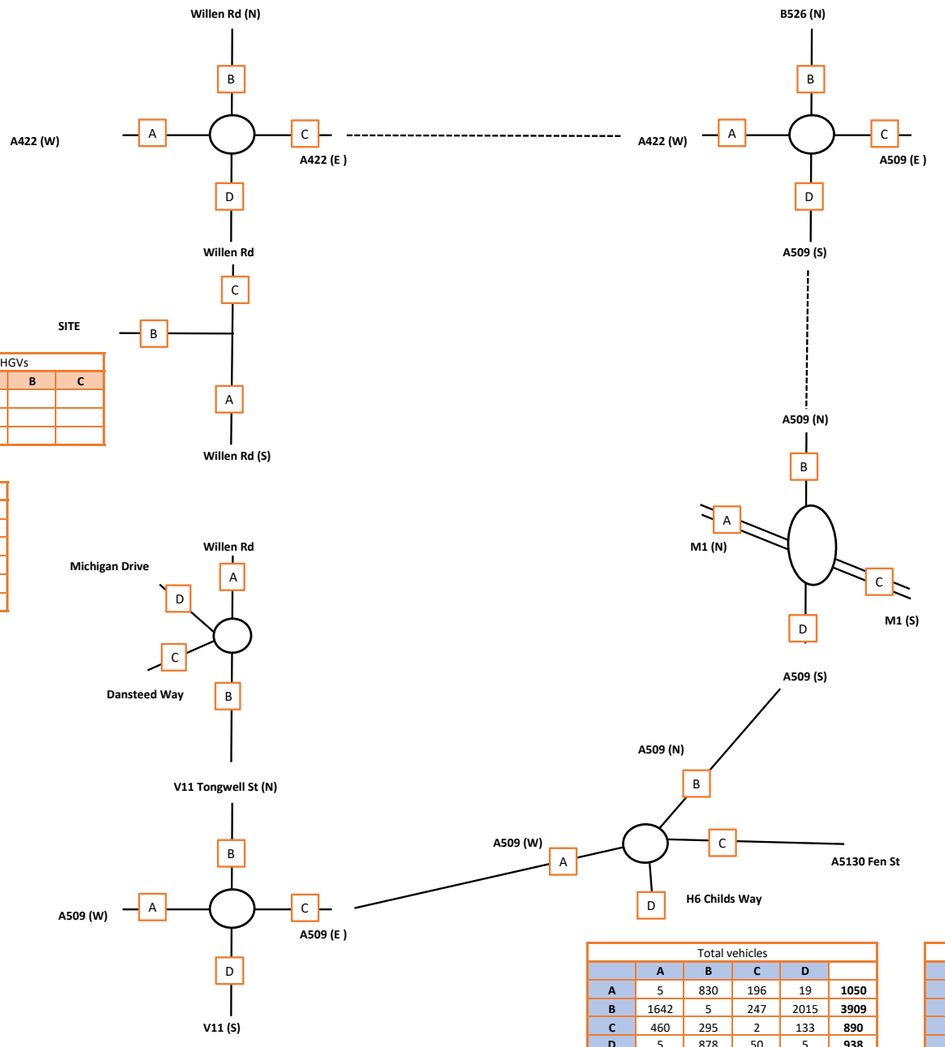
HGVs					
	A	B	C	D	
A	0	18	6	1	**25**
B	19	0	2	55	**76**
C	7	13	0	2	**22**
D	0	57	0	0	**57**
	26	**88**	**8**	**58**	**180**

PCUs					
	A	B	C	D	
A	4	1345	245	7	**1601**
B	648	7	197	1072	**1924**
C	241	423	1	110	**775**
D	2	1159	52	6	**1219**
	895	**2934**	**495**	**1195**	**5519**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 11: 2020 BACKGROUND TRAFFIC FLOWS - PM PEAK HOUR



2016 count
2018 count

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	
A				0
B				0
C				0
	0	0	0	0

HGVs

	A	B	C	
A				0
B				0
C				0
	0	0	0	0

% HGVs

	A	B	C
A			
B			
C			

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

PCUs

	A	B	C	D	
A	0	0	0	0	0
B	0	0	0	0	0
C	0	0	0	0	0
D	0	0	0	0	0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A	4	255	0	1598	**1857**
B	153	12	352	688	**1205**
C	2	329	8	1671	**2010**
D	955	406	627	0	**1988**
	1114	**1002**	**987**	**3957**	**7060**

HGVs

	A	B	C	D	
A	1	20	0	114	**135**
B	14	1	37	24	**76**
C	0	17	0	42	**59**
D	94	25	36	0	**155**
	109	**63**	**73**	**180**	**425**

PCUs

	A	B	C	D	
A	5	275	0	1712	**1992**
B	167	13	389	712	**1281**
C	2	346	8	1713	**2069**
D	1049	431	663	0	**2143**
	1223	**1065**	**1060**	**4137**	**7485**

Total vehicles

	A	B	C	D	
A	5	830	196	19	**1050**
B	1642	5	247	2015	**3909**
C	460	295	2	133	**890**
D	5	878	50	5	**938**
	2112	**2008**	**495**	**2172**	**6787**

HGVs

	A	B	C	D	
A	1	57	9	0	**67**
B	52	0	20	107	**179**
C	9	14	0	1	**24**
D	0	81	1	0	**82**
	62	**152**	**30**	**108**	**352**

PCUs

	A	B	C	D	
A	6	887	205	19	**1117**
B	1694	5	267	2122	**4088**
C	469	309	2	134	**914**
D	5	959	51	5	**1020**
	2174	**2160**	**525**	**2280**	**7139**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 12: 2031 BACKGROUND TRAFFIC FLOWS - AM PEAK HOUR

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles				
	A	B	C	
A				0
B				0
C				0
	0	0	0	0

HGVs				
	A	B	C	
A				0
B				0
C				0
	0	0	0	0

% HGVs			
	A	B	C
A			
B			
C			

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

PCUs					
	A	B	C	D	
A	0	0	0	0	0
B	0	0	0	0	0
C	0	0	0	0	0
D	0	0	0	0	0
	0	0	0	0	0

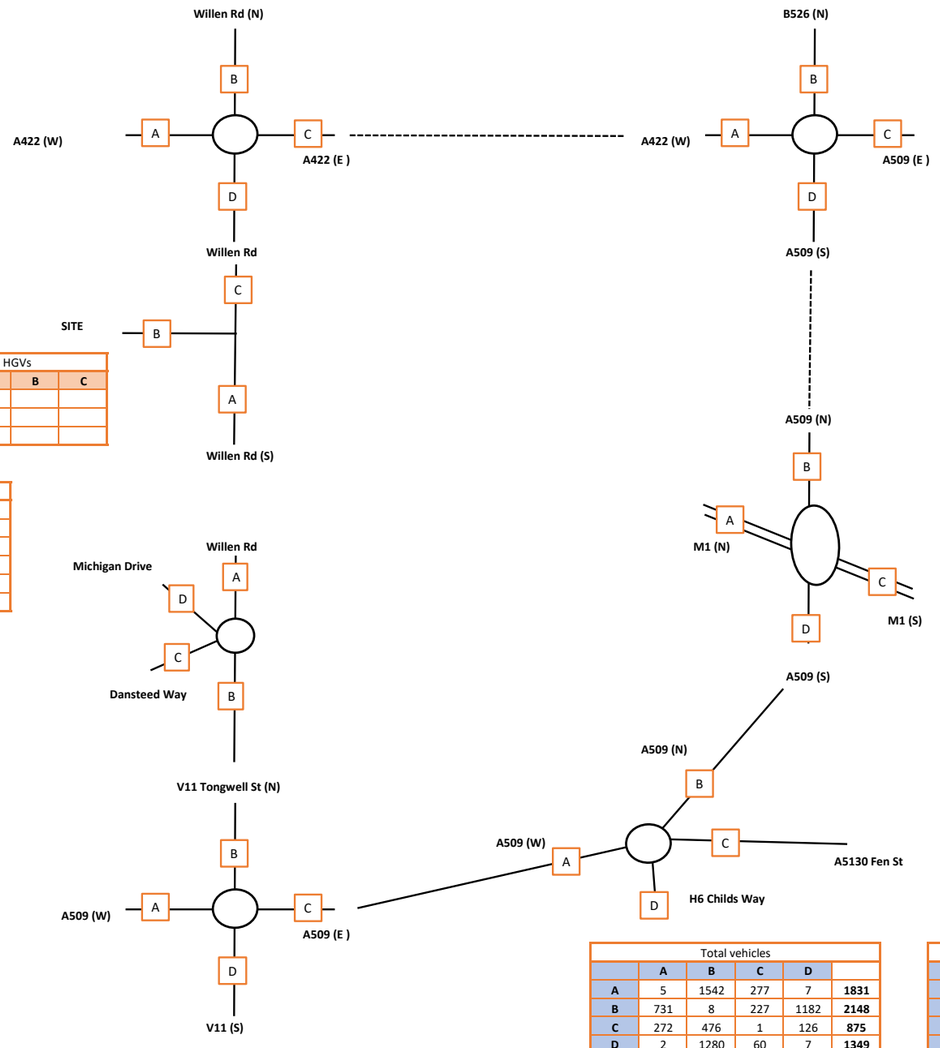
HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%



Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	2	276	0	878	**1156**
B	263	36	402	514	**1215**
C	0	425	16	767	**1208**
D	1468	677	1156	0	**3301**
	1733	**1414**	**1574**	**2159**	**6880**

HGVs					
	A	B	C	D	
A	0	20	0	60	**80**
B	10	0	13	5	**28**
C	0	28	2	29	**59**
D	79	10	13	0	**102**
	89	**58**	**28**	**94**	**269**

PCUs					
	A	B	C	D	
A	2	296	0	938	**1236**
B	273	36	415	519	**1243**
C	0	453	18	796	**1267**
D	1547	687	1169	0	**3403**
	1822	**1472**	**1602**	**2253**	**7149**

Total vehicles					
	A	B	C	D	
A	5	1542	277	7	**1831**
B	731	8	227	1182	**2148**
C	272	476	1	126	**875**
D	2	1280	60	7	**1349**
	1010	**3306**	**565**	**1322**	**6203**

HGVs					
	A	B	C	D	
A	0	20	7	1	**28**
B	22	0	2	64	**88**
C	8	16	0	2	**26**
D	0	66	0	0	**66**
	30	**102**	**9**	**67**	**208**

PCUs					
	A	B	C	D	
A	5	1562	284	8	**1859**
B	753	8	229	1246	**2236**
C	280	492	1	128	**901**
D	2	1346	60	7	**1415**
	1040	**3408**	**574**	**1389**	**6411**

2016 count
2018 count

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 13: 2031 BACKGROUND TRAFFIC FLOWS - PM PEAK HOUR

Total vehicles					
	A	B	C	D	
A	15	274	763	68	**1120**
B	269	0	37	650	**956**
C	1121	55	1	873	**2050**
D	17	260	285	0	**562**
	1422	**589**	**1086**	**1591**	**4688**

HGVs					
	A	B	C	D	
A	1	2	46	3	**52**
B	9	0	2	11	**22**
C	41	1	0	21	**63**
D	2	9	20	0	**31**
	53	**12**	**68**	**35**	**168**

% HGVs				
	A	B	C	D
A	6.7%	0.7%	6.0%	4.4%
B	3.3%	0.0%	5.4%	1.7%
C	3.7%	1.8%	0.0%	2.4%
D	11.8%	3.5%	7.0%	0.0%

Total vehicles				
	A	B	C	
A	0	58	546	**604**
B	12	0	16	**28**
C	1532	59	0	**1591**
	1544	**117**	**562**	**2223**

HGVs				
	A	B	C	
A	0	8	20	**28**
B	7	0	11	**18**
C	24	11	0	**35**
	31	**19**	**31**	**81**

% HGVs			
	A	B	C
A	0.0%	13.8%	3.7%
B	58.3%	0.0%	68.8%
C	1.6%	18.6%	0.0%

Total vehicles					
	A	B	C	D	
A	1	564	963	36	**1564**
B	286	7	583	140	**1016**
C	323	144	9	38	**514**
D	18	30	21	1	**70**
	628	**745**	**1576**	**215**	**3164**

PCUs					
	A	B	C	D	
A	1	582	978	36	**1597**
B	299	7	599	145	**1050**
C	336	155	10	39	**540**
D	19	32	23	1	**75**
	655	**776**	**1610**	**221**	**3262**

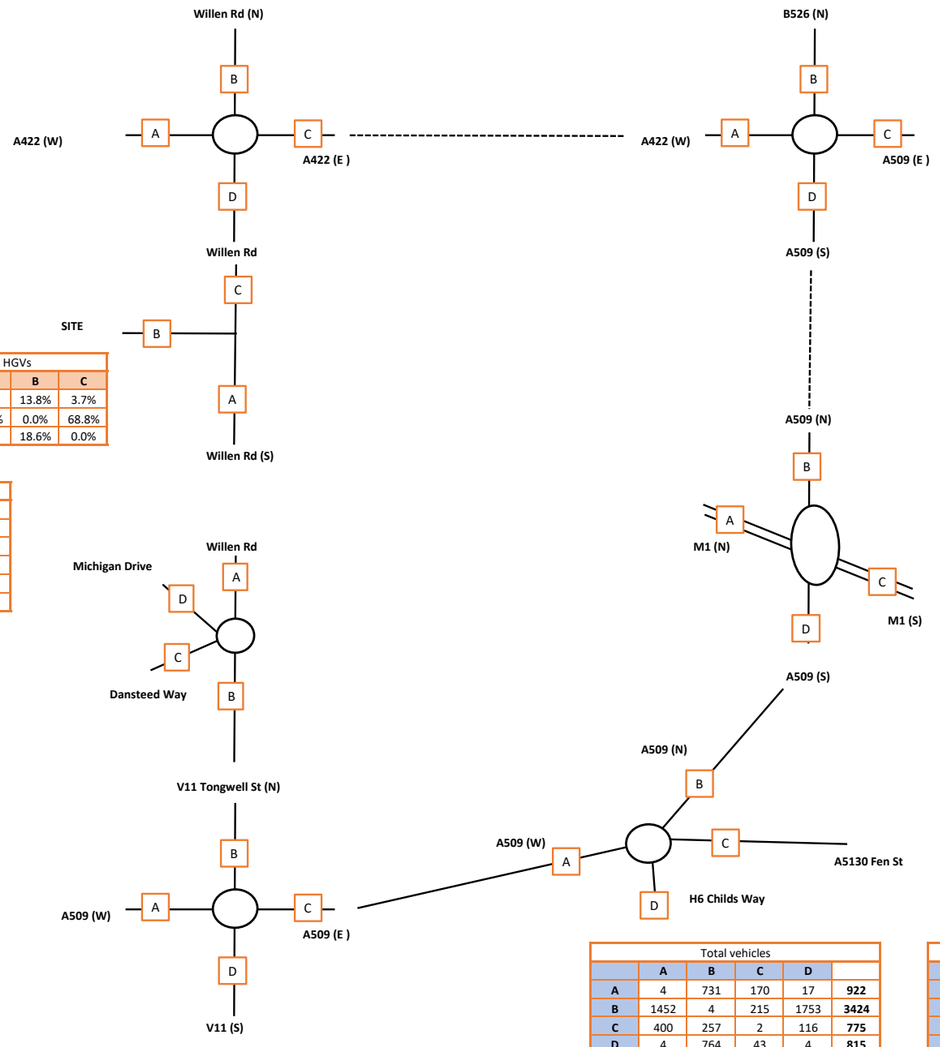
HGVs					
	A	B	C	D	
A	0	18	15	0	**33**
B	13	0	16	5	**34**
C	13	11	1	1	**26**
D	1	2	2	0	**5**
	27	**31**	**34**	**6**	**98**

% HGVs				
	A	B	C	D
A	0.0%	3.2%	1.6%	0.0%
B	4.5%	0.0%	2.7%	3.6%
C	4.0%	7.6%	11.1%	2.6%
D	5.6%	6.7%	9.5%	0.0%

Total vehicles					
	A	B	C	D	
A	1	26	614	286	**927**
B	34	2	197	617	**850**
C	1352	423	5	53	**1833**
D	207	562	51	3	**823**
	1594	**1013**	**867**	**959**	**4433**

HGVs					
	A	B	C	D	
A	0	5	29	3	**37**
B	3	0	18	29	**50**
C	27	20	2	6	**55**
D	2	12	7	0	**21**
	32	**37**	**56**	**38**	**163**

% HGVs				
	A	B	C	D
A	0.0%	19.2%	4.7%	1.0%
B	8.8%	0.0%	9.1%	4.7%
C	2.0%	4.7%	40.0%	11.3%
D	1.0%	2.1%	13.7%	0.0%



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A	1	314	635	132	**1082**
B	561	1	28	174	**764**
C	1357	25	0	384	**1766**
D	226	214	222	1	**663**
	2145	**554**	**885**	**691**	**4275**

HGVs					
	A	B	C	D	
A	0	3	33	32	**68**
B	9	1	2	6	**18**
C	34	1	0	34	**69**
D	28	20	20	0	**68**
	71	**25**	**55**	**72**	**223**

% HGVs				
	A	B	C	D
A	0.0%	1.0%	5.2%	24.2%
B	1.6%	100.0%	7.1%	3.4%
C	2.5%	4.0%	0.0%	8.9%
D	12.4%	9.3%	9.0%	0.0%

Total vehicles					
	A	B	C	D	
A	3	245	0	1390	**1638**
B	133	10	315	599	**1057**
C	2	286	7	1476	**1771**
D	840	353	545	0	**1738**
	978	**894**	**867**	**3465**	**6204**

HGVs					
	A	B	C	D	
A	1	26	0	99	**126**
B	12	1	39	21	**73**
C	0	14	0	44	**58**
D	89	22	31	0	**142**
	102	**63**	**70**	**164**	**399**

PCUs					
	A	B	C	D	
A	4	271	0	1489	**1764**
B	145	11	354	620	**1130**
C	2	300	7	1520	**1829**
D	929	375	576	0	**1880**
	1080	**957**	**937**	**3629**	**6603**

Total vehicles					
	A	B	C	D	
A	4	731	170	17	**922**
B	1452	4	215	1753	**3424**
C	400	257	2	116	**775**
D	4	764	43	4	**815**
	1860	**1756**	**430**	**1890**	**5936**

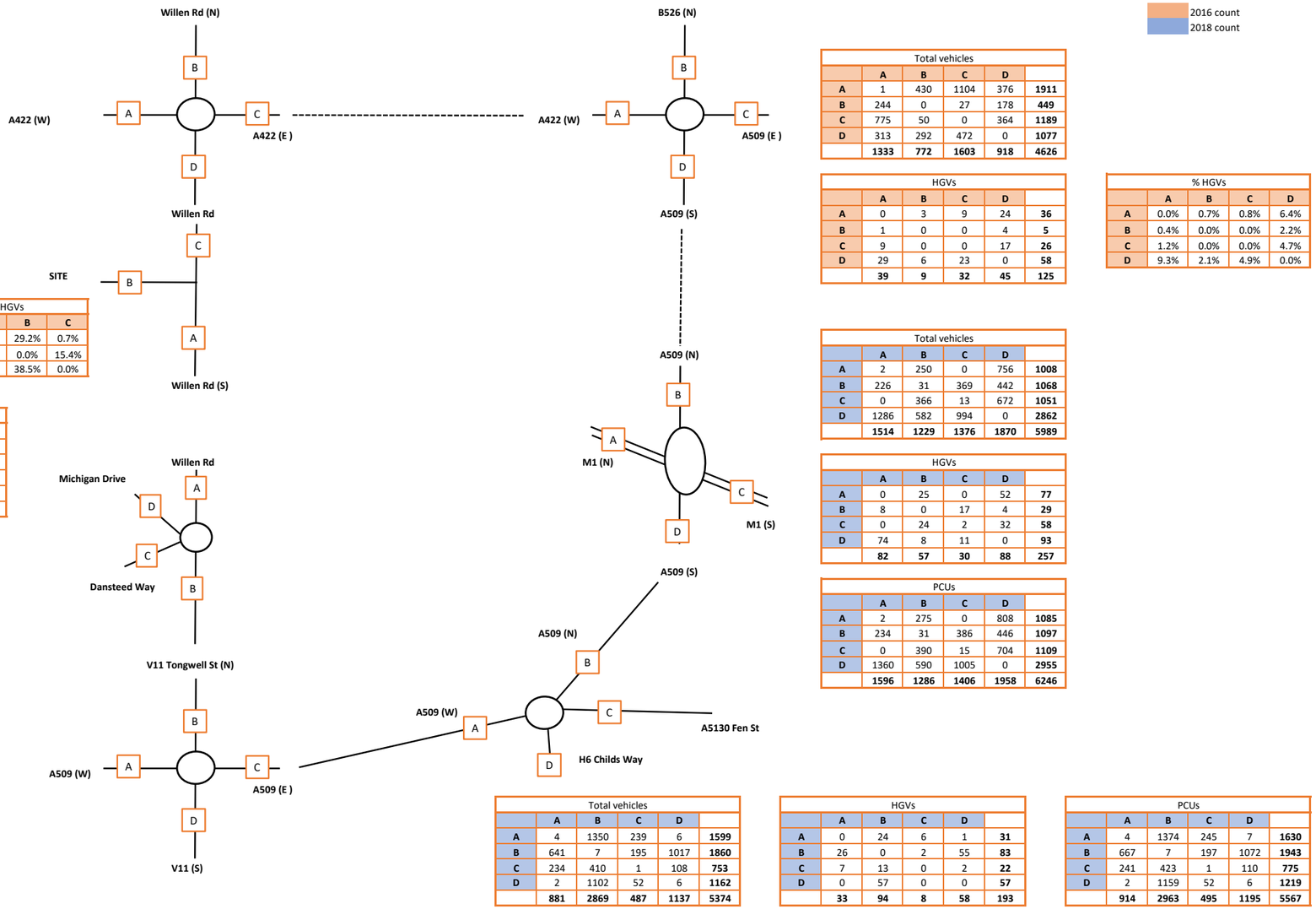
HGVs					
	A	B	C	D	
A	0	25	6	1	**32**
B	27	0	2	55	**84**
C	7	13	0	2	**22**
D	0	57	0	0	**57**
	34	**95**	**8**	**58**	**195**

PCUs					
	A	B	C	D	
A	4	756	176	18	**954**
B	1479	4	217	1808	**3508**
C	407	270	2	118	**797**
D	4	821	43	4	**872**
	1894	**1851**	**438**	**1948**	**6131**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 14: 2020 WITH DEVELOPMENT TRAFFIC FLOWS - AM PEAK HOUR



Total vehicles					
	A	B	C	D	
A	12	452	1303	27	**1794**
B	202	0	113	268	**583**
C	880	191	0	264	**1335**
D	39	449	465	0	**953**
	1133	**1092**	**1881**	**559**	**4665**

HGVs					
	A	B	C	D	
A	1	3	22	1	**27**
B	3	0	2	3	**8**
C	28	0	0	14	**42**
D	3	3	10	0	**16**
	35	**6**	**34**	**18**	**93**

% HGVs				
	A	B	C	D
A	8.3%	0.7%	1.7%	3.7%
B	1.5%	0.0%	1.8%	1.1%
C	3.2%	0.0%	0.0%	5.3%
D	7.7%	0.7%	2.2%	0.0%

Total vehicles					
	A	B	C	D	
A	1	430	1104	376	**1911**
B	244	0	27	178	**449**
C	775	50	0	364	**1189**
D	313	292	472	0	**1077**
	1333	**772**	**1603**	**918**	**4626**

HGVs					
	A	B	C	D	
A	0	3	9	24	**36**
B	1	0	0	4	**5**
C	9	0	0	17	**26**
D	29	6	23	0	**58**
	39	**9**	**32**	**45**	**125**

% HGVs				
	A	B	C	D
A	0.0%	0.7%	0.8%	6.4%
B	0.4%	0.0%	0.0%	2.2%
C	1.2%	0.0%	0.0%	4.7%
D	9.3%	2.1%	4.9%	0.0%

Total vehicles				
	A	B	C	
A	0	24	887	**911**
B	65	0	65	**130**
C	533	26	0	**559**
	598	**50**	**952**	**1600**

HGVs				
	A	B	C	
A	0	7	6	**13**
B	6	0	10	**16**
C	8	10	0	**18**
	14	**17**	**16**	**47**

% HGVs			
	A	B	C
A	0.0%	29.2%	0.7%
B	9.2%	0.0%	15.4%
C	1.5%	38.5%	0.0%

Total vehicles					
	A	B	C	D	
A	2	250	0	756	**1008**
B	226	31	369	442	**1068**
C	0	366	13	672	**1051**
D	1286	582	994	0	**2862**
	1514	**1229**	**1376**	**1870**	**5989**

HGVs					
	A	B	C	D	
A	0	25	0	52	**77**
B	8	0	17	4	**29**
C	0	24	2	32	**58**
D	74	8	11	0	**93**
	82	**57**	**30**	**88**	**257**

PCUs					
	A	B	C	D	
A	2	275	0	808	**1085**
B	234	31	386	446	**1097**
C	0	390	15	704	**1109**
D	1360	590	1005	0	**2955**
	1596	**1286**	**1406**	**1958**	**6246**

Total vehicles					
	A	B	C	D	
A	0	232	342	16	**590**
B	359	7	271	106	**743**
C	358	159	13	7	**537**
D	176	289	81	0	**546**
	893	**687**	**707**	**129**	**2416**

PCUs					
	A	B	C	D	
A	0	240	345	18	**603**
B	367	7	281	111	**766**
C	360	163	13	7	**543**
D	177	292	81	0	**550**
	904	**702**	**720**	**136**	**2462**

HGVs					
	A	B	C	D	
A	0	8	3	2	**13**
B	8	0	10	5	**23**
C	2	4	0	0	**6**
D	1	3	0	0	**4**
	11	**15**	**13**	**7**	**46**

% HGVs				
	A	B	C	D
A	0.0%	3.4%	0.9%	12.5%
B	2.2%	0.0%	3.7%	4.7%
C	0.6%	2.5%	0.0%	0.0%
D	0.6%	1.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	4	28	1030	165	**1227**
B	27	1	329	453	**810**
C	782	177	7	23	**989**
D	328	543	102	2	**975**
	1141	**749**	**1468**	**643**	**4001**

HGVs					
	A	B	C	D	
A	0	0	23	7	**30**
B	0	0	12	3	**15**
C	21	18	0	2	**41**
D	2	6	2	0	**10**
	23	**24**	**37**	**12**	**96**

% HGVs				
	A	B	C	D
A	0.0%	0.0%	2.2%	4.2%
B	0.0%	0.0%	3.6%	0.7%
C	2.7%	10.2%	0.0%	8.7%
D	0.6%	1.1%	2.0%	0.0%

Total vehicles					
	A	B	C	D	
A	4	1350	239	6	**1599**
B	641	7	195	1017	**1860**
C	234	410	1	108	**753**
D	2	1102	52	6	**1162**
	881	**2869**	**487**	**1137**	**5374**

HGVs					
	A	B	C	D	
A	0	24	6	1	**31**
B	26	0	2	55	**83**
C	7	13	0	2	**22**
D	0	57	0	0	**57**
	33	**94**	**8**	**58**	**193**

PCUs					
	A	B	C	D	
A	4	1374	245	7	**1630**
B	667	7	197	1072	**1943**
C	241	423	1	110	**775**
D	2	1159	52	6	**1219**
	914	**2963**	**495**	**1195**	**5567**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 15: 2020 WITH DEVELOPMENT TRAFFIC FLOWS - PM PEAK HOUR

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles				
	A	B	C	
A				0
B				0
C				0
	0	0	0	0

HGVs				
	A	B	C	
A				0
B				0
C				0
	0	0	0	0

% HGVs			
	A	B	C
A	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

PCUs					
	A	B	C	D	
A	0	0	0	0	0
B	0	0	0	0	0
C	0	0	0	0	0
D	0	0	0	0	0
	0	0	0	0	0

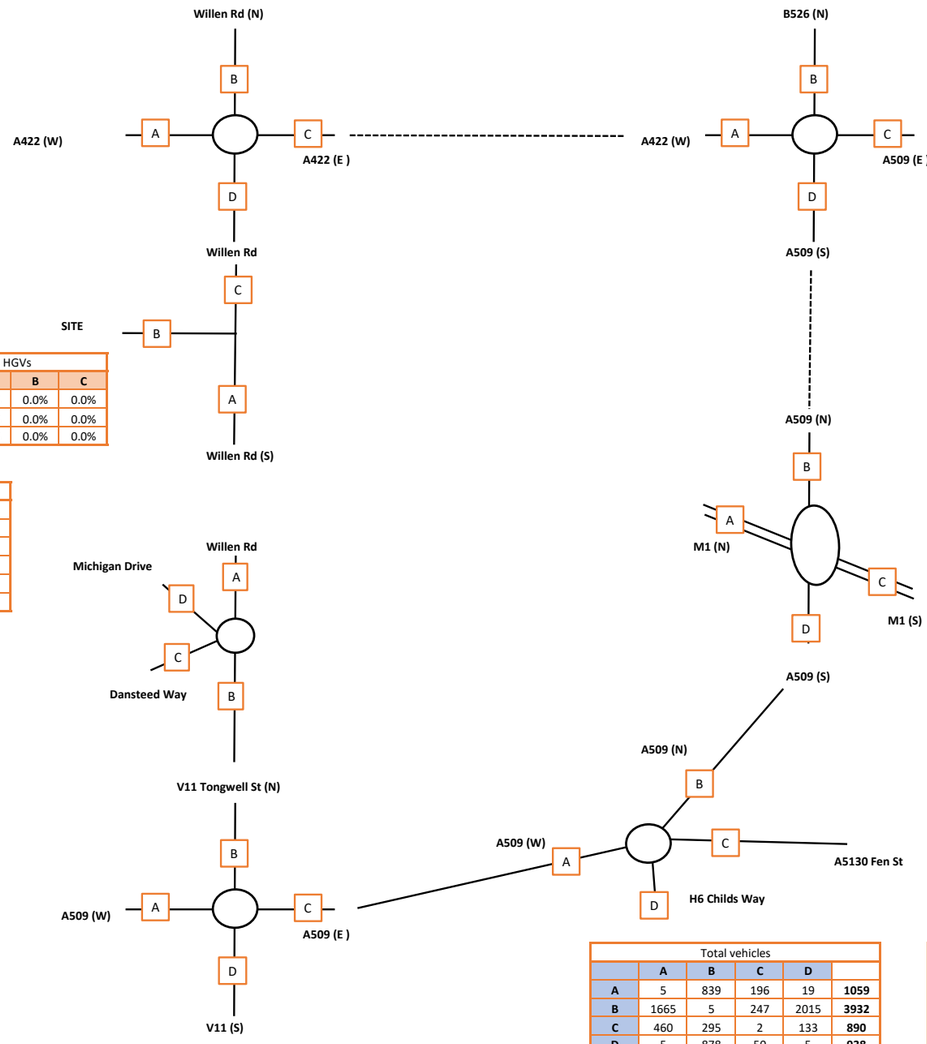
HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%



2016 count
2018 count

Total vehicles					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs					
	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs				
	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles					
	A	B	C	D	
A	4	278	0	1598	**1880**
B	153	12	360	688	**1213**
C	2	329	8	1694	**2033**
D	964	406	627	0	**1997**
	1123	**1025**	**995**	**3980**	**7123**

HGVs					
	A	B	C	D	
A	1	28	0	114	**143**
B	14	1	44	24	**83**
C	0	17	0	50	**67**
D	101	25	36	0	**162**
	116	**71**	**80**	**188**	**455**

PCUs					
	A	B	C	D	
A	5	306	0	1712	**2023**
B	167	13	404	712	**1296**
C	2	346	8	1744	**2100**
D	1065	431	663	0	**2159**
	1239	**1096**	**1075**	**4168**	**7578**

Total vehicles					
	A	B	C	D	
A	5	839	196	19	**1059**
B	1665	5	247	2015	**3932**
C	460	295	2	133	**890**
D	5	878	50	5	**938**
	2135	**2017**	**495**	**2172**	**6819**

HGVs					
	A	B	C	D	
A	0	25	6	1	**32**
B	27	0	2	55	**84**
C	7	13	0	2	**22**
D	0	57	0	0	**57**
	34	**95**	**8**	**58**	**195**

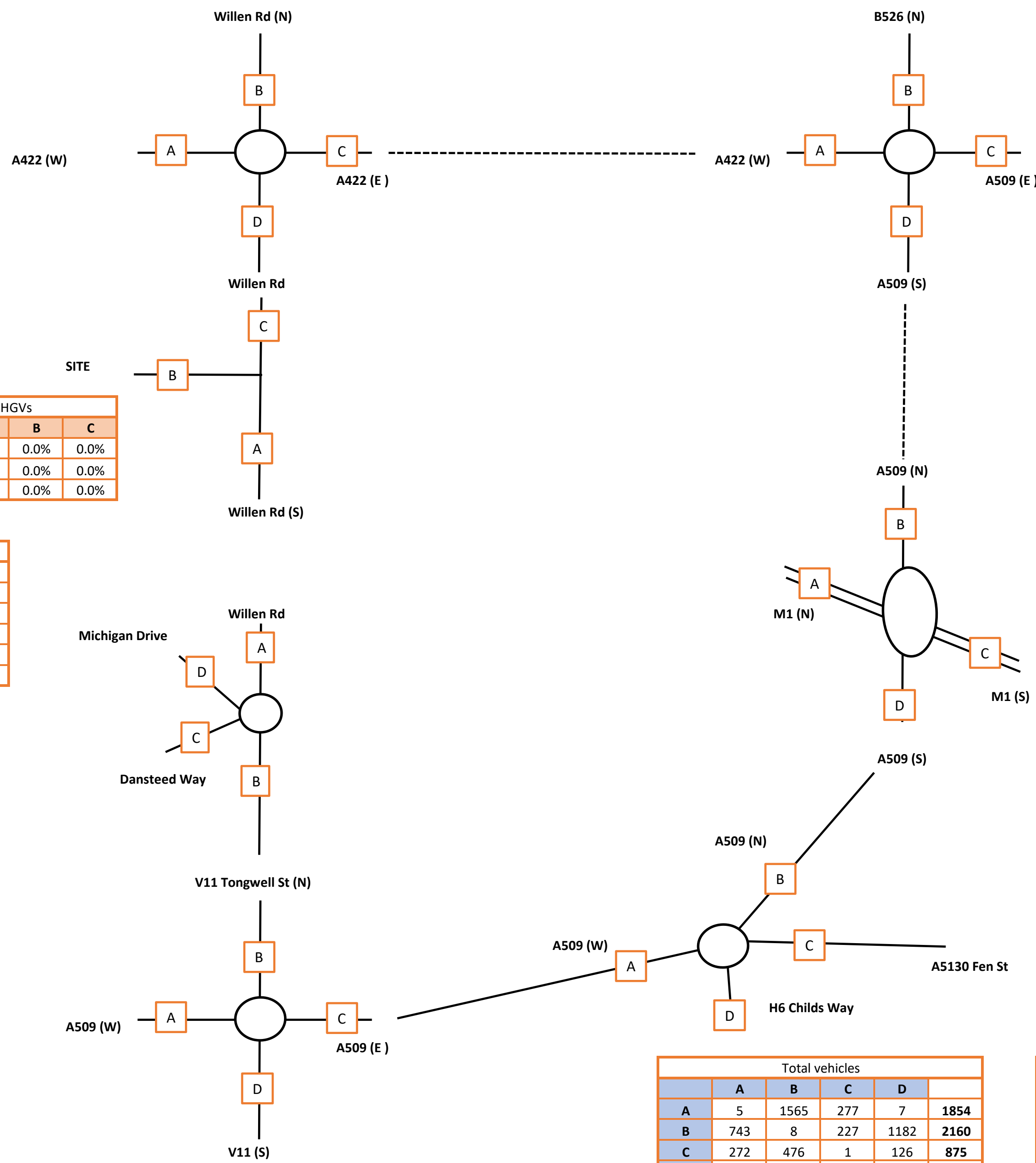
PCUs					
	A	B	C	D	
A	5	864	202	20	**1091**
B	1692	5	249	2070	**4016**
C	467	308	2	135	**912**
D	5	935	50	5	**995**
	2169	**2112**	**503**	**2230**	**7014**

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 16: 2031 WITH DEVELOPMENT TRAFFIC FLOWS - AM PEAK HOUR

2016 count
2018 count



Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	
A				0
B				0
C				0
	0	0	0	0

HGVs

	A	B	C	
A				0
B				0
C				0
	0	0	0	0

% HGVs

	A	B	C
A	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

PCUs

	A	B	C	D	
A	0	0	0	0	0
B	0	0	0	0	0
C	0	0	0	0	0
D	0	0	0	0	0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

HGVs

	A	B	C	D	
A					0
B					0
C					0
D					0
	0	0	0	0	0

% HGVs

	A	B	C	D
A	0.0%	0.0%	0.0%	0.0%
B	0.0%	0.0%	0.0%	0.0%
C	0.0%	0.0%	0.0%	0.0%
D	0.0%	0.0%	0.0%	0.0%

Total vehicles

	A	B	C	D	
A	2	288	0	878	1168
B	263	36	425	514	1238
C	0	425	16	779	1220
D	1491	677	1156	0	3324
	1756	1426	1597	2171	6950

HGVs

	A	B	C	D	
A	0	27	0	60	87
B	10	0	19	5	34
C	0	28	2	36	66
D	85	10	13	0	108
	95	65	34	101	295

PCUs

	A	B	C	D	
A	2	315	0	938	1255
B	273	36	444	519	1272
C	0	453	18	815	1286
D	1576	687	1169	0	3432
	1851	1491	1631	2272	7245

Total vehicles

	A	B	C	D	
A	5	1565	277	7	1854
B	743	8	227	1182	2160
C	272	476	1	126	875
D	2	1280	60	7	1349
	1022	3329	565	1322	6238

HGVs

	A	B	C	D	
A	0	24	6	1	31
B	26	0	2	55	83
C	7	13	0	2	22
D	0	57	0	0	57
	33	94	8	58	193

PCUs

	A	B	C	D	
A	5	1589	283	8	1885
B	769	8	229	1237	2243
C	279	489	1	128	897
D	2	1337	60	7	1406
	1055	3423	573	1380	6431

ADC INFRASTRUCTURE

WILLEN ROAD, NEWPORT PAGNELL

DIAGRAM 17: 2031 WITH DEVELOPMENT TRAFFIC FLOWS - PM PEAK HOUR

APPENDIX A

SCOPING DISCUSSIONS WITH MKC HIGHWAYS AND HIGHWAYS ENGLAND AND FORMAL OBSERVATIONS OF PLANNING APPLICATION 18/01719/FUL

ROXHILL DEVELOPMENTS LTD

PROPOSED EMPLOYMENT DEVELOPMENT ON LAND WEST OF WILLEN ROAD, NEWPORT PAGNELL, MILTON KEYNES

TRANSPORT ASSESSMENT SCOPING REPORT

ADC Infrastructure Limited
Western House
Western Street
Nottingham
NG1 3AZ

www.ADCinfrastructure.com

project number: ADC1392			report reference: ADC1392 SR
version	date	author	comments
1a	02/03/2017	Rebecca Leconte	issued to MKC
2a	05/04/2017	Rebecca Leconte/ Stuart Dunhill	amended to focus on key areas for agreement following comments from MKC
3a	08/05/2017	Rebecca Leconte/ Stuart Dunhill	revision 2a amended to reflect changed development proposals.
4	05/09/2017	Rebecca Leconte/ Stuart Dunhill	revision 3a amended to reflect changed development proposals.

CONTENTS

DRAWINGS

APPENDICES

1.0 INTRODUCTION

1.1 Roxhill Developments Ltd commissioned ADC Infrastructure Ltd to produce a Transport Assessment and Travel Plan to support a planning application for employment development on land west of Willen Road, in Newport Pagnell (**Figures 1-3**).

1.2 The development proposals comprise two large B8 warehouse and distribution units with ancillary B1 office use. The total GFA including the gatehouse is 79,220sqm (the total B8 GFA is 74,693sqm whilst the total ancillary office GFA is 4,459sqm).

1.3 The aim of this Scoping Report is to identify the key parameters for use in the subsequent Transport Assessment, and agree them with Milton Keynes Council (MKC). This includes the trip rates and resultant trip generation, the traffic distribution and assignment, the study area for further assessment, and the appropriate methodology for assessing and mitigating the off-site traffic impacts.

1.4 This report is structured as follows:

- Section 2 describes the preliminary development proposals, including the vehicular access, parking and servicing arrangements, and the new infrastructure that would be provided to encourage the use of sustainable travel modes.
- Section 3 presents the forecast trip rates and resultant trip generation of the development.
- Section 4 presents the distribution pattern and assignment of development traffic on the local highway network, with separate methodologies adopted for the light vehicle and HGVs, to establish the study area for further assessment.
- Section 5 presents the proposed 2026 assessment year traffic flows, including growth rates and committed development at the proposed study area junctions, and proposes the assessment methodology for the Transport Assessment.
- Section 6 presents the summary and conclusions.

Figure 1: general site location

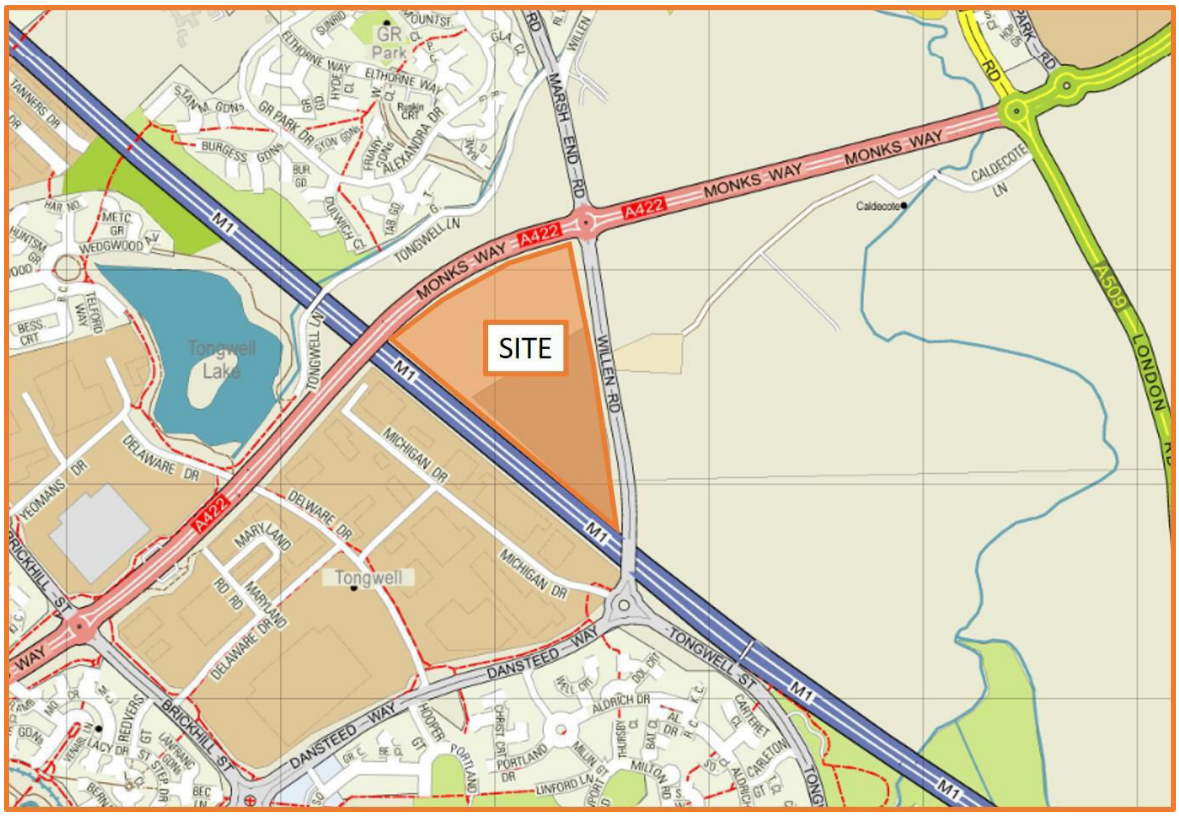


Figure 2: detailed site location

Figure 3: aerial photograph

2.0 PROPOSED DEVELOPMENT

Development proposals

2.1 The development proposals comprise two large B8 warehouse and distribution units with ancillary B1 office use. As shown in the masterplan in **Appendix A**:

- Unit 1 comprises 46,822sqm of B8 warehousing and 3,344sqm of ancillary B1 office. The warehouse could be constructed in two phases, with 31,029sqm in Phase One and 15,793sqm in Phase Two.
- Unit Two comprises 27,871sqm of B8 warehousing and 1,115sqm of ancillary office use.

2.2 The total GFA including the gatehouse is 79,220sqm, whilst:

- the total B8 GFA is 74,693sqm,
- the total ancillary office GFA is 4,459sqm, and
- the gatehouse GFA is 68sqm.

Likely operation and number of employees

2.3 It is likely that the units will operate 24 hours a day and utilise shift patterns (typically 0600-1400, 1400-2200 and 2200-0600 hours). The development is therefore unlikely to generate significant trips in the highway network peak hours, other than by staff working in the offices who will work standard hours.

2.4 The HCA Employment Density Guide 2015 suggests that B8 uses have a density ranging from 1 employee per 95sqm for national distribution centres, to 1 employee per 77sqm for regional distribution centres, to 1 employee per 70sqm for 'last mile' distribution. This figure includes admin roles within the ancillary offices. Therefore, taking the middle value, and a total GFA of 79,152sqm (excluding the gatehouses), the site could employ approximately 1,028 employees.

2.5 However, there is a difference between the total number of employees, and the number on-site during any one time period. To calculate the traffic generation of the employees, it is necessary to obtain a daily profile of trip rates. This is therefore examined in Section 3, using the profile from similar B8 warehousing and distribution sites.

Car and cycle parking provision

2.6 MKC's car parking standard[1] for B8 uses in Zone 4, within which the site is located, is one space per 100sqm GFA. In addition, car parking for the ancillary office use, which must be provided in accordance with the B1 parking standard, is one space per 30sqm.

2.7 MKC's electric vehicles charging space standards are 2 spaces for developments with 51 to 100 car parking spaces, and then 1 electric vehicle charging space per 100 car parking spaces thereafter.

2.8 MKC's powered two wheelers standards are 1 space per 70 total car spaces.

2.9 The cycle parking standard for B8 uses in Zone 4 is one per 700sqm or 1 per 10 full time employees, plus a minimum of two for visitors and one per 1000sqm thereafter. The standard for B1 uses is 1 per 120sqm or 1 per 10 full time employees, plus a minimum of two for visitors and 1 per 500sqm thereafter.

[1] Milton Keynes Council Supplementary Planning Document (January 2016)

2.10 The table below shows the proposed provision (shown in the masterplan in **Appendix A**) compared with the standards. The proposed provision should be acceptable subject to minor alterations to the masterplan.

Type	Unit 1				Unit 2			
	B8	B1	total allowance	proposed	B8	B1	total allowance	proposed
car parking	468	111	579	580	278	37	315	316
electric vehicle charging			8	6			5	6
powered two wheelers			8	9			5	5
cycle parking	116	37	153	150	70	13	83	87

Servicing provision

2.11 The guideline figure for HGV parking for B8 uses in Zone 4 is one per 300sqm. Therefore, based on a B8 GFA of 46,822sqm, the suggested figure is 156 spaces (103 for Phase One and 53 for Phase Two). The development masterplan currently includes 60 spaces including 16 dock accesses, but shows space for future yard expansion.

2.12 Based on a B8 GFA of 27,871sqm, the suggested figure for Unit 2 is 93 HGV spaces. The masterplan in **Appendix A** includes 85 spaces, including 31 dock accesses.

2.13 This provision is sufficient based on the guideline parking standards, and the Transport Assessment will include an HGV trip generation and accumulation assessment to justify the provision.

Access

2.14 With regards to access by sustainable modes, appropriate infrastructure will be identified as part of the Transport Assessment in order to facilitate access by foot, cycle and bus. This will include a new footway/cycleway along Willen Road and into the site, and new bus stops within walking distance on Willen Road. Funding will also be provided towards improved bus services, to coincide with shift changeover times, if this is identified as necessary within the Transport Assessment.

2.15 With regards to vehicular access, Willen Road is classed as a district distributor road (marked as a locally strategic route within MKC's Highway Guide), and MKC have a general policy to 'normally resist' new accesses onto this type of road. Willen Road is also subject to the national speed limit and MKC do not 'normally' permit new accesses on roads with the national speed limit.

2.16 The access strategy will therefore depend on discussions with MKC. Nevertheless, the Draft Plan: MK (March 2017) includes the site as part of a wider mixed-use Sustainable Urban Extension, and it is therefore assumed that new access onto Willen Road is acceptable in principle.

2.17 At this stage, a single point of access is proposed, on the basis that this is preferable to having multiple points of access into the site.

2.18 Initially, a priority-controlled arrangement was examined (including both a staggered priority-controlled crossroads with the junction opposite the site, and a standard crossroads arrangement). However, due to the high traffic flows on Willen Road, particularly southbound in the morning peak hour, initial junction modelling suggests that development traffic would struggle to exit the site, leading to queuing and delay. Traffic attempting to turn right out of the site to travel south would be most affected. This could, in turn, cause road safety issues as

vehicles attempt to exit during gaps in the traffic. Therefore, a priority-controlled arrangement was dismissed as unsuitable.

2.19 As a result, a traffic signal controlled arrangement was examined, as shown in **Drawing ADC1392/002 P2.** The junction is designed in accordance with DMRB TD50/04 and based on the existing national speed limit (although it is possible that the speed limit along Willen Road would be reduced in the future as part of the wider Sustainable Urban Extension referred to in Draft Plan: MK).

2.20 Due to the high southbound flow on Willen Road in the morning peak hour, initial modelling confirms that the access arrangement would need to include two southbound lanes and a right turn lane into the site.

2.21 It is concluded that a signal controlled access arrangement could be designed to the relevant standards, and would have sufficient capacity to accommodate the development traffic flows. It would therefore provide a safe and suitable access for the development.

2.22 A pedestrian crossing would be provided on Willen Road to facilitate trips across to the new bus stop. The access road would also provide a Toucan crossing, to connect the new footway/cycleway on Willen Road with the on-site facilities.

2.23 In addition, to the north of the site, Willen Road joins the A422 and Marsh End Road at a four-arm roundabout, known as the Marsh End Roundabout. All approach arms have three entry lanes, and there are two circulatory lanes, but the junction has known capacity issues. The proposed traffic signal controlled access would provide opportunity to co-ordinate traffic flows on Willen Road with a potential signal controlled improvement to the Marsh End roundabout. The potential Marsh End improvement scheme is shown in **Drawing ADC1392/006 P3**, and initial junction modelling confirms that the improved scheme would provide a better than nil detriment solution.

2.24 Both Drawing ADC1392/002 P2 and the masterplan in **Appendix A** show how the internal layout would be arranged to provide access to both Units 1 and 2. The proposed layout to Unit 1 includes a two lane approach to the gatehouse, and a right turn lane for the car park, thereby providing storage for right turners into the car park, without blocking HGVs accessing the main site. The access to Unit 2 is via a priority-controlled T-junction. Along the internal road, access to the service yard would take priority, and vehicles travelling from the car park would give-way.

3.0 TRIP GENERATION

Traffic generation

3.1 Over a number of years, Roxhill Developments have built a considerable number of large scale B8 developments. These have been surveyed and the data stored for re-use on future projects. A summary of the recorded trip rates for these sites, along with those for the large scale B8 units survey data that is available from the TRICS database is summarised in Table 1 in **Appendix B**.

3.2 The Swan Valley site is most comparable to the proposed development for the following reasons:

- it is located on an A road with good access to the strategic road network
- the site includes large scale warehouses
- it has an employee density of 1 employee per 77sqm, which matches the Home and Communities Agency (HCA) employment density guide (see paragraph 2.3)
- the majority of units at the site operate a three shift system (6 – 2 – 10)
- at the time of the survey the site had no bus service with low pedestrian and cycle usage (3% combined), with a car driver usage rate of 92%, providing a robust car usage figure as a base starting point.

3.3 The October 2007 traffic survey and masterplan for the Swan Valley site is given at **Appendix C.** At the time of the survey 1.48million sqft of floor space was occupied and operational at Swan Valley.

3.4 In order to further check the validity of use of the Swan Valley trip rates, a number of comparisons were undertaken. The below table compares the resulting morning and evening peak hour and daily Swan Valley trip rates per 100sqm for light vehicles with the average light vehicle trip rates per 100sqm for all survey sites given in Table 1 in **Appendix B**.

comparison of Swan Valley light vehicle trip rates/100sqm to average of all survey sites									
	am peak (0800 to 0900 hrs)			pm peak (1700 to 1800 hrs)			daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
average of sites	0.087	0.036	0.124	0.032	0.083	0.115	0.978	1.102	2.08
Swan Valley	0.121	0.013	0.135	0.029	0.108	0.137	1.06	1.04	2.10

3.5 The above comparison demonstrates that the peak hour trip rates for Swan Valley are slightly higher than the average trip rates determined across all the survey sites. In addition, it can be seen that the Swan Valley rates produce an elevated inbound trip rate in the morning peak hour and an elevated outbound trip rate in the evening peak hour. The correlation of these elevated values with the direction of peak tidal flow (inbound in the morning peak hour and outbound in the evening peak hour), adds robustness to the assessment. It is concluded that the Swan Valley site provides robust trip rates for the light vehicle trips associated with the proposed development.

3.6 The table below compares the morning and evening peak hour and daily Swan Valley trip rates for HGV trips per 100sqm with the average HGV trip rates per 100sqm for all survey sites given in Table 1 in **Appendix B.**

comparison of Swan Valley HGV trip rates per 100sqm to average of all survey sites									
	am peak (0800 to 0900 hrs)			pm peak (1700 to 1800 hrs)			daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
average of sites	0.024	0.022	0.046	0.021	0.019	0.040	0.319	0.277	0.596
Swan Valley	0.012	0.015	0.028	0.013	0.016	0.029	0.306	0.316	0.622

3.7 The above comparison shows that Swan Valley has a peak hour HGV profile that is below the average. However, the daily trip rates are above the average. Compared to the average, in the morning peak hour the Swan Valley two-way HGV trip rate is underestimated by around 64% and by around 37% in the evening peak hour. Therefore, to ensure a robust assessment of the peak hour HGV generations, the average HGV trip rates have been adopted for the peak hours. This has the effect of also increasing the overall daily HGV trip rates, providing further robustness to the assessment. This approach has been used and agreed elsewhere.

3.8 The resulting daily vehicle trip rate profile is summarised at Table 2 in **Appendix B**. The table identifies that in the evening, both the pre and post shoulder peak hours are forecast to generate higher traffic flows than the traditional 1700 to 1800 peak hour period. The earlier shoulder peak hour of 1600 to 1700 hours has a higher departure rate. Therefore, to ensure a robust assessment, the light vehicle trip rates associated with this shoulder peak hour are used as a proxy for the 1700 to 1800 peak hour. This ensures that any potential overlap of this shoulder peak with the highway network peak hour is considered. This is not an issue in the morning peak hour, where the shift change peak occurs much earlier.

3.9 The resulting peak hour and daily trip rates to be used for assessment purposes are summarised in the table below.

proposed assessment B8 use peak hour and daily vehicle trip rates/100sqm GFA									
	am peak (0800 to 0900 hrs)			pm peak (1700 to 1800 hrs)			daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Light	0.121	0.013	0.135	0.040*	0.140*	0.180*	1.060	1.043	2.103
HGV	0.024	0.022	0.046	0.021	0.019	0.040	0.326	0.326	0.652
Total	0.145	0.035	0.181	0.061	0.159	0.220	1.386	1.369	2.755

**shoulder peak of 1600 to 1700hrs light vehicle trip rates used*

3.10 Based on these assessment trip rates, the proposed development with a worst case total GFA of 79,220sqm (including the gatehouse) would generate the following traffic flows for the morning and evening peak hours and daily.

proposed development traffic flows (total development – 79,220sqm)									
	am peak (0800 to 0900 hrs)			pm peak (1700 to 1800 hrs)			daily (24 hrs)		
	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Light	96	10	106	*32**	*111**	*142**	839	826	1666
HGV	19	17	36	17	15	32	258	258	516
Total	115	27	142	49	126	174	1097	1085	2182

**based on shoulder peak of 1600 to 1700hrs light vehicle trip rates*

Modal split and person trip generation

3.11 The Transport Assessment will identify the modal split and associated person trip generation using 2011 Census journey to work data. The existing sustainable travel infrastructure will be

examined, and any further infrastructure required to promote sustainable travel and accommodate the additional demand will be proposed.

4.0 VEHICLE DISTRIBUTION AND ASSIGNMENT

Light vehicles (staff and visitors)

4.1 In order to determine the likely distribution pattern of the forecast light vehicle traffic, reference was made to the 2011 National Census 'location of usual residence and place of work by method of travel to work' dataset (reference WU03EW). The data provides information on the in moves and out moves to and from each MSOA associated with journeys to work. The site is located in the Milton Keynes 002 MSOA, but borders the Milton Keynes 007 MSOA, which includes the employment estate adjacent to the proposed development site.

4.2 Therefore, the data for the Milton Keynes MSOA 007 was examined to identify where people working in the MSOA, who travel by car, travel from. From this information, the travel route was estimated using maps, and the proportion using each highway route was identified (**Appendix D**). This approach is appropriate given that new employees within the development would display similar travel patterns to existing employees in the area.

4.3 **Diagram 3 in Appendix E** shows the resultant distribution pattern of the traffic generated by the proposed employment development. It suggests that approximately 50% of employee traffic would route to and from the north, and through the Marsh End Roundabout, and 50% would route to and from the south through the Tongwell Roundabout.

4.4 Almost 30% of the development traffic would route to and from the M1, with 15% travelling to and from the M1(N) and 14.9% travelling to and from the M1(S). Traffic travelling between the site and the M1 can either route via the A509, A422 and Willen Road (N), or via the A509, V11 and Willen Road (S). Therefore, for the purposes of the distribution pattern, it was assumed that all traffic travelling to and from the M1(N) would route via the A509, A422 and Willen Road (N), whilst all traffic travelling to and from the M1(S) would take the alternative route via Willen Rd (S). However, given that there are aspirations for the A509 to be dualled between the M1 Junction 14 and the Tickford Roundabout, that route may be more attractive to use. It is noted that MKC's Challenge Funding bid to the DfT for improvements to the A509 and A422 was successful, and that the funding will be used to provide improvements to the surfacing, white lining, signage and drainage along the A509 to the north of the A422. However, it is understood that there is currently no funding in place for the dualling of the A509 between the A422 and the M1.

4.5 The development light vehicle traffic was assigned to the highway network in accordance with the distribution pattern shown in **Diagram 3**. The morning and evening peak hour development light vehicle traffic assignment is shown in **Diagrams 4 and 5 in Appendix E** respectively.

HGVs

4.6 HGVs bringing and distributing goods would primarily route to and from the motorway network. Given the location of the site in relation to London to the south and other cities to the north, east and west, it is considered traffic would distribute evenly along the motorway, whilst some would route to and from the A45 to the east and the M40 to the west. The distribution pattern therefore assumes 40% routing to/from the M1(N), 40% routing to/from the M1(S), 10% routing along the A509 (E) and 10% routing along the A422(W).

4.7 The development HGV traffic (paragraph 3.10) was assigned in accordance with the distribution pattern shown in **Diagram 3**. The morning and evening peak hour development HGV assignment is shown in **Diagrams 4 and 5 in Appendix E** respectively.

5.0 ASSESSMENT TRAFFIC FLOWS

Observed traffic flows

5.1 Traffic counts were undertaken at the four junctions shown in **Figure 4**, on Tuesday 18 October 2016. All vehicle movements turning at and travelling through the junctions were recorded in 15 minute intervals between 0730-0930 and 1600-1830 hours. The results are contained in **Appendix F.**

5.2 The highway network peak hours were found to be 0745-0845 and 1700-1800 hours, and the observed morning and evening peak hour traffic flows are shown in **Diagrams 1 and 2 in Appendix E.** Traffic flows past the site access junction have been replicated from the traffic flows recorded on the Willen Road arm at the Tongwell Roundabout. This shows a high southbound flow of 1,455 vehicles on Willen Road in the morning peak hour. Traffic flows are lower in the evening peak hour.

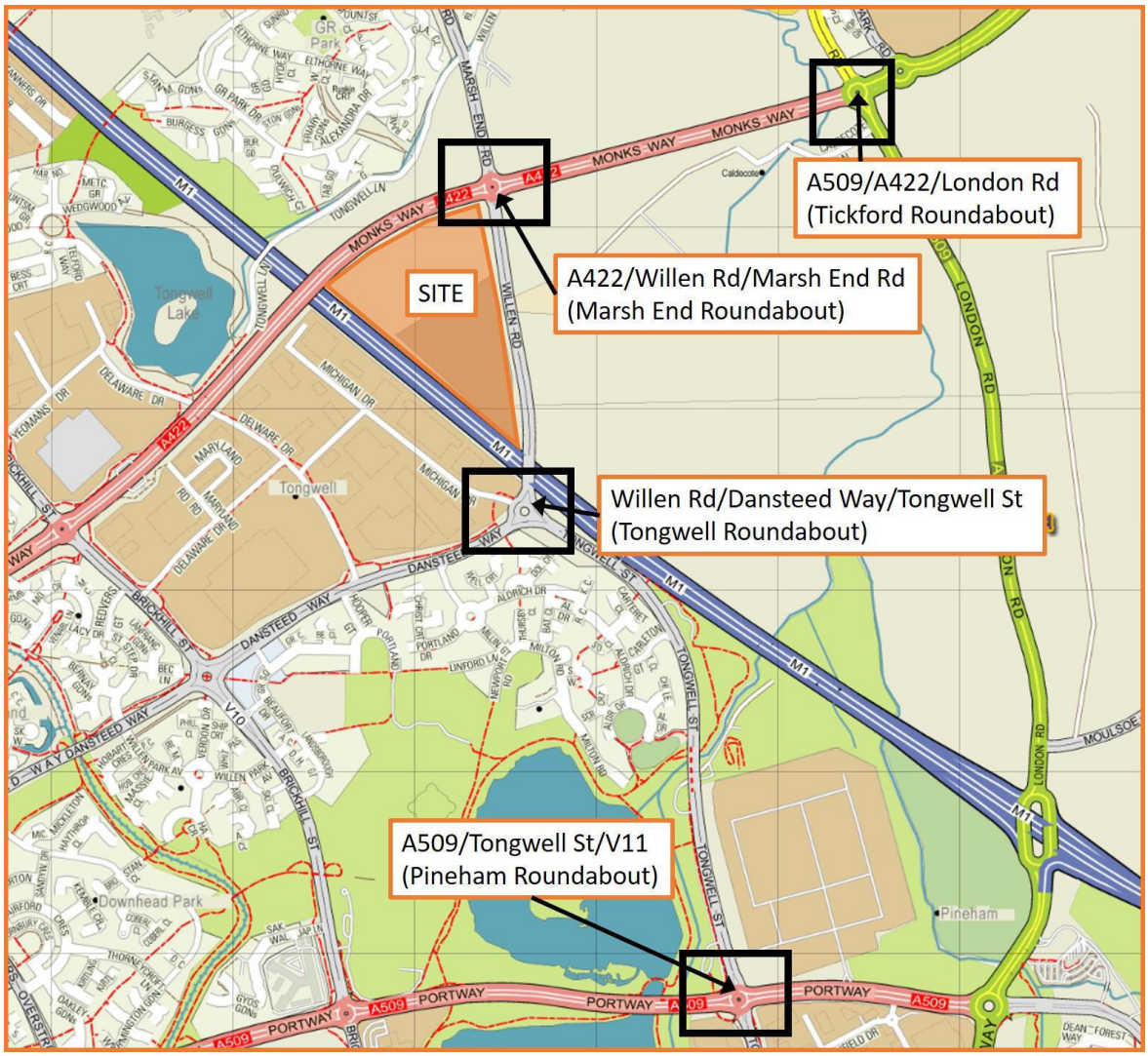


Figure 4: study area junctions

Assessment year background traffic flows and committed development

5.3 The Milton Keynes Traffic Model uses a future assessment year of 2026, in line with the end of the current Core Strategy. Therefore, for consistency, it is also proposed to use 2026 as the assessment year in the Transport Assessment.

5.4 The observed traffic flows were therefore increased to 2026 levels using growth factors from TEMPRO (version 7.2, dataset 72), which includes links to the National Traffic Model. The growth rates for 'all roads' in the Milton Keynes 007 MSOA are shown in **Appendix G** and are as follows:

- 2016 to 2026 (AM) 1.1797
- 2016 to 2026 (PM) 1.1773.

These growth rates were applied to the observed traffic flows, and the resultant '2026 background' traffic flows are shown in **Diagrams 6 and 7 in Appendix E**.

5.5 In addition to the background growth, it is usually necessary to include traffic flows associated with any committed developments within the 2026 assessment year traffic flows. The NPPG states that *"it is important to give appropriate consideration to the cumulative impacts arising from other committed development (i.e. development that is consented or allocated where there is a reasonable degree of certainty will proceed within the next three years). At the decision-taking stage this may require the developer to carry out an assessment of the impact of those adopted Local Plan allocations which have the potential to impact on the same sections of transport network as well as other relevant local sites benefitting from as yet unimplemented planning approval."*

5.6 **Figure 5** shows the major development sites in Milton Keynes. The two developments closest to the site, and which may generate traffic through the study area junctions, are the Northern Expansion Area (Redhouse Park) and the Eastern Expansion Area. However, it is understood that large parts of these developments have already been completed, and any associated traffic generation will have therefore been included in the traffic counts undertaken at each study area junction. As a result, to avoid double counting, it is not proposed to include additional 'site specific' traffic beyond the TEMPRO growth for these uses.

5.7 In addition, **Figure 6** shows the location of the Tickford Fields Farm Strategic Reserve Site and Tickford Fields Farm East, which is to be a residential led extension with approximately 1280 homes, a local centre and primary school. Whilst referred to in Policy NP2 of the Newport Pagnell Neighbourhood Plan, the site is not allocated in the Local Plan and at the time of writing, no planning applications have been submitted. There is therefore no information available on the likely traffic flows that this development would generate through the study area junctions. As a result, it is not possible or necessary to include this development within the background flows.

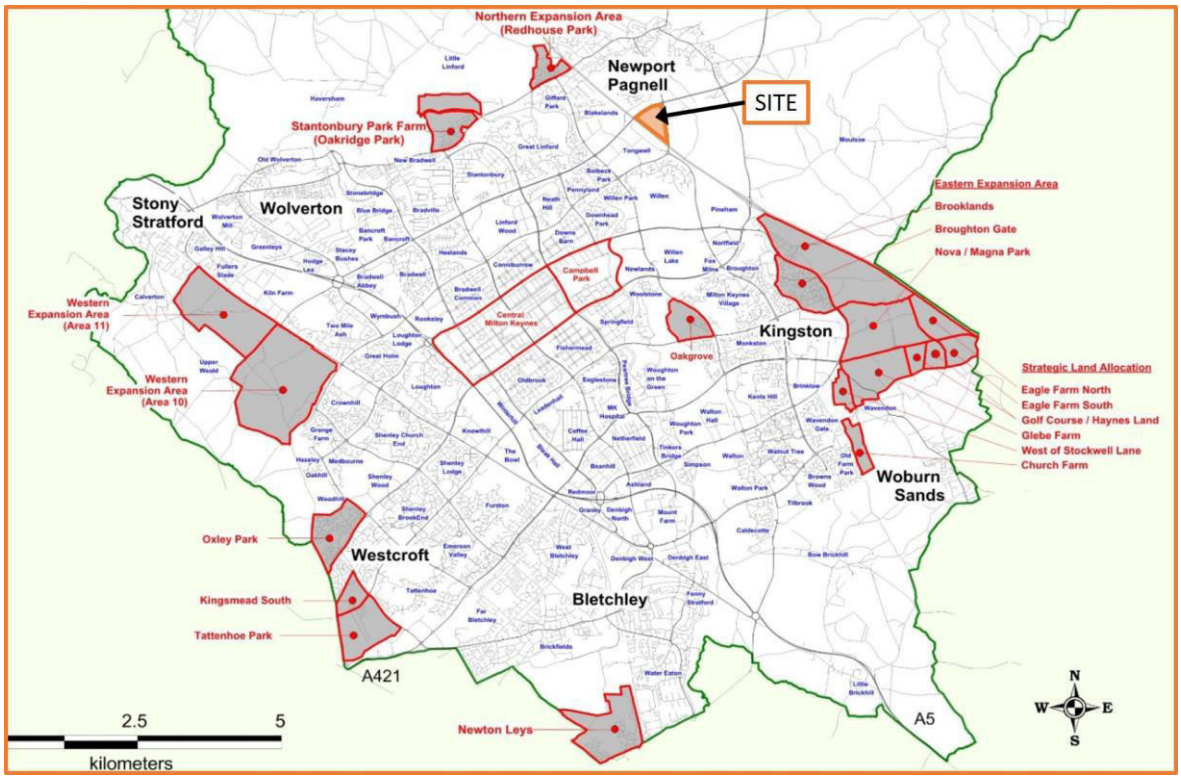


Figure 5: Milton Keynes Major Development sites

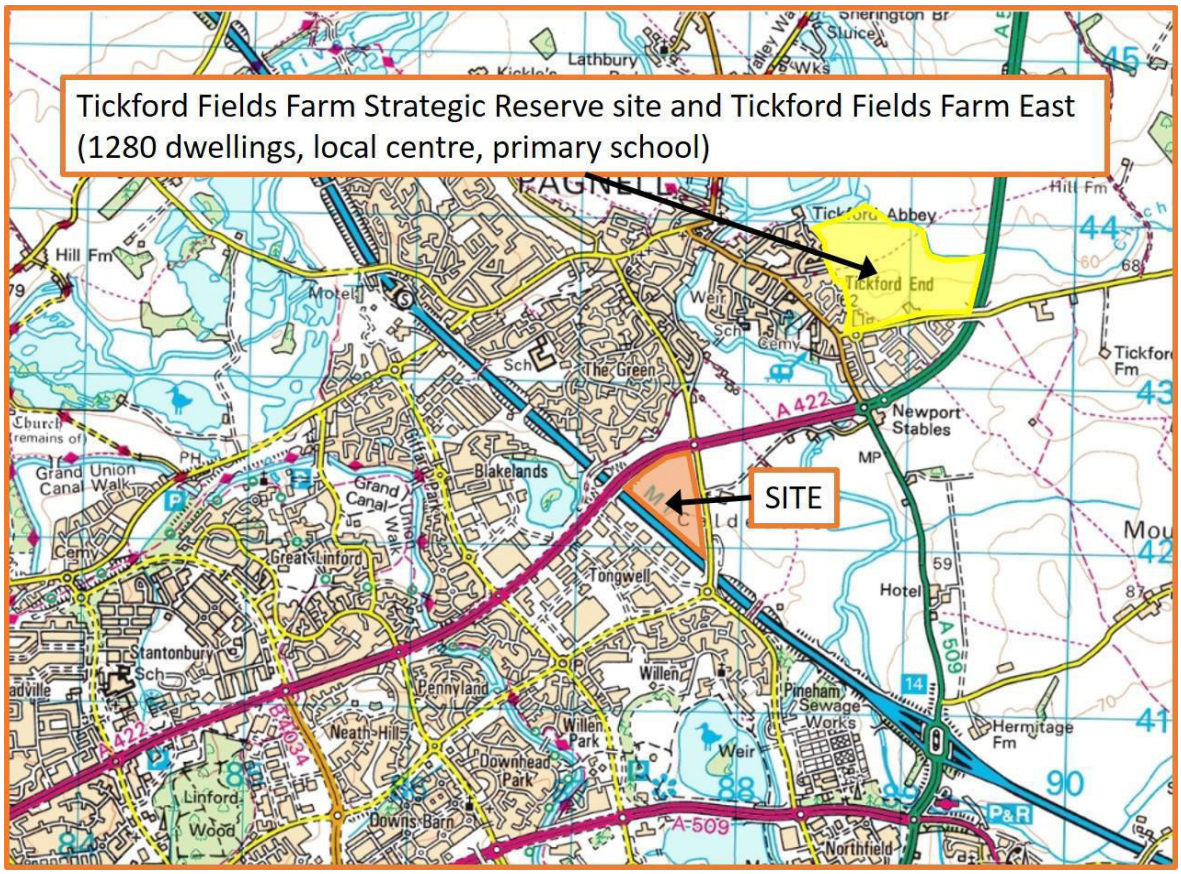


Figure 6: Tickford Fields

2026 with development traffic flows

5.8 The proposed development traffic flows, shown in **Diagrams 4 and 5** for the morning and evening peak hours, were added to the 2026 background traffic flows shown in **Diagrams 6**

and 7 in Appendix E. The '2026 with development' traffic flows are shown in **Diagrams 8 and 9 in Appendix E** for the morning and evening peak hours respectively.

Study area

5.9 The table below shows the two-way traffic flows on each of the arms of the four junctions in the 2026 background scenario. It also shows the two-way development traffic flows, and the associated percentage increase as a result of the development.

		am peak			pm peak		
		2026 background	development traffic	% increase	2026 background	development traffic	% increase
Tickford	A422 (W)	3520	43	1.2%	3522	50	1.4%
	B526 (N)	1455	1	0.1%	1346	2	0.1%
	A509 (E)	2919	11	0.4%	3062	13	0.4%
	A509 (S)	1462	31	2.1%	2162	35	1.6%
Marsh End	A422 (W)	2783	25	0.9%	3190	32	1.0%
	Willen Rd (N)	1703	6	0.4%	1840	8	0.4%
	A422 (E)	3420	43	1.3%	3489	48	1.4%
	Willen Rd (S)	2300	**74**	3.2%	1565	**88**	5.6%
Tongwell	**Willen Rd (N)**	2344	**69**	2.9%	1538	**86**	5.6%
	Willen Rd (S)	1896	45	2.4%	1518	53	3.5%
	Dansteed Way	2282	24	1.1%	1333	33	2.5%
	Michigan Drive	316	0	0.0%	745	0	0.0%
Pineham	A509 (W)	2787	3	0.1%	2607	5	0.2%
	Tongwell St (N)	2011	44	2.2%	1660	54	3.3%
	A509 (E)	2954	31	1.0%	2674	35	1.3%
	V11 (S)	1962	10	0.5%	1769	14	0.8%

5.10 The table below shows the 2026 background traffic flows at each junction as a whole. It also shows the total development traffic at each junction as a whole, and the associated percentage increase.

	am peak			pm peak		
	2026 background	development traffic	% increase	2026 background	development traffic	% increase
Tickford	4678	43	0.9%	5046	50	1.0%
Marsh End	5103	74	1.5%	5042	88	1.7%
Tongwell	3419	69	2.0%	2567	86	3.4%
Pineham	4857	44	0.9%	4355	54	1.2%

5.11 As shown, the increase in traffic as a result of the development is minimal at all junctions. Only Willen Road, to the north and south of the site access, would experience significant increases compared to the background flow.

5.12 Therefore, based on the actual forecast increase in traffic as well as the proportional percentage increase, the proposed study area is limited to the Marsh End Roundabout to the north of the site and the Tongwell Roundabout to the south of the site. Elsewhere, traffic increases would be immaterial, and do not require assessment.

5.13 The proposed development would add 61 movements in the morning peak hour and 69 movements in the evening peak hour at the M1 Junction 14 as a whole. These would be distributed across all arms, resulting in minimal increases, as shown in the table below.

	AM	PM
M1 southbound off-slip	21	11
M1 southbound on-slip	8	23
A509 (N) (two-way)	30	34
M1 northbound on-slip	9	23
M1 northbound off-slip	22	12
A509 (S) (two-way)	31	35

5.14 Furthermore, at the M1 Junction 14, the development traffic is likely to be within the day to day fluctuations in peak hour traffic flows at the junction. Compared to the background traffic flows, this increase is minimal and would not result in a severe impact on the operation or safety of the junction. Therefore, no further assessment is required.

Assessment methodology

5.15 It is proposed to assess the operation of the two study area junctions using Junctions 8 ARCADY software, for the 2026 background and 2026 with development traffic flow scenarios. Where the development traffic is considered to have a severe impact on the operation of the junction, mitigation measures will be proposed. As detailed earlier, a preliminary improvement scheme at the Marsh End Roundabout, that co-ordinates with the proposed site access junction, has already been prepared.

6.0 SUMMARY AND CONCLUSIONS

6.1 Roxhill Developments Ltd have commissioned ADC Infrastructure Ltd to produce a Transport Assessment and Travel Plan to support a planning application for employment development on land west of Willen Road, in Newport Pagnell.

6.2 This scoping report has been prepared to present the preliminary proposals to Milton Keynes Council (MKC), who are the local highway authority, and to agree the assessment methodology and key parameters for use in the forthcoming Transport Assessment.

6.3 The development proposals comprise two large B8 warehouse and distribution units with ancillary B1 office use:

- Unit 1 comprises 46,822sqm of B8 warehousing and 3,344sqm of ancillary B1 office. The warehouse would be constructed in two phases, with 31,029sqm in Phase One and 15,793sqm in Phase Two.
- Unit Two comprises 27,871sqm of B8 warehousing and 1,115sqm of ancillary office use.

6.4 The total GFA including the gatehouse is 79,220sqm, whilst:

- the total B8 GFA is 72,693sqm
- the total ancillary office GFA is 4,459sqm.

6.5 The development proposals include car parking, motorcycle parking, electric vehicle parking and HGV parking in accordance with the standards.

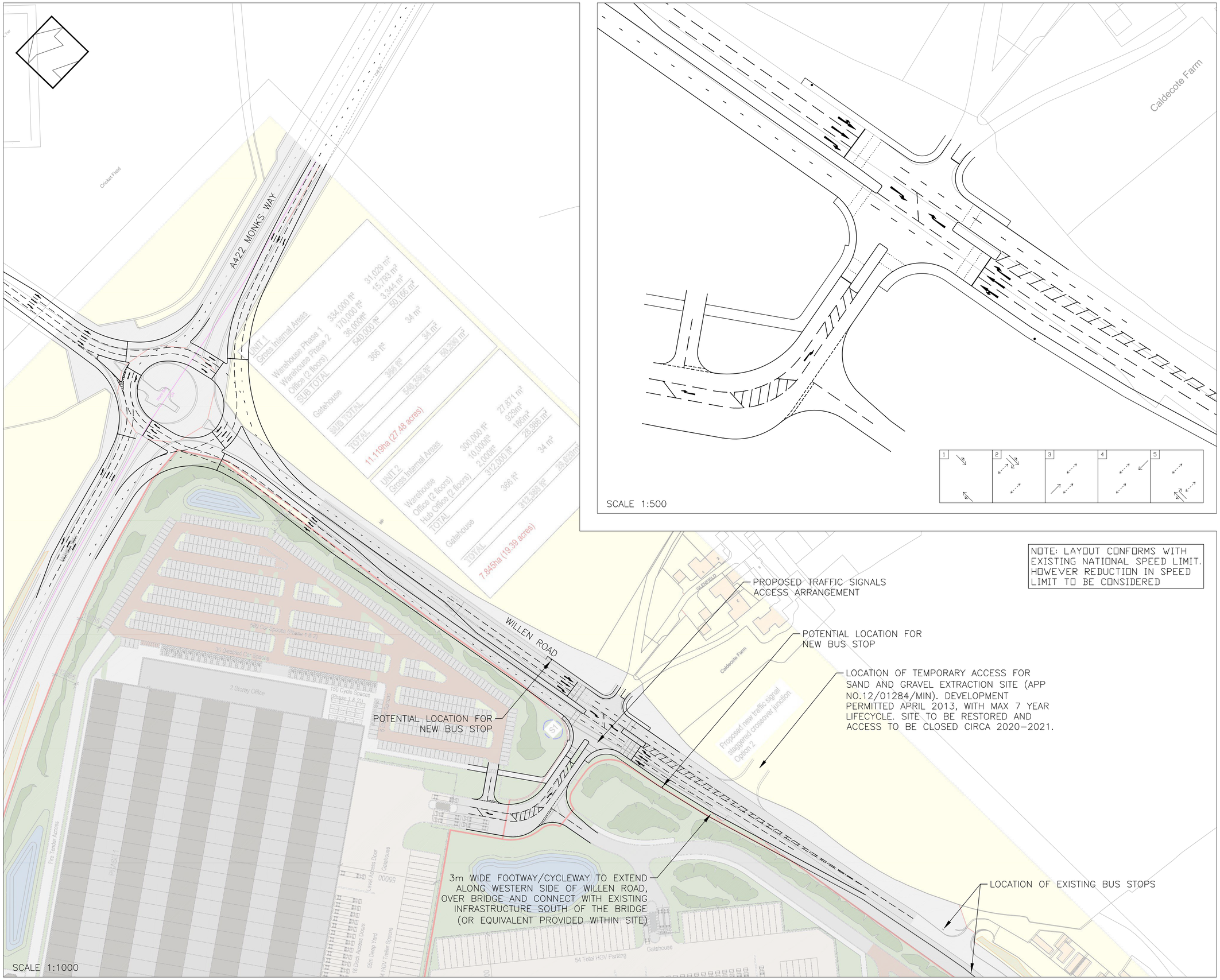
6.6 The ultimate access strategy will depend on discussions with MKC. At this stage, a single point of access is proposed, on the basis that this is preferable to having multiple points of access into the site.

6.7 Initial access options have been investigated, and the traffic signal controlled crossroads shown in **Drawing ADC1392/002 P2** is proposed. This arrangement would provide opportunity to co-ordinate traffic flows on Willen Road with a potential signal controlled improvement to the Marsh End roundabout, as shown in **Drawing ADC1392/006 P3**.

6.8 The development would generate 142 two-way vehicle movements in the morning peak hour and 174 in the evening peak hour.

6.9 The Transport Assessment will assess the impact of the development traffic in the 2026 assessment year at the study area junctions comprising the Marsh End Roundabout to the north and the Tongwell Roundabout to the south of the site. It is proposed to assess each junction using Junctions 8 ARCADY software.

6.10 The Transport Assessment will be prepared following MKC's review of the contents of this report, and agreement of the key parameters including the trip rates, distribution and assignment, study area and assessment methodology/junction modelling.



Rev	Description	Date
P2	Revised Layout	05/09/17
P1	Preliminary Issue	27/10/16

Client: ROXHILL

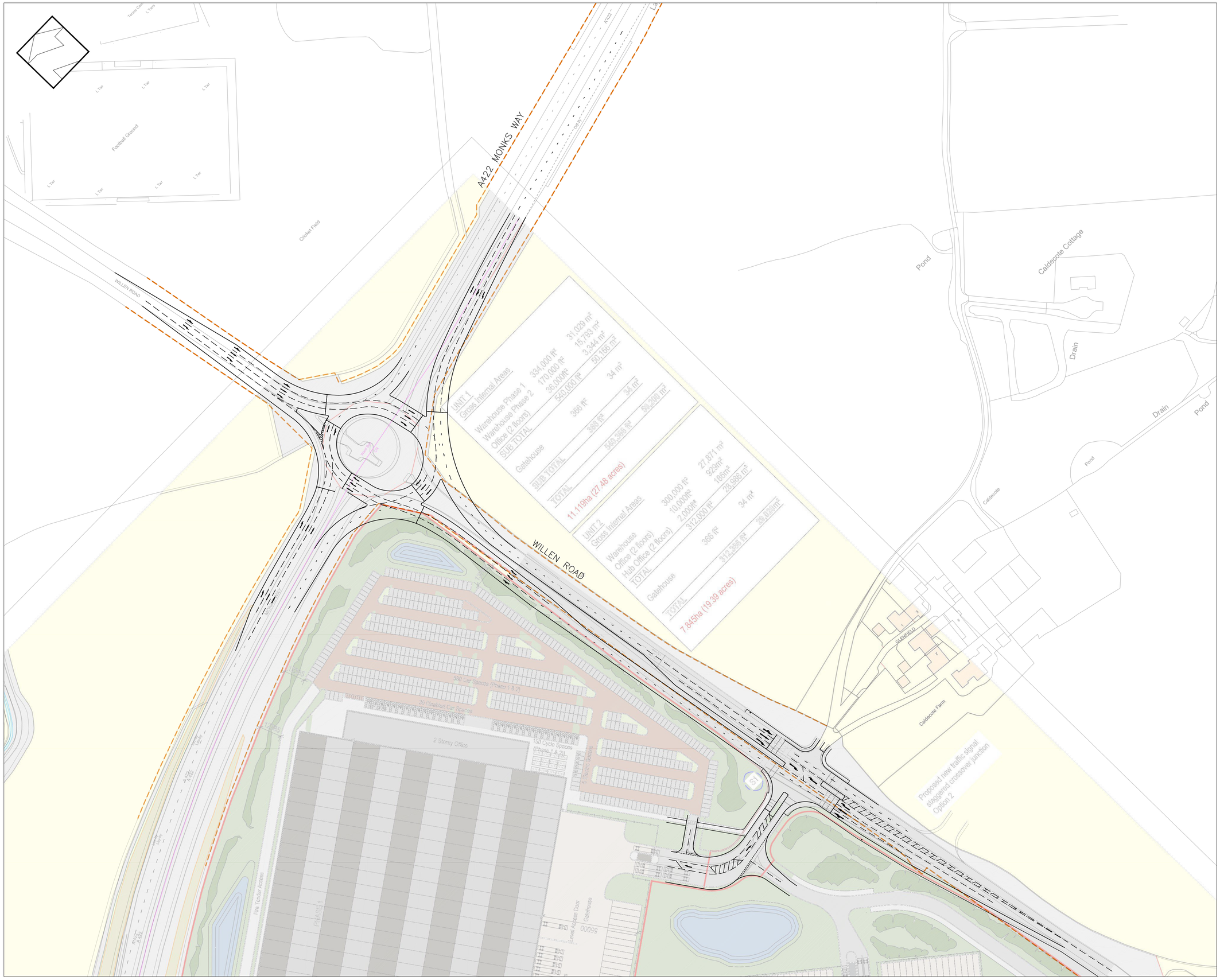
Project: Willen Road, Newport Pagnell

Title: Proposed Traffic Signal Crossroad Junction Layout

ADC INFRASTRUCTURE

Drg Size:	Scale:	Date:
A1	As Shown	27/10/2016

Drg No: ADC1392/002 Rev: P2



HIGHWAY BOUNDARY

Rev	Description	Date
P3	Revised Site Access Arrangement	05/09/17
P2	Includes mastplan underlay	03/04/17
P1	Preliminary Issue	23/03/17

Client:

ROXHILL

Project:

Willen Road,
Newport Pagnell

Title:

Proposed Traffic Signals
Improvements to Marsh End Roundabut

ADC INFRASTRUCTURE

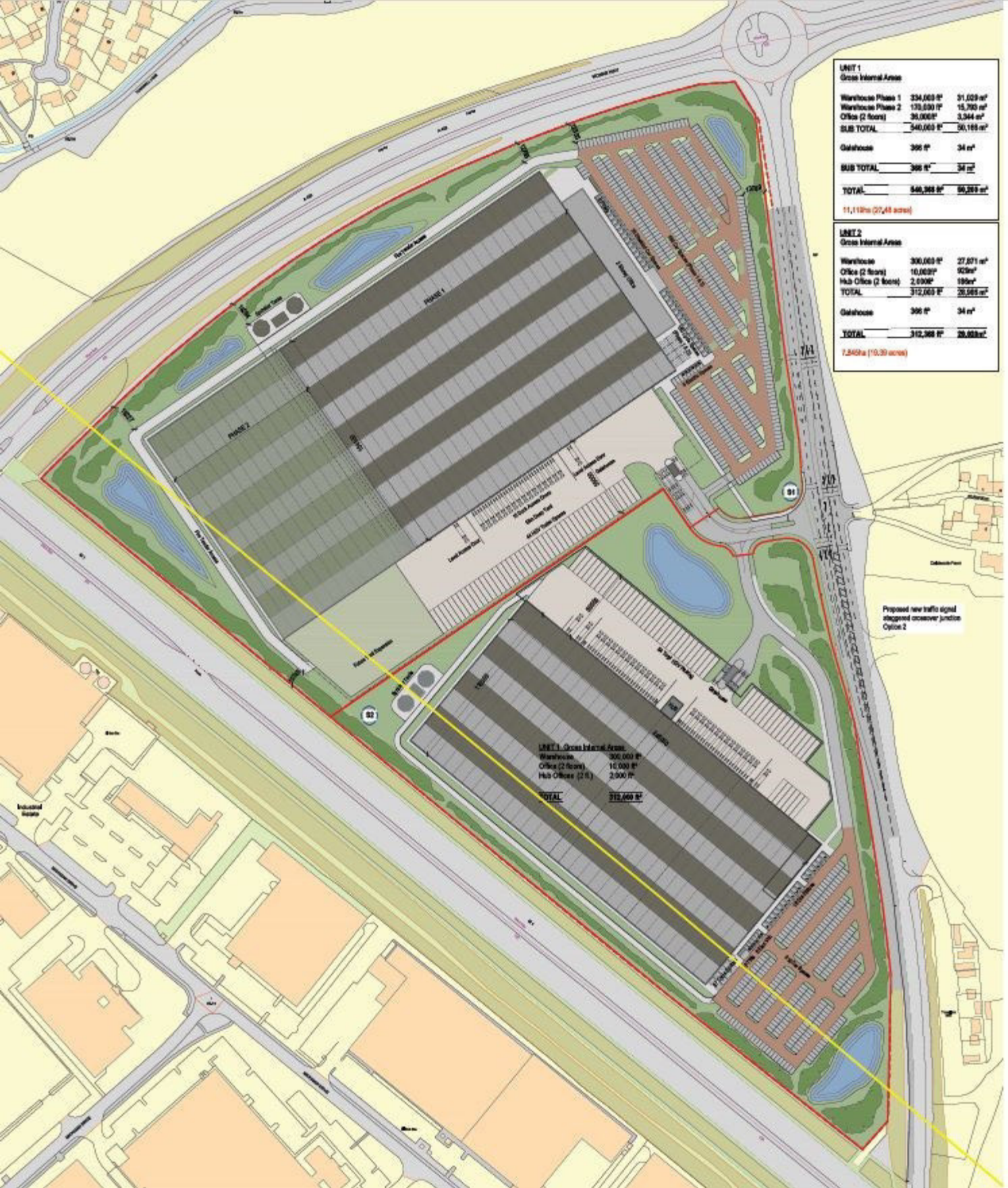
Drg Size:	Scale:	Date:
A1	1:1000	23/03/2017

Drg No: ADC1392/006

Rev: P3

APPENDIX A

DEVELOPMENT MASTERPLAN


UNIT 1
Gross Internal Areas
Warehouse Phase 1 334,000 ft² 31,029 m²
Warehouse Phase 2 170,000 ft² 15,793 m²
Office (2 floors) 36,000ft² 3,344 m²
SUB TOTAL 540,000 ft² 50,166 m²
Gatehouse 366 ft² 34 m²
SUB TOTAL 366 ft² 34 m²
TOTAL 540,366 ft² 50,200 m²
11,118ha (27,48 acres)
UNIT 2
Gross Internal Areas
Warehouse 300,000 ft² 27,871 m²
Office (2 floors) 10,000ft² 929m²
Hub Office (2 floors) 2,000ft² 186m²
TOTAL 312,000 ft² 28,986 m²
Gatehouse 366 ft² 34 m²
TOTAL 312,366 ft² 29,020m²
7,846ha (19,39 acres)
PHASE 1
PHASE 2
Proposed new traffic signal staggered crossover junction Option 2
UNIT 1 Gross Internal Areas
Warehouse 300,000 ft²
Office (2 floors) 10,000 ft²
Hub Offices (2 ft) 2,000 ft²
TOTAL 312,000 ft²

APPENDIX B

TRIP RATES

			Light vehicle trip rates per 100sqm GFA									HGV trip rates per 100 sqm									Total trip rates per 100sqm GFA								
			AM peak hour			PM peak hour			Daily (24 hours)			AM peak hour			PM peak hour			Daily (24 hours)			AM peak hour			PM peak hour			Daily (24 hours)		
SITE	GFA (in sqm)	Information	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way	arrive	depart	two-way
Grange Park M1 J15, Northants	49,237	Three large units, all occupied by New Wave Logistics, each with approx. 5% ancillary B1	**0.152**	**0.018**	**0.170**	**0.051**	**0.118**	**0.169**	unknown			**0.020**	**0.022**	**0.042**	**0.020**	**0.019**	**0.040**	unknown			**0.172**	**0.040**	**0.212**	**0.071**	**0.138**	**0.209**	unknown		
Marston Gate, M1 J13, Brogborough	92668	Three large units, occupiers UCI Logistics, Wolseley, Amazon and Argos. Average B1 across the three units 7%	**0.110**	**0.048**	**0.158**	unknown			unknown			**0.024**	**0.015**	**0.039**	unknown			unknown			**0.133**	**0.064**	**0.197**	**0.084**	**0.141**	**0.225**	unknown		
Swan Valley, M1 J15A M1 J15A, Northants	137,500	Four large units, occupiers Carlsberg, Levi-Strauss and Morrison within two units, approx. 5.6% ancillary B1	**0.122**	**0.013**	**0.135**	**0.029**	**0.108**	**0.137**	**1.060**	**1.043**	**2.103**	**0.012**	**0.015**	**0.028**	**0.013**	**0.016**	**0.029**	**0.306**	**0.316**	**0.622**	**0.134**	**0.028**	**0.162**	**0.042**	**0.124**	**0.166**	**1.366**	**1.359**	**2.725**
EuroHub A43, Corby	80,823	Three large units, occupiers Wincanton, Comet and Sainsbury's. Average ancillary B1 5.7% across the three units	**0.153**	**0.015**	**0.168**	**0.027**	**0.138**	**0.165**	unknown			**0.023**	**0.031**	**0.054**	**0.032**	**0.012**	**0.044**	unknown			**0.175**	**0.046**	**0.222**	**0.059**	**0.150**	**0.209**	unknown		
Gap M6 J1, Rugby	41,805	One large unit, ancillary office space 3.6%	**0.045**	**0.081**	**0.126**	**0.012**	**0.018**	**0.030**	unknown			**0.017**	**0.019**	**0.037**	**0.005**	**0.039**	**0.044**	unknown			**0.062**	**0.100**	**0.163**	**0.017**	**0.057**	**0.074**	unknown		
Sainsbury's M25 J25, Waltham	63,172	One large unit, ancillary office space 2.6%	**0.042**	**0.012**	**0.054**	**0.023**	**0.056**	**0.079**	unknown			**0.050**	**0.038**	**0.087**	**0.038**	**0.020**	**0.058**	unknown			**0.091**	**0.050**	**0.141**	**0.060**	**0.076**	**0.137**	unknown		
DIRFT M1 J18, Crick (Daventry)	60,385		**0.124**	**0.047**	**0.171**	**0.040**	**0.096**	**0.136**	unknown			**0.048**	**0.026**	**0.074**	**0.020**	**0.014**	**0.034**	unknown			**0.172**	**0.073**	**0.245**	**0.060**	**0.110**	**0.170**	unknown		
Sainsbury's M5 J7 Worcester	31,586		unknown			unknown			unknown			unknown			unknown			unknown			**0.166**	**0.064**	**0.229**	**0.039**	**0.173**	**0.212**	unknown		
Andover Airfield A303, Andover	43,500	One large unit occupied by the Co-op, with a high employee density ratio of around 1 per 46 sqm	**0.069**	**0.066**	**0.135**	**0.067**	**0.099**	**0.166**	**1.786**	**2.094**	**3.880**	**0.018**	**0.021**	**0.039**	**0.039**	**0.023**	**0.062**	**0.577**	**0.379**	**0.956**	**0.087**	**0.087**	**0.174**	**0.106**	**0.122**	**0.228**	**2.363**	**2.473**	**4.836**
Ocado (TRICS) Hatfield	80,000	Ocade distrbution centre, one large unit	**0.065**	**0.048**	**0.113**	**0.029**	**0.091**	**0.120**	**0.861**	**1.021**	**1.882**	**0.010**	**0.004**	**0.014**	**0.005**	**0.003**	**0.008**	**0.139**	**0.128**	**0.267**	**0.075**	**0.052**	**0.127**	**0.034**	**0.094**	**0.128**	**1.000**	**1.149**	**2.149**
Argos (TRICS) Darlington	80,066	Argos, two units approx 5% ancillary B1	**0.011**	**0.009**	**0.020**	**0.011**	**0.034**	**0.045**	**0.268**	**0.310**	**0.578**	**0.006**	**0.010**	**0.016**	**0.009**	**0.011**	**0.020**	**0.146**	**0.137**	**0.283**	**0.017**	**0.019**	**0.036**	**0.020**	**0.045**	**0.065**	**0.414**	**0.447**	**0.861**
Tesco (TRICS) Milton Keynes	52,125	Nation distrbution centre, one large unit	**0.068**	**0.042**	**0.110**	**0.031**	**0.069**	**0.100**	**0.915**	**1.041**	**1.956**	**0.036**	**0.042**	**0.078**	**0.025**	**0.035**	**0.060**	**0.426**	**0.425**	**0.851**	**0.104**	**0.084**	**0.188**	**0.056**	**0.104**	**0.160**	**1.341**	**1.466**	**2.807**
		AVERAGE	**0.087**	**0.036**	**0.124**	**0.032**	**0.083**	**0.115**	**0.978**	**1.102**	**2.080**	**0.024**	**0.022**	**0.046**	**0.021**	**0.019**	**0.040**	**0.319**	**0.277**	**0.596**	**0.116**	**0.059**	**0.175**	**0.054**	**0.111**	**0.165**	**1.297**	**1.379**	**2.676**

Table 1: Summary of surveyed vehicle trip rate data for large scale warehousing and distribution uses

Time Window	Swan Valley Traffic Count			Swan Valley Traffic Count			Trip rates per 100sqm/GFA									Predicted Daily Traffic Profile									% HGV
	Arrive			Depart			Light vehicles trip rates per 100 sqm			Heavy vehicles trip rates per 100 sqm			Total vehicles trip rates per 100 sqm			Light vehicles			Heavy vehicles			Total vehicles			
	Lights	Heavies	Total	Lights	Heavies	Total	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Two-way
00.00-01.00	14	10	24	10	16	26	0.010	0.007	0.017	0.007	0.012	0.019	0.017	0.019	0.036	8	6	14	6	9	15	14	15	29	52.0%
01.00-02.00	9	15	24	3	15	18	0.007	0.002	0.009	0.011	0.011	0.022	0.017	0.013	0.031	5	2	7	9	9	17	14	10	24	71.4%
02.00-03.00	6	16	22	23	16	39	0.004	0.017	0.021	0.012	0.012	0.023	0.016	0.028	0.044	3	13	17	9	9	18	13	22	35	52.5%
03.00-04.00	10	11	21	13	17	30	0.007	0.009	0.017	0.008	0.012	0.020	0.015	0.022	0.037	6	7	13	6	10	16	12	17	29	54.9%
04.00-05.00	32	15	47	15	10	25	0.023	0.011	0.034	0.011	0.007	0.018	0.034	0.018	0.052	18	9	27	9	6	14	27	14	41	34.7%
05.00-06.00	224	23	247	108	14	122	0.163	0.079	0.241	0.017	0.010	0.027	0.180	0.089	0.268	129	62	191	13	8	21	142	70	213	10.0%
06.00-07.00	107	23	130	79	10	89	0.078	0.057	0.135	0.017	0.007	0.024	0.095	0.065	0.159	62	46	107	13	6	19	75	51	126	15.1%
07.00-08.00	123	21	144	39	28	67	0.089	0.028	0.118	0.015	0.020	0.036	0.105	0.049	0.153	71	22	93	12	16	28	83	39	122	23.2%
08.00-09.00	167	17	184	18	21	39	0.121	0.013	0.135	0.024	0.022	0.046	0.145	0.035	0.181	96	10	107	19	17	36	115	28	143	25.5%
09.00-10.00	80	22	102	25	20	45	0.058	0.018	0.076	0.016	0.015	0.031	0.074	0.033	0.107	46	14	60	13	12	24	59	26	85	28.6%
10.00-11.00	62	25	87	38	27	65	0.045	0.028	0.073	0.018	0.020	0.038	0.063	0.047	0.111	36	22	58	14	16	30	50	37	88	34.2%
11.00-12.00	47	22	69	35	21	56	0.034	0.025	0.060	0.016	0.015	0.031	0.050	0.041	0.091	27	20	47	13	12	25	40	32	72	34.4%
12.00-13.00	68	17	85	76	15	91	0.049	0.055	0.105	0.012	0.011	0.023	0.062	0.066	0.128	39	44	83	10	9	18	49	52	101	18.2%
13.00-14.00	111	14	125	80	23	103	0.081	0.058	0.139	0.010	0.017	0.027	0.091	0.075	0.166	64	46	110	8	13	21	72	59	131	16.2%
14.00-15.00	54	17	71	122	27	149	0.039	0.089	0.128	0.012	0.020	0.032	0.052	0.108	0.160	31	70	101	10	16	25	41	86	127	20.0%
15.00-16.00	31	11	42	154	21	175	0.023	0.112	0.135	0.008	0.015	0.023	0.031	0.127	0.158	18	89	107	6	12	18	24	101	125	14.7%
16.00-17.00	55	23	78	192	14	206	0.040	0.140	0.180	0.017	0.010	0.027	0.057	0.150	0.207	32	111	142	13	8	21	45	119	164	13.0%
17.00-18.00	40	18	58	149	22	171	0.029	0.108	0.137	0.021	0.019	0.040	0.050	0.127	0.177	23	86	109	17	15	32	40	101	141	22.5%
18.00-19.00	123	22	145	122	18	140	0.089	0.089	0.178	0.016	0.013	0.029	0.105	0.102	0.207	71	70	141	13	10	23	84	81	164	14.0%
19.00-20.00	18	19	37	46	13	59	0.013	0.033	0.047	0.014	0.009	0.023	0.027	0.043	0.070	10	27	37	11	7	18	21	34	55	33.3%
20.00-21.00	21	21	42	24	17	41	0.015	0.017	0.033	0.015	0.012	0.028	0.031	0.030	0.060	12	14	26	12	10	22	24	24	48	45.8%
21.00-22.00	48	13	61	18	19	37	0.035	0.013	0.048	0.009	0.014	0.023	0.044	0.027	0.071	28	10	38	7	11	18	35	21	56	32.7%
22.00-23.00	4	12	16	34	15	49	0.003	0.025	0.028	0.009	0.011	0.020	0.012	0.036	0.047	2	20	22	7	9	16	9	28	37	41.5%
23.00-00.00	3	14	17	11	16	27	0.002	0.008	0.010	0.010	0.012	0.022	0.012	0.020	0.032	2	6	8	8	9	17	10	16	25	68.2%
Totals	**1457**	**421**	**1878**	**1434**	**435**	**1869**	**1.060**	**1.043**	**2.103**	**0.326**	**0.326**	**0.652**	**1.385**	**1.369**	**2.754**	**839**	**826**	**1666**	**258**	**258**	**516**	**1097**	**1085**	**2182**	**23.7%**

	B8 Swan Valley Statistics
GFA /sqm	137500
Employees	1780
Ratio	1 per 77sqm

	Proposed use	
GFA /sqm	79220	
Employees	1029	
Ratio	1 per 77	sqm

TABLE 2: TRIP GENERATION

APPENDIX C

SWAN VALLEY DATA

SWAN VALLEY

NORTHAMPTON

PROPOSED MASTERPLAN

SWAN VALLEY

SITE 100

UNIT	TYPE	SITE AREA	DEVELOPMENT AREA
100	HOTEL, LEISURE, RETAIL AND OFFICES	12.6 Acres	9.0 Acres
150	MIXED USE DEVELOPMENT	14.4 Acres	11.0 Acres

SITE 300

UNIT	TYPE	GIA	SITE AREA	DEVELOPMENT AREA
THE BIG SWAN	D2	301,000 sq ft	17.8 Acres	16.1 Acres
310	B1 Offices	40,500 sq ft (max)	4.7 Acres	2.2 Acres
TOTAL		340,500 sq ft	35.1 Acres	18.3 Acres

SITE 400

UNIT	TYPE	GIA	SITE AREA	DEVELOPMENT AREA
420	B8	46,310 sq ft	4.24 Acres	3.35 Acres
460	B8	40,000 sq ft	3.37 Acres	2.74 Acres
TOTAL		86,310 sq ft	8.61 Acres	6.09 Acres

'OFFICE QUARTER'

UNIT	TYPE	GIA	SITE AREA	DEVELOPMENT AREA
MIX	B1 Offices	1 X 6,200 sq ft 4 X 7,750 sq ft 2 X 12,400 sq ft 2 X 13,000 sq ft		
TOTAL		86,000 sq ft	7.3 Acres	5.9 Acres

AVIVA INVESTORS

ISIS LAND

RPS

CAPITA SYMONDS

Job Title: Swan Valley

Site Name and Number: Swan Valley Way

Job Number: CS26558/F33

Client: Lawrence Walker

Date: 4th October 2007

CAPITA SYMONDS	Job Number:	CS26558/F33
Swan Valley	Client:	Lawrence Walker
Swan Valley Way	Date:	4th October 2007

N

CAPITA SYMONDS

Job Number: CS26558/F33

Swan Valley

Client: Lawrence Walker

Swan Valley Way

Date: 4th October 2007

			Movement A ENTERING SITE						Movement B LEAVING SITE					
			Total Traffic		Pineham		Swan Valley		Total Traffic		Pineham		Swan Valley	
Times			Cars	HGV's	Cars	HGV's	Cars	HGV's	Cars	HGV's	Cars	HGV's	Cars	HGV's
00:00	-	00:15	8	1	0	0	8	1	1	3	0	0	1	3
00:15	-	00:30	2	2	0	0	2	2	1	2	0	0	1	2
00:30	-	00:45	1	3	0	0	1	3	5	7	0	0	5	7
00:45	-	01:00	3	3	0	0	3	3	3	3	0	0	3	3
Hourly Total			14	9	0	0	14	9	10	15	0	0	10	15
01:00	-	01:15	1	2	0	0	1	2	0	2	0	0	0	2
01:15	-	01:30	2	2	0	0	2	2	1	6	0	0	1	6
01:30	-	01:45	2	4	0	0	2	4	1	3	0	0	1	3
01:45	-	02:00	4	7	0	0	4	7	1	4	0	0	1	4
Hourly Total			9	15	0	0	9	15	3	15	0	0	3	15
02:00	-	02:15	1	4	0	0	1	4	5	1	-1	0	4	1
02:15	-	02:30	2	2	0	0	2	2	7	5	-3	0	4	5
02:30	-	02:45	1	5	0	0	1	5	8	4	0	0	8	4
02:45	-	03:00	2	5	0	0	2	5	7	6	0	0	7	6
Hourly Total			6	16	0	0	6	16	27	16	-4	0	23	16
03:00	-	03:15	2	1	0	0	2	1	4	2	0	0	4	2
03:15	-	03:30	2	2	0	0	2	2	2	4	0	0	2	4
03:30	-	03:45	1	2	0	0	1	2	4	6	0	0	4	6
03:45	-	04:00	5	6	0	0	5	6	4	5	-1	0	3	5
Hourly Total			10	11	0	0	10	11	14	17	-1	0	13	17
04:00	-	04:15	6	4	0	0	6	4	4	1	0	0	4	1
04:15	-	04:30	8	3	0	0	8	3	5	1	0	0	5	1
04:30	-	04:45	10	6	0	0	10	6	4	3	0	0	4	3
04:45	-	05:00	8	2	0	0	8	2	2	5	0	0	2	5
Hourly Total			32	15	0	0	32	15	15	10	0	0	15	10
05:00	-	05:15	6	3	0	0	6	3	7	0	0	0	7	0
05:15	-	05:30	22	8	0	0	22	8	6	2	0	0	6	2
05:30	-	05:45	87	7	-2	0	85	7	78	7	0	0	78	7
05:45	-	06:00	117	5	-6	0	111	5	17	5	0	0	17	5
Hourly Total			232	23	-8	0	224	23	108	14	0	0	108	14
06:00	-	06:15	14	5	-4	0	10	5	37	2	0	0	37	2
06:15	-	06:30	25	6	-6	0	19	6	24	3	-2	-3	22	0
06:30	-	06:45	47	7	-20	-2	27	5	10	4	0	0	10	4
06:45	-	07:00	91	8	-40	-1	51	7	11	4	-1	0	10	4
Hourly Total			177	26	-70	-3	107	23	82	13	-3	-3	79	10
07:00	-	07:15	53	12	-34	-6	19	6	19	10	-3	-2	16	8
07:15	-	07:30	85	7	-47	-2	38	5	7	8	0	-3	7	5
07:30	-	07:45	70	13	-42	-8	28	5	10	8	-2	-3	8	5
07:45	-	08:00	76	10	-38	-5	38	5	12	12	-4	-2	8	10
Hourly Total			284	42	-161	-21	123	21	48	38	-9	-10	39	28
08:00	-	08:15	79	12	-45	-1	34	11	8	5	-3	-1	5	4
08:15	-	08:30	69	7	-34	-6	35	1	10	10	-7	-6	3	4
08:30	-	08:45	69	3	-19	-2	50	1	8	7	-3	-4	5	3
08:45	-	09:00	60	7	-12	-3	48	4	13	15	-8	-5	5	10
Hourly Total			277	29	-110	-12	167	17	39	37	-21	-16	18	21
09:00	-	09:15	30	11	-12	-4	18	7	17	10	-13	-4	4	6
09:15	-	09:30	29	7	-9	-3	20	4	14	16	-6	-8	8	8
09:30	-	09:45	29	9	-9	-2	20	7	9	5	-4	-3	5	2
09:45	-	10:00	33	10	-11	-6	22	4	14	7	-6	-3	8	4
Hourly Total			121	37	-41	-15	80	22	54	38	-29	-18	25	20
10:00	-	10:15	27	11	-11	-4	16	7	18	6	-10	0	8	6
10:15	-	10:30	28	13	-11	-4	17	9	19	12	-7	-3	12	9
10:30	-	10:45	23	10	-8	-8	15	2	16	10	-7	-4	9	6
10:45	-	11:00	25	11	-11	-4	14	7	19	11	-10	-5	9	6
Hourly Total			103	45	-41	-20	62	25	72	39	-34	-12	38	27
11:00	-	11:15	14	14	-7	-2	7	12	18	11	-11	-6	7	5
11:15	-	11:30	15	11	-9	-5	6	6	16	11	-7	-2	9	9
11:30	-	11:45	36	10	-9	-7	27	3	13	9	-9	-2	4	7
11:45	-	12:00	21	11	-14	-10	7	1	22	7	-7	-7	15	0
Hourly Total			86	46	-39	-24	47	22	69	38	-34	-17	35	21
12:00	-	12:15	25	10	-5	-2	20	8	25	11	-7	-6	18	5
12:15	-	12:30	27	12	-7	-4	20	8	30	10	-12	-3	18	7
12:30	-	12:45	26	8	-11	-7	15	1	32	3	-5	-3	27	0
12:45	-	13:00	23	6	-10	-6	13	0	19	7	-6	-4	13	3
Hourly Total			101	36	-33	-19	68	17	106	31	-30	-16	76	15
13:00	-	13:15	25	11	-5	-3	20	8	34	6	-11	-4	23	2
13:15	-	13:30	39	8	-11	-5	28	3	31	10	-13	-1	18	9
13:30	-	13:45	51	8	-15	-5	36	3	30	8	-11	-4	19	4
13:45	-	14:00	39	3	-12	-3	27	0	29	10	-9	-2	20	8
Hourly Total			154	30	-43	-16	111	14	124	34	-44	-11	80	23
14:00	-	14:15	30	11	-15	-8	15	3	64	4	-6	-3	58	1
14:15	-	14:30	11	9	-10	-2	1	7	43	16	-17	-6	26	10
14:30	-	14:45	27	6	-6	0	21	6	28	11	-9	-3	19	8
14:45	-	15:00	25	5	-8	-4	17	1	31	8	-12	0	19	8
Hourly Total			93	31	-39	-14	54	17	166	39	-44	-12	122	27
15:00	-	15:15	17	7	-9	-8	8	-1	58	6	-18	-4	40	2
15:15	-	15:30	12	4	-5	-2	7	2	50	13	-20	-2	30	11
15:30	-	15:45	18	3	-9	-1	9	2	76	7	-19	-3	57	4
15:45	-	16:00	9	9	-2	-1	7	8	50	5	-23	-1	27	4
Hourly Total			56	23	-25	-12	31	11	234	31	-80	-10	154	21
16:00	-	16:15	20	6	-3	0	17	6	66	4	-25	-3	41	1
16:15	-	16:30	15	9	-3	0	12	9	69	3	-25	-1	44	2
16:30	-	16:45	16	5	-2	0	14	5	103	9	-22	-1	81	8
16:45	-	17:00	14	3	-2	0	12	3	46	3	-20	0	26	3
Hourly Total			65	23	-10	0	55	23	284	19	-92	-5	192	14
17:00	-	17:15	4	4	-2	0	2	4	58	9	-18	-1	40	8
17:15	-	17:30	9	4	-1	0	8	4	55	2	-25	-1	30	1
17:30	-	17:45	21	6	-5	0	16	6	68	8	-16	0	52	8
17:45	-	18:00	14	4	0	0	14	4	76	6	-49	-1	27	5
Hourly Total			48	18	-8	0	40	18	257	25	-108	-3	149	22
18:00	-	18:15	18	5	-3	0	15	5	86	5	-31	-1	55	4
18:15	-	18:30	27	6	-3	0	24	6	29	4	-7	-1	22	3
18:30	-	18:45	38	7	-1	0	37	7	27	5	-7	0	20	5
18:45	-	19:00	49	5	-2	-1	47	4	37	7	-12	0	25	7
Hourly Total			132	23	-9	-1	123	22	179	21	-57	-2	122	19
19:00	-	19:15	8	4	-1	0	7	4	31	5	-7	0	24	5
19:15	-	19:30	1	5	0	0	1	5	11	1	-3	0	8	1
19:30	-	19:45	5	6	0	0	5	6	6	3	-1	0	5	3
19:45	-	20:00	5	4	0	0	5	4	11	4	-2	0	9	4
Hourly Total			19	19	-1	0	18	19	59	13	-13	0	46	13
20:00	-	20:15	8	5	0	0	8	5	2	0	0	0	2	0
20:15	-	20:30	6	9	0	0	6	9	8	5	-2	0	6	5
20:30	-	20:45	2	4	0	0	2	4	14	6	-2	0	12	6
20:45	-	21:00	5	3	0	0	5	3	7	6	-3	0	4	6
Hourly Total			21	21	0	0	21	21	31	17	-7	0	24	17
21:00	-	21:15	4	1	0	0	4	1	7	4	-4	0	3	4
21:15	-	21:30	11	4	0	-1	11	3	4	4	0	0	4	4
21:30	-	21:45	16	4	0	0	16	4	4	9	0	0	4	9
21:45	-	22:00	17	5	0	0	17	5	7	2	0	0	7	2
Hourly Total			48	14	0	-1	48	13	22	19	-4	0	18	19
22:00	-	22:15	2	3	0	0	2	3	21	6	0	0	21	6
22:15	-	22:30	1	5	0	0	1	5	11	6	0	0	11	6
22:30	-	22:45	0	4	0	0	0	4	2	1	0	0	2	1
22:45	-	23:00	1	0	0	0	1	0	0	2	0	0	0	2
Hourly Total			4	12	0	0	4	12	34	15	0	0	34	15
23:00	-	23:15	1	5	0	0	1	5	2	4	0	0	2	4
23:15	-	23:30	1	2	0	0	1	2	6	8	0	0	6	8
23:30	-	23:45	1	3	0	0	1	3	0	0	0	0	0	0
23:45	-	00:00	0	5	0	0	0	5	3	4	0	0	3	4
Hourly Total			3	15	0	0	3	15	11	16	0	0	11	16
						Total Inbound	1457	421				Total Outbound	1434	435
												Total Two-Way	2891	856