

**Himley Village Development
NW Bicester Eco-Town
Transport Assessment
Addendum**

Prepared for

P3Eco

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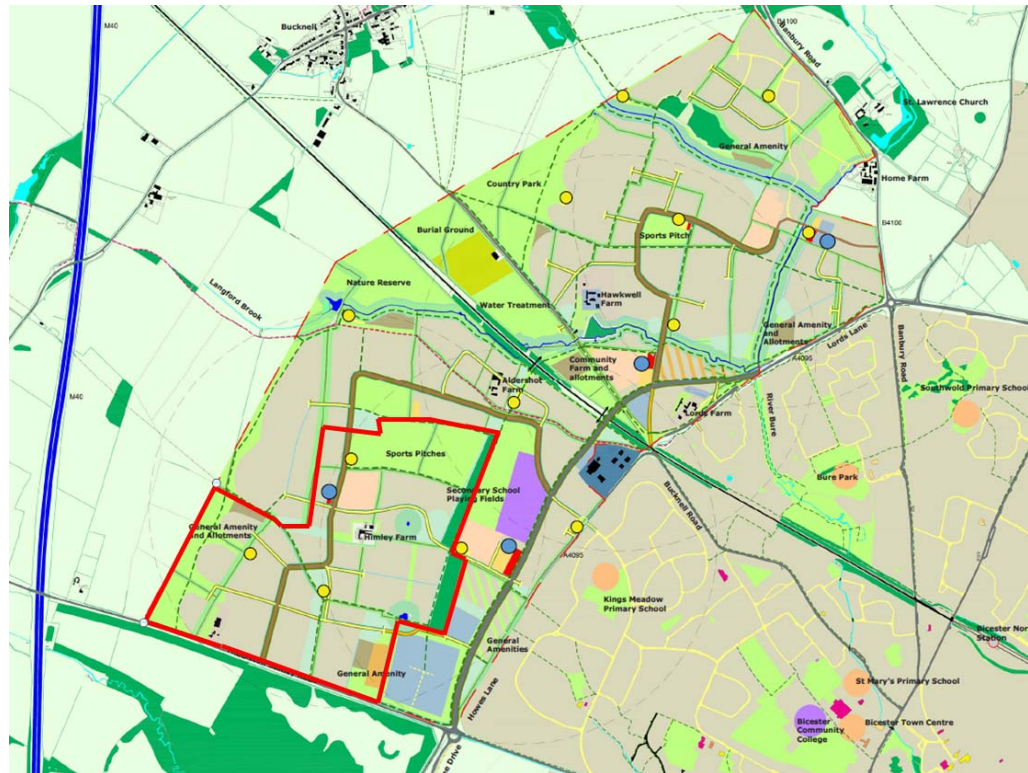
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1.0 Introduction

Alan Baxter Ltd (ABA) prepared a Transport Assessment on behalf of P3Eco that was submitted to Cherwell District Council (CDC) in December 2014 to support the outline application for development at Himley Village (CDC planning reference 14/02121/OUT). The Himley Village proposals comprise 1,700 homes, extra care housing, commercial uses, community facilities and a primary school. The Himley Village development is part of the overall 6,000 home NW Bicester eco-town. Full details of the site and the development proposals are included within the original Transport Assessment. The wider NW Bicester masterplan, including the strategic link road, is shown in Figure 1-1 with Himley Village indicated in red.

Figure 1-1 NW Bicester masterplan [Source: NW Bicester Masterplan (Farrells / A2 Dominion)]



For the full NW Bicester masterplan to be delivered a new strategic link road through the development is required in order to remove the traffic capacity problems on the Howes Lane / Lords Lane corridor. Hyder have undertaken an assessment to identify the development trigger point at which the strategic link road is required. This is set out in a technical note dated December 2014. The Hyder assessment used the Bicester SATURN model in order to test a number of development scenarios at key junctions on the road network surrounding Bicester. The assessment identified that the strategic link road is required at the point when 900 homes (including the 393 homes at the Exemplar site) and 4 ha of employment land are occupied. Without the

link road in place the Hyder assessment indicates that the performance of the Howes Lane / Bucknell Road junction in particular deteriorates significantly. Currently, CDC as planning authority are minded to locate all 900 homes north of the railway and that the developer of these homes A2Dominion will be responsible for delivering the strategic link road. As P3Eco do not currently have the option of taking forward delivery of the strategic link road this means that development of Himley Village is entirely dependent on the actions and performance of a third party.

P3Eco want to deliver much needed housing and jobs for Oxfordshire at the earliest possible opportunity. However, they recognise the importance of the strategic link road and that existing highway capacity constraints at the Howes Lane / Bucknell need to be addressed. This was identified in the Transport Assessment for Himley Village and the Transport Assessments of the other NW Bicester applications.

This Addendum sets out an interim junction scheme at the Howes Lane / Bucknell Road and Lords Lane Bucknell Road junctions that can be delivered in advance of the full strategic link road and that will allow development to take place on the Himley Village site while the design development, Network Rail agreements/approvals and construction are ongoing for the strategic link road. It is not intended that the interim junction scheme replaces the strategic link road and P3Eco remain committed to supporting the delivery of the strategic link and the wider masterplan proposals.

Nonetheless, the interim junction scheme at the Howes Lane / Bucknell Road and Lords Lane / Bucknell Road junctions provides sufficient capacity to allow development to take place on Himley Village in advance of the strategic link road. This allows development at Himley Village to be brought forward early, not only delivering new homes but also a substantial number of new jobs associated with the construction process.

P3Eco intend to use a modular construction process for Himley Village. This will ensure consistent high quality, substantial local employment and will allow significantly faster delivery of housing than standard construction techniques. The result will be housing at Himley Village being delivered at a faster pace than other sites in NW Bicester. This Addendum report therefore also sets out how sufficient local facilities will be provided on-site to enable as many trips as possible to be made locally on foot and by bike in advance of the full masterplan coming forward. It also sets out the new walking and cycling links that will be made within the site and to Bicester as well as proposals for a new bus connection to be delivered as development is occupied in phase 1.

These measures will ensure residents, employees and construction workers are able to access both on-site facilities and those available in Bicester easily and safely by sustainable modes, fulfilling the desire of Himley Village to be a true Eco-Town. The measures are essential to ensuring Himley Village becomes a thriving community that is well connected to Bicester, as well as the rest of NW Bicester in the future. This Addendum also provides an update to the framework Travel Plan.

2.0 Background

2.1 Howes Lane / Lords Lane Road Corridor

The Howes Lane / Bucknell Road junction has been identified as a key capacity constraint on the Howes Lane / Lords Lane corridor. The NW Bicester Masterplan includes a new strategic link road with an underpass beneath the railway line to relieve this capacity constraint. This strategic infrastructure will facilitate not only NW Bicester but have wider benefits for housing and employment growth elsewhere in the town.

Based on a traffic assessment by Hyder, OCC have concluded that the strategic link road is required before occupation of 900 homes and 4ha of employment land across NW Bicester. Delivery of the link road is contingent on securing agreement from Network Rail to the underpass which currently introduces uncertainty over cost and programme. It is likely that the entire link road and underpass will not be completed for some years due to the timescales associated with design approvals and construction.

The scenarios assessed by Hyder were based on a distribution of housing and employment across the entire NW Bicester site in proportion to the final masterplan development. Having reviewed the SATURN model inputs and outputs in detail it has been identified that the 900 home and 4ha employment scenario was based on a factor of 40% being applied to the interim year (2024) 2256 homes and 10ha employment scenario. The interim year scenario comprised 1021 homes south of the railway and 1235 north and therefore the 900 home scenario comprised 408 units south of the railway and 494 units to the north (including the 393 homes at the Exemplar). It is on that basis that the impact of development on the existing junctions was tested and the 900 home trigger identified.

Based on the outputs from the Bicester SATURN model (reported in **Section 3.3**) development to the south of the railway introduces proportionally less traffic at the congested Howes Lane / Bucknell Road junction than does development to the north of the railway. CDC is currently minded to consent all 900 homes being located to the north of the railway, which will have a greater impact on the junction than was modelled by Hyder.

Clearly there is a future issue with the capacity of the Howes Lane/Bucknell Road junction. The strategic link road will take time to deliver and there is the need to maximise housing delivery at allocated sites at the earliest opportunity. Given this context, the interim junction scheme set out in this report provide a means of substantially increasing capacity on the Howes Lane / Lords Lane corridor so that development can take place while congestion is eased.

2.2 Discussion with Oxfordshire County Council

The proposals submitted as part of this Transport Assessment Addendum have been the subject of detailed discussion with and submission to OCC. The methodology used to assess the impact of the proposals has been developed in agreement with OCC.

3.0 Interim Junction Scheme

3.1 Proposed Interim Junction Scheme

The proposed scheme comprises the removal of the Lords Lane / Bucknell Road roundabout and the signalisation of both the Howes Lane and Lords Lane junctions with Bucknell Road. The two signalised T junctions created would both be integrated into a single signal phasing plan. The existing Lords Lane junction would be relocated further to the north with Lords Lane itself realigned to provide storage for up to eight vehicles between the Lords Lane and Howes Lane junction. The layout of the existing junctions, the proposed interim junction scheme, together with swept path analysis, is shown on the drawings in **Appendix A**.

The current Howes Lane / Bucknell Road junction is a priority junction with traffic turning into or out of Howes Lane giving way to traffic on Bucknell Road. This does not reflect the dominant movement of traffic which is east-west along Howes Lane and Lords Lane. This results in the dominant movement being restricted by lower traffic flows on Bucknell Road, which results in reduced capacity and significant congestion.

By linking the signals, priority through the junctions would be given to the dominant traffic movement, substantially increasing capacity and allowing a significant increase in the number of vehicles able to pass through the junction.

The junction proposals would also provide enhanced facilities for pedestrians in comparison to the current arrangement through the introduction of footways, crossings and pedestrian refuges. It should be noted however that the junction is likely to remain little used by pedestrians as new development would be some distance away and there would not be a natural desire line through the junction to the town centre.

The proposed changes, including the realignment of Lords Lane, would all be accommodated within the existing highway boundary. Highway boundary plans have been obtained from OCC and reviewed.

An independent Stage 1 Road Safety Audit has been undertaken of the interim junction scheme. The audit report and designer's response can be found in **Appendix B**.

3.2 Assessment Methodology

Following discussion with OCC it was agreed that use of the Bicester SATURN model was required in order to ensure a robust basis for assessment of the interim junction scheme.

Trip rate assumptions and subsequent trip generation and distribution were agreed with OCC by way of a note prepared by ABA on 25 April 2016 (**Appendix C**). The subsequent trips generated were then inputted into the Bicester SATURN model in order to establish the distribution of traffic across the Bicester road network. The outputs from the model were then tested at the local level using LinSig.

The trip generation agreed was for the following interim development scenario:

- 2600 homes including:
 - Exemplar (393 homes) + non-residential uses
 - Application 1 (507 homes) + non-residential uses
 - Himley Village (1700 homes) + non-residential uses
- Employment floorspace on the Albion site including:
 - 10,079m² of B1 floorspace
 - 16,154m² of B2 floorspace (no B8 floorspace has been assumed in order to ensure a robust worst case)

The trip rates used were those agreed in the Transport Assessments submitted by Hyder for Application 1 and ABA for Himley Village and, to ensure a robust worst case, a lower set of internalisation assumptions were applied to reflect the interim situation. The trip generation for the Exemplar is already included in the SATURN model and therefore the additional trips added to the network are those set out in Tables 3-1 to 3-3.

Table 3-1 Application 1 (507 homes) vehicle trips added to the network

Trip Destination	AM peak			PM peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Internal (added to network as worst case)	3	8	11	3	2	6
External in Bicester	22	40	62	36	26	62
External outside Bicester	47	102	149	100	53	173
TOTAL	75	157	232	144	84	247

Table 3-2 Himley Village (1700 homes) vehicle trips added to the network

Trip Destination	AM peak			PM peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Internal (added to network as worst case)	6	16	22	7	5	11
External in Bicester	74	134	208	122	86	208
External outside Bicester	184	362	546	360	262	622
TOTAL	264	512	776	489	353	841

Table 3-3 Employment vehicle trips added to the network

Trip Destination	AM peak			PM peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
External in Bicester	58	16	74	10	54	64
External outside Bicester	81	22	103	14	75	89
TOTAL	139	37	177	24	130	154

The traffic for Himley Village will be generated in zone 1 (Figure 3-1) of the model and will be loaded onto the network at point A as shown in Figure 3-2. The traffic for the employment uses will be generated from zone 2 (Figure 3-1) of the model and will be loaded onto the network at point B as shown in Figure 3-2. The traffic for Application 1 will be generated in zone 5 and zone 6 (Figure 3-1) of the model and traffic will be loaded onto the network at point C as shown in Figure 3-2. For the first phase of Application 1 it is assumed that the accesses on Banbury Road created by the Exemplar development will be used.

Figure 3-1 Development zones within NW Bicester

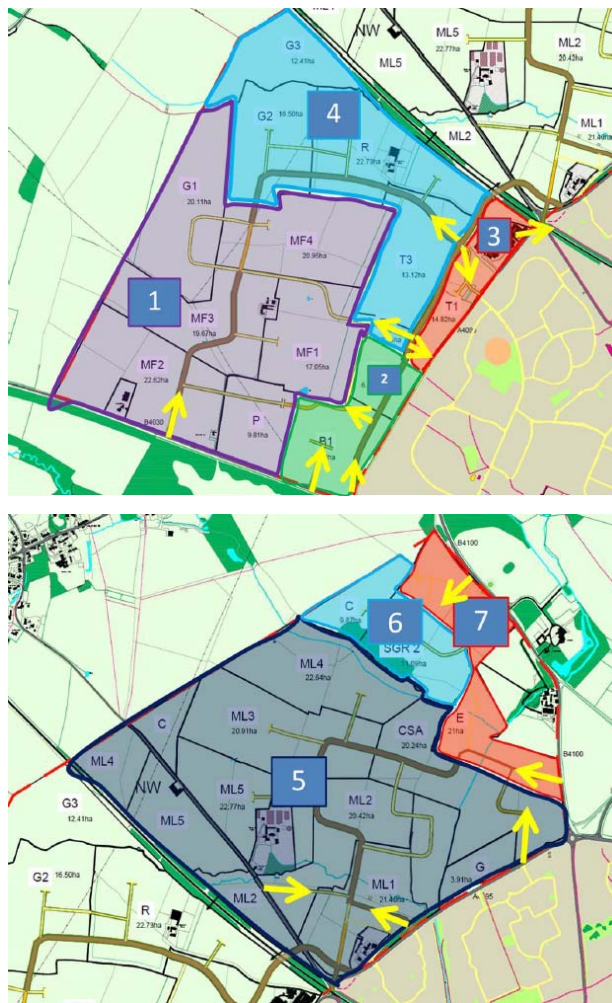
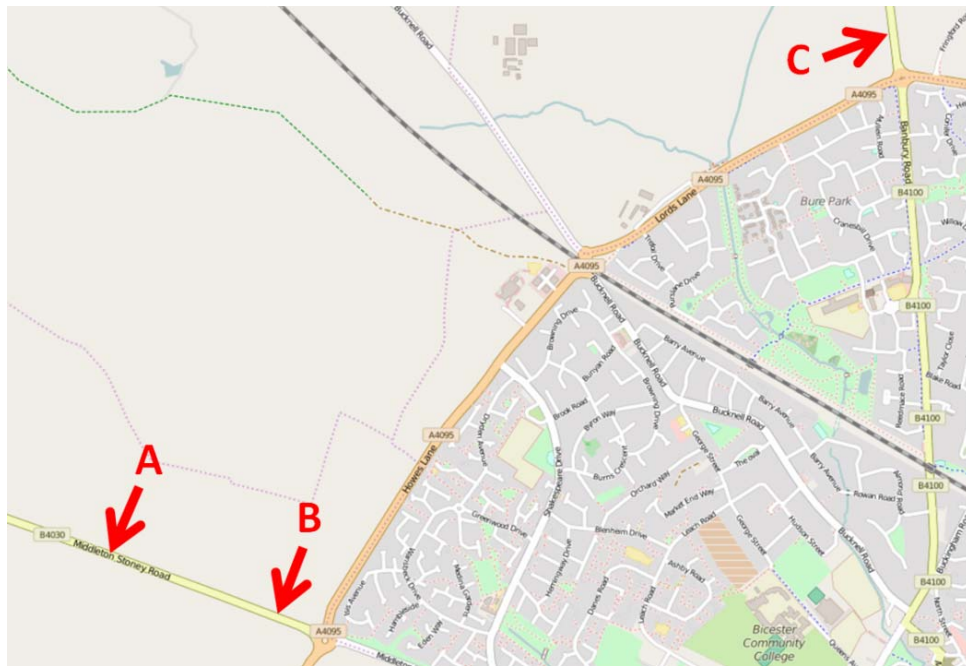


Figure 3-2 Loading points of development traffic onto the network



Three main SATURN model runs have been undertaken, these are:

- 2024 Reference Case: comprises no NW Bicester development (except the Exemplar) and the existing highway layout but with up to date development proposals (consented and proposed) over the wider network and the wider 2024 mitigation measures agreed with OCC
- 2024 No Mitigation: comprises the Reference Case plus the interim development scenario set out above
- 2024 Initial Mitigation: comprises the Reference Case, the interim development scenario set out above plus the interim junction scheme

3.3 Howes Lane / Bucknell Road and Lords Lane / Bucknell Road Junction Capacity Analysis

Existing junction performance

In order to allow a comparison of existing performance at the Howes Lane / Bucknell Road junction to the 2024 No Mitigation scenario the SATURN traffic flows have been modelled using PICADY and compared to the existing traffic flow (based on 2013 traffic surveys provided by OCC). The outputs are provided in Tables 3-4 and 3-5. The modelling indicates that the existing junction is over capacity and that the additional traffic included in the 2024 No Mitigation scenario results in more severe over capacity problems.

Table 3-4 Comparison of existing Howes Lane / Bucknell Road junction performance with the 2024 No Mitigation scenario AM peak

AM (09.00-08.00)	Existing (2013)		2024 No Mitigation	
Movement	RFC	Q	RFC	Q
Howes Lane - left turn	1	23.1	1.06	40.3
Howes Lane - right turn	0.91	3.43	1.01	7.12
Bucknell Road southbound - ahead and right	0.82	3.99	0.91	6.52

Table 3-5 Comparison of existing Howes Lane / Bucknell Road junction performance with the 2024 No Mitigation scenario PM peak

PM (17.00-18.00)	Existing (2013)		2024 No Mitigation	
Movement	RFC	Q	RFC	Q
Howes Lane - left turn	1.76	67.7	1.39	145.3
Howes Lane - right turn	1.65	13.6	1.37	27.2
Bucknell Road southbound - ahead and right	1.34	145	0.86	4.91

2024 No Mitigation Scenario

The performance of the Howes Lane / Bucknell Road junction in the 2024 No Mitigation scenario as represented by SATURN is substantially less congested than predicated by a junction specific PICADY model using the same flows. This suggests that the SATURN model is underestimating the degree of congestion at this critical junction in the 2024 No Mitigation scenario. Nonetheless both SATURN and PICADY predict that the critical junction will be over capacity in the busier PM peak in the 2024 scenario, as set out in Table 3-6.

Table 3-6 Comparison of junction performance assumed by SATURN and PICADY in the PM peak

Arm	SATURN DoS	PICADY RFC
Howes Lane, left	103%	1.39
Howes Lane, right	53%	1.37
Bucknell Road south	101%	0.86

The 2024 No Mitigation scenario PM peak outputs show very different patterns of congestion than for the existing scenario. This is because, despite having far higher overall traffic flows (2,165 vehicles in comparison to 1,587 vehicles), the distribution of traffic across the junction changes as a result of the different distribution of development around Bicester and the opening of Vendee Drive.

In the existing scenario there is a very dominant movement from Bucknell Road (N) to Howes Lane. In the 2024 No Mitigation scenario this movement is reduced but traffic volumes for all other movements are significantly increased. This means that other arms are more sensitive to congestion and delay, as shown in Table 3-5.

The SATURN outputs for the Howes Lane / Bucknell Road junction are set out in **Appendix D** with the PICADY outputs provided in **Appendix E**.

2024 Initial Mitigation Scenario

In order to identify the development flows reaching the critical junction the origin and destination plots have been analysed for each development parcel. For Himley Village 19% of traffic generated (145 vehicles) passes through the junction in the AM and 18% (148 vehicles) in the PM. For the employment uses 11% of traffic generated (33 vehicles) passes through the junction in the AM and 5% (14 vehicles) in the PM. For Application 1 36% of traffic generated (82 vehicles) passes through the junction in the AM and 31% (69 vehicles) in the PM. Plots showing the traffic introduced to the network by each development are provided in **Appendix F**.

The 2024 Initial Mitigation scenario results in the traffic flows set out in Table 3-7 and 3-8 passing through the critical junction.

Table 3-7 2024 Initial Mitigation flows in the AM peak

AM (08.00-09.00)		TO				
		Bucknell Road (S)	Howes Lane	Bucknell Road (N)	Lords Lane	TOTAL
FROM	Bucknell Road (S)	0	1	37	241	279
	Howes Lane	2	0	81	537	620
	Bucknell Road (N)	18	60	0	2	80
	Lords Lane	186	619	3	0	808
	TOTAL	206	680	121	780	1787

Table 3-8 2024 Initial Mitigation flows in the PM peak

PM (17.00-18.00)		TO				
		Bucknell Road (S)	Howes Lane	Bucknell Road (N)	Lords Lane	TOTAL
FROM	Bucknell Road (S)	0	54	60	319	433
	Howes Lane	35	0	109	574	718
	Bucknell Road (N)	52	85	0	1	138
	Lords Lane	261	427	4	0	692
	TOTAL	347	567	173	894	1981

SATURN shows that the junction operates within capacity in the 2024 Initial Mitigation scenario with no arms displaying a Degree of Saturation (DoS) over 85% in the AM peak and in the PM peak the Howes Lane arm at 98% DoS. To establish more clearly the performance of the junction it has been tested as a standalone junction in LinSig.

As suggested by SATURN, LinSig shows that the junction operates well within capacity in the AM peak, with Practical Reserve Capacity (PRC) of 29.4%. Also consistent with SATURN in the PM peak there is a higher volume of traffic and therefore PRC is reduced to 10.9% with the maximum DoS on any arm being 81.1% on Howes Lane.

Queues on the internal arms (i.e. northbound and southbound on Bucknell Road between Howes Lane and Lords Lane) of up to 15 vehicles are shown, which exceeds the available storage capacity of eight vehicles. However, despite this the queues formed clear the stop line within each phase of the lights and therefore there would not be any build-up of queuing over the peak hour beyond that set out in the model.

In conclusion the interim junction scheme proposals are operating comfortably within capacity in the 2024 Initial Mitigation scenario. The model outputs are summarised in Table 3-9 and full model outputs are provided in **Appendix G**.

Table 3-9 LinSig model outputs for the Initial Mitigation scenario

Initial Mitigation scenario	AM (09.00-08.00)		PM (17.00-18.00)	
	DoS	Queue	DoS	Queue
Howes Lane	69.5%	16.6	81.1%	21.6
Bucknell Road south - ahead and left	35.7%	6.7	53.6%	11.4
Bucknell Road internal southbound – ahead and right	67.6%	8.3	66.1%	9.9
Bucknell Road internal northbound - ahead and right	63.8%	10	77.7%	15.4
Lords Lane	65.3%	9.3	56.5%	7.1
Bucknell Road north – ahead and left	47.5%	3	74.4%	5.8

By comparing the performance of the interim junction scheme summarised in Table 3-9 to the outputs provided in Tables 3-5 and 3-6 it is clear that not only does the interim scheme substantially improve performance of the junction in comparison to the 2024 No Mitigation scenario but it also improves the situation in comparison to the existing situation. Queues are reduced from a maximum of 145 vehicles to just 22 with the interim junction scheme in place. This is possible because the interim junction scheme is able to better balance demand across the junction and provide priority to the higher flow movements. Lengthened approach lanes on Howes Lane and Lords Lane also increase capacity across the stop line.

It is also relevant to compare the performance of the interim junction scheme as set out in Table 3-9 to the level of congestion predicted in the Hyder technical note dated 12 December 2014. The Hyder note is the basis on which OCC have set the 900 home threshold for the strategic link road. It is important to understand however that the assumptions underpinning the modelling for the Hyder note are different to the development scenario now being tested. Furthermore the Hyder work does not highlight that the existing situation shows significant congestion. Nonetheless the comparison is important as it indicated the level of congestion and delay considered acceptable by OCC when they reviewed Hyder’s note.

As can be seen in Table 3-10 the Hyder 900 home scenario results in minimal queueing in the AM peak but in the PM peak the junction operates over capacity on Howes Lane with queues of 28 vehicles forming. The interim junction scheme results in the junction remaining within capacity on all arms in both peaks with levels of queueing that are comparable to those in the 900 home scenario. While junction performance remains broadly similar it is important to note that the interim junction scheme allows an additional 1700 homes to be delivered for no worsening in congestion.

Table 3-10 PICADY model outputs from the Hyder December 2014 note

Hyder 900 home scenario	AM (08.00 – 09.00)		PM (17.00- 18.00)	
	RFC	Q	RFC	Q
Howes Lane - left turn	0.225	0	0.886	4
Howes Lane - right turn	0.768	3	1.028	28
Bucknell Road southbound - ahead and right	0.845	7	0.863	8

3.4 Sensitivity Tests

Reduced rat running

The Bicester SATURN model is a dynamic micro simulation model. This means that as congestion develops the model responds by re-routeing vehicles to areas where there are fewer delays. As set out in **Section 3.4** the model is predicting that in the absence of measures to limit rat running, some vehicles will divert away from the Howes Lane / Lords Lane corridor.

It should be noted that use of the Bicester SATURN model was requested by OCC and the assessment methodology agreed with them. The methodology used is consistent with the approach adopted for all other developments that form part of NW Bicester. However, OCC have also requested that the impact of reduced rat running on junction performance be considered.

In order to demonstrate the operation of the junction with reduced rat running the performance of the junction has been tested with traffic distributed from NW Bicester based on the 2007 Bicester Household Travel Diary survey rather than by SATURN. The baseline traffic volumes are derived by factoring up the recorded 2013 traffic volumes to 2021. The scenario includes traffic from 1700 homes at Himley Village, 507 homes on the Application 1 site and 393 homes on the Exemplar site. The total traffic volumes through the junction are set out in Table 3-11 and 3-12.

Table 3-11 Sensitivity test AM traffic flow

AM (08.00-09.00)		TO				
		Bucknell Road (S)	Howes Lane	Bucknell Road (N)	Lords Lane	TOTAL
FROM	Bucknell Road (S)	0	115	18	155	288
	Howes Lane	48	0	86	758	891
	Bucknell Road (N)	15	57	0	54	126
	Lords Lane	128	566	70	0	763
	TOTAL	190	737	173	967	2068

Table 3-12 Sensitivity test PM traffic flow

PM (17.00-18.00)		TO				
		Bucknell Road (S)	Howes Lane	Bucknell Road (N)	Lords Lane	TOTAL
FROM	Bucknell Road (S)	0	67	13	166	247
	Howes Lane	94	0	47	584	726
	Bucknell Road (N)	19	60	0	53	132
	Lords Lane	267	843	93	0	1203
	TOTAL	381	970	154	803	2307

By comparing the flows set out in Table 3-12 and Table 3-13 with Table 3-7 and Table 3-8 it can be seen that the sensitivity test scenario includes 281 additional vehicles in the AM peak and 326 additional vehicles in the PM peak. It should be noted that as the baseline is based on factoring up existing flows the distribution of traffic is somewhat different.

The performance of the junction with the sensitivity test flows is set out in Table 3-13.

Table 3-13 Performance of the junction with sensitivity test flows

Movement	Sensitivity test AM		Sensitivity test PM	
	DoS	Queue	DoS	Queue
Howes Lane	81.2%	18.1	79.2%	11
Bucknell Road south - ahead and left	78.9%	10.9	61.2%	8.2
Bucknell Road internal southbound – ahead and right	60.3%	2.2	89.5%	5.7
Bucknell Road internal northbound - ahead and right	84.1%	11.2	67.2%	6.5
Lords Lane	59.5%	11.1	90.7%	34.2
Bucknell Road north – ahead and left	81.1%	6	84.7%	6.6

In this scenario PRC reduces to 7% in the AM peak with a maximum DoS of 84.1% on Bucknell Road northbound between Howes Lane and Lords Lane. In the PM peak PRC is reduced to -0.8% with a maximum DoS of 90.7% on Lords Lane. Relatively large queues form on Lords Lane in the PM peak due to the higher demand for the Lords Lane to Howes Lane movement in this scenario. However, the maximum queue of 34 vehicles is within the storage capacity of the arm before it reaches Trefoil Drive. Keep clear/yellow box markings could be introduced at this junction in order to ensure vehicles can access and exit this side road. Overall the proposed junction arrangement operates within capacity.

It should be noted that the queue on Bucknell Road northbound between Howes Lane and Lords Lane exceeds the maximum storage capacity of eight vehicles in the AM peak. The maximum queue is 11 vehicles. The queue forms when traffic from Bucknell Road south joins the arm in signal stage four and meets a red light at the stop line downstream. This stage is required in order to allow traffic from Bucknell Road internal southbound and Bucknell Road south northbound to be released at the same time. It should be noted that the queue is transitory, clearing in stage 5 when the queuing traffic is released. In response to this issue a yellow box marking is proposed in order to hold traffic back from Bucknell Road south and to ensure there is no blocking of traffic from Bucknell Road north turning right into Howes Lane.

This sensitivity test demonstrates that even in a scenario where up to 16% additional traffic is added to the interim junction scheme in comparison to the volumes forecast by OCC's Bicester SATURN model, the junction would continue to operate within capacity.

It should also be noted that OCC have modelled the existing junctions using traffic flows collected in 2013. This modelling shows that the junctions are already operating significantly over capacity on certain arms in the peak periods. CDC are

currently minded to locate 900 homes north of the railway in advance of the strategic link road without improvements to the junctions. This would significantly worsen the current situation with modelling indicating major over capacity issues within a few years. By contrast the interim junction improvement allows 2,600 homes and 4 ha of employment to be delivered with less queuing than existing even under the sensitivity test scenario.

The modelling outputs are provided in **Appendix H**.

Reduced development on Himley Village

The Bicester SATURN model assumes that 7,000 new homes and 26ha of commercial floorspace will be delivered by 2024 and therefore this growth is included in the traffic baseline, despite many of the sites not yet having planning permission. Based on figures provided by OCC in 2014/2015 and 2015/2016 only 225 and 367 homes were delivered respectively. A delivery rate of 800 homes per year on average is required for the 2024 traffic baseline to be reached, which seems highly unlikely. It is clear therefore that the modelling represents a robust worst case and that the likelihood of housing coming forward quicker than assumed in the Bicester SATURN model is low.

Nonetheless, the traffic implications of reducing development at Himley Village has been considered as a further sensitivity in order to understand what spare capacity might then be freed up for development elsewhere. The proportions of Himley Village traffic using the critical junction are set out in **Section 3.3** (19% in the AM peak and 18% in the PM peak) and the total traffic generated by the proposals are set out in **Table 3-2**.

Given that the majority of traffic generated by Himley Village will not pass through the interim junction scheme, reducing homes on the site does not lead to significant reductions in traffic at the junction. For example if the number of homes is reduced by 500 to 1,200 (a 29% reduction), the traffic reaching the junction is reduced by only 43 vehicles or 2.4% in the AM peak and 2.2% in the PM peak. Reducing housing on Himley Village therefore has a relatively modest impact on traffic volumes reaching the interim junction scheme and does not significantly affect the ability to provide additional housing elsewhere around Bicester. This is particularly clear in the context of the interim junction scheme having spare capacity for at least an additional 16% of traffic above the 2,600 homes development scenario tested, as set out above.

The spare capacity within the interim junction scheme, as demonstrated by the reduced rat running sensitivity test, also provides comfort that additional development beyond the 7,000 new homes and 26ha of commercial floorspace assumed in the modelled year of 2024 can be accommodated on the network.

3.5 Wider Network Effects

As identified in the Transport Assessments supporting all the planning applications for NW Bicester an increase in traffic is anticipated between Middleton Stoney Road and Bucknell Road via Shakespeare Drive, Blenheim Drive and The Approach in the 2031 NW Bicester Masterplan. These were reported in Table 11.32 of the Himley Village TA and are reproduced in Table 3-14 below with the 2024 Initial Mitigation flows added.

Table 3-14 Shakespeare Drive area link flows

Link	Base Year		Reference Case 2031		With NW Bicester 2031		2024 Initial Mitigation	
	AM	PM	AM	PM	AM	PM	AM	PM
Shakespeare Drive, E of Howes Lane	142	152	138	85	280	212	75	65
Shakespeare Drive, E of Middleton Stoney Road	611	455	950	873	1135	1222	1257	1305
The Approach W of Bucknell Road	320	243	401	507	801	715	549	715

The 2024 Initial Mitigation scenario results in lower flows at the northern end of Shakespeare Drive and on The Approach but slightly higher flows on the southern end of Shakespeare Drive. As set out in the TAs supporting all the planning applications for NW Bicester, a number of measures have been proposed to mitigate the impacts of increased traffic movements through the Shakespeare Drive area, including speed reduction measures such as build outs, widened footways, cycle routes and crossing points and one-way restrictions. It was also identified that there are side roads to Shakespeare Drive where additional traffic calming measures might need to be considered, should traffic routeing on them increase and issues emerge.

Assessing the conditions across both peaks the impact of the 2024 Initial Mitigation scenario is relatively neutral compared to the full NW Bicester masterplan. The issue of additional traffic on Shakespeare Drive is already understood and accepted as part of the impact of the wider NW Bicester Masterplan and mitigation measures have been outlined to deal with it.

The 2024 Initial Mitigation scenario results in an increase in vehicles travelling through Middleton Stoney of 94 vehicles (13.2%) in the AM peak and 62 (8.2%) in the PM peak. These vehicles are travelling to and from the south making use of Middleton Stoney Road and Oxford Road and do not pass through the centre of the village. Potential traffic calming measures have been considered and discussed in **Section 5**.

The full SATURN demand plots are provided in **Appendix I**.

3.6 Other Major Junctions

Hyder in their technical note from December 2014, not only considered the critical Howes Lane/Bucknell Road/Lords Lane junction but two other major junctions on the primary road network – the A4095 Howes Lane/Middleton Stoney Road/Vendee Drive and the A4095/B4100 Banbury Road Roundabout.

Whilst this Addendum does not include a detailed capacity analysis for these two junctions the overall flows through these junctions have been reviewed.

A4095 Howes Lane/Middleton Stoney Road/Vendee Drive

The SATURN output for the 2024 Initial Mitigation scenario gives AM and PM peak flows of 3070 and 3213 respectively. The SATURN output for the 2024 Initial Mitigation shows no junction capacity issues in the AM peak but a DoS of 96% on Middleton Stoney Road westbound and 93% on Vendee Drive in the PM. In order to better understand the performance of the junction, the SATURN flows were tested using an ARCADY model for the junction.

The results from ARCADY show that in the AM peak the junction is operating within capacity. On Middleton Stoney Road the east arm has a Ratio of Flow to Capacity (RFC) of 0.88 and a queue of 7 vehicles. In the PM peak the junction is generally operating within capacity but with the Vendee Drive arm having an RFC of 0.98 and a queue of 25 vehicles. Whilst there is an over capacity issue on this arm it is less than that identified in the Hyder note and accepted by OCC at the Howes Lane/Bucknell Road junction in relation to the 900 home trigger point.

These issues could potentially be resolved by increasing the length of the two lane approach on these arms, thereby creating additional capacity. However, this improvement would need to be balanced with the long term requirements for this junction once the strategic link road is complete.

It is considered that in the short term a relatively minor level of over-capacity can be accepted on the basis that in the medium to long term an increase in capacity is not needed as the demand on this junction will be reduced once the strategic link road is implemented and alternative routes are available that allow a greater dispersal of vehicle movements.

A4095/B4100 Banbury Road Roundabout

The SATURN output for the 2024 Initial Mitigation scenario gives AM and PM peak flows of 3,084 and 3,493 respectively. This compares to the Hyder maximum scenario (2,256 homes and 10 ha of employment land) flows in the AM and PM of 2,825 and 3,326 respectively. The increase to the 2024 Initial Mitigation is 5-9% and 167 to 259 vehicles.

The SATURN output for the 2024 Initial Mitigation shows some over-capacity issues on the B4100 and A4095 east arms in both the AM and PM peaks with DoS between 92% and 101%.

It should be noted that under the scenario of the NW Bicester masterplan, the flows at this junction in the AM and PM peak are 3,013 and 3,210 respectively i.e. in the AM peak broadly the same as under the 2024 Initial Mitigation scenario and slightly less in the PM peak.

In reviewing the flows and the detailed capacity analysis that Hyder undertook it seems likely that in the AM peak 2024 Initial Mitigation scenario this junction will be over capacity in both peaks but there will be more congestion in the PM peak. Hyder in their work identified that this junction would need to be improved once 1,500 homes (including the Exemplar) are occupied at NW Bicester as a whole. With potentially a different distribution of housing to that assessed by Hyder it is likely that the trigger for this improvement would need to be earlier at around 1,300-1,400 homes overall.

3.7 Interim Junction Scheme and the Strategic Link Road

The design of the strategic link road and the masterplan north of the railway requires the re-alignment of Bucknell Road. The interim junction scheme does not physically prejudice this design and the interim junction scheme can be integrated into the final NW Bicester Masterplan. The proposed masterplan arrangements around the Howes Lane and Lords Lane junctions with Bucknell Road are shown in **Appendix J**.

Drawing 1665/75/203 in **Appendix J** superimposes the proposed interim junction scheme over the strategic link road and demonstrates both that the interim junction scheme will not compromise the delivery of the strategic link road and that it can be readily adapted to meet the masterplan requirements.

The level of detail provided in drawing 1665/75/203 is consistent with the level of detail at which the masterplan proposals have been developed. The specific details of whether the Howes Lane and Lords Lane carriageways would be narrowed, the treatment at the junctions and the removal of signals would be dealt with closer to the time and it is anticipated that these matters would be reserved for later agreement.

4.0 Interim Sustainable Movement Strategy

4.1 Introduction

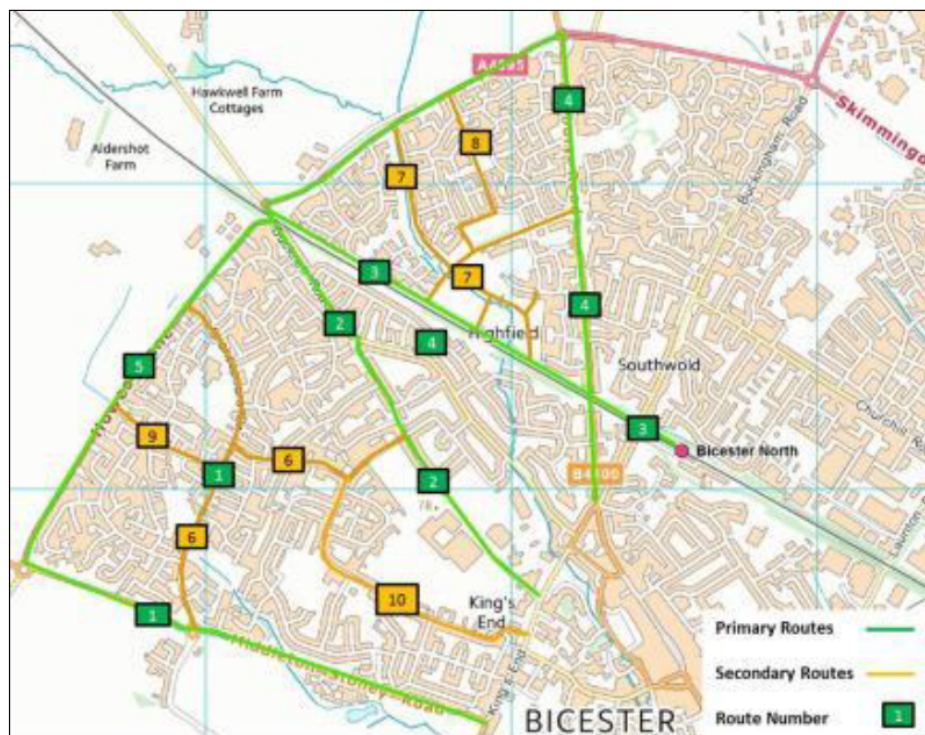
The Himley Village Transport Assessment sets out a sustainable movement strategy that assumes the rest of the NW Bicester masterplan is delivered. This chapter sets out an interim strategy that assumes Himley Village is developed in isolation.

4.2 Walking and Cycling

In order to achieve the walking and cycling modal split set out in the NW Bicester masterplan, a walking and cycling access strategy for the masterplan has been formulated and is set out in Appendix 1 to the Access and Travel Strategy. The masterplan layout proposes a fine grid of streets together with the routes through green corridors to ensure the entire development is accessible on foot and by bike.

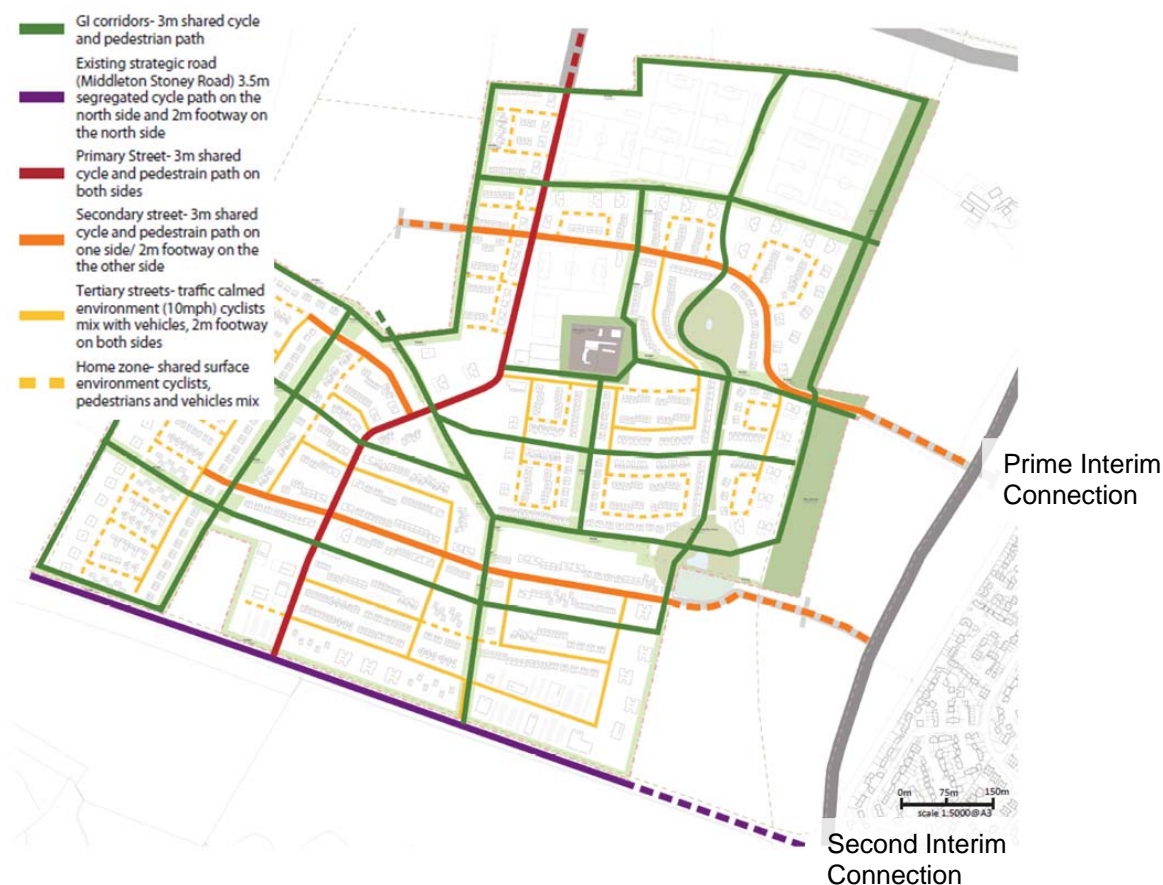
A detailed audit and review was undertaken of walking and cycling routes between the NW Bicester development site and the rest of Bicester as part of the masterplan. From this, a number of primary and secondary connections were identified which are likely to be the main routes for residents of the NW Bicester masterplan. It is recognised that these connections are not the only routes which will be used but these provide the best opportunity for direct routes which could be enhanced or upgraded to provide for both pedestrians and cyclists. These primary and secondary routes are reproduced in Figure 4-1.

Figure 4-1 Primary and Secondary Connections from NW Bicester (Source: NW Bicester masterplan (Farrells / A2 Dominion))



Section 7.3 of the Himley Village Transport Assessment sets out the strategy for internal connections within the Himley Village site, the characteristics of each street type and how these will be connected to the wider NW Bicester masterplan and to Bicester. These connections show the situation once the strategic link road is delivered and they are summarised in Figure 4-2.

Figure 4-2 Proposed walking and cycling connections



On the basis that Himley Village will come forward in advance of the strategic link road and adjoining development, the proposed walking and cycling connections have been reviewed. In order to ensure connectivity during the interim phase before delivery of the strategic link road, two key connections are proposed that continue the strategy agreed as part of the wider masterplan.

The prime interim connection will be the northernmost link to Bicester shown in Figure 4-2. This will be a traffic free walking and cycling route that will extend to Howes Lane and will be delivered in phase 1 of Himley Village (290 homes). A toucan crossing will be introduced on Howes Lane to connect the new route with the existing traffic free pedestrian and cycling link to the north of Beckdale Close. See **Figure K.1** in **Appendix K**. The crossing is situated 400m from the Shakespeare Drive junction and is unlikely to affect the operation of the junction.

Within Himley Village the link will be connected to the Green Infrastructure corridor network, which will also be brought forward in phase 1 as part of the interim connectivity strategy.

The principle of this route is already agreed as part of the wider masterplan and therefore the proposals do not prejudice the delivery of the strategic link road or

adjacent development. Agreement will be required from the Thames Valley Police Authority, who own the land across which the link will pass, in order to deliver the new link earlier than proposed as part of the NW Bicester masterplan.

A second interim connection will be provided to the north of Middleton Stoney Road, consistent with the agreed NW Bicester masterplan. Ideally this would be brought forward early within the adjoining land, in the form proposed as part of the NW Bicester masterplan. However, should this not be possible it has been assessed that a route can be delivered within the highway boundary itself. The connection would be delivered in phase 1.

To demonstrate that there is sufficient space within the highway at Middleton Stoney Road to accommodate a shared pedestrian and cycle route, a cross section is provided in **Figure K.2 of Appendix K**. The cross section was taken at the narrowest point of the route, immediately to the east of the red line of the Himley Village site. At the narrowest point a shared pedestrian and cyclist route of 4m could be provided between the edge of the carriageway and the existing hedge line.

It should be noted that the proposals would require the ditch to be culverted with appropriate drainage provided within the carriageway and land to the north. The exact location of the highway boundary would also need to be determined.

The Himley Village development will generate 370 external walking and cycling trips in the AM peak and 386 in the PM peak (Tables 8.9 and 8.9 of the Himley Village Transport Assessment). If it is assumed that 60% of users will use the primary route and 40% the Middleton Stoney Road route the likely peak volume of users is around 154 per hour. DfT Local Transport Note 1/12 (Shared Use Routes for Pedestrians and Cyclists) states that flows in excess of 180 per metre width per hour are likely to be comfortably accommodated on shared routes. Taking into account a 500mm buffer adjacent to the hedge row which leaves a 3.5m clear unsegregated route, the proposed shared route is acceptable in capacity terms.

At the Howes Lane / Vendee Drive roundabout the route will cross Howes Lane via a new toucan crossing. This has been positioned 30m north of the roundabout, which provides storage space for five vehicles when the green signal for pedestrians and cyclists is called. The northbound vehicle flow in the 2024 Initial Mitigation scenario is 668 vehicles in the busiest PM peak period. Storage space for five vehicles ensures that queueing is unlikely to block back into the junction. The proposals at the Howes Lane / Vendee Drive roundabout are shown in **Figure K.3 of Appendix K**.

The overall Interim Connectivity Strategy overlaid over the full Himley Village masterplan is shown in **Figure K.4 of Appendix K**. Given that the interim connectivity strategy broadly maintains the NW Bicester masterplan connections the accessibility to existing town facilities remains unchanged and is as shown in Figure C.3 of Appendix C of the Himley Village Transport Assessment.

As set out in the Design and Access Statement and Transport Assessment the Himley Village proposals are designed to be walkable and attractive for cycling. The footpaths and cycleways link with existing networks and the wider urban area. The proposals provide a clear hierarchy of routes that will encourage sustainable travel.

The interim proposals are consistent with the NW Bicester masterplan. The delivery of the external and internal routes will be brought forward early in order to ensure a cohesive network is developed and the site is connected to the wider area from day one.

A contribution towards the improvements within wider Bicester will be agreed as part of the NW Bicester masterplan will be provided as part of the S106 Agreement.

4.3 Himley Village Facilities

As well as providing high quality connections to Bicester, phase 1 of the Himley Village development will include a range of day to day facilities to ensure that residents are able to make a significant number of trips without leaving the site, as envisaged in the original Transport Assessment.

The facilities to be provided in phase 1 include:

- Local shops (700m²)
- Offices (1,000m²)
- Health facilities (1,500m²)
- Nursery (100m²)
- Veterinary surgery (2,000m²)
- Hotel (2,600m²)
- Playing fields

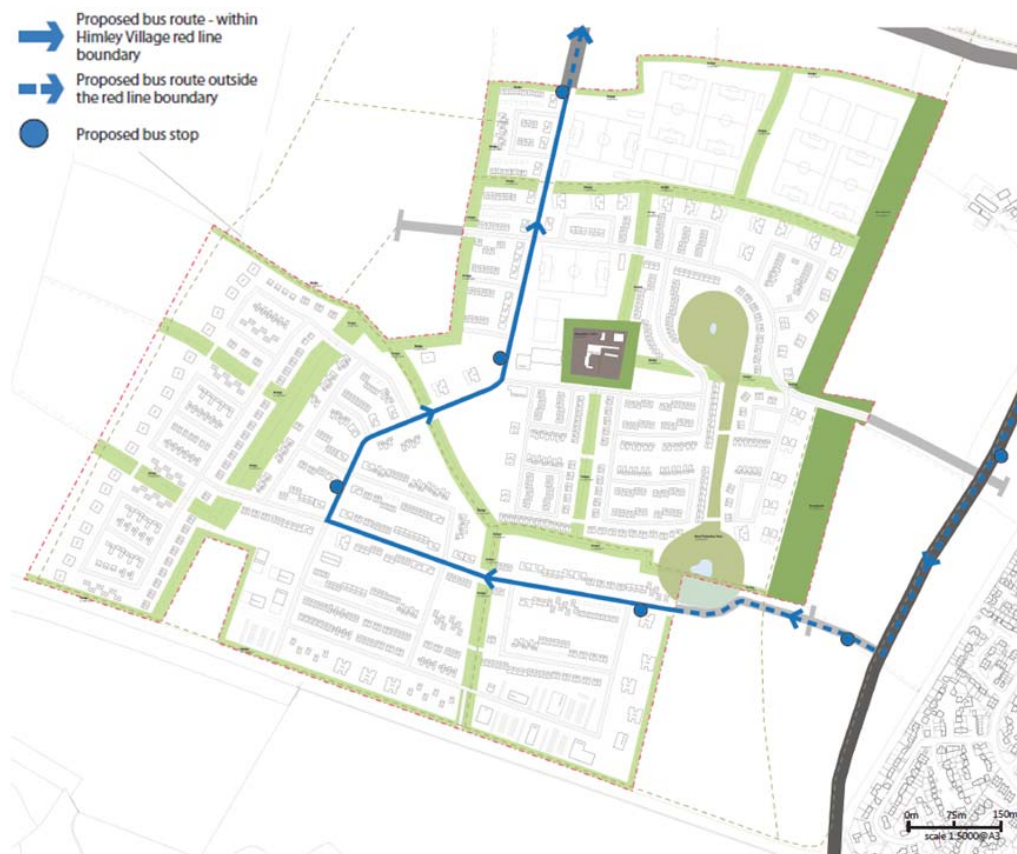
Due to the accelerated delivery of housing now proposed, the 2FE primary school will also be delivered in phase 1. In the second phase of development the pub / community centre (400m²) will be delivered.

By front loading the delivery of the non-residential facilities new residents will be able to make use of a wide range of local facilities from early on. The proposed walking and cycling connections set out in **Section 4.1** ensure that local facilities in Bicester such as the Tesco Express, take away and pub on Shakespeare Drive are also within a 15 minute walk or short cycle from the development.

4.4 Proposed Bus Services

As part of the NW Bicester masterplan a bus loop is proposed that will enter the site via the strategic link road and pass through the development and onward via the Application 2 site to the north. The proposal is set out in Figure C.7 of Appendix C of the original Transport Assessment and is summarised in Figure 4-3.

Figure 4-3 Proposed bus route and stop arrangement



On the basis that Himley Village will come forward in advance of development of the strategic link road and adjoining development an interim bus strategy has been developed. This will involve the provision of new bus stops on Middleton Stoney Road that will serve the local centre and allow residents to make use of the 25A bus route between Oxford and Bicester. The proposed west bound bus stop will have a pedestrian refuge to ensure crossing Middleton Stoney Road is safe and convenient. The proposed stop arrangement is shown in **Figure K.5 of Appendix K**.

A new bus route dedicated to Himley Village will also be provided to serve residents within the site. This will enter the site at the Middleton Stoney Road / Primary Street junction and will continue along the Primary Street serving two locations within the site. The bus will then turn and continue back down the Primary Street before re-joining Middleton Stoney Road. The interim arrangement is shown in **Figure K.6 of Appendix K**. The spacing of the stops has been provided to ensure that the majority of residents are within a 400m of walk of a stop. The coverage of the stops is shown in **Figure K.7 of Appendix K**.

It is anticipated that two buses would serve the new route and an initial frequency of a bus every 20 minutes would be provided to residents, in addition to the hourly 25A service on Middleton Stoney Road. This gives an overall frequency of four buses an hour serving the site, which is a level of service that represents an attractive alternative to the car for local trips. It is envisaged that a 10 minute frequency at Himley Village will be achieved once the service becomes fully viable as the wider NW Bicester masterplan is built out.

5.0 Middleton Stoney Village Traffic Calming

5.1 Impact on Middleton Stoney Village

The Himley Village development will have a modest impact on traffic volumes within Middleton Stoney with the increase in traffic forecast being below 5% in the 2024 Initial Mitigation scenario at the junction of Bicester Road / Ardley Road / Oxford Road. Along Ardley Road and Heyford Road increases will be even less as the majority of development traffic will not pass through the village but rather turn left towards Oxford. Nonetheless concerns have been raised that the development of NW Bicester could increase vehicle speeds through the junction.

It is understood that the Ardley Road / Oxford Road is used occasionally as a diversionary route when there are problems on the M40. At these times it is likely that the village suffers from congestion and therefore any traffic calming measures should not exacerbate such problems by reducing capacity.

In order to mitigate the impact of the Himley Village development a range of measures could be considered within the village and include:

- Enhanced gateway features close to the village centre that physically or visually narrow the carriageway, encouraging lower speeds
- Traffic calming features at least every 50m such as a change of surfacing, speed cushions, carriageway narrowing
- Tightened kerb radii at the Bicester Road / Ardley Road / Oxford Road junction (swept path analysis to ensure HGVs retain adequate access would be required)
- Removal of road markings within the centre of the village
- Change of surfacing or raised tables at key points in the village such as outside the pub and village hall

The intention should be to reduce traffic speeds by introducing measures that signal to drivers they should reduce speed while also enhance the character of the village.

It should be noted that measures such as raised tables and speed cushions would need to be lit and signed. The impact this would have on the character of the village would need careful consideration.

A drawing setting out potential measures, as well as precedents from other villages, is provided in **Appendix L**. The suite of measures to be implemented would require consultation with Middleton Stoney Parish Council, as well as OCC.

A contribution towards traffic calming in Middleton Stoney will be agreed as part of the S106.

6.0

Framework Travel Plan Update

Himley village is anticipated to be delivered in full by 2021, in advance of the strategic link road and the adjoining development. The proposed mix of land-use at Himley Village and the interim sustainable movement strategy discussed in **Section 4** reinforces the development as one which can be self-reliant.

The Framework Travel Plan has been updated to reflect Himley Village coming forward in advance of wider NW Bicester developments, as a sustainable and self-reliant development.

The updated Framework Travel Plan is included in **Appendix M**.

7.0 Summary and Conclusion

7.1 Overview

This Transport Assessment Addendum has been prepared to support the planning application submitted for the Himley Village development.

The main Transport Assessment considered the current situation with regards to sustainable travel modes, the highway network, traffic conditions and road safety in the vicinity of the application site and the impact of the development once the strategic link road is in place.

This Addendum has set out an interim junction scheme that allows development to be brought forward in advance of the strategic link road and has provided an interim sustainable movement strategy and Framework Travel Plan that will support early development of the site.

7.2 Interim Junction Scheme

The interim junction scheme has been assessed making use of the Bicester SATURN model using a methodology agreed with OCC. This modelling work has demonstrated that the proposed scheme can accommodate the forecast demand from 1,700 homes on Himley Village, 393 homes at the Exemplar, 507 homes on the Application 1 site and 26,233m² of commercial floorspace before the strategic link road is required.

The report has demonstrated that the existing junction is over capacity now and that it will become severely congested if 900 homes are permitted north of the railway. The impact of such an allocation of housing would be greater than that assumed in the Hyder traffic assessment due to the greater impact of homes located north of the railway at the critical junction.

The interim junction scheme provides a lower level of congestion than currently exists. It provides a significantly lower level of congestion than would exist if 900 homes were permitted to the north of the railway without improvements. More importantly it allows these benefits to be achieved while delivering 1,700 additional homes. This interim junction scheme allows development to take place rapidly in NW Bicester in advance of the strategic link road being delivered.

The delivery of 1,700 homes on Himley Village and 900 homes to the north of the railway would result in some increased rat running in Bicester around Shakespeare Drive. This is consistent with the pattern forecast once the full NW Bicester masterplan is completed. As for the full NW Bicester masterplan, mitigation measures may need to be brought forward to mitigate these impacts and a contribution will be secured in the S106.

7.3 Interim Sustainable Movement Strategy

Walking and Cycling

The proposed interim sustainable movement strategy for walking and cycling will deliver two connections to Bicester in advance of the strategic link road. These will ensure that the levels of connectivity to facilities in Bicester are the same as was envisaged as part of the full masterplan.

The prime route will be to the north of the site and it will provide a pleasant and traffic free connection to existing walking and cycling infrastructure within Bicester. The second route will be provided north of Middleton Stoney Road and provide residents with greater options regarding external connections. The internal green infrastructure corridors will be brought forward early to ensure these routes are well connected from phase 1 of the development.

A contribution will be made to improve walking and cycling facilities within Bicester, as set out in the Transport Assessment.

Himley Village Facilities

A wide range of day to day facilities will be provided within NW Bicester in order to ensure that residents are able to make a significant proportion of their daily journeys on foot and by bike. The early delivery of these facilities will also help to foster community spirit within Himley Village.

Proposed Bus Services

A new bus service will serve the site on a 20 minute frequency. Stops will be arranged to ensure that the majority of homes are within a 400m walk of a bus stop. New stops on Middleton Stoney Road will also be provided that will allow residents and visitors to make use of the existing 25A service. Taken together the site will be served by four buses an hour from phase 1 of the development.

The bus services provided, along with the excellent walking and cycling facilities, will ensure that residents are able to choose sustainable modes, fulfilling the mode split targets and aspirations of the eco-town designation.

7.4 Middleton Stoney Village Traffic Calming

A package of potential measures has been prepared that would mitigate the modest impact on traffic conditions likely to result from the Himley Village development. These would need to be subject to consultation with the Middleton Stoney Parish Council and OCC.

A contribution to traffic calming measures in Middleton Stoney will be agreed as part of the S106.

7.5 Framework Travel Plan

A revised Framework Travel Plan has been prepared taking into account the accelerated delivery of the Himley Village proposals.

7.6 Conclusion

As concluded in the Transport Assessment the provision of the mitigation measures within the site and a proportionate contribution to off-site measures will address the impacts of NW Bicester and Himley Village on the road network as well as support improvements to Bicester's infrastructure.

The interim junction scheme proposed will unlock development of Himley Village in advance of the strategic link road being delivered. However, the strategic link road is still required in order to develop the full NW Bicester masterplan and to ensure Himley Village is fully integrated into it. For that reason P3Eco remain fully committed to supporting the delivery of the strategic link road.

Given that Himley Village will be coming forward early it is acknowledged that additional walking and cycling and bus links will be required. These are essential to promote sustainable travel and ensure that the PPS1 supplement targets are met. This will help make the vision for NW Bicester a reality.

It is concluded that there are no transport reasons why the development should not be granted consent with delivery in advance of the strategic link road.