

TECHNICAL NOTE

Job Name: Heyford Park
Job No: 39304
Note No: 035 Rev C
Date: 29th June 2020
Prepared By: Phil Rawlins
Subject: **Reassessment of the Impacts of Heyford Park and Associated Mitigation on Local Villages**

Item	Subject
1.	<p>Introduction</p> <p>This Technical Note has been prepared by Stantec on behalf of Dorchester Group to set out an updated assessment of the transport impacts on local villages arising from the Cherwell District Council Local Plan allocation at Heyford Park (Policy Villages 5).</p> <p>An assessment of the impact of development on local villages was set out at Section 10.4 of the original Transport Assessment (TA) Report (Peter Brett Associates, April 2018) for the Heyford Park development allocation submitted in support of the current outline planning application. Since this report was submitted extensive work has been undertaken in liaison with Oxfordshire County Council (OCC) to finalise the mitigation strategy for the development and as part of this further transport modelling has been undertaken using the OCC Bicester SATURN model. On this basis OCC have requested that the analysis of the development impact on local villages be updated and submitted as part of the Transport Assessment Addendum supporting the main application for the Heyford site. It is considered that this will provide an understanding of the wider impacts of the mitigation proposed beyond that set out within the TA Addendum (Stantec, March 2020).</p> <p>OCC have requested that an assessment of impacts be undertaken for the following villages:</p> <ul style="list-style-type: none"> - Fritwell - Ardley - Bucknell - Middleton Stoney - Kirtlington - Lower Heyford - The Bartons - North Aston - Somerton - Upper Heyford - Caulcott - Chesterton <p>It was agreed with OCC that the assessment should be undertaken utilising data from the Bicester Transport Model that was updated for the purposes of assessing the Heyford Park development and mitigation proposals.</p>

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2.	<p>Criteria for Assessing Impact on Local Villages</p> <p>It was agreed with OCC that the links / junctions set out in Table 1 should be used to assess the impact of the Heyford Park development in each of the village locations. The links / junctions have been assessed based on the most appropriate link / junction data available.</p> <p>Table 1: Links / Junctions Assessed</p> <table border="1"> <thead> <tr> <th>Village</th> <th>Link / Junction Assessed</th> </tr> </thead> <tbody> <tr> <td>Fritwell</td> <td>Two-way flow on Ardley Rd west of the B430 / Ardley Rd junction</td> </tr> <tr> <td>Ardley</td> <td>Total flow at the B430 / Ardley Rd junction</td> </tr> <tr> <td>Bucknell</td> <td>Two-way flow on Ardley Rd east of the B430 / Ardley Rd junction</td> </tr> <tr> <td>Middleton Stoney</td> <td>Total flow at B430 / B4030 (Middleton Stoney) junction and two-way flows on individual arms at the B430 / B4030 junction</td> </tr> <tr> <td>Kirtlington</td> <td>Two-way flow on the A4095 Portway south of the A4095 / Portway junction</td> </tr> <tr> <td>Lower Heyford</td> <td>Total flow at the B4030 / Station Rd / Freehold St junction</td> </tr> <tr> <td>The Bartons</td> <td>Two-way flow on the B4030 west of the A4260 / B4030 (Hopcrofts Holt) junction</td> </tr> <tr> <td>North Aston</td> <td>Two-way flow on Somerton Rd east of the A4260 / Somerton Rd junction</td> </tr> <tr> <td>Somerton</td> <td>Two-way flow on Somerton Rd east of the A4260 / Somerton Rd junction</td> </tr> <tr> <td>Upper Heyford</td> <td>Total flow at the Camp Rd / Station Rd / Somerton Rd junction and Two-way flow on Somerton Rd north of the Camp Rd / Station Rd / Somerton Rd junction.</td> </tr> <tr> <td>Caulcott</td> <td>Two way flow on the B4030 east of the B4030 / Portway junction</td> </tr> <tr> <td>Chesterton</td> <td>Two way flow on the A4095 east of the A4095 / B430 junction.</td> </tr> </tbody> </table>	Village	Link / Junction Assessed	Fritwell	Two-way flow on Ardley Rd west of the B430 / Ardley Rd junction	Ardley	Total flow at the B430 / Ardley Rd junction	Bucknell	Two-way flow on Ardley Rd east of the B430 / Ardley Rd junction	Middleton Stoney	Total flow at B430 / B4030 (Middleton Stoney) junction and two-way flows on individual arms at the B430 / B4030 junction	Kirtlington	Two-way flow on the A4095 Portway south of the A4095 / Portway junction	Lower Heyford	Total flow at the B4030 / Station Rd / Freehold St junction	The Bartons	Two-way flow on the B4030 west of the A4260 / B4030 (Hopcrofts Holt) junction	North Aston	Two-way flow on Somerton Rd east of the A4260 / Somerton Rd junction	Somerton	Two-way flow on Somerton Rd east of the A4260 / Somerton Rd junction	Upper Heyford	Total flow at the Camp Rd / Station Rd / Somerton Rd junction and Two-way flow on Somerton Rd north of the Camp Rd / Station Rd / Somerton Rd junction.	Caulcott	Two way flow on the B4030 east of the B4030 / Portway junction	Chesterton	Two way flow on the A4095 east of the A4095 / B430 junction.
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3.	<p>Model Validation</p> <p>It was agreed with OCC that the first step in undertaking the updated assessment of the impact on local villages should be to review the validation of the model in the areas being assessed. This has been undertaken using data extracted from the Bicester Transport Model: Heyford Park Update: Addendum to the Local Model Validation Report (LMVR) (WYG, August 2018).</p> <p>It should be noted that the LMVR set out that the model validated well against the required criteria and the model validation was agreed with OCC at the time that the model was prepared. This assessment considers the detailed validation at specific points of the modelled area.</p> <p>Section 5.4 of the LMVR sets out the criteria for calibration and validation that the flows in the model should meet in order to be considered as acceptable based on WebTAG unit M3.1. For the purposes of this exercise the most appropriate section of this criteria is replicated within Appendix A.</p> <p>The LMVR sets out the acceptability of individual turning movements at Appendices D and G. This data for has been amalgamated to provide a validation assessment for each link and junction. A summary of the validation of each link / junction is provided at Appendix B and the full calculations are provided at Appendix C of this Technical Note. Data was not available to provide an assessment for the links assessed relating to Fritwell and Bucknell. Data was also not available for the B430 / Ardley Road junction being used to assess the impacts in Ardley, therefore an assessment has been made of the B430 to the north and south of the existing junction in this location.</p> <p>Green cells shown within the table at Appendix B validate within the criteria set out at Appendix A. Orange cells are close to meeting the validation criteria (within 10%). Red cells do not meet the validation criteria.</p>																										

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	<p>Appendix B demonstrates that the majority of links / junctions considered for assessment purposes either meet or are very close to meeting the identified validation criteria. On this basis it is considered that the model is fit for the purpose of testing the impact of development on the local villages.</p> <p>In instances where links or junctions have been identified as not validating well in one peak it is the case that the other peak validates within the defined parameters or close to it. Generally, in these instances the development impacts set out below are similar in the AM and PM peak hours, therefore, it is not considered that this will materially impact the assessment undertaken.</p>
4.	<p>Assessment of Development Impact on Local Villages</p> <p>As set out in Section 1 this assessment has been based upon data extracted from the Bicester Transport Model that was updated for the purposes of assessing the mitigation package associated with development at Heyford Park. Flows have been extracted from the model for the following scenarios:</p> <ul style="list-style-type: none"> - 2031 Reference Case (RC): This scenario includes background growth and infrastructure improvements to 2031 but excludes the Heyford Park development allocation and associated mitigation. - 2031 Do Nothing (DN): This scenario is as the reference case scenario but includes the Heyford Park development allocation (Local Plan Policy Villages 5). There is no mitigation associated with the Heyford Park allocation included in this scenario - 2031 Do Something 1 (DS1): This scenario is as the Do Nothing scenario but includes the proposed highway mitigation associated with the Heyford Park development including the proposed two-way bus gate at Middleton Stoney. <p>It should be noted that the signalisation of the B430 / Ardley Road junction is not included within the DS1 scenario as mitigation at this junction location was agreed with OCC after the initial SATURN modelling was undertaken. It has been agreed with OCC that the exclusion of mitigation at this location from the model is unlikely to materially impact on the assessment being undertaken within this note.</p> <p>Tables 2 and 3 set out the flows extracted for each scenario (RC DN and DS1) along with the forecast impact of the development allocation and its associated mitigation in each location for the 2031 horizon representing the full build out of the development at the end of the adopted Local Plan period. A summary of the impact in each village location is provided below in Tables 2 and 3 representing the AM and PM peak hours respectively.</p>

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Table 2: Assessment of Development Impact on Local Villages – AM Peak

VILLAGE	LINK / JUNCTION	AM PEAK								
		2031 RC	2031 DN	2031 DN Impact	2031 DN Impact %	2031 DS1	2031 DS1 Impact compared to RC	2031 DS1 Impact compared to RC %	2031 DS1 Impact compared to DN	2031 DS1 Impact compared to DN %
Fritwell	Ardley Rd west of the B430 / Ardley Rd junction	217	307	90	41.7%	332	115	53.2%	25	8.1%
Ardley	B430 / Ardley Rd junction	2159	2319	160	7.4%	2225	65	3.0%	-94	-4.1%
Bucknell	Ardley Rd east of the B430 / Ardley Rd junction	559	625	66	11.8%	600	40	7.2%	-26	-4.1%
Middleton Stoney	Ardley Road north of B430 / B4030 junction	1281	1153	-128	-10.0%	2098	817	63.8%	944	81.9%
	Bicester Road east of B430 / B4030 junction	895	1007	113	12.6%	1095	200	22.4%	87	8.7%
	Oxford Road south of B430 / B4030 junction	1394	1306	-88	-6.3%	1279	-116	-8.3%	-27	-2.1%
	Heyford Road west of B430 / B4030 junction	908	1083	175	19.3%	116	-791	-87.2%	-966	-89.3%
	B430 / B4030 junction	2239	2275	36	1.6%	2294	55	2.5%	19	0.8%
Kirtlington	A4095 south of the A4095 / Portway junction	801	896	95	11.9%	803	2	0.2%	-93	-10.4%
Lower Heyford	B4030 / Station Rd / Freehold St junction	626	608	-17	-2.8%	492	-134	-21.4%	-116	-19.1%
The Bartons	B4030 west of the A4260 / B4030 junction	332	340	8	2.4%	318	-14	-4.2%	-22	-6.5%
North Aston	Somerton Rd east of the A4260 / Somerton Rd junction	223	306	83	37.3%	355	132	59.4%	49	16.1%
Somerton	Somerton Rd east of the A4260 / Somerton Rd junction	223	306	83	37.3%	355	132	59.4%	49	16.1%
Upper Heyford	Camp Rd / Station Rd / Somerton Rd junction	426	511	85	20.0%	636	211	49.5%	126	24.6%
	Somerton Rd north of the Camp Rd / Station Rd / Somerton Rd junction	321	378	57	17.8%	485	164	51.1%	107	28.3%
Caulcott	B4030 east of the B4030 / Portway junction	453	361	-92	-20.3%	38	-415	-91.6%	-323	-89.5%
Chesterton	A4095 east of the A4095 / B430 junction.	466	665	198	42.5%	574	107	23.0%	-91	-13.7%

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Table 3: Assessment of Development Impact on Local Villages – PM Peak

VILLAGE	LINK / JUNCTION	PM PEAK								
		2031 RC	2031 DN	2031 DN Impact	2031 DN Impact %	2031 DS1	2031 DS1 Impact compared to RC	2031 DS1 Impact compared to RC %	2031 DS1 Impact compared to DN	2031 DS1 Impact compared to DN %
Fritwell	Ardley Rd west of the B430 / Ardley Rd junction	343	410	67	19.6%	356	13	3.7%	-55	-13.3%
Ardley	B430 / Ardley Rd junction	1580	1831	251	15.9%	2082	502	31.8%	251	13.7%
Bucknell	Ardley Rd east of the B430 / Ardley Rd junction	339	571	232	68.3%	438	99	29.1%	-133	-23.3%
Middleton Stoney	Ardley Road north of B430 / B4030 junction	1041	929	-112	-10.8%	1973	931	89.4%	1044	112.4%
	Bicester Road east of B430 / B4030 junction	1010	1114	104	10.3%	1135	125	12.4%	21	1.9%
	Oxford Road south of B430 / B4030 junction	1067	1080	13	1.2%	1117	50	4.7%	37	3.4%
	Heyford Road west of B430 / B4030 junction	872	992	120	13.8%	89	-783	-89.8%	-903	-91.0%
B430 / B4030 junction		1995	2057	62	3.1%	2157	162	8.1%	100	4.8%
Kirtlington	A4095 south of the A4095 / Portway junction	811	888	77	9.5%	865	54	6.6%	-23	-2.6%
Lower Heyford	B4030 / Station Rd / Freehold St junction	712	729	16	2.3%	480	-232	-32.6%	-249	-34.1%
The Bartons	B4030 west of the A4260 / B4030 junction	283	315	32	11.2%	254	-30	-10.5%	-62	-19.5%
North Aston	Somerton Rd east of the A4260 / Somerton Rd junction	205	317	112	54.4%	435	230	111.8%	118	37.2%
Somerton	Somerton Rd east of the A4260 / Somerton Rd junction	205	317	112	54.4%	435	230	111.8%	118	37.2%
Upper Heyford	Camp Rd / Station Rd / Somerton Rd junction	460	543	84	18.2%	515	55	12.0%	-29	-5.3%
	Somerton Rd north of the Camp Rd / Station Rd / Somerton Rd junction	366	413	47	12.9%	364	-2	-0.5%	-49	-11.9%
Caulcott	B4030 east of the B4030 / Portway junction	531	477	-54	-10.2%	38	-493	-92.8%	-439	-92.0%
Chesterton	A4095 east of the A4095 / B430 junction.	529	588	59	11.2%	635	107	20.2%	47	8.0%

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Fritwell

Flows on the Ardley Road west of the B430 / Ardley Road junction have been used to assess the impact of development on Fritwell.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 40% (90 vehicles two way) in the AM peak hour with development but without highway mitigation and this increases to approximately 50% (115 vehicles two way) when mitigation is included under the DS1 scenario.

In the PM peak an impact of approximately 20% (67 vehicles two way) is predicted with development but without highway mitigation but this reduces to approximately 4% (13 vehicles two way) when the proposed mitigation measures are introduced under the DS1 scenario.

Whilst it is not considered that the quantity of extra traffic predicted (approximately 2 cars per minute in the AM peak) would have a material impact on the operation of the highway in this location, it is considered that this increase may have an impact on the amenity of residents in Fritwell in the AM peak. On this basis it is considered that a contribution towards traffic management measures in this location should be provided.

Ardley

Flows at the B430 / Ardley Road junction have been used to assess the impact of development on Ardley.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 7% (160 vehicles) in the AM peak hour with development but without the proposed highway mitigation but that this reduces to approximately 3% (65 vehicles) when mitigation measures are introduced under the DS1 scenario.

In the PM peak an impact of approximately 16% (250 vehicles) is predicted with development but none of the proposed highway mitigation and this increases to approximately 30% (350 vehicles) when the proposed mitigation measures are introduced under the DS1 scenario.

Highway improvements in the form of traffic signals have been separately identified for the B430 / Ardley Road junction improve the operational performance of the junction under future traffic conditions with the full development of the Heyford Park allocation. On the basis of the predicted impact of development in Ardley in the PM peak it is also considered that a contribution towards traffic management measures in this village location should be provided to compliment the junction specific improvements that are proposed to the B430 / Ardley Road junction.

Bucknell

Flows on the Ardley Road east of the B430 / Ardley Road junction have been used to assess the impact of development on Bucknell.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 12% (65 vehicles two way) with development but no highway mitigation in the AM peak hour. This impact is reduced to approximately 7% (40 vehicles two way) when the full package of mitigation measures is introduced in the DS1 scenario.

In the PM peak an impact of approximately 68% (230 vehicles two-way) is predicted with none of the proposed highway mitigation but this reduces to approximately 30% (100 vehicles) when the proposed mitigation measures are introduced in the DS1 scenario.

It is considered that the highway mitigation measures proposed to support the Heyford Park development (most notably the introduction of the bus gate on the B4030 Heyford Road which is shown to re-assign traffic throughout the local network) are having a beneficial impact in reducing

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development related traffic in Bucknell in both peak hours and that the resultant traffic flows of less than 2 vehicles per minute in the PM peak would not have a detrimental impact on the capacity of the highway in this location. It is also considered that the proposed signalisation of the B430 / Ardley Road junction will provide significant benefit to the residents of Bucknell through increasing capacity on the Ardley Road east arm of the junction and allowing vehicles to turn onto the B430 far more easily. On this basis it is not considered that further mitigation measures are required in this location.

Middleton Stoney

Flows at the B430 / B4030 (Middleton Stoney) junction have been used to assess the impact of development on Middleton Stoney. The total flows at the junction have been assessed as well as flows on each arm.

The modelling undertaken indicates that traffic flows at the junction are predicted to increase by approximately 2% (35 vehicles) in the AM peak hour with the development but with no highway mitigation and that this increases to approximately 3% (55 vehicles) when mitigation measures are introduced under the DS1 scenario. When the arms are assessed individually it is predicted that there will be some significant re-assignment of flow with the bus gate operational and the Heyford Road arm closed to through traffic. In the AM peak traffic on the B430 Ardley Road increases by approximately 64% (815 vehicles two way) and increases on the Bicester Road are approximately 22% (200 vehicles two way). Flows are reduced by approximately 87% (-790 vehicles two way) on the B4030 Heyford Road arm and by 8% (-115 vehicles two way) on the B4030 Oxford Road arm.

In the PM peak an impact of approximately 3% (60 vehicles) is predicted without the proposed highway mitigation and this increases to approximately 8% (160 vehicles) when the proposed mitigation measures are introduced under the DS1 scenario. When the arms are assessed individually it is predicted that there will be some significant re-assignment of flow with the bus gate operational and the Heyford Road arm closed to through traffic. In the PM peak traffic on the B430 Ardley Road increases by approximately 90% (930 vehicles two way respectively). Flows on the B4030 Bicester Road arm are predicted to increase by approximately 12% (125 vehicles two way). Flows on the B430 Oxford Road arm are predicted to increase by approximately 5% (50 vehicles two way). Finally flows are reduced by approximately 90% (-780 vehicles two way) on the B4030 Heyford Road arm.

It should be noted that the assessment of flows at the junction has been based on data taken directly from the Bicester SATURN model. This presents a robust assessment of the development impact in this location and doesn't take into account the potential benefits of Travel Plan measures aimed at reducing car borne movement to and from the development as considered in Technical Note 024 Rev D (TN024D) which formed Appendix E of the submitted TA Addendum (Stantec, March 2020). Analysis of the flows set out within TN024D note demonstrates that in the DS1 scenario during the AM peak flows at the junction are predicted to be approximately 5% lower than set out in Table 4. It is considered that if the analysis of the AM peak flows as set out in TN024D were to be replicated in the PM peak predicted flow reductions at this junction in this peak would be similar.

Notwithstanding the above, this assessment demonstrates that there are noticeable changes in movements arising on individual arms at the junction with the introduction of the proposed bus gate on the western arm causing the re-routing of development and background traffic in the wider network. However, the overall changes in total movements through the junction between the RC without development and DN and DS1 (with development and with development and mitigation) scenarios are relatively small representing a change of up to 2 additional movements (two-way) per minute in the PM peak.

Significant measures are proposed by the development that will benefit people living in Middleton Stoney including:

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- Implementation of Highway upgrades to the existing junction layout to increase capacity as part of the consented development at Heyford)
- The introduction of a bus gate on the western arm of the junction which will help to increase overall junction operation in the village
- an increased frequency bus service (to 15 minutes), between Heyford and Bicester via Middleton Stoney
- the introduction of an off road cycle route between Middleton Stoney and Bicester
- the introduction of an on road cycle route along quiet roads between Middleton Stoney and the Heyford Park development
- An HGV restriction on the B4030 Bicester Road.

Given the extent of mitigation measures proposed in Middleton Stoney it is not considered that further mitigation measures will be required in this location.

Kirtlington

Flows on the A4095 south of the A4095 / Portway junction have been used to assess the development impact in Kirtlington.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 12% (95 vehicles two way) with development but no highway mitigation in the AM peak hour. This impact is reduced to approximately 0% (2 vehicles two way) when the full package of mitigation measures is introduced under the DS1 scenario.

In the PM peak an impact of approximately 10% (75 vehicles two-way) is predicted with development but no highway mitigation and this reduces to approximately 7% (55 vehicles two way) when the proposed mitigation measures are introduced under the DS1 scenario.

The impacts of development with proposed mitigation measures in place result in additional traffic movements of less than 1 vehicle per minute (two-way). The impacts of the development are considered negligible and therefore further mitigation measures are not considered to be required in this location.

Lower Heyford

Flows at the B4030 / Station Road / Freehold Street junction have been used to assess the development impact in Lower Heyford.

The modelling undertaken predicts that traffic flows on this link are likely to decrease by approximately 3% (-17 vehicles two way) with development but no highway mitigation in the AM peak hour. The reduction in traffic is further improved when the highway mitigation is added and a decrease of approximately 21% (-135 vehicles two way) is predicted in the DS1 scenario.

In the PM peak an impact of approximately 2% (16 vehicles two-way) is predicted with development but no highway mitigation and this is reduced when highway mitigation is added to predict a decrease of approximately 33% (-230 vehicles two way) in the DS1 scenario.

The traffic at the B4030 / Station Road / Freehold Street junction is reduced in the AM peak and the impact is low in the PM peak in the DN scenario (with development and no mitigation). Analysis of traffic movements show that development traffic is using this route in the model and that the reductions are attributed to a re-assignment of background traffic, not associated with the development, to an alternative route. This can be brought about due to delay increasing at some point in the network (for example at Middleton Stoney) and traffic is therefore re-allocating to an alternative quicker route through the network. It could also be as a result of re distribution of traffic for example trips that were previously travelling from west of Lower Heyford to Bicester for work may have moved to start their journey at the development and travel to Bicester and are therefore do not use this route in the Do Nothing scenario.

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In the DS1 scenario the reductions in traffic at the B4030 / Station Road / Freehold Street junction are more pronounced as a consequence of the proposed highway mitigation package (most notably the introduction of the bus gate on the B4030 which effectively closes this road as a through route) which is predicted to reduce background traffic on the B4030 through Lower Heyford significantly.

On the basis that the proposed package of mitigation is providing benefit in Lower Heyford and brings about a reduction in traffic it is not considered that further mitigation measures are required in this location.

The Bartons

Flows on the B4030 west of the A4260 / B4030 (Hopcrofts Holt) junction have been used to assess the development impact on The Bartons.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 2% (8 vehicles two way) with development but no highway mitigation in the AM peak hour. The impact is reduced when highway mitigation is added and a reduction of approximately 4% (-14 vehicles two way) is predicted in the DS1 scenario.

In the PM peak an impact of approximately 11% (32 vehicles two-way) is predicted with development but no highway mitigation. When highway mitigation is added a reduction of approximately 11% (-30 vehicles two way) is predicted in the DS1 scenario.

As the development and its associated highway mitigation package is predicted to reduce traffic through The Bartons due to the bus gate on the B4030 Heyford Road effectively closing this east / west corridor to through traffic it is not considered that further mitigation measures are required in this location.

North Aston and Somerton

Flows on Somerton Road east of the A4260 Somerton Road junction have been used to assess the development impact on North Aston and Somerton.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 37% (83 vehicles two way) with development but no highway mitigation in the AM peak hour. This impact is increased to approximately 59% (130 vehicles two way) when the full package of mitigation measures is introduced in the DS1 scenario.

In the PM peak an impact of approximately 55% (110 vehicles two-way) is predicted with development but no highway mitigation and this is increased to approximately 112% (230 vehicles two way) when the proposed mitigation measures are introduced in the DS1 scenario.

The proportional (%) impact of the development and its associated mitigation package is relatively large in these locations, with the proposed bus gate in the DS1 scenario causing a re-assignment of traffic onto the main highway route through the villages. Whilst it is not considered that the quantity of traffic predicted (approximately an additional 4 cars two-way per minute in the PM peak) would have a material impact on the operation of the highway in these locations, it is considered that this increase may have an impact on the amenity of residents in North Aston and Somerton. On this basis it is considered that a contribution towards the provision of traffic management measures in North Aston and Somerton should be provided. The mitigation proposed in these locations should be focused on discouraging through traffic from using this route.

It is also noted that there will be additional impact on the A4260 / Somerton Road / North Aston Road junction as a result of the proposed mitigation package. The impact at the junction is set out within **Table 4**.

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Table 4: Development impact at A4260 / Somerton Road / North Aston Road Junction

	2031 RC	2031 DN	2031 DN Impact	2031 DN Impact %	2031 DS1	2031 DS1 Impact compared to RC	2031 DS1 Impact compared to RC %
AM Peak	1752	1838	86	4.9%	2023	272	15.5%
PM Peak	1779	1884	105	5.9%	1920	141	7.9%

The modelling undertaken predicts that traffic flows at this junction are likely to increase by approximately 5% (85 vehicles) with development but no highway mitigation in the AM peak hour. This impact is increased to approximately 15% (270 vehicles) when the full package of mitigation measures is introduced in the DS1 scenario.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 6% (105 vehicles) with development but no highway mitigation in the PM peak hour. This impact is increased to approximately 8% (140 vehicles) when the full package of mitigation measures is introduced in the DS1 scenario.

In the original TA The junction was predicted to operate well within capacity (RFC of 0.36 in the AM peak and 0.23 in the PM peak in the 2031 test case scenario) and therefore it is not considered that the impacts predicted in **Table 6** would have a significant impact on the operation of the junction.

Upper Heyford

Flows at the Camp Road / Somerton Station Road junction and flows on the Somerton Road north arm of the Camp Road / Somerton Road / Station Road junction have been used to assess the impact of development on Upper Heyford.

The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 20% (85 vehicles at the junction, 55 vehicles two way on the arm) in the AM peak hour with development but with no highway mitigation and this increases to approximately 50% (210 vehicles at the junction, 165 vehicles two way on the arm) when highway mitigation is included under the DS1 scenario.

In the PM peak an impact of approximately 15% (85 vehicles at the junction, 45 vehicles two way on the arm) is predicted with development but no highway mitigation but this reduces to between approximately 0% - 12% (55 vehicles at the junction, -2 vehicles two way on the arm) when the proposed mitigation measures are introduced under the DS1 scenario.

Whilst it is not considered that the quantity of extra traffic predicted (approximately 3.5 cars per minute in the AM peak) would have a material impact on the operation of the highway in this location, it is considered that this increase may have an environmental amenity impact on residents in Upper Heyford. On this basis it is considered that a contribution towards the provision of mitigation such as traffic management measures in this location should be provided and this was secured as part of the S106 agreement for planning application 16/02446/F that formed part of the current Local Plan allocation at Heyford Park.

Caulcott

Flows on the B4030 east arm of the B4030 / Portway junction have been used to assess the development impact in Caulcott.

The modelling undertaken predicts that traffic flows on this link are likely to decrease by approximately 20% (-90 vehicles two way) with development but no highway mitigation in the AM

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	<p>peak hour. The impact is further reduced when highway mitigation is included with a reduction of approximately 90% (-415 vehicles two way) predicted in the DS1 scenario.</p> <p>In the PM peak a reduction of approximately 10% (-55 vehicles two-way) is predicted with development but no highway mitigation. The impact is reduced further when mitigation is added with a reduction of approximately 90% (-495 vehicles two way) predicted in the DS1 scenario.</p> <p>As the development and its associated highway mitigation package (most notably the introduction of the bus gate on the B4030 which effectively closes this road as a through route) is predicted to reduce traffic on the B4030 through Caulcott it is not considered that further mitigation measures are required in this location.</p> <p><u>Chesterton</u></p> <p>Flows on the A4095 east of the A4095 / B430 junction have been used to assess the development impact in Chesterton.</p> <p>The modelling undertaken predicts that traffic flows on this link are likely to increase by approximately 43% (200 vehicles two way) with development but no highway mitigation in the AM peak hour. This impact is reduced to approximately 23% (105 vehicles two way) when the full package of mitigation measures is introduced in the DS1 scenario.</p> <p>In the PM peak an impact of approximately 11% (60 vehicles two-way) is predicted with development but no highway mitigation and this increases slightly to approximately 20% (105 vehicles two way) when the proposed mitigation measures are introduced in the DS 1 scenario.</p> <p>The modelling has predicted that in the AM peak hour, the highway mitigation measures associated with the development are having a significant impact on reducing development related traffic on the A4095 through Chesterton. It is not considered that the quantity of extra traffic predicted (approximately 1.75 vehicles per minute) is within acceptable levels given the A class status of the road and would not have a material impact on the operation of the highway in this location. On this basis it is not considered that mitigation measures are required in this location.</p>
<p>5.</p>	<p>Recommendations and Conclusions</p> <p>This Technical Note has set out an assessment of the impact of Heyford Park and its associated highway mitigation measures on the local villages utilising data from the OCC Bicester SATURN Model. The following modelled scenarios have been assessed:</p> <ul style="list-style-type: none"> - 2031 Reference Case (RC): This scenario includes background growth and infrastructure improvements to 2031 but excludes the Heyford Park development allocation and associated mitigation. - 2031 Do Nothing (DN): This scenario is as the reference case scenario but includes the Heyford Park development allocation. There is no mitigation associated with the Heyford Park allocation included in this scenario - 2031 Do Something 1 (DS1): This scenario is as the Do Nothing scenario but includes the proposed highway mitigation associated with the Heyford Park development including the proposed two-way bus gate at Middleton Stoney. <p>On the basis of the assessment undertaken it is recommended that developer contributions towards village based mitigation measures should be provided in the following locations:</p> <ul style="list-style-type: none"> - Fritwell - Ardley - North Aston - Somerton - Upper Heyford

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	It is considered that the mitigation provided should be focused on traffic management with the aim of managing volumes and speed to reduce potential severance effects and improve general safety and amenity in these locations
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DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
39304/TN035	-	23.06.20	PR	-	-	MW
39304/TN035	A	25.06.20	PR	-	-	MW
39304/TN035	B	29.06.20	PR	-	-	MW
39304/TN035	C	29.06.20	PR	-	-	MW

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APPENDIX A

TN035 Appendix A: Calibration / Validation Acceptability Criteria

Criteria	Description of Criteria
1	Individual flows within 100 v/h of counts for flows of less than 700 v/h
	Individual flows within 15% of counts for flows of between 700 v/h and 2,700 v/h
	Individual flows within 400 v/h of counts for flows of more than 2,700 v/h
2	GEH less than 5 for individual flows

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APPENDIX B

TN035 Appendix B: Summary of Model Validation

Village	Link / Junction Assessed	AM Peak			PM Peak		
		Flow Diff (<700 v/h)	% Flow Diff (Flow of 700 - 2700 v/h)	GEH	Flow Diff (<700 v/h)	% Flow Diff (Flow of 700 - 2700 v/h)	GEH
Fritwell	Ardley Rd west of B430 / Ardley Rd junction	Data not available for validation assessment					
Ardley	B430 south of M40, J10		5.3%	1.66		2.2%	0.62
	B430 north of B430 / Unnamed Rd junction		-20.7%	7.04		-15.2%	4.38
Bucknell	Ardley Rd east of B430 / Ardley Rd junction	Data not available for validation assessment					
Middleton Stoney	Ardley Rd north of B430 / B4030 junction		-9.04%	2.58	-129		5.47
	Bicester Rd east of B430 / B4030 junction	-72		2.92	-8		0.34
	Oxford Rd south of B430 / B4030 junction		-11.6%	3.28	-125		5.07
	Heyford Rd west of B430 / B4030 junction	-93		5.54	-109		5.06
	B430 / B4030 Junction		-8.8%	3.30		-10.5%	3.74
Kirtlington	A4095 south of A4095 / Portway junction	34		1.73	1		0.05
Lower Heyford	B4030 / Station Rd / Freehold St junction	-202		8.79	-64		2.96
The Bartons	B4030 west of A4260 / B4030 junction	-55		3.00	-15		0.96
North Aston	Somerton Rd east of A4260 / Somerton Rd junction	18		1.54	37		3.28
Somerton	Somerton Rd east of A4260 / Somerton Rd junction	18		1.54	37		3.28
	Somerton Rd north of Camp Rd / Station Rd / Somerton Rd junction	-4		0.33	-8		0.56
Upper Heyford	Camp Rd / Station Rd / Somerton Rd junction	-33		2.06	-26		1.52
	Somerton Rd north of Camp Rd / Station Rd / Somerton Rd junction	-4		0.33	-8		0.56
Caulcott	B4030 east of B4030 / Portway junction	-86		5.14	-44		2.66
Chesterton	A4095 east of A4095 / B430 junction	-33		2.31	-67		4.28

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APPENDIX C

TN035: APPENDIX A - REVIEW OF MODEL VALIDATION

LINK / JUNCTION	DATA SOURCE	TURN REFERENCE	TO	FROM	AM					PM				
					OBSERVED	MODELLED	DIFFERENCE	% DIFFERENCE	GEH	OBSERVED	MODELLED	DIFFERENCE	% DIFFERENCE	GEH
B430 S OF M40, J10 (J2c)	TURN VALIDATION	301	A43 East	B430	536	646	110	20.5%	4.52	271	315	44	16.2%	2.57
		303	M40 NB Off Slip	B430	34	4	-30	-88.2%	6.88	28	8	-20	-71.4%	4.71
		304	B430	A43 East	226	174	-52	-23.0%	3.68	373	271	-102	-27.3%	5.68
		305	B430	M40 NB On Slip	231	257	26	11.3%	1.66	160	256	96	60.0%	6.66
		B430 S ARM				1027	1081	54	5.3%	1.66	832	850	18	2.2%
B430 N OF ARM J5	TURN CALIBRATION	337	B430 North	B430 South	576	461	-115	-20.0%	5.05	190	163	-27	-14.2%	2.03
		338	B430 North	Unclassified	154	121	-33	-21.4%	2.81	69	61	-8	-11.6%	0.99
		339	B430 South	B430 North	227	182	-45	-19.8%	3.15	389	327	-62	-15.9%	3.28
		341	Unclassified	B430 North	84	62	-22	-26.2%	2.57	113	94	-19	-16.8%	1.87
		B430 N ARM				1041	826	-215	-20.7%	7.04	761	645	-116	-15.2%
MIDDLETON STONEY (J6)	TURN CALIBRATION	343	Ardley Road	Bicester Road	43	11	-32	-74.4%	6.16	27	10	-17	-63.0%	3.95
		344	Ardley Road	Oxford Road	429	439	10	2.3%	0.48	163	145	-18	-11.0%	1.45
		345	Ardley Road	Heyford Road	8	12	4	50.0%	1.26	11	9	-2	-18.2%	0.63
		346	Bicester Road	Ardley Road	48	42	-6	-12.5%	0.89	28	26	-2	-7.1%	0.38
		347	Bicester Road	Oxford Road	53	24	-29	-54.7%	4.67	19	13	-6	-31.6%	1.50
		348	Bicester Road	Heyford Road	235	235	0	0.0%	0.00	244	257	13	5.3%	0.82
		349	Oxford Road	Ardley Road	172	126	-46	-26.7%	3.77	387	298	-89	-23.0%	4.81
		350	Oxford Road	Bicester Road	19	14	-5	-26.3%	1.23	40	36	-4	-10.0%	0.65
		351	Oxford Road	Heyford Road	7	11	4	57.1%	1.33	7	15	8	114.3%	2.41
		352	Heyford Road	Ardley Road	9	12	3	33.3%	0.93	5	4	-1	-20.0%	0.47
	353	Heyford Road	Bicester Road	247	247	0	0.0%	0.00	212	220	8	3.8%	0.54	
	354	Heyford Road	Oxford Road	69	48	-21	-30.4%	2.75	55	39	-16	-29.1%	2.33	
	ARDLEY ROAD ARM				709	642	-67	-9.4%	2.58	621	492	-129	-20.8%	5.47
	BICESTER ROAD ARM				645	573	-72	-11.2%	2.92	570	562	-8	-1.4%	0.34
OXFORD ROAD ARM				749	662	-87	-11.6%	3.28	671	546	-125	-18.6%	5.07	
HEYFORD ROAD ARM				328	235	-93	-28.4%	5.54	519	410	-109	-21.0%	5.06	
TOTAL JUNCTION				1339	1221	-118	-8.8%	3.30	1198	1072	-126	-10.5%	3.74	
PORTWAY S (J19)	TURN CALIBRATION	474	Port Way	A4095 South	62	57	-5	-8.1%	0.65	48	43	-5	-10.4%	0.74
		476	A4095 East	A4095 South	155	191	36	23.2%	2.74	142	147	5	3.5%	0.42
		477	A4095 South	Port Way	58	48	-10	-17.2%	1.37	91	83	-8	-8.8%	0.86
		478	A4095 South	A4095 East	94	107	13	13.8%	1.30	177	186	9	5.1%	0.67
		PORTWAY S ARM				369	403	34	9.2%	1.73	458	459	1	0.2%
B4030 / STATION RD / FREEHOLD ST (J13)	TURN CALIBRATION	413	Station Road	B4030 East	30	27	-3	-10.0%	0.56	6	9	3	50.0%	1.10
		414	Station Road	B4030 South	125	45	-80	-64.0%	8.68	86	62	-24	-27.9%	2.79
		415	Station Road	Freehold Street	5	5	0	0.0%	0.00	3	2	-1	-33.3%	0.63
		416	B4030 East	Station Road	3	7	4	133.3%	1.79	19	16	-3	-15.8%	0.72
		417	B4030 East	B4030 South	176	126	-50	-28.4%	4.07	157	148	-9	-5.7%	0.73
		418	B4030 East	Freehold Street	9	9	0	0.0%	0.00	15	13	-2	-13.3%	0.53
		419	B4030 South	Station Road	75	46	-29	-38.7%	3.73	89	59	-30	-33.7%	3.49
		420	B4030 South	B4030 East	175	137	-38	-21.7%	3.04	116	114	-2	-1.7%	0.19
		421	B4030 South	Freehold Street	2	1	-1	-50.0%	0.82	3	5	2	66.7%	1.00
		422	Freehold Street	Station Road	10	8	-2	-20.0%	0.67	6	5	-1	-16.7%	0.43
		423	Freehold Street	B4030 East	14	14	0	0.0%	0.00	1	2	1	100.0%	0.82
424	Freehold Street	B4030 South	5	2	-3	-60.0%	1.60	0	2	2	#DIV/0!	2.00		
TOTAL JUNCTION				629	427	-202	-32.1%	8.79	501	437	-64	-12.8%	2.96	
B4030 WEST ARM (J15)	TURN CALIBRATION	439	A4260 Oxford Road	B4030 West	25	27	2	8.0%	0.39	27	22	-5	-18.5%	1.01
		442	B4030 East	B4030 West	109	92	-17	-15.6%	1.70	92	77	-15	-16.3%	1.63
		445	A4260 Banbury Road	B4030 West	12	1	-11	-91.7%	4.31	7	16	9	128.6%	2.65
		446	B4030 West	A4260 Oxford Road	20	16	-4	-20.0%	0.94	24	24	0	0.0%	0.00
		447	B4030 West	B4030 East	120	113	-7	-5.8%	0.65	84	81	-3	-3.6%	0.33
		448	B4030 West	A4260 Banbury Road	77	59	-18	-23.4%	2.18	19	18	-1	-5.3%	0.23
B4030 W ARM				363	308	-55	-15.2%	3.00	253	238	-15	-5.9%	0.96	
SOMERTON RD ARM OF J14	TURN CALIBRATION	425	A4260 Oxford Road North	Somerton Road	17	29	12	70.6%	2.50	29	32	3	10.3%	0.54
		428	Somerton Road	A4260 Oxford Road North	28	20	-8	-28.6%	1.63	46	42	-4	-8.7%	0.60
		429	Somerton Road	A4260 Oxford Road South	24	23	-1	-4.2%	0.21	8	19	11	137.5%	2.99
		430	Somerton Road	N Aston Road	26	21	-5	-19.2%	1.03	9	22	13	144.4%	3.30
		432	A4260 Oxford Road South	Somerton Road	20	23	3	15.0%	0.65	5	16	11	220.0%	3.39
		435	N Aston Road	Somerton Road	13	30	17	130.8%	3.67	12	15	3	25.0%	0.82
SOMERTON ROAD ARM				128	146	18	14.1%	1.54	109	146	37	33.9%	3.28	
CAMP ROAD / SOMERTON ROAD (J11)	TURN CALIBRATION	395	Somerton Road	Camp Road	68	70	2	2.9%	0.24	34	46	12	35.3%	1.90
		396	Somerton Road	Station Road	45	33	-12	-26.7%	1.92	28	24	-4	-14.3%	0.78
		397	Camp Road	Somerton Road	26	31	5	19.2%	0.94	79	78	-1	-1.3%	0.11
		398	Camp Road	Station Road	60	45	-15	-25.0%	2.07	66	50	-16	-24.2%	2.10
		399	Station Road	Somerton Road	14	15	1	7.1%	0.26	70	55	-15	-21.4%	1.90
		400	Station Road	Camp Road	60	46	-14	-23.3%	1.92	27	25	-2	-7.4%	0.39
TOTAL JUNCTION				273	240	-33	-12.1%	2.06	304	278	-26	-8.6%	1.52	
SOMERTON ROAD NORTH ARM OF (J11)	TURN CALIBRATION	395	Somerton Road	Camp Road	68	70	2	2.9%	0.24	34	46	12	35.3%	1.90
		396	Somerton Road	Station Road	45	33	-12	-26.7%	1.92	28	24	-4	-14.3%	0.78
		397	Camp Road	Somerton Road	26	31	5	19.2%	0.94	79	78	-1	-1.3%	0.11
		399	Station Road	Somerton Road	14	15	1	7.1%	0.26	70	55	-15	-21.4%	1.90
		SOMERTON ROAD ARM				153	149	-4	-2.6%	0.33	211	203	-8	-3.8%
B4030 EAST ARM OF (J12)	TURN VALIDATION	401	Port Way North	B4030 East	3	0	-3	-100.0%	2.45	3	1	-2	-66.7%	1.41
		404	B4030 East	Port Way North	2	1	-1	-50.0%	0.82	2	0	-2	-100.0%	2.00
		405	B4030 East	Port Way South	0	0	0	#DIV/0!	#DIV/0!	6	0	-6	-100.0%	3.46
		406	B4030 East	B4030 West	158	118	-40	-25.3%	3.41	165	144	-21	-12.7%	1.69
		408	Port Way South	B4030 East	4	0	-4	-100.0%	2.83	5	0	-5	-100.0%	3.16
		411	B4030 West	B4030 East	156	118	-38	-24.4%	3.25	114	106	-8	-7.0%	0.76
B4030 E ARM				323	237	-86	-26.6%	5.14	295	251	-44	-14.9%	2.66	
A4095 EAST ARM OF (J7)	TURN CALIBRATION	355	Oxford Road	A4095 East	3	0	-3	-100.0%	2.45	5	0	-5	-100.0%	3.16
		358	A4095 East	Oxford Road	3	3	0	0.0%	0.00	4	0	-4	-100.0%	2.83
		359	A4095 East	Northampton Road	37	12	-25	-67.6%	5.05	17	13	-4	-23.5%	1.03
		360	A4095 East	A4095 West	115	117	2	1.7%	0.19	103	101	-2	-1.9%	0.20
		362	Northampton Road	A4095 East	6	1	-5	-83.3%	2.67	37	8	-29	-78.4%	6.11
		365	A4095 West	A4095 East	56	54	-2	-3.6%	0.27	113	90	-23	-20.4%	2.28
A4095 E ARM				220	187	-33	-15.0%	2.31	279	212	-67	-24.0%	4.28	