



# Environmental Statement Addendum

Himley Village, Bicester

October 2016

**Waterman Infrastructure & Environment Limited**

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# Environmental Statement Addendum

## Himley Village, Bicester

**Client Name:** Property Portfolio Partners Ltd  
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### Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

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Issue	Date	Prepared by	Checked by	Approved by
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#### Our Markets



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## Non-Technical Summary of the ES Addendum

### Introduction

In December 2014, Property Portfolio Partners Ltd (the Applicant) submitted an outline application for a residential led development on land bound by Middleton Stoney Road to the south, and agricultural land to the north, east and west. The development is known as Himley Village and is hereafter referred to as Himley Village or the Development. Himley Village forms part of the North West Bicester EcoTown.

The outline application (Planning Application Reference: 14/02121/OUT) was accompanied by an Environmental Statement (hereafter referred to as the 2014 ES) which set out the likely environmental effects of the Himley Village Development.

Following submission of the planning application and discussions with Cherwell District Council (CDC), changes were made to a number of the scheme plans for the Himley Village Development. These were submitted in September 2015 and were accompanied by an Environmental Statement Addendum (hereafter referred to as the 2015 ES Addendum) which considered whether the changes were likely to affect the findings of the 2014 ES. Where the potential for the significance of effects to change was identified, further environmental assessment work was undertaken, the findings of which were reported in the 2015 ES Addendum.

Since submission of the application, Oxfordshire County Council have maintained concerns regarding the ability of the highways network to accommodate additional traffic from developments within North West Bicester EcoTown (including Himley Village) prior to construction of the proposed North West Bicester Link Road. As a result, an 'Interim Scenario' for 2024 has been modelled by Alan Baxter Associates using traffic modelling software to consider whether the highways network is able to accommodate the base flows (2024 Reference case) plus 1,700 dwellings and other non-residential uses at Himley Village, 507 homes plus other non-residential uses forming part of Application 1 of North West Bicester and approximately 26,000 square metres of employment space at the Albion / Bonner Land in North West Bicester. A third scenario, the '2024 Reference Case Plus Himley Village' has also been considered, which is the 2024 Reference Case with the addition of traffic flows from 1,700 dwellings and other non-residential uses at Himley Village only.

This ES Addendum describes the significance of the Transport, Noise and Air Quality effects of the 2024 scenarios. No other technical chapters of the 2014 ES (as amended by the 2015 ES Addendum) are considered to be affected by the 2024 Interim Scenario. In addition, the 2031 Completed Development Scenario remains unchanged from that reported in the 2014 ES and has therefore not been considered within this ES Addendum except for comparative purposes.

This ES Addendum should be read in conjunction with 2014 ES and 2015 ES Addendum. All of these documents are available for viewing at Cherwell District Council (CDC) Development Department in Banbury during normal office hours, or on line via the Public Access service, which can be accessed from the Cherwell District Council website.

### Transport

Under the 2024 Interim Scenario, traffic flows on the road network near to the Site are different from that of the completed Development. However, whilst the roads are affected in different ways, the overall magnitude of the effects remains similar in the 2024 Interim Scenario and Completed Development Scenario, once mitigation is taken into consideration. The likely residual effects of the 2024 Interim

Scenario range from **minor adverse to minor beneficial**. On a small number of road links, the effect has worsened to minor adverse in the 2024 Interim Scenario compared to a negligible effect for the completed Development Scenario. This is as a result of temporarily increased traffic flows on the existing highway network, before the completion of the NW Bicester link road.

No changes have been made to the Completed Development Scenario and therefore these effects remain as set out in the 2014 ES.

## Noise

The change in road traffic noise levels for the 2024 Interim Scenario, as a result of the proposed Development is predicted to be comparable to those predicted for the completed Development. Mitigation is not proposed as, although several road links are predicted to experience an increase in noise of **minor adverse** significance, this is likely to be imperceptible. There is the potential for one road link to experience an increase in noise of +3.2dB which is an **adverse effect** of **moderate** significance, but this is only just above the threshold of perceptibility for a gradual change in environmental noise and mitigation is not considered necessary.

## Air Quality

The change in road traffic noise levels for the 2024 Interim Scenario, as a result of the proposed Development is predicted to be comparable to those predicted for the completed Development. Mitigation is not proposed as, although several road links are predicted to experience a small increase in pollutant levels, these are predicted to remain well below Air Quality Standard Objective Levels. It is considered that overall the air quality effect of the Development is insignificant, in line with that reported in the 2014 ES.

## Availability of Documents

This Environmental Statement Addendum including the Non-Technical Summary are available for viewing during normal office hours at Cherwell District Council's offices in Banbury. Comments on the planning application should be forwarded to the following address:

Development Department  
Cherwell District Council  
Bodicote House  
Bodicote  
Banbury  
OX15 4AA

If you would like to receive further copies of this Addendum including Non-Technical Summary, please contact:

Waterman Infrastructure & Environment Limited  
South Central  
Peter Street  
Manchester  
M2 5QR  
email: [ie@watermangroup.com](mailto:ie@watermangroup.com)

## 1. Introduction

- 1.1. In December 2014, Property Portfolio Partners Ltd (the Applicant) submitted an outline application, with all matters reserved, for a residential led development on land bound by Middleton Stoney Road to the south, and agricultural land to the north, east and west (Planning Application Reference: 14/02121/OUT). The application, known as Himley Village forms part of the North West Bicester EcoTown and comprises:

*"Development to provide up to 1,700 residential dwellings (Class C3), a retirement village (Class C2), flexible commercial floorspace (Classes A1, A2, A3, A4, A5, B1 and C1), social and community facilities (Class D1), land to accommodate one energy centre and land to accommodate one new primary school (up to 2FE) (Class D1). Such development to include provision of strategic landscape, provision of new vehicular, cycle and pedestrian access routes, infrastructure and other operations (including demolition of farm buildings on Middleton Stoney Road)".*

- 1.2. A plan showing the location of the Himley Village Site (the Site) is presented as Figure 1.1 and application boundary is shown on Figure 1.2.
- 1.3. An Environmental Impact Assessment (EIA) of the Himley Village Development was co-ordinated by Waterman Energy, Environment & Design Ltd (now Waterman Infrastructure & Environment Ltd) and an Environmental Statement (ES) was prepared to accompany the outline application. This is hereafter referred to as the 2014 ES.
- 1.4. Following submission of the planning application and discussions with Cherwell District Council (CDC), changes were made to the Landscape, Land Use, Height, Density and Outline Sustainable Drainage System Parameter Plans for the Himley Village Development. In addition, a number of comments relevant to the EIA were made by consultees during the determination period. The revised plans were submitted in September 2015 and were accompanied by an Environmental Statement Addendum (hereafter referred to as the 2015 ES Addendum) which considered whether the changes were likely to affect the findings of the 2014 ES and addressed the comments relevant to the EIA. Where the potential for the significance of effects to change was identified, further environmental assessment work was undertaken, the findings of which were reported in the 2015 ES Addendum. The 2015 ES Addendum did not consider Transport, Noise and Air Quality (to which this ES Addendum relates) and is therefore not directly relevant to this ES Addendum.
- 1.5. Since submission of the outline application, Oxfordshire County Council (OCC) have maintained concerns regarding the ability of the highways network to accommodate additional traffic from developments within North West Bicester EcoTown (including Himley Village) prior to construction of the proposed North West Bicester Link Road. As a result, a number of scenarios for 2024 have been modelled by Alan Baxter Limited to consider whether the highways network is able to accommodate the base flows (a 2024 Reference Case), the 2024 Reference Case plus 1,700 dwellings and other non-residential uses at Himley Village (referred to as the 2024 Reference Case Plus Himley Village) and a cumulative interim scenario for 2024 comprising of the 2024 Reference Case Plus Himley Village Development, 507 homes plus other non-residential uses forming part of Application 1 of North West Bicester and approximately 26,000 square metres of employment space at the Albion / Bonner Land in North West Bicester (referred to as the 2024 Interim Scenario). It should be noted that the 2024 scenarios represent only a temporary condition until the Development at NW Bicester (including the Strategic Link Road) are completed in full.
- 1.6. No other changes have been made to the Himley Village Development since submission of the revised parameter plans in September 2015.



## The Scope of this ES Addendum

- 1.7. In accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011<sup>1</sup> (hereafter referred to as the 'EIA Regulations') as amended, this Environmental Statement Addendum reports the findings of the Transport, Noise and Air Quality assessments of the 2024 scenarios. These assessments have been undertaken as it has been identified that the potential transport, noise and air quality impacts of these temporary scenarios could be significant and of a different magnitude to those of the 2031 'Completed Development Scenario' as set out in the 2014 ES. This is because the link road will not have been constructed by this date, and therefore the traffic flows on some of the local road network will be higher than in the Completed Development Scenario.
- 1.8. Only Transport, Noise and Air Quality Assessments of the 2024 scenarios have been undertaken as it is considered that the findings of the other technical assessments presented in the 2014 ES, as amended by the 2015 ES Addendum, would not be significantly changed as a result of the 2024 scenarios.
- 1.9. With regard to cumulative effects, the schemes included in the cumulative assessment of the 2014 ES and 2015 ES Addendum have been reviewed, to confirm that they are still relevant. In addition, the list of cumulative schemes was reviewed by CDC to confirm that no additional schemes have come forward that should to be included. CDC confirmed that there were no additional schemes requiring consideration and the schemes included in the 2014 ES and 2015 ES Addendum are considered to remain relevant. Given that there is no change to the schemes assessed, it is considered that the likely significant cumulative effects of the Development, in combination with the other identified schemes will remain as reported in the 2014 ES and 2015 ES Addendum.
- 1.10. The 2024 Interim Scenario includes other schemes that are likely to have come forward by this date, as agreed with OCC and CDC. The 2024 Interim Scenario therefore represents a cumulative scenario at this time and has been assessed as such within this ES Addendum.
- 1.11. Information and impact assessments that remain unchanged from the 2014 ES have not been reproduced within this ES Addendum. The paragraph numbers and table numbers set out in the Sections below do not relate to those of the 2014 ES or 2015 ES Addendum. Each section below provides an addendum to the particular technical chapter of the 2014 ES and does not, unless specifically stated, replace individual elements of each technical chapter.
- 1.12. This ES Addendum should be read in conjunction with 2014 ES and the 2015 ES Addendum which are available for viewing at CDC Planning Department or on line via the Public Access service, which can be accessed from the Cherwell District Council website.

## ES Availability and Comments

- 1.13. Additional copies of this addendum and Non-Technical Summary are available free of charge. Copies of the full ES are available for purchase. For copies of these documents please contact:

Waterman Infrastructure & Environment Limited  
South Central  
11 Peter Street  
Manchester  
M2 5QR

Email: [ie@watermangroup.com](mailto:ie@watermangroup.com)

<sup>1</sup> Town and Country Planning. (2011) *Environmental Impact Assessment: EIA Regulations SI 2011 139*.

- 1.14. Additional copies are also available for viewing by the public during normal office hours in the planning department of CDC. Comments on the application, should be forwarded to CDC at the address below:

Development Department  
Cherwell District Council  
Bodicote House  
Bodicote  
Banbury  
OX15 4AA

## 2. Transport

### Introduction

- 2.1. This Section of the ES Addendum has been prepared by Alan Baxter Ltd and assesses the transportation effects of the 2024 Reference Case Plus Himley Village Scenario and the 2024 Interim Scenario. The assessment has been undertaken as a change with respect to the 2024 Reference Case, the future baseline. The Demolition and Construction and Completed Development Effects remain unchanged from those presented in the 2014 ES.

### Planning Policy & Guidance

- 2.2. With the exception of the adoption of the Cherwell Local Plan and North West Bicester Supplementary Planning Document (SPD), the Planning Policy and Guidance section of the Transport Chapter of the 2014 ES remains unchanged. Only these two documents have therefore been considered by this ES Addendum. Reference should be made to the 2014 ES for other relevant planning policies.

### Cherwell Local Plan

- 2.3. The Cherwell Local Plan<sup>2</sup> was adopted in July 2015, however, there is no significant change from the policies set out in the Cherwell Draft Local Plan (January 2014) referred to in the 2014 ES, with regard to Transport.

### NW Bicester SPD

- 2.4. The North West Bicester SPD<sup>3</sup> draws from the Eco Bicester One Shared Vision which encourages *'walking and cycling as the first choice of travel within the town to improve health, reduce carbon emissions and improve the quality of the environment'*. A number of principles are set out which are aimed at reducing car dependency, prioritising walking and cycling, generating activity and connectivity, highway and transport improvements and bus priority and links. Reference is also made to a target of 50% of trips from NW Bicester being by sustainable mode and the need for a high number of trips to be contained within the town.

### Assessment Methodology and Significance Criteria

- 2.5. Other than for the derivation of the 2024 traffic flows, there have been no changes to the Assessment Methodology or Significance Criteria set out in the Transport Chapter of the 2014 ES. Only those items that relate to the 2024 traffic flows are therefore discussed in this Chapter.

### Assessment Scenarios

#### 2024 Reference Case

- 2.6. In order to assess the impact of the 2024 Reference Case Plus Himley Village Scenario and 2024 Interim Scenario, a 2024 Reference Case was developed by White Young Green using the Bicester Saturn Model (this model was also used for the 2031 Completed Development Scenario). Use of the Bicester Saturn Model was recommended and agreed with OCC and the Highways Agency

<sup>2</sup> Cherwell District Council (2015), 'Cherwell Local Plan 2011 - 2031', Cherwell District Council, Banbury

<sup>3</sup> Cherwell District Council (2016), 'North West Bicester Supplementary Planning Document', Cherwell District Council, Banbury

(HA) as the appropriate tool for assessing the impacts of the Himley Village Development within the submission timescale.

2.7. In order to determine the 2024 Reference Case traffic flows, committed and planned development were considered, as set out below:

- **Bicester Eco Town Exemplar Site** - 393 house/ 3,000sqm employment;
- **Graven Hill** - 1,400 house/ 26 ha of employment land;
- **Kingsmere Phase 1** - 1,462 house development at SW Bicester;
- **Kingsmere Phase 2** - 726 house development at SW Bicester;
- **Bicester Business Park** - 29.5 ha of employment land at, including relocation of Tesco store;
- **South East Bicester** – 1,100 house development;
- **Gavray Drive** - 300 house development;
- **Talisman Road** - 125 house development;
- **Bicester Gateway** - 18 ha of employment land;
- **NE Bicester** - 15 ha of employment land;
- **SE Bicester** - 28.8 ha of employment land.

2.8. In addition, there are various proposals for transport included in the 2024 Reference Case of the traffic model:

- Town centre access improvements (these have already been implemented but were not in the base year model 2012);
- Traffic calming and 30mph speed limit on Middleton Stoney Road east of Vendee Drive;
- Changes at the Pingle Drive junction, A41 / Oxford Road (Esso) junction and along the A41 corridor as part of the mitigation measures from Tesco's move and Bicester Village phase 4;
- Park & ride entrance/exit at the junction of Vendee Drive and the A41;
- A4095/B4100 junction alterations as part of NW Bicester Exemplar Site;
- Alterations to the A41/London Road (Rodney House) junction as part of Graven Hill mitigation;
- M40 Junction 9 Phase 2 improvements;
- M40 Junction 10 Pinch Point Scheme;
- London Road level crossing closed permanently to through traffic at points immediately north and south of the current rail level crossing; and
- Removal of the existing level crossing at Charbridge Lane.

2.9. It has been assumed that all of the above schemes would be built and operational by 2024. Additionally, it has been assumed that no further developments, new highway schemes or changes to public transport services other than those previously committed, or as part of the NW Bicester Masterplan, will be introduced within the area.

#### [2024 Reference Case Plus Himley Village](#)

2.10. The Reference Case Plus Himley Village Scenario includes the same schemes and assumptions as the Reference Case but also includes 1,700 homes plus other non-residential uses at Himley Village only. This has been calculated using outputs from the Saturn Model which identify the proportion of traffic within the 2024 Interim Scenario that is attributable to Himley Village.

### Interim Scenario

2.11. The 2024 Interim Scenario includes the same schemes and assumptions as the 2024 Reference Case, with the additional traffic from the following schemes:

- **Himley Village, North West Bicester** – 1,700 homes plus other non-residential uses;
- **Application 1, North West Bicester** - 507 homes plus other non-residential uses;
- **Albion/Bonner Land, North West Bicester** - 10,079 sq m of B1 and 16,154 sq m of B2 employment space.

### Baseline Conditions

2.12. The 2012 Base Year considered in the 2014 ES has not changed since the Transport Chapter of the 2014 ES was produced and details of the baseline conditions have therefore not been reproduced in this ES Addendum.

### 2024 Reference Case Traffic Flows

2.13. A 2024 Reference Case has been produced by WYG using the Bicester Saturn Model. For the purposes of the ES Addendum this scenario is to be used as the Interim Future Year Baseline against which the Interim (2024) impacts of the Himley Village Development and 2024 Interim Scenario will be assessed.

2.14. It is predicted that there would be a significant increase in traffic flow on the majority of links assessed by 2024 compared to the Base Year of 2012. For a small number of links there is a decrease in flows which reflects a change in vehicle movement patterns across the highway network in and around Bicester. The same effect was evident in the 2014 ES which compared 2031 Reference Case flows to 2012 Base Year flows. Table 2.1 provides the predicted 2024 Reference Case traffic flows, with flows shown for the AM and PM peak hours and over an 18-hour period. The percentage change in flow is shown. The increase in flows is the direct result of planned development in Bicester (detailed in paragraph 2.7 and excluding Himley Village and the majority of the remainder of the NW Bicester EcoTown) and growth in traffic movements on the wider network.

Table 2.1 - 2024 Reference Case Forecast Traffic Flows

Link Ref	Link Description	2024 Reference Case			Percentage Change of Traffic Flow compared to Base Year 2012		
		AM Peak Hour	PM Peak Hour	Flow over 18 hours	AM Peak hour	PM Peak hour	Flow over 18 hours
1	A41 northbound, N of M40 J9	2023	1379	17394	67%	-8%	26%
2	A41 southbound, N of M40 J9	1061	1989	15595	-12%	79%	32%
3	A41 Oxford Rd, S of A41 junction	4405	3867	42295	72%	55%	64%
4	Vendee Drive, W of A41 junction	1627	1491	15942	361%	499%	418%
5	A41, N of Pringle Drive	2088	2252	22190	40%	34%	37%
6	Middleton Stoney Rd, W of Kings End	1026	1132	11034	6%	34%	19%

Link Ref	Link Description	2024 Reference Case			Percentage Change of Traffic Flow compared to Base Year 2012		
		AM Peak Hour	PM Peak Hour	Flow over 18 hours	AM Peak hour	PM Peak hour	Flow over 18 hours
7	Middleton Stoney Rd, W of Howes Lane	707	754	7470	27%	15%	21%
8	Howes Lane, N of Middleton Stoney Rd	1110	1233	11980	80%	77%	78%
9	Howes Lane, E of Shakespeare Drive	1152	1148	11760	54%	35%	44%
10	Lords Lane, E of Bucknell Road	1269	1382	13555	27%	24%	25%
11	Lords Lane, W of Banbury Road	1366	1526	14787	23%	26%	24%
12	Bucknell Road, N of Lords Lane	207	319	2689	-16%	66%	20%
13	Bucknell Road, S of Howes Lane	559	909	7506	4%	9%	7%
14	Banbury Road, N of Lords Lane	1479	1749	16505	32%	47%	40%
15	A4095 E of Banbury Road	1878	2319	21459	0%	23%	11%
16	Banbury Road, S of A4095	727	889	8263	59%	40%	48%
17	Buckingham Road, S of Skimmingdish Lane	847	1204	10487	18%	43%	32%
18	Queens Road, S of Bucknell Road	1925	2294	21572	86%	58%	70%
19	A41 E of A41 Oxford Road	3633	3434	36134	71%	52%	61%
20	A4421 Neumkirchen Way	1439	1357	14296	5%	-18%	-8%
21	A41, E of London Road roundabout	2852	2846	29134	24%	19%	22%
22	A4421, E of Skimmingdish Lane	1760	1964	19041	20%	16%	18%
23	Shakespeare Drive, S of Howes Lane	89	145	1196	-37%	-5%	-20%
24	M40 J10 northbound off slip road	1056	1056	10799	119%	76%	95%
25	Ardley Road (E of B430)	217	623	4295	5%	219%	109%
26	M40 J10 southbound on slip road	1178	926	10758	79%	162%	108%

Link Ref	Link Description	2024 Reference Case			Percentage Change of Traffic Flow compared to Base Year 2012		
		AM Peak Hour	PM Peak Hour	Flow over 18 hours	AM Peak hour	PM Peak hour	Flow over 18 hours
27	B430 M40 over bridge	1411	1510	14935	-35%	-30%	-33%
28	A4095 N of Chesterton	277	252	2705	-54%	-54%	-54%
29	Shakespeare Drive, E of Middleton Stoney Road	996	918	9786	63%	102%	80%
30	The Approach, W of Bucknell Road	374	368	3794	17%	51%	32%
31	A41 East of Pioneer Road	2852	2846	29134	33%	20%	26%
32	Bicester Road, E of A4421 junction	777	799	8058	17%	29%	23%
33	A4421 N of Skimmingdish Lane	1752	1545	16858	34%	36%	35%
34	Fringford Road, N of Caverfield	94	182	1411	27%	63%	48%
35	B4100 Banbury Road, N of Bainton Road	1302	1273	13166	17%	7%	12%
36	Ardley Road, N of Bucknell	217	623	4295	5%	219%	109%
37	Middleton Road, W of Bucknell	69	246	1611	156%	1950%	708%
38	B4030 Middleton Stoney Road, NW of NWB	707	754	7470	27%	15%	21%
39	Green Lane, W of Chesterton	624	556	6033	53%	54%	54%
40	Wendlebury, E of M40	22	71	476	-93%	-66%	-83%
41	M40 northbound (mainline only), S of J9	4016	4293	42484	4%	-1%	1%
42	M40 southbound (mainline only), S of J9	4378	4099	43343	-1%	2%	0%
43	M40 northbound (mainline only), S of J10/N of J9	6093	6895	66408	11%	10%	10%
44	M40 southbound (mainline only), S of J10/N of J9	6507	5759	62716	18%	13%	16%

Link Ref	Link Description	2024 Reference Case			Percentage Change of Traffic Flow compared to Base Year 2012		
		AM Peak Hour	PM Peak Hour	Flow over 18 hours	AM Peak hour	PM Peak hour	Flow over 18 hours
45	M40 northbound (mainline only), N of J10	5234	6051	57700	0%	3%	2%
46	M40 southbound (mainline only), N of J10	5329	4832	51953	10%	-5%	2%

## Potential Effects

### Demolition and Construction

- 2.15. The introduction of the 2024 scenarios does not result in any change to the predicted demolition and construction impacts set out in the 2014 ES. These have therefore not been reproduced in this ES Addendum.

### Completed Development

#### Traffic Generation and Assignment

- 2.16. Table 2.2 shows the total predicted number of trips generated by the 2024 Reference Case plus Himley Village and the 2024 Interim Scenario for each link and compares them to the traffic flows in the 2024 Reference Case. The percentage change on each link in the different time periods is then identified.



Table 2.2 - Himley Village Development and Interim Scenario Flows 2024

Link Ref	Link Description	2024 Reference Case		2024 Plus Himley Village		2024 Interim Scenario		Percentage Change (Himley Village only)		Percentage Change (Interim Scenario)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	A41 northbound, N of M40 J9	2023	1379	38	12	54	15	1.9%	0.8%	2.7%	1.1%
2	A41 southbound, N of M40 J9	1061	1989	4	53	6	68	0.4%	2.7%	0.6%	3.4%
3	A41 Oxford Rd, S of A41 junction	4405	3867	69	94	79	109	1.6%	2.4%	1.8%	2.8%
4	Vendee Drive, W of A41 junction	1627	1491	71	102	100	131	4.4%	6.9%	6.1%	8.8%
5	A41, N of Pingle Drive	2088	2252	44	127	51	148	2.1%	5.7%	2.4%	6.6%
6	Middleton Stoney Rd, W of Kings End	1026	1132	52	85	58	108	5.1%	7.5%	5.7%	9.5%
7	Middleton Stoney Rd, W of Howes Lane	707	754	574	725	736	874	81.2%	96.2%	104.1%	115.9%
8	Howes Lane, N of Middleton Stoney Rd	1110	1233	68	-4	105	-5	6.1%	-0.3%	9.5%	-0.4%
9	Howes Lane, E of Shakespeare Drive	1152	1148	96	70	147	97	8.3%	6.1%	12.8%	8.4%
10	Lords Lane, E of Bucknell Road	1269	1382	92	23	214	51	7.3%	1.6%	16.9%	3.7%
11	Lords Lane, W of Banbury Road	1366	1526	91	22	223	50	6.7%	1.5%	16.3%	3.3%
12	Bucknell Road, N of Lords Lane	207	319	0	-1	-6	-8	-0.2%	-0.2%	-2.9%	-2.5%
13	Bucknell Road, S of Lords Lane	559	909	-32	-57	-75	-128	-5.8%	-6.3%	13.4%	-14.1%
14	Banbury Road, N of Lords Lane	1479	1749	6	11	98	162	0.4%	0.6%	6.6%	9.3%
15	A4095 E of Banbury Road	1878	2319	48	37	103	80	2.6%	1.6%	5.5%	3.4%
16	Banbury Road, S of A4095	727	889	20	34	43	76	2.8%	3.8%	5.9%	8.5%
17	Buckingham Road, S of Skimmingdish Lane	847	1204	0	42	-1	95	-0.1%	3.5%	-0.1%	7.9%
18	Queens Avenue, S of Bucknell Road	1925	2294	-67	-66	-145	-148	-3.5%	-2.9%	-7.5%	-6.5%
19	A41 E of A41 Oxford Road	3633	3434	56	115	64	134	1.5%	3.4%	1.8%	3.9%
20	A4421 Neunkirchen Way	1439	1357	-3	34	-3	40	-0.2%	2.5%	-0.2%	2.9%
21	A41, E of London Road roundabout	2852	2846	-69	-3	-79	-4	-2.4%	-0.1%	-2.8%	-0.1%

Link Ref	Link Description	2024 Reference Case		2024 Plus Himley Village		2024 Interim Scenario		Percentage Change (Himley Village only)		Percentage Change (Interim Scenario)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
22	A4421, E of Skimmingdish Lane	1760	1964	28	28	60	61	1.6%	1.4%	3.4%	3.1%
23	Shakespeare Drive, S of Howes Lane	89	145	-19	-80	-29	-111	21.2%	55.1%	32.6%	-76.6%
24	M40 J10 northbound off slip road	1056	1056	44	-8	62	-10	4.2%	-0.7%	5.9%	-0.9%
25	Ardley Road (E of B430)	217	623	-7	-20	-10	-25	-3.3%	-3.1%	-4.6%	-4.0%
26	M40 J10 southbound on slip road (from A43)	1178	926	-78	0	-110	0	-6.6%	0.0%	-9.3%	0.0%
27	B430 M40 over bridge	1411	1510	-48	62	-67	79	-3.4%	4.1%	-4.7%	5.2%
28	A4095 N of Chesterton	277	252	13	13	19	17	4.9%	5.3%	6.9%	6.7%
29	Shakespeare Drive, E of Middleton Stoney Road	996	918	247	319	313	387	24.8%	34.8%	31.4%	42.2%
30	The Approach, W of Bucknell Road	374	368	108	247	144	263	28.9%	67.2%	38.5%	71.5%
31	A41 East of Pioneer Road	2852	2846	-69	-3	-79	-4	-2.4%	-0.1%	-2.8%	-0.1%
32	Bicester Road, E of A4421 junction	777	799	-5	20	-6	23	-0.7%	2.5%	-0.8%	2.9%
33	A4421 N of Skimmingdish Lane	1752	1545	-16	23	-34	51	-0.9%	1.5%	-1.9%	3.3%
34	Fringford Road, N of Caversfield	94	182	-1	1	-2	2	-1.0%	0.5%	-2.1%	1.1%
35	B4100 Banbury Road, N of Bainton Road	1302	1273	93	195	186	390	7.1%	15.3%	14.3%	30.6%
36	Ardley Road, N of Bucknell	217	623	-1	-15	-10	-225	-0.3%	-2.3%	-4.6%	-36.1%
37	Middleton Road, W of Bucknell	69	246	36	45	42	51	51.7%	18.1%	60.9%	20.7%
38	B4030 Middleton Stoney Road, NW of NWB	707	754	38	92	45	115	5.4%	12.2%	6.4%	15.3%
39	Green Lane, W of Chesterton	624	556	-12	-3	-17	-4	-1.9%	-0.6%	-2.7%	-0.7%
40	Wendlebury Road, E of M40	22	71	2	4	3	5	9.7%	5.5%	13.6%	7.0%
41	M40 northbound (mainline only), S of J9	4016	4293	-30	2	-42	2	-0.7%	0.0%	-1.0%	0.0%

Link Ref	Link Description	2024 Reference Case		2024 Plus Himley Village		2024 Interim Scenario		Percentage Change (Himley Village only)		Percentage Change (Interim Scenario)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
42	M40 southbound (mainline only), S of J9	4378	4099	-46	1	-65	1	-1.1%	0.0%	-1.5%	0.0%
43	M40 northbound (mainline only), S of J10 / N of J9	6093	6895	-137	-5	-193	-6	-2.2%	-0.1%	-3.2%	-0.1%
44	M40 southbound (mainline only), S of J10 / N of J9	6507	5759	-58	-1	-82	-1	-0.9%	0.0%	-1.3%	0.0%
45	M40 northbound (mainline only), N of J10	5234	6051	-185	1	-261	1	-3.5%	0.0%	-5.0%	0.0%
46	M40 southbound (mainline only), N of J10	5329	4832	20	0	28	0	0.4%	0.0%	0.5%	0.0%

2.17. Table 2.2 highlights those links where a 10% or more increase in traffic is forecast compared to the 2024 Reference Case. The impact on the following links has therefore been considered further:

- Middleton Stoney Road, W of Howes Lane;
- Howes Lane, E of Shakespeare Drive;
- Lords Lane, E of Bucknell Road;
- Lords Lane, W of Banbury Road;
- Shakespeare Drive, E of Middleton Stoney Road;
- The Approach, W of Bucknell Road;
- B4100 Banbury Road, N of Bainton Road;
- Middleton Road, W of Bucknell;
- B4030 Middleton Stoney Road, NW of NWB; and
- Wendlebury Road, E of M40.

#### Pedestrian Severance

2.18. Table 2.3 identifies the likely impact of the 2024 Reference Case Plus Himley Village Scenario and the Interim Scenario on pedestrian severance and amenity for each of the relevant links and compares this with the assessment of the 2031 Completed Development Scenario as presented in the 2014 ES. Severance occurs when there is difficulty experienced in crossing a heavily trafficked road. The guidance set out in DMRB Volume 11, Section 3, Part 8 Pedestrians, Cyclists, Equestrians and Community Effects suggests that changes in traffic flow of 30%, 60% and 90% are considered as 'minor', 'moderate' and 'substantial' changes in severance respectively.

Table 2.3: Impact on Level of Pedestrian Severance

Link ref	Link Description	2024 Reference Case Plus Himley Village				2024 Interim Scenario				Effect on Level of Pedestrian Severance					
		Traffic Flows		Percentage Change from 2024 Reference Case		Traffic Flows		Percentage Change from 2024 Reference Case		2031 Assessment (Himley Village only)		2024 Assessment (Himley Village only)		2024 Assessment Interim Scenario	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
7	Middleton Stoney Rd, W of Howes Lane	1281	1479	81.2%	96.2%	1443	1628	104.1%	115.9%	Minor Adverse	Minor Adverse	Moderate Adverse	Substantial Adverse	Substantial Adverse	Substantial Adverse
9	Howes Lane, E of Shakespeare Drive	1248	1218	8.3%	6.1%	1299	1245	12.8%	8.4%	Not assessed	Not assessed	-	-	-	-
10	Lords Lane, E of Bucknell Road	1361	1405	7.3%	1.6%	1483	1433	16.9%	3.7%	Not assessed	Not assessed	-	-	-	-
11	Lords Lane, W of Banbury Road	1388	1548	6.7%	1.5%	1589	1576	16.3%	3.3%	Not assessed	Not assessed	-	-	-	-
29	Shakespeare Drive, E of Middleton Stoney Road	1243	1237	24.8%	34.8%	1309	1305	31.4%	42.2%	-	-	-	Minor Adverse	Minor Adverse	Minor Adverse
30	The Approach, W of Bucknell Road	482	615	28.9%	67.2%	518	631	38.5%	71.5%	-	-	-	Moderate Adverse	Minor Adverse	Moderate Adverse

Link ref	Link Description	2024 Reference Case Plus Himley Village				2024 Interim Scenario				Effect on Level of Pedestrian Severance					
		Traffic Flows		Percentage Change from 2024 Reference Case		Traffic Flows		Percentage Change from 2024 Reference Case		2031 Assessment (Himley Village only)		2024 Assessment (Himley Village only)		2024 Assessment Interim Scenario	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
35	B4100 Banbury Road N of Bainton	1497	1468	7.1%	15.3%	1488	1663	14.3%	30.6%	Not assessed	Not assessed	-	-	-	Minor Adverse
37	Middleton Road, W of Bucknell	105	291	51.7%	18.2%	111	297	60.9%	20.7%	Substantial Adverse	Substantial Adverse	Minor Adverse	-	Moderate Adverse	-
38	B4030 Middleton Stonery Road, NW of NWB	745	846	5.4%	12.2%	752	869	6.4%	15.3%	Not assessed	Not assessed	-	-	-	-
40	Wendlebury Road E of M40	24	75	9.7%	5.5%	25	76	13.6%	7.0%	Not assessed	Not assessed	-	-	-	-

- 2.19. It can be seen that the increased traffic flows resulting from the 2024 Reference Case Plus Himley Village Scenario would be likely to have an effect on pedestrian severance on four of the links. The increased traffic on Middleton Road would be likely to have a **moderate adverse** effect on pedestrian severance at the **local level** during the AM peak and a **substantial adverse** effect at the **local level** on pedestrian severance during the PM peak. The traffic changes are likely to result in a **minor adverse** effect of **local** significance at Shakespeare Drive south of Howes Lane and a **moderate adverse** effect of **local** significance at The Approach, West of Bucknell Road in the AM peak only. Shakespeare Drive and Middleton Road are more sensitive than Middleton Stoney Road with existing residential properties and other land uses such as schools.
- 2.20. During the 2024 Interim Scenario, the increased traffic flows would be likely to have an effect on pedestrian severance at five of the links. The significance of effect is the same as, or slightly higher than that of the 2024 Reference Case Plus Himley Village Scenario comprising of a substantial adverse effect during both the AM and PM peak hours on Middleton Road; a minor adverse effect during both the AM and PM peak hours on Shakespeare Drive; a minor adverse effect during the AM peak at The Approach, W of Bucknell Road and a moderate adverse effect during the PM peak; a minor adverse effect during the PM peak on the B4100 Banbury Road N of Bainton; and a moderate adverse effect during the AM peak on Middleton Road, W of Bucknell.
- 2.21. The effect on pedestrian severance for both the 2024 Reference Case Plus Himley Village Scenario and the 2024 Interim Scenario is of a slightly higher magnitude than that reported in the 2014 ES for the 2031 Completed Development Scenario.

#### Pedestrian Amenity

- 2.22. Table 2.4 sets out each link and identifies where there would be a likely impact on pedestrian amenity based on the predicted increase in traffic flows with the Himley Village Development Flows and during the 2024 Interim Scenario. The pedestrian amenity threshold, as set out in the IEMA Guidelines to assess the significance of change, is where the traffic flow is doubled.

Table 2.4: Effect on Level of Pedestrian Amenity for 2031 and 2024 Interim Scenario

Link ref	Link Description	2024 Reference Case Plus Himley Village				2024 Interim Scenario				Effect on Level of Pedestrian Amenity					
		Traffic Flows		Percentage Change from 2024 Reference Case		Traffic Flows		Percentage Change from 2024 Reference Case		2031 Assessment (Himley Village only)		2024 Assessment (Himley Village Only)		2024 Interim Scenario	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	PM	AM	AM	PM
7	Middleton Stoney Rd, W of Howes Lane	1281	1479	81.2%	96.2%	1443	1628	104.1%	115.9%	-	-	-	-	Minor	Minor
9	Howes Lane, E of Shakespeare Drive	1248	1218	8.3%	6.1%	1299	1245	12.8%	8.4%	Not assessed	Not assessed	-	-	-	-
10	Lords Lane, E of Bucknell Road	1361	1405	7.3%	1.6%	1483	1433	16.9%	3.7%	Not assessed	Not assessed	-	-	-	-
11	Lords Lane, W of Banbury Road	1388	1548	6.7%	1.5%	1589	1576	16.3%	3.3%	Not assessed	Not assessed	-	-	-	-
29	Shakespeare Drive, E of Middleton Stoney Road	1243	1237	24.8%	34.8%	1309	1305	31.4%	42.2%	-	-	-	-	-	-
30	The Approach, W of Bucknell Road	482	615	28.9%	67.2%	518	631	38.5%	71.5%	-	-	-	-	-	-
35	B4100 Banbury Road N of Bainton	1497	1468	7.1%	15.3%	1488	1663	14.3%	30.6%	Not assessed	Not assessed	-	-	-	-
37	Middleton Road, W of Bucknell	105	291	51.7%	18.2%	111	297	60.9%	20.7%	Substantial	Substantial	-	-	-	-
38	B4030 Middleton Stonery Road, NW of NWB	745	846	5.4%	12.2%	752	869	6.4%	15.3%	Not assessed	Not assessed	-	-	-	-
40	Wendlebury Road E of M40	24	75	9.7%	5.5%	25	76	13.6%	7.0%	Not assessed	Not assessed	-	-	-	-

- 2.24. It can be seen that of the links assessed there would be likely to be an adverse effect on pedestrian amenity on Middleton Road. This potential effect is anticipated to be of **minor adverse** significance at the **local level**.

#### Driver Delay

- 2.25. Driver delay is assessed by using link speeds on the basis that where there is a reduction in link speed this gives an indication of increased driver delay.
- 2.26. Link speeds are not available for any of the 2024 scenarios. However, link flows have been reviewed in relation to those for the 2031 Completed Development Scenario in the 2014 ES. As might be expected, for the vast majority of the links, the traffic flows in the 2024 scenarios are less than those for the 2031 Completed Development Scenario. However, there are thirteen links where flows are higher in either or both of the peak hours. Of these, five are on links for the M40 (mainline or slip road) and the change is of such a scale that it is related to a change in the 2024 Reference Case rather than from traffic generated by development at Himley Village, Application 1 or the Albion/Bonner Land. These links have therefore been ignored.
- 2.27. The remaining eight links are as follows:
- Vendee Drive, W of A41 junction;
  - Howes Lane No of Middleton Stoney Road;
  - Howes Lane E of Shakespeare Drive;
  - Lords Lane E of Bucknell Road;
  - Lords Lane W of Banbury Road;
  - A41 E of London Road Roundabout;
  - Shakespeare Drive E of Middleton Stoney Road;
  - Bicester Road E of A4421 junction.

In comparing the flows in the 2024 Reference Case Plus Himley Village Scenario and 2024 Interim Scenario with the 2024 Reference Case at these locations and considering the likely capacity of these links, it has been assessed on the basis of professional judgement and considering the increase in traffic flows and resulting reduction in speeds, that the impact on driver delay will likely be **negligible to minor adverse**.

#### Pedestrian Delay

- 2.28. The IEMA Guidelines suggest that pedestrian delay is experienced at a lower threshold when pedestrians experience a 10 second delay crossing a carriageway with no crossing facilities for a two-way flow of 1,400 vehicles per hour. The upper threshold amounts to a 40 second delay, also where no crossing facilities exist.
- 2.29. The likely impact of pedestrian delay based on the predicted traffic flows of the Himley Village Development has been assessed. A commentary on each link is provided in Table 2.5. There are four links where the threshold volume of traffic (1,400 vehicles per hour) is exceeded. On these links, there are crossings which coincide with public footpaths and therefore the effect is considered to be minor adverse. In addition, a potential **minor adverse** effect is anticipated on Shakespeare Drive, east of Middleton Stoney Road due to a lack of pedestrian crossings. The effect on Shakespeare Drive remains as assessed in the 2014 ES. However, the links where a minor adverse



effect is assessed in the 2024 scenarios, were assessed as a negligible effect in the 2031 Completed Development Scenario. This is due to the increased traffic flows on these links.

Table 2.5 Effect on Pedestrian Delay

Link ref	Link Description	2024 Reference Case Plus Himley Village		2024 Interim Scenario		Commentary - 2031 Assessment (Himley Village only)	Commentary - 2024 Assessment (Himley Village only)	Commentary - 2024 Interim Scenario
		AM peak	PM Peak	AM peak	PM Peak			
7	Middleton Stoney Rd, W of Howes Lane	1281	1479	1443	1628	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is above the threshold volume of traffic. The only destination on the west side of Middleton Stoney Road will be a bus stop. The impact maybe minor adverse.	The flow level is above the threshold volume of traffic. The only destination on the west side of Middleton Stoney Road will be a bus stop The impact maybe minor adverse
9	Howes Lane, E of Shakespeare Drive	1248	1218	1299	1245	Not assessed	The flow level is below the threshold volume of traffic. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be negligible.
10	Lords Lane, E of Bucknell Road	1361	1405	1483	1433	Not assessed	The flow level is very marginally above the threshold in the PM peak. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be minor adverse.	The flow level is above the threshold. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be minor adverse.
11	Lords Lane, W of Banbury Road	1388	1548	1589	1576	Not assessed	The flow level is above the threshold. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be minor adverse	The flow level is above the threshold. There are infrequent crossing locations provided but these coincide with public footpaths. The impact would be minor adverse
13	Bucknell Road, S of Howes Lane	527	852	484	781	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.
16	Banbury Road, S of A4095	747	923	770	965	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.

Link ref	Link Description	2024 Reference Case Plus Himley Village		2024 Interim Scenario		Commentary - 2031 Assessment (Himley Village only)	Commentary - 2024 Assessment (Himley Village only)	Commentary - 2024 Interim Scenario
		AM peak	PM Peak	AM peak	PM Peak			
23	Shakespeare Drive, S of Howes Lane	70	65	60	34	The flow level is well below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is well below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are various crossing locations provided. The impact would be negligible.
24	M40 J10 northbound off slip road	1100	1048	1118	1046	The flow level is below the threshold volume of traffic. There are no pedestrian routes given that it is part of the motorway. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are no pedestrian routes given that it is part of the motorway. The impact would be negligible.	The flow level is below the threshold volume of traffic. There are no pedestrian routes given that it is part of the motorway. The impact would be negligible.
29	Shakespeare Drive, E of Middleton Stoney Road	1243	1237	1309	1305	The flow level is below the threshold volume of traffic but there are limited crossing facilities. The impact may be minor adverse.	The flow level is below the threshold volume of traffic but there are limited crossing facilities. The impact may be minor adverse.	The flow level is below the threshold volume of traffic but there are limited crossing facilities. The impact may be minor adverse.
30	The Approach, W of Bucknell Road	482	615	518	631	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.
35	B4100 Banbury Road N of Bainton	1395	1468	1488	1663	Not assessed	The flow level is above the threshold in the PM peak. There are infrequent crossing locations provided and these coincide with public footpaths. The impact would be minor adverse.	The flow level is above the threshold. There are infrequent crossing locations provided and these coincide with public footpaths. The impact would be minor adverse.
36	Ardley Road, N of Bucknell	216	608	207	398	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.
37	Middleton Road, W of Bucknell	105	291	111	297	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.	The flow level is well below the threshold volume of traffic. The impact would be negligible.
38	B4030 Middleton Stoney Road, NW of NWB	745	846	752	869	The flow level is below the threshold volume of traffic. There are no destinations for pedestrians on the	The flow level is below the threshold volume of traffic. There are no destinations for pedestrians on the west	The flow level is below the threshold volume of traffic. There are no destinations for pedestrians on the

Link ref	Link Description	2024 Reference Case Plus Himley Village		2024 Interim Scenario		Commentary - 2031 Assessment (Himley Village only)	Commentary - 2024 Assessment (Himley Village only)	Commentary - 2024 Interim Scenario
		AM peak	PM Peak	AM peak	PM Peak			
						west side of Middleton Stoney Road. The impact would be negligible.	side of Middleton Stoney Road. The impact would be negligible.	west side of Middleton Stoney Road. The impact would be negligible.
40	Wendelbury Road E of M40	24	75	25	76	Not assessed	The flow level is well below the threshold volume of traffic. The impact would be negligible	The flow level is well below the threshold volume of traffic. The impact would be negligible

### Fear and Intimidation

- 2.30. Fear and intimidation can be established through a combination of traffic flow, speed and composition. The criteria from the IEMA Guidelines for assessing this have been set out previously in the 2014 ES.
- 2.31. Table 2.6 shows that the impact on Fear and Intimidation ranges from Moderate / substantial adverse to negligible. The effects of the 2024 Reference Case Plus Himley Village Scenario and the 2024 Interim Scenario are slightly worse on 1 link (Shakespeare Drive East of Howes Lane) than that of the 2031 Completed Development Scenario with a minor adverse effect in 2024 rather than a negligible effect in 2031. Four of the links were not required to be assessed in the 2014 ES but were required to be assessed in this ES Addendum due to changes in traffic flows. The assessment of effects on these links (Howes Lane, Lords Lane (2 links) and Banbury Road) are moderate / substantial adverse. This is a reflection of the increased traffic flows on these links that result in higher levels of pedestrian fear and intimidation.

Table 2.6: Impact on Level of Fear and Intimidation

Link ref	Link Description	2024 Reference Case Plus Himley Village Hourly flow averaged over 18-hour period	2024 Reference Case Plus Himley Village Estimated Average speed (PM peak average of two way) kph	2024 Interim Scenario Hourly flow averaged over 18-hour period	2024 Interim Scenario Estimated Average speed (PM peak average of two way) kph	Assessment of Effect – 2031 (Himley Village only)	Assessment of Effect – 2024 (Himley Village onl)	Assessment of Effect – 2024 Interim Scenario
7	Middleton Stoney Rd, W of Howes Lane	784	60	872	55	Moderate / substantial adverse	Moderate/ substantial adverse	Moderate/ substantial adverse
13	Bucknell Road, S of Howes Lane	391	50	359	45	Moderate adverse	Moderate adverse	Moderate adverse
9	Howes Lane, E of Shakespeare Drive	700	60	722	60	Not assessed	Moderate/ substantial adverse	Moderate/ substantial adverse
10	Lords Lane, E of Bucknell Road	785	60	828	60	Not assessed	Moderate/ substantial adverse	Moderate/ substantial adverse
11	Lords Lane, W of Banbury Road	853	60	899	60	Not assessed	Moderate/ substantial adverse	Moderate/ substantial adverse
16	Banbury Road, S of A4095	474	35	493	35	Negligible	Negligible	Negligible
23	Shakespeare Drive, S of Howes Lane	38	45	27	45	Minor adverse	Minor adverse	Minor adverse
24	M40 J10 northbound off slip road	610	45	615	45	Minor adverse	Minor adverse	Minor adverse
29	Shakespeare Drive, E of Middleton Stoney Road	704	35	743	35	Negligible	Minor Adverse	Minor Adverse
30	The Approach, W of Bucknell Road	312	25	326	25	Negligible	Negligible	Negligible

Link ref	Link Description	2024 Reference Case Plus Himley Village Hourly flow averaged over 18-hour period	2024 Reference Case Plus Himley Village Estimated Average speed (PM peak average of two way) kph	2024 Interim Scenario Hourly flow averaged over 18-hour period	2024 Interim Scenario Estimated Average speed (PM peak average of two way) kph	Assessment of Effect – 2031 (Himley Village only)	Assessment of Effect – 2024 (Himley Village onl)	Assessment of Effect – 2024 Interim Scenario
35	B4100 Banbury Road N of Bainton	813	60	895	60	Not assessed	Moderate/substantial adverse	Moderate/substantial adverse
36	Ardley Road, N of Bucknell	234	45	172	50	Minor adverse	Minor adverse	Minor adverse
37	Middleton Road, W of Bucknell	112	70	116	70	Moderate adverse	Moderate adverse	Moderate adverse
38	B4030 Middleton Stoney Road, NW of NWB	452	75	460	75	Moderate/substantial adverse	Moderate/substantial adverse	Moderate/substantial adverse
40	Wendlebury Road E of M40	28	50	29	50	Not assessed	Negligible	Negligible

### Accidents and Safety

- 2.32. An updated analysis of accidents has not been undertaken from that contained in the 2014 ES. However, the traffic flows in the 2024 scenarios have been reviewed and an assessment undertaken as to the increased risk of accidents. It is considered that the assessment remains the same as for the 2031 Completed Development Scenario with the exception of Shakespeare Drive E of Middleton Stoney Road where the assessment has increased from negligible to minor adverse. This is due to the increased traffic flows on this link without the NW Bicester link road present.

### Effect on Public Transport

- 2.33. There are no bus stops serving the Site and currently no demand for the service. However, on completion of the Himley Village Development there would be a significantly increased demand for public transport. Without implementation of mitigation in the form of new public transport facilities, the effect is considered to be of **minor adverse** significance at the **local** level. The assessment is unchanged from that in the 2014 ES.

### Mitigation

- 2.34. The assessment of potential effects has identified that there are a number of locations where moderate and substantial adverse effects may arise and there is a need for further mitigation to reduce the significance of these effects. These are discussed below.

### Demolition and Construction

- 2.35. The introduction of the 2024 scenarios does not alter the predicted demolition and construction effects set out in the 2014 ES. The proposed mitigation measures therefore remain unchanged and are not reproduced in this ES Addendum.

### Completed Development

- 2.36. Unless otherwise stated, all mitigation will be delivered in full by 2024, much of it during the first two years of the build programme.

### Pedestrian Severance and Amenity

- 2.37. Whilst the levels of traffic are predicted to change between the 2024 scenarios and the 2031 Completed Development Scenario, the mitigation measures proposed are the same.
- 2.38. The level of traffic increase forecast on the Middleton Stoney Road, west of Howes Lane is anticipated to have a substantial adverse effect on pedestrian severance and amenity. However, there are few existing properties on Middleton Stoney Road west of Howes Lane and therefore the actual impact of severance is likely to be minimal. Nonetheless, as access points into the Himley Village Development would be provided from Middleton Stoney Road, there would be a need to introduce speed limits and appropriate speed reduction measures on this section. Additionally, the provision of segregated footways and cycle path along Middleton Stoney Road as part of the Himley Village Development would improve pedestrian amenity and safety. The only crossing point required on Middleton Stoney Road would be to access a bus stop for westbound buses.
- 2.39. The Bicester Saturn Model forecasts an increase in traffic routing through Bucknell village and using Middleton Road in all 2024 scenarios including the Reference Case. It is considered likely that the model does not fully take account of the difficult alignment of Bainton Road as an access to the village and may be over-predicting traffic movements. Nonetheless, it is recognised that the NW Bicester Development is in close proximity to the village and the routes westwards towards J10 of the M40 / south to the A34 via the village may be used by Development related traffic and affect



pedestrian severance and amenity within the village. In order to minimise this effect, it is proposed to introduce traffic calming measures in the village, the nature and extent of which would be agreed with OCC and the Parish Council.

- 2.40. As part of the NW Bicester Masterplan, measures would be introduced in the area of the Shakespeare Drive link to mitigate effects on pedestrians and cyclists. These measures to be delivered by others may include widened footways, new pedestrian crossings and speed reduction measures such as kerb build outs which narrow the carriageway, reduce crossing distance and improve visibility for pedestrians. As the rate at which the other NW Bicester Developments are brought forward is currently unknown and therefore the timescale to implement these mitigation measures is also unknown, these measures have not been taken into account in the residual effects assessment.

#### Driver Delay

- 2.41. Driver delay is anticipated to increase between the 2024 Reference Case and 2024 Reference Case Plus Himley Village and 2024 Interim Scenario due to a general increase in traffic in the north west part of Bicester. Some interim junction improvements are proposed and some permanent improvements will be brought forward as part of the 2024 Interim Scenario. These improvements comprise the signalisation of the Howes Lane / Bucknall Road junctions and the alteration of the Lords Lane / Banbury Road roundabout to form a signal controlled crossroads. Ultimately driver delay will be addressed through construction of the strategic link road through North West Bicester but this would occur beyond 2024.

#### Pedestrian Delay

- 2.42. The level of traffic increase forecast on Shakespeare Drive east of Middleton Stoney Road, and Middleton Stoney Road west of Howes Lane are anticipated to have a minor adverse effect pedestrian delay. However, it is proposed that measures such as speed reduction measures, widened footways and crossing points are introduced in the Himley Village Development and surrounding area to reduce reliance on the private car and to facilitate crossing of streets by pedestrians. Compared to the 2014 ES there are four additional locations where the effect is minor adverse - these are Middleton Stoney Road, Lords Lane (2 links assessed) and Banbury Road. These roads are on the edge or outside of Bicester and as such there is negligible pedestrian movement other than that associated with footpaths that cross these roads. At these locations, crossing facilities already exist and no improvement to these is proposed.

#### Fear and Intimidation

- 2.43. The applicable mitigation measures are unchanged from those reported in the 2014 ES, and it is anticipated that a condition would be placed on any planning consent to require these measures to be in place prior to construction of 1,700 homes plus non residential uses at Himley Village as assessed in this ES Addendum. Compared to the 2014 ES there, is one link where the impact is now minor adverse rather than negligible (Shakespeare Drive) and are four additional locations which weren't previously assessed in the 2014 ES where the effect is moderate / substantial adverse. These locations are Howes Lane, Lords Lane (2 links assessed) and Banbury Road. These roads are on the edge or outside of Bicester and as such there is negligible pedestrian movement other than that associated with footpaths that cross these roads. At these locations, crossing facilities already exist and it is therefore not considered necessary to implement additional mitigation measures. At Shakespeare Drive the effects would remain minor adverse.

#### Accidents and Safety

- 2.44. The applicable mitigation measures are unchanged from those reported in the 2014 ES, and it is anticipated that a condition would be placed on any planning consent to require these measures to

be in place prior to construction of 1,700 homes plus non residential uses at Himley Village as assessed in this ES Addendum.

#### Public Transport

- 2.45. The applicable mitigation measures are unchanged from those reported in the 2014 ES, and it is anticipated that a condition would be placed on any planning consent to require these measures, including the provision of a bus service, to be in place prior to construction of 1,700 homes plus non residential uses at Himley Village as assessed in this ES Addendum.

### Residual Effects

#### Demolition and Construction

- 2.46. The introduction of the 2024 Interim Scenario does not alter the predicted demolition and construction effects set out in the 2014 ES. The residual effects therefore remain as set out in the 2014 ES.

#### Completed Development

- 2.47. The 2024 Interim Scenario does not change the effects for the 2031 Completed Development Scenario as set out within the 2014 ES. The effects set out below are those that are considered likely to result during the 2024 scenarios when the link road has not been completed and the Development is partially completed. For clarity each of the effects is restated below for the 2024 Reference Case plus Himley Village Scenario and 2024 Interim Scenario. Where an effect is not restated it should be considered that the 2024 scenarios will not change the scale or magnitude of any effect, and that this is as stated in the 2014 ES.

#### Pedestrian Severance and Amenity

- 2.48. The effects of increased traffic flows on pedestrian severance and amenity are anticipated to be of **negligible to minor adverse** significance at the **local** level for all links.
- 2.49. Given the provision of a new pedestrian and cycleway along the northern side of Middleton Stoney Road and a crossing to a westbound bus stop as part of the Himley Village Development, the effect on pedestrian and cyclist amenity on Middleton Stoney Road is anticipated to be of **minor beneficial** significance at the **local** level.
- 2.50. Shakespeare Drive and The Approach are more sensitive than Middleton Stoney Road with existing residential properties and other land uses such as schools. Following mitigation on The Approach, the effect on pedestrian severance is likely to be a **local** effect of **minor adverse** significance during the PM peak hours and negligible at other times of the day. At Shakespeare Drive, the effect remains **minor adverse** due to the uncertainty of when mitigation to be implemented as part of the wider NW Bicester Development is brought forward.

#### Driver and Pedestrian Delay

- 2.51. With mitigation in place from the 2024 Interim Scenario it is anticipated that the effect on driver and pedestrian delay will be **negligible to minor adverse** significance at the **local** level.

#### Fear and intimidation

- 2.52. The effects of the 2024 Interim Scenario accounting for the implementation of the mitigation on fear and intimidation on Middleton Stoney Road, Shakespeare Drive and Ardley Road are anticipated to be a **permanent** effect of **minor adverse** significance at the **local** level. Based on traffic flow, speed and composition, the effects on Howes Lane, Lords Lane and Banbury Road are assessed,

in accordance with IEMA guidance, as having a moderate / substantial adverse effect on pedestrian fear and intimidation. However, given that there is very little pedestrian movement on these roads, the effect is assessed as being **negligible**.

- 2.53. No mitigation is proposed on M40 junction 10 slip road as this is unsuitable for pedestrian access therefore the effect of fear and intimidation on this link is of **negligible** significance.

#### Accidents and safety

- 2.54. The potential effects of accidents remain with an increased volume of traffic generated from the NW Bicester Development. The effects are anticipated to be of either **negligible** or **minor adverse** significance across all links.

#### Public transport

- 2.55. The effects of a new bus route and bus stops are anticipated to be a permanent effect of **minor beneficial** significance at the **local** level.

### Summary and Conclusion

- 2.56. As the demolition and construction phase effects are not changed as a result of the 2024 Interim Scenario these have not been replicated, and remain as reported in the 2014 ES. With regard to the 2024 Reference Case Plus Himley Village Scenario and 2024 Interim Scenario, the likely effects are minor adverse to minor beneficial. On a small number of links, the likely residual effects have worsened to minor adverse in the 2024 scenarios rather than negligible as assessed for the 2031 Completed Development Scenario. This is as a result of temporarily increased traffic flows on the existing highway network, before the completion of the NW Bicester link road.

### 3. Air Quality

#### Introduction

- 3.1. An assessment of changes in air quality for the 2024 Interim Scenario has been undertaken by Waterman Infrastructure & Environment Ltd based on traffic data supplied by the transport consultants Alan Baxter Limited. The following scenarios have been assessed against the 2024 Reference Case flows:
- 2024 Reference Case Plus Himley Village; and
  - 2024 Interim Scenario Flows.
- 3.2. The assessment methodology and assessment criteria remain as reported in the 2014 ES, other than the changes set out in the following paragraphs.

#### Legislation, Planning Policy & Guidance

- 3.3. Where relevant Legislation, Planning Policy and Guidance have been updated in the following paragraphs.

#### Legislation

- 3.4. There has been no significant change to relevant legislation, which remains as reported in the 2014 ES.

#### Planning Policy

- 3.5. The Cherwell Local Plan<sup>4</sup> was adopted in July 2015, however, there is no significant change to the policies set out in the Cherwell Draft Local Plan (January 2014) referred to in the 2014 ES, with regard to Air Quality. The Cherwell Local Plan, 2015 supersedes the Cherwell Local Plan 1996.

#### Guidance

- 3.6. A number of new and updated guidance documents have been published since the 2014 ES was submitted. A summary of these documents is set out below.

#### Improving Air Quality in the UK: Tackling nitrogen dioxide in our towns and cities UK Overview Document

- 3.7. Defra adopted the 'Improving Air Quality in the UK: Tackling nitrogen dioxide in our towns and cities UK Overview Document' in January 2016<sup>5</sup>, which sets out the plan to improve air quality in the UK by reducing NO<sub>2</sub> emissions in towns and cities as part of the UK's commitment for cleaner air. The air quality improvement plan sets out targeted local, regional and national measures in order to meet the UK's legal obligations to achieve the NO<sub>2</sub> limit values set out in the EU Framework Directive 2008/50/EC.

<sup>4</sup> Cherwell District Council (2015), 'Cherwell Local Plan 2011 - 2031', Cherwell District Council, Banbury

<sup>5</sup> Defra (2016), 'Improving Air Quality in the UK: Tackling nitrogen dioxide in our towns and cities UK Overview Document' (18 January 2016), Defra, London

### Air quality plan for reducing nitrogen dioxide (NO<sub>2</sub>) in South East

- 3.8. There are seventeen measures specific to Cherwell District Council (CDC) within the Air Quality Plan for Reducing Nitrogen dioxide in South East<sup>6</sup>. Of these measures the following are relevant to the scheme:
- Cherwell District Council Measure 8: Planning application - travel plan requirement; and
  - Cherwell District Council Measure 16: Bicester Ecotown electric vehicle promotion.

### Environmental Protection UK & Institute of Air Quality Management Guidance; Land-Use Planning & Development Control: Planning for Air Quality, 2015

- 3.9. Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) published updated guidance; which supersedes the EPUK 2010 guidance<sup>7</sup>. The Guidance<sup>8</sup> provides a framework for air quality considerations within local development control processes, promoting a consistent approach to the treatment of air quality issues.
- 3.10. The guidance explains how development proposals can adopt good design principals to reduce emissions and contribute to better air quality. The guidance also provides a method for screening the need for an air quality assessment and a consistent approach for describing the impacts at individual receptors.
- 3.11. The EPUK and IAQM Guidance, advises that:

*"In arriving at a decision about a specific proposed development the local planning authority is required to achieve a balance between economic, social and environmental considerations. For this reason, appropriate consideration of issues such as air quality, noise and visual amenity is necessary. In terms of air quality, particular attention should be paid to:*

- *Compliant with national air quality objectives and of EU Limit Values;*
- *Whether the development will materially affect any air quality action plan or strategy;*
- *The overall degradation (or improvement) in local air quality; or*
- *Whether the development will introduce new public exposure into an area of existing poor air quality".*

### Local Air Quality Management Policy Guidance (LLAQM.PG (16)), 2016

- 3.12. The Local Air Quality Management Policy Guidance LAQM.PG(16)<sup>9</sup> provides an update to the LAQM.PG(09)<sup>10</sup>. LAQM.PG(16) provides additional guidance on the links between transport and air quality. LAQM.PG(16) describes how road transport contributes to local air pollution and how transport measures may bring improvements in air quality. Key transport-related Government initiatives are set out, including regulatory measures and standards to reduce vehicle emissions and improve fuels, tax-based measures and the development of an integrated transport strategy.
- 3.13. LAQM.PG(16) also provides guidance on the links between air quality and the land use planning system. The guidance advises that air quality considerations should be integrated within the planning process at the earliest stage, and is intended to aid local authorities in developing action plans to deal with specific air quality issues and create strategies to improve air quality.

<sup>6</sup> Defra (2015), 'Air Quality Plan for Reducing Nitrogen dioxide in South East', Defra, London

<sup>7</sup> Environmental Protection UK. (2010) Development Control: Planning for Air Quality, EPUK: London.

<sup>8</sup> Environmental Protection UK & Institute of Air Quality Management (2015), 'Land-Use Planning & Development Control: Planning for Air Quality', EPUK & IAQM, London.

<sup>9</sup> Defra (2016), 'Local Air Quality Management (LAQM) Policy guidance 2016 (LAQM.PG (16))', Defra, London.

<sup>10</sup> Defra (2009), 'Local Air Quality Management (LAQM) Policy guidance 2009 (LAQM.PG (09))', Defra, London.

LAQM.PG(16) summarises the means in which the land use planning system can help deliver compliance with the air quality objectives.

## Assessment Methodology and Significance Criteria

### Completed Development Assessment Methodology

- 3.14. The effects on local air quality from traffic movements and heating plant emissions generated from the completed and operational Development have been assessed using the ADMS-Roads dispersion model. **Technical Appendix 3.1** presents the details of the modelling.
- 3.15. For the purposes of the modelling, traffic data for the relevant local road network has been provided by the Applicant's transport consultant (Alan Baxter Limited). Further details are provided in **Technical Appendix 3.1**. As outlined in Chapter 2 of this ES Addendum, the following scenarios for the year 2024 have been assessed:
- Reference Case (i.e. Baseline);
  - Reference Case Plus Himley Village' (i.e. with Development); and
  - The Interim Scenario, which is the Reference Case Plus Himley Village plus Application 1, North West Bicester and Albion/Bonner Land (i.e. a cumulative 'Interim Scenario').
- 3.16. The dispersion model predicts how emissions from roads and small scale industrial sources combine with local background pollution levels, taking account of meteorological conditions, to affect local air quality. The model has been run for the completion year of 2024, and therefore used background data and vehicle emission rates for 2024 as inputs. The model output allows pollutant concentrations to be quantified at a number of locations representative of nearby sensitive receptors.
- 3.17. Data relating to the proposed heating plant for the Development, was provided by the Applicant's Building Services Engineers (BU-UK) for the 2014 ES. The proposed heating plant would comprise a combination of boilers; assumed for the purposes of the air quality assessment to comprise a gas fired Combined Heat and Power (CHP) unit, four gas fired boilers and a biomass boiler. It is understood that there have been no changes made to the proposed heating plant since the 2014 ES, and the same operational parameters have been used as for the 2014 ES.
- 3.18. Full details of the modelling study, including the road traffic and heating plant data used in the assessment, are presented within **Technical Appendix 3.1**.
- 3.19. The introduction of the 2024 Interim Scenario will not result in any change to the demolition and construction effects. Accordingly, these remain as set out in the 2014 ES and are not considered further in this document.

### NO<sub>2</sub> Sensitivity Analysis

- 3.20. Analyses of historical monitoring data by Defra<sup>11</sup> have identified a disparity between actual measured NO<sub>x</sub> and NO<sub>2</sub> concentrations and the expected decline associated with emission forecasts which form the basis of air quality modelling as described above. The precise reason for the disparity is not fully understood but is thought to be related to the on-road performance of certain vehicles compared to calculations based on Euro emission standards which inform emission forecasts. It is thought that there may be reduction in NO<sub>x</sub> and NO<sub>2</sub> concentrations post 2015 when the Euro 6 emission standards begin to take effect.

<sup>11</sup> <http://laqm.defra.gov.uk/faqs/faqs.html>.

- 3.21. A note on Projecting NO<sub>2</sub> Concentrations<sup>12</sup> published by Defra provides a number of alternative approaches that can be followed in air quality assessments, in relation to the modelling of future NO<sub>2</sub> concentrations, considering that future NO<sub>x</sub>/NO<sub>2</sub> road-traffic emissions and background concentrations may not reduce as previously expected. This includes the use of revised background pollution maps, alternative projection factors and revised vehicle emission factors. However, the Defra note does not form part of statutory guidance and no prescriptive method is recommended for use in an air quality assessment.
- 3.22. This air quality assessment has been based on current guidance, i.e. using existing forecast emission rates and background concentrations to the completion year of 2024, which assumes a progressive reduction compared to the baseline year 2013 which was used in the 2014 ES. However, in addition, a sensitivity analysis has been undertaken on the basis of no future NO<sub>x</sub> and NO<sub>2</sub> reductions by 2024 (i.e. considering the likely significant effects of the tested scenarios against the baseline 2013 conditions, assuming no reduction in background concentrations or road-traffic emissions rates between 2013 and 2024). The sensitivity approach presented in this air quality assessment is now typically agreed and accepted by local authorities as being robust, and provides a clear method to account for the uncertainty in future NO<sub>x</sub> and NO<sub>2</sub> concentrations in air quality assessments. The results of this sensitivity analysis, which represents a more conservative assessment scenario, are presented in **Technical Appendix 3.1**.

#### Background Pollutant Concentrations

- 3.23. The dispersion of pollutant concentrations due to road-traffic emissions and the proposed heating plant emissions has been modelled. To estimate the total concentrations due to the contribution of any other nearby sources of pollution, background pollutant concentrations have been added to the modelled concentrations. Full details in relation to the background data used within the air quality assessment are included in **Technical Appendix 3.1**.

#### Model Verification

- 3.24. The same model verification as used in the 2014 ES has been used in this assessment. The verification and adjustment process is described in detail in **Technical Appendix 3.1**.

#### Potentially Sensitive Receptors

- 3.25. The same receptor locations as used in the 2014 ES have been assessed in this addendum. Table 3.1 presents the receptor locations.

Table 3.1: Selected Receptor Locations included in the ADMS Roads modelling

ID	Address of Receptor	Receptor Type	Grid Reference		Height Above Ground (m)
			X	Y	
1	Ardley Road, Bucknell	Residential	455941	225647	0
2	Bicester Road, Bucknell	Residential	455952	225569	0
3	Middleton Road, Bucknell	Residential	455770	225504	0
4	Swallowfield Farm	Residential	455191	224952	0
5	Loevlynch House	Residential	455426	223131	0
6	A4095, Chesterton	Residential	455756	221656	0

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Defra, 2012, Local Air Quality Management: Note on Projecting NO<sub>2</sub> Concentrations.



ID	Address of Receptor	Receptor Type	Grid Reference		Height Above Ground (m)
			X	Y	
7	B4100, Watergate Lodge	Residential	457252	226297	0
8	Fringford Road, Old School Close	Residential	458643	225146	0
9	Bricknells Farm, Fringford Road	Residential	458448	224757	0
10	A4421	Residential	459464	225338	0
11	Harmon Close	Residential	459211	224880	0
12	Pine Close	Residential	458936	224316	0
13	Juniper Gardens	Residential	458208	224460	0
14	Mullein Road	Residential	458144	224415	0
15	Trefoil Drive	Residential	457402	224005	0
16	Goldsmith Close	Residential	457188	223851	0
17	Chaucer Close	Residential	456961	223612	0
18	Kings Meadow School	School	457050	223408	0
19	Wensum Crescent	Residential	456619	223133	0
20	Isis Avenue	Residential	456435	222804	0
21	Shannon Road	Residential	456924	222626	0
22	St Marys Close	Residential	457521	222372	0
23	Bicester Community Hospital	Hospital	457982	222342	0
24	Brookside Primary School	School	458023	223008	0
25	North Street	Residential	458276	222932	0
26	Manor Farm	Residential	460386	222898	0
27	Bucknell Road	Residential	458195	222841	0
28	Queens Crescent	Residential	458099	222604	0
29	Kings End	Residential	458024	222469	0
30	Kestrel Way	Residential	459190	221258	0
31	Shearwater Drive	Residential	459972	221840	0
32	Sunderland Drive	Residential	459384	224033	0
33	Derwent Road	Residential	456772	223360	0
34	On-Site 1	Residential	455994	222925	0
35	On-Site 2	Residential	455596	223075	0

3.26. In addition to the above, Table 3.2 presents ecological receptors within the nearby Ardley Cutting Site of Special Scientific Interest (SSSI) and the Bure Park Local Nature Reserve (LNR) that have been considered with the assessment focusing on NO<sub>x</sub> concentrations and nitrogen deposition. These receptors are also the same as those assessed in the 2014 ES.



Table 3.1: Selected Ecological Receptor Locations

ID	Address of Receptor	Grid Reference	Distance from Closest Road (m)	Height Above Ground (m)
36	Ardley Cutting SSSI 1	Residential	15m (M40)	0
37	Ardley Cutting SSSI 2	Residential	15m (M40)	0
38	Ardley Cutting SSSI 3	Residential	5m (Middleton Road)	0
39	Ardley Cutting SSSI 4	Residential	5m (Middleton Road)	0
40	Bure Park LNR	Residential	15m (A4095)	0

## Significance Criteria

### Completed Development

- 3.27. As set out above, since the submission of the 2014 ES, EPUK and IAQM have updated guidance on determining the impacts of a development on air quality. This ES addendum has used the updated guidance to determine the impacts from the proposed Development. A summary of the guidance is provided below.
- 3.28. The guidance provides an approach to assigning the magnitude of change as a result of a development as a proportion of a relevant assessment level, followed by examining this change in the context of the new total concentration and its relationship with the assessment criterion to provide a description of the impact at selected receptor locations.
- 3.29. Table 3.3 presents the IAQM framework for describing the impacts (the change in concentration of an air pollutant) at individual receptors. The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist.

Table 3.2: Impact Descriptors for Individual Receptors

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Note: AQAL may be an air quality objective, EU limit value, or an Environment Agency 'Environmental Assessment Level (EAL)'

The table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers. Changes of 0% (i.e. less than 0.5%) are described as Negligible.  
The table is only to be used with annual mean concentrations

- 3.30. The approach set out in the EPUK / IAQM Guidance provides a method for describing the impact magnitude at individual receptors only. The Guidance outlines that this change may have an effect on the receptor depending on the severity of the impact and other factors that may need to be taken into account. The assessment framework for describing impacts can be used as a starting point to make a judgement on significance of effect. However, whilst there may be 'slight', 'moderate' or 'substantial' impacts described at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances.
- 3.31. Following the approach to assessing significance outlined in the EPUK / IAQM Guidance, the significance of likely residual effects of the completed Development on air quality has been established through professional judgement and the consideration of the following factors:
- The geographical extent (local, district or regional) of effects;
  - Their duration (temporary or long term);
  - Their reversibility (reversible or permanent);
  - The magnitude of changes in pollution concentrations;
  - The exceedance of standards (e.g. AQS objectives); and
  - Changes in pollutant exposure.

## Baseline Conditions

### Cherwell District Council's Review and Assessment Process

- 3.32. As presented in the 2014 ES, the previous rounds of the Review and Assessment Process concluded that Air Quality Management Areas should be declared for the following three areas:
- Horsefair, Banbury;
  - Hennef Way, Banbury; and
  - Queens Avenue / Kings End, Bicester.
- 3.33. The 2014 Updating and Screening Assessment (USA)<sup>13</sup> supported these conclusions and CDC is now in the process of declaring these areas as AQMAs. However, before declaring an AQMA for Queens Avenue / Kings End, CDC plans to evaluate the impacts of improvements to the road transport network in Bicester. Since the 2014 ES CDC have published their 2015 USA<sup>14</sup>. The 2015 USA supports the conclusions of the previous rounds of the review and assessment process and the declaration of an AQMA in Bicester.

### Cherwell District Council Air Quality Monitoring

- 3.34. CDC currently undertakes monitoring of NO<sub>2</sub> at eleven locations within Bicester using passive diffusion tubes. There are no automatic analysers installed in the District. Table 3.4 presents the most recent monitoring data for the nine roadside and kerbside diffusion tubes. The urban background monitoring locations are discussed further in the Background Pollutant Concentration section of **Technical Appendix 3.1**.

13 Cherwell District Council. (2014) Air Quality Updating and Screening Assessment

14 Cherwell District Council (2015) Air Quality Updating and Screening Assessment

Table 3.3: CDC Diffusion Tube Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>)

Site Name	Classification	Approximate Distance to Site (km)	2012	2013	2014	2015
Howes Lane	Roadside	2.3	-	-	23.4	23.9
Queens Avenue	Kerbside	2.4	<b>45.0</b>	<b>41.0</b>	<b>40.3</b>	38.7
Kings End South	Roadside	2.4	<b>49.0</b>	<b>48.5</b>	<b>46.9</b>	<b>46.0</b>
Field Street	Kerbside	2.5	<b>41.6</b>	<b>40.3</b>	36.2	36.5
North Street	Kerbside	2.5	<b>45.6</b>	<b>44.7</b>	<b>41.9</b>	39.8
St Johns	Kerbside	2.6	-	-	36.3	38.3
Causeway	Roadside	2.8	-	23.2	20.2	20.0
Market Square	Roadside	2.9	-	-	23.5	23.7
Aylesbury Road	Roadside	4.0	-	-	32.7	30.5

Note: Data obtained from CDC Progress Report.

Exceedances of the AQS Objectives shown in **bold** text.

- 3.35. The NO<sub>2</sub> results summarised in Table 3.4 indicate that the annual mean objective (40µg/m<sup>3</sup>) was exceeded at a number of monitoring locations within Bicester, including Queens Avenue between 2012 and 2014, Kings End between 2012 and 2015, Field Street between 2012 and 2013, and North Street between 2012 and 2014. Despite these exceedance's, as mentioned previously, CDC has not yet declared an AQMA for Bicester town centre, as it plans to continue monitoring the concentrations at these locations to evaluate the impacts of improvements to the road transport network in Bicester, as these could modify any future AQMA boundary.

## Potential Effects

### Completed Development

- 3.36. Effects on local air quality associated with the 2024 Reference Case Plus Himley Village and the 2024 Interim Scenario would likely result from changes to traffic flows and emissions from the heating plant associated with the Himley Village Development.
- 3.37. The results of the air quality modelling of operational traffic (based on current guidance, i.e. with reduced emission rates and background concentration to the year of 2024) and the proposed heating plant are presented in Tables 3.5 to Table 3.7. Full details are provided within **Technical Appendix 3.1**.

### Nitrogen Dioxide (NO<sub>2</sub>)

Table 3.4: Modelled NO<sub>2</sub> Annual Mean Concentrations at Sensitive Receptors (µg/m<sup>3</sup>) for 2024

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus HimleyVillage Change	2024 Interim Scenario	2024 Interim Scenario Change
1	13.6	13.7	0.1	13.6	0.0

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
2	13.9	14.2	0.3	14.3	0.4
3	13.7	14.0	0.3	14.0	0.3
4	14.6	14.7	0.1	14.7	0.1
5	13.8	14.1	0.3	14.1	0.3
6	13.7	13.8	0.1	13.8	0.1
7	14.9	15.3	0.4	15.5	0.6
8	13.0	13.3	0.3	13.3	0.3
9	13.2	13.6	0.4	13.6	0.4
10	15.2	15.4	0.2	15.4	0.2
11	14.3	14.6	0.3	14.6	0.3
12	16.0	16.3	0.3	16.3	0.3
13	16.3	16.9	0.6	17.0	0.7
14	14.4	15.1	0.7	15.2	0.8
15	14.3	15.4	1.1	15.5	1.2
16	15.1	16.2	1.1	16.2	1.1
17	16.6	17.9	1.3	18.0	1.4
18	13.0	13.7	0.7	13.7	0.7
19	15.7	16.5	0.8	16.6	0.9
20	15.5	16.2	0.7	16.3	0.8
21	15.6	16.7	1.1	17.0	1.4
22	14.9	15.1	0.2	15.2	0.3
23	22.3	22.2	-0.1	21.9	-0.4
24	13.5	13.6	0.1	13.6	0.1
25	27.0	26.8	-0.2	26.4	-0.6
26	14.7	14.8	0.1	14.8	0.1
27	22.4	22.2	-0.2	21.8	-0.6
28	19.8	19.7	-0.1	19.5	-0.3
29	21.6	21.5	-0.1	21.2	-0.4
30	17.9	18.0	0.1	18.0	0.1
31	14.3	14.4	0.1	14.4	0.1
32	14.3	14.5	0.2	14.5	0.2
33	14.4	15.5	1.1	15.6	1.2

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
34	-	14.8	-	14.8	-
35	-	13.9	-	14.0	-

Note: The 2024 Reference Case Plus Himley Village Change and 2024 Interim Scenario Change is calculated against the 2024 Reference Case

For accuracy, the changes have been calculated using the exact output from the ADMS-Road model rather than the rounded numbers within Table 3.5.

- 3.38. The results in Table 3.5 indicate that for 2024, annual mean NO<sub>2</sub> concentrations are predicted to meet the objective at all receptor locations. As described in **Technical Appendix 3.1**, the 1-hour mean objective for NO<sub>2</sub> is unlikely to be exceeded at a roadside location where the annual-mean NO<sub>2</sub> concentration is less than 60µg/m<sup>3</sup>. As shown in Table 3.5, the predicted concentrations in 2024 are below 60µg/m<sup>3</sup> at all of the existing locations and as such it is likely that the hourly objective is met at these locations.
- 3.39. Using the impact descriptors outlined in Table 3.3, the 2024 Reference Case Plus Himley Village scenario is predicted to result in ‘negligible’ impacts at all of the existing receptor locations. It is considered that the 2024 Reference Case Plus Himley Village scenario would also have a ‘negligible’ impact on hourly NO<sub>2</sub> concentrations. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors it is considered that the effect of the 2024 Reference Case Plus Himley Village scenario on NO<sub>2</sub> concentrations would be **insignificant**.
- 3.40. Using the impact descriptors outlined in Table 3.3, the 2024 Interim Scenario is predicted to result in ‘negligible’ impacts at all of the existing receptor locations. It is considered that the 2024 Interim Scenario would also have a ‘negligible’ impact on hourly NO<sub>2</sub> concentrations. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors. it is considered that the effect of the 2024 Interim Scenario on NO<sub>2</sub> concentrations would be **insignificant**.

#### Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

Table 3.5: Modelled PM<sub>10</sub> Concentrations at Sensitive Receptors for 2024

ID	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )					Daily Mean PM <sub>10</sub> (No. days > 50µg/m <sup>3</sup> )				
	Reference Case	2024 Reference case Plus	2024 Reference case	2024 Interim Scenario	2024 Interim Scenario Change	2024 Reference Case	2024 Reference case Plus	2024 Reference Case Plus	2024 Interim Scenario	2024 Interim Scenario Change
1	18.0	18.0	0.0	17.9	-0.1	1	1	0	1	0
2	18.0	18.0	0.0	18.0	0.0	1	1	0	1	0
3	17.9	17.9	0.0	17.9	0.0	1	1	0	1	0
4	18.4	18.4	0.0	18.4	0.0	1	1	0	1	0
5	18.1	18.1	0.0	18.1	0.0	1	1	0	1	0

ID	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )					Daily Mean PM <sub>10</sub> (No. days > 50µg/m <sup>3</sup> )				
	Reference Case	2024 Reference case Plus	2024 Reference case	2024 Interim Scenario	2024 Interim Scenario Change	2024 Reference Case	2024 Reference case Plus	2024 Reference Case Plus	2024 Interim Scenario	2024 Interim Scenario Change
6	18.0	18.0	0.0	18.0	0.0	1	1	0	1	0
7	18.5	18.6	0.1	18.7	0.2	1	1	0	2	1
8	17.8	17.8	0.0	17.8	0.0	1	1	0	1	0
9	17.8	17.8	0.0	17.8	0.0	1	1	0	1	0
10	18.6	18.6	0.0	18.6	0.0	1	1	0	1	0
11	18.3	18.3	0.0	18.3	0.0	1	1	0	1	0
12	18.4	18.4	0.0	18.4	0.0	1	1	0	1	0
13	18.5	18.5	0.0	18.6	0.1	1	1	0	1	0
14	18.2	18.2	0.0	18.2	0.0	1	1	0	1	0
15	18.2	18.2	0.0	18.3	0.1	1	1	0	1	0
16	18.2	18.3	0.1	18.3	0.1	1	1	0	1	0
17	18.5	18.6	0.1	18.6	0.1	1	1	0	1	0
18	17.8	17.8	0.0	17.8	0.0	1	1	0	1	0
19	18.8	18.8	0.0	18.9	0.1	2	2	0	2	0
20	18.4	18.5	0.1	18.6	0.2	1	1	0	1	0
21	18.4	18.6	0.2	18.7	0.3	1	1	0	2	1
22	18.4	18.5	0.1	18.5	0.1	1	1	0	1	0
23	19.6	19.5	-0.1	19.5	-0.1	2	2	0	2	0
24	17.8	17.8	0.0	17.8	0.0	1	1	0	1	0
25	19.8	19.8	0.0	19.7	-0.1	3	3	0	3	0
26	18.1	18.2	0.1	18.2	0.1	1	1	0	1	0
27	19.1	19.1	0.0	19.0	-0.1	2	2	0	2	0
28	19.0	19.0	0.0	19.0	0.0	2	2	0	2	0
29	19.4	19.4	0.0	19.3	-0.1	2	2	0	2	0
30	18.8	18.8	0.0	18.8	0.0	2	2	0	2	0
31	18.3	18.3	0.0	18.3	0.0	1	1	0	1	0
32	18.3	18.3	0.0	18.3	0.0	1	1	0	1	0
33	18.3	18.3	0.0	18.3	0.0	1	1	0	1	0
34	-	18.1	-	18.1	-	-	1	-	1	-
35	-	18.0	-	18.0	-	-	1	-	1	-

Note: The 2024 Reference Case Plus Himley Village Change and 2024 Interim Scenario Change is calculated against the 2024 Reference Case.

For accuracy, the changes have been calculated using the exact output from the ADMS-Road model rather than the rounded numbers within Table 3.6.

- 3.41. As shown in Table 3.6, the annual mean concentrations of PM<sub>10</sub> are predicted to be well below the objective of 40µg/m<sup>3</sup> in 2024, at all the existing receptor locations considered, in both development scenarios. The maximum predicted concentration in all scenarios is 19.8µg/m<sup>3</sup> at Receptor 25. Using the impact descriptors outlined in Table 3.3, the development scenarios are predicted to result in a ‘negligible’ impact at all existing receptors.
- 3.42. The results in Table 3.6 also indicate that in 2024 all existing receptor locations are predicted to be below the 24-hour mean PM<sub>10</sub> objective value of 35 days exceeding 50µg/m<sup>3</sup>. The maximum number of days in all scenarios is five at Receptor 3.
- 3.43. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors it is considered that the effect of the development scenarios on PM<sub>10</sub> concentrations would be **insignificant**.

Table 3.6: Modelled PM<sub>2.5</sub> Annual Mean Concentrations at Sensitive Receptors (µg/m<sup>3</sup>) for 2024

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
1	10.3	10.4	0.0	10.3	0.0
2	10.4	10.4	0.0	10.4	0.0
3	10.3	10.3	0.0	10.3	0.0
4	10.6	10.6	0.0	10.6	0.0
5	10.4	10.4	0.0	10.4	0.0
6	10.4	10.4	0.0	10.4	0.0
7	10.6	10.7	0.1	10.7	0.1
8	10.2	10.2	0.0	10.2	0.0
9	10.3	10.3	0.0	10.3	0.0
10	10.7	10.7	0.0	10.7	0.0
11	10.5	10.5	0.0	10.5	0.0
12	10.6	10.6	0.0	10.6	0.0
13	10.6	10.7	0.1	10.7	0.1
14	10.4	10.5	0.1	10.5	0.1
15	10.5	10.5	0.0	10.5	0.0
16	10.5	10.5	0.0	10.5	0.0
17	10.6	10.7	0.1	10.7	0.1
18	10.2	10.2	0.0	10.2	0.0
19	10.8	10.8	0.0	10.8	0.0

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
20	10.6	10.7	0.1	10.7	0.1
21	10.6	10.7	0.1	10.7	0.1
22	10.6	10.6	0.0	10.6	0.0
23	11.2	11.2	0.0	11.2	0.0
24	10.3	10.3	0.0	10.3	0.0
25	11.4	11.4	0.0	11.3	-0.1
26	10.4	10.4	0.0	10.4	0.0
27	11.0	10.9	-0.1	10.9	-0.1
28	10.9	10.9	0.0	10.9	0.0
29	11.1	11.1	0.0	11.1	0.0
30	10.8	10.8	0.0	10.8	0.0
31	10.5	10.5	0.0	10.5	0.0
32	10.5	10.5	0.0	10.5	0.0
33	10.5	10.5	0.0	10.5	0.0
34	-	10.4	-	10.4	-
35	-	10.4	-	10.4	-

Note: The 2024 Reference Case Plus Himley Village Change and 2024 Interim Scenario Change is calculated against the 2024 Reference Case

For accuracy, the changes have been calculated using the exact output from the ADMS-Road model rather than the rounded numbers within Table 3.7.

- 3.44. As shown in Table 3.7 in 2024 for both development scenarios, all existing receptor locations are predicted to be below the annual mean PM<sub>2.5</sub> objective of 25µg/m<sup>3</sup>. The maximum predicted concentration in all scenarios is 11.4µg/m<sup>3</sup> at Receptor 25. Using the impact descriptors outlined in Table 3, the development scenarios are predicted to result in a 'negligible' impact at all existing receptors.
- 3.45. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors it is considered that the effect of the development scenarios on PM<sub>2.5</sub> concentrations would be **insignificant**.

#### Conditions within the Development

- 3.46. As shown by the results in Tables 3.5 to 3.7, the predicted NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations for locations within the Himley Village Development itself (Receptor 34 and 35) are below the relevant objectives in 2024. As such, it is considered that for the NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> objectives, the effect of introducing residential uses to the Himley Village Site would be **insignificant**.

#### Ecological Assessment

- 3.47. Table 3.8 presents the modelled NO<sub>x</sub> concentration at the ecological receptors within the Ardley Cuttings Quarry SSSI and Bure Park LNR.



Table 3.7: Modelled PM<sub>2.5</sub> Annual Mean Concentrations at Sensitive Receptors (µg/m<sup>3</sup>) for 2024

ID	2024 Reference Case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village	Predicted Change as % of AQS Objective	2024 Interim Scenario	2024 Interim Scenario Change	Predicted Change as % of AQS Objective
36	30.3	30.2	-0.1	-0.3	30.2	-0.1	-0.5
37	39.9	39.8	-0.1	-0.4	39.7	-0.2	-0.7
38	14.1	14.4	0.3	1.0	14.4	0.3	1.1
39	14.1	14.4	0.3	1.0	14.4	0.3	1.1
40	15.4	17.2	1.8	6.1	17.3	1.9	6.2

- 3.48. The annual average modelled concentration of NO<sub>x</sub> at two of the ecological receptors exceed the AQS objective of 30µg/m<sup>3</sup>. This is due to the proximity (distance) of these receptors to the M40. The AQS is met at the other three ecological receptors. The DMRB guidance<sup>15</sup> states that increases in annual mean NO<sub>x</sub> concentrations of less than 2µg/m<sup>3</sup> at ecological designations are not considered significant. It is therefore considered that both development scenarios will have an **insignificant** effect on ecological receptors as a result of changes in air quality.

#### Nitrogen Dioxide Sensitivity Analysis Results

- 3.49. The results of the sensitivity analysis (i.e. considering the likely air quality effects of the 2024 Development Scenarios against the 2013 baseline conditions within the 2014 ES, assuming no reduction in background concentrations or road traffic emission factors between 2013 and 2024) are presented in Table A1.9 in **Technical Appendix 3.1**. The overall predicted concentrations are higher than those presented above for 2024 due to higher background concentrations and vehicle emissions rates in 2013 than 2024.
- 3.50. As shown in Table A1.9 in **Technical Appendix 3.1**, in the 2024 Reference Case Plus Himley Village scenario, assuming no improvements in future NO<sub>x</sub> and NO<sub>2</sub>, the NO<sub>2</sub> annual mean objective is exceeded at five of the existing receptor locations and is met at the remaining 28 existing receptor locations. The maximum predicted concentration at Receptor 25 is 57.5µg/m<sup>3</sup> in 2024 'with Development scenario'.
- 3.51. Using the impact descriptors outlined in Table 3.3, the 2024 Reference Case Plus Himley Village scenario is predicted to result in a 'negligible' impact at 22 existing receptors, a 'slight adverse' impact at three receptor locations (Receptors 6, 17 and 19), a 'moderate adverse' impact at three receptor locations (Receptors 12, 13 and 30) and a 'substantial adverse' impact at the remaining five receptor locations (Receptors 23, 25, 27, 28 and 29).
- 3.52. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors it is considered that the effect of the 2024 Reference Case Plus Himley Village scenario on NO<sub>2</sub> concentrations, when assuming no future improvements in NO<sub>x</sub> and NO<sub>2</sub>, would be **insignificant**.
- 3.53. As shown in Table A1.9 in **Technical Appendix 3.1**, in the 2024 'Interim Scenario', assuming no improvements in future NO<sub>x</sub> and NO<sub>2</sub>, the NO<sub>2</sub> annual mean objective is exceeded at four of the

<sup>15</sup> Highways Agency (2007) Design manual for Roads and Bridges Volume 11 Environmental Assessment Section 3 Environmental Assessment Techniques Part 1 HA207/07 Air Quality.

existing receptor locations and is met at the remaining 29 of the existing receptor locations. The maximum predicted concentration at Receptor 25 is  $53.1\mu\text{g}/\text{m}^3$  in 2024 'Interim Scenario'.

- 3.54. Using the impact descriptors outlined in Table 3.3, the Interim Scenario are predicted to result in a 'negligible' impact at 26 existing receptors, a 'slight adverse' impact at one receptor location (Receptor 13), a 'moderate adverse' impact at one receptor location (Receptor 25) and a beneficial impact at the remaining five receptor locations.
- 3.55. Using professional judgement, based on the severity of the impact and the concentrations predicted at the sensitive receptors it is considered that the effect of the Interim Scenario on  $\text{NO}_2$  concentrations, when assuming no future improvements in  $\text{NO}_x$  and  $\text{NO}_2$ , would be **insignificant**.

## Mitigation

### Completed Development

- 3.56. As identified earlier in this Chapter, even in the absence of mitigation, the Development is predicted to have an insignificant effect on local air quality. Therefore, mitigation measures would not be required. However, a Travel Plan would be produced for the Himley Village Development with the aim of reducing the number of car trips associated with the Development by actively promoting alternative modes of transport. This would have the potential to bring about air quality benefits.

## Residual Effects

### Completed Development

- 3.57. The residual effects would remain as **insignificant**.

## 4. Noise and Vibration

### Introduction

- 4.1. An assessment of changes in road traffic noise for the 2024 Interim Scenario has been undertaken by Waterman Infrastructure & Environment Ltd based on traffic data supplied by the transport consultants Alan Baxter and Associates. The following scenarios have been assessed against the 2024 Reference Case flows:
- 2024 Reference Case Plus Himley Village Flows (Scenario A); and
  - 2024 Interim Scenario Flows (Scenario B).
- 4.2. There have been no significant changes to the guidance from the 2014 ES. The calculation methodology and assessment criteria are as detailed within the 2014 ES. For completeness these are the calculation methodology detailed within the Calculation of Road Traffic Noise (CRTN)<sup>16</sup> and the significance criteria of The Design Manual for Roads and Bridges (DMRB)<sup>17</sup>. Table 4.1 presents the significance criteria used in the noise assessment.

Table 4.1: Significance Criteria for Road Traffic Noise Assessment

Significance	Change or Difference in Noise Level, dB(A)
<b>Insignificant</b>	0 to 0.9
<b>Adverse effect of minor significance</b>	1.0 to 2.9
<b>Adverse effect of moderate significance</b>	3.0 to 4.9
<b>Adverse effect of substantial significance</b>	> 5

- 4.3. For assessment purposes the percentage of HGVs and speed are the same as used within the 2014 ES.
- 4.4. The Cherwell Local Plan was adopted in July 2015, however, there is no significant change to the policies set out in the Cherwell Draft Local Plan (January 2014) referred to in the 2014 ES, with regard to Air Quality.

### Significance of Effects Interim Road Traffic Noise

- 4.5. The predicted change in road traffic noise levels for the 2024 scenarios: 2024 Reference Case Plus Himley Village Flows (Scenario A) and 2024 Interim Development Scenario Flows (Scenario B) are presented in Tables 4.2 and 4.3 respectively. Full details are provided within **Technical Appendix 4.1**.
- 4.6. The results in Table 4.2 indicate that for the majority of traffic links the predicted change in noise levels for the interim year 2024 Scenario A are less than 1dB and are therefore **insignificant**. Three road links (ID's 29, 30 and 37) are forecast to have noise increases of less than 2dB with another link (ID 7 Middleton Stoney Road) predicted to experience a noise increase of 2.8dB. Noise increases of this level are **adverse** effects of **minor significance**. A gradual change in environmental noise of less than 3dB is generally imperceptible and is therefore not a cause for concern. One road link, ID 23 (Shakespeare Drive), is predicted to have a noise decrease of -2.4dB which is of **minor beneficial significance**.

<sup>16</sup> Department of Transport. (1988) *Calculation of Road Traffic Noise*.

<sup>17</sup> Highway Agency. (2011) *Design Manual for Road and Bridges, Volume 11 Environmental Assessment, Section 3, Environmental Assessment Techniques, Part 7 Noise and Vibration*.

- 4.7. The results in Table 4.3 which present the results for Scenario B, indicates that for the majority of traffic links the predicted change in noise levels are less than 1dB and are therefore **insignificant**. Three road links (ID's 29, 30 and 37) are forecast to have noise increases of less than 2dB which would result in an **adverse** effect of **minor significance** whilst one road link, ID 36 Ardley Road, is forecast to have a noise reduction of -1.4dB and therefore of **minor beneficial significance**. A gradual change in noise level of less than 2dB is unlikely to be perceptible and is therefore not a cause for concern. One road link, ID 23 (Shakespeare Drive), is predicted to have a noise decrease of -4dB which is of **moderate beneficial significance** whilst link ID 7 (Middleton Stoney Road) is predicted to experience a 3.2dB increase in noise in the interim year of 2024, which is an **adverse** effect of **moderate significance**. A gradual change in environmental noise of 3dB is generally only just perceptible, so an increase of +3.2dB is not considered to give a cause for concern.

Table 4.2: Predicted Change in Interim Road Traffic Basic Noise Level Scenario A

Link Number	Road Link	dB LA10,18hr BNL		Change
		2024 Reference Case Flow	2024 Reference Case Plus Himley Village Flows	
1	A41 northbound, N of M40 J9	75.0	75.1	0.1
2	A41 Oxford Rd, S of A41 junction	74.5	74.6	0.1
3	Vendee Drive, W of A41 junction	78.9	79.0	0.1
4	A41, N of Pingle Drive	74.6	74.9	0.2
5	Middleton Stoney Rd, W of Kings End	74.7	74.9	0.2
6	Middleton Stoney Rd, W of Kings End	71.7	71.9	0.3
7	Middleton Stoney Rd, W of Howes Lane	70.0	72.7	2.8
8	Howes Lane, N of Middleton Stoney Rd	72.0	72.1	0.1
9	Howes Lane, E of Shakespeare Drive	71.9	72.2	0.3
10	Lords Lane, E of Bucknell Road	72.5	72.7	0.2
11	Lords Lane, W of Banbury Road	72.9	73.1	0.2
12	Bucknell Road, N of Lords Lane	61.7	61.7	0.0
13	Bucknell Road, S of Lords Lane	66.2	65.9	-0.3
14	Banbury Road, N of Lords Lane	69.6	69.6	0.0
15	A4095 E of Banbury Road	74.5	74.6	0.1
16	Banbury Road, S of A4095	66.6	66.7	0.1
17	Buckingham Road, S of Skimmingdish Lane	67.6	67.7	0.1
18	Queens Avenue, S of Bucknell Road	70.8	70.6	-0.1
19	A41 E of A41 Oxford Road	73.0	73.1	0.1
20	A4421 Neunkirchen Way	69.0	69.0	0.0
21	A41, E of London Road roundabout	72.1	72.0	-0.1
22	A4421, E of Skimmingdish Lane	70.2	70.3	0.1
23	Shakespeare Drive, S of Howes Lane	58.2	55.8	-2.4
24	M40 J10 northbound off slip road	74.1	74.1	0.1
25	Ardley Road (E of B430)	68.9	68.8	-0.1
26	M40 J10 southbound on slip road (from A43)	74.1	73.9	-0.2

Link Number	Road Link	dB LA10,18hr BNL		Change
		2024 Reference Case Flow	2024 Reference Case Plus Himley Village Flows	
27	B430 M40 over bridge	74.4	74.4	0.0
28	A4095 N of Chesterton	65.5	65.8	0.2
29	Shakespeare Drive, E of Middleton Stoney Road	67.3	68.4	1.1
30	The Approach, W of Bucknell Road	63.2	64.9	1.7
31	A41 East of Pioneer Road	72.1	72.0	-0.1
32	Bicester Road, E of A4421 junction	66.5	66.5	0.0
33	A4421 N of Skimmingdish Lane	69.7	69.7	0.0
34	Fringford Road, N of Caversfield	58.9	58.9	0.0
35	B4100 Banbury Road, N of Bainton Road	73.8	74.3	0.5
36	Ardley Road, N of Bucknell	68.9	68.9	-0.1
37	Middleton Road, W of Bucknell	64.7	65.7	1.0
38	B4030 Middleton Stoney Road, NW of NWB	71.3	71.7	0.4
39	Green Lane, W of Chesterton	70.4	70.4	-0.1
40	Wendlebury Road, E of M40	59.4	59.7	0.3
41	M40 northbound (mainline only), S of J9	81.2	81.2	0.0
42	M40 southbound (mainline only), S of J9	81.3	81.3	0.0
43	M40 northbound (mainline only), S of J10 / N of J9	83.2	83.1	0.0
44	M40 southbound (mainline only), S of J10 / N of J9	82.9	82.9	0.0
45	M40 northbound (mainline only), N of J10	82.5	82.5	-0.1
46	M40 southbound (mainline only), N of J10	82.1	82.1	0.0

Table 4.3: Predicted Change in Interim Road Traffic Basic Noise Level Scenario B

Link Number	Road Link	dB LA10,18hr BNL		Change
		2024 Reference Case Flow	2024 Interim Scenario	
1	A41 northbound, N of M40 J9	75.0	75.1	0.1
2	A41 Oxford Rd, S of A41 junction	74.5	74.6	0.1
3	Vendee Drive, W of A41 junction	78.9	79.0	0.1
4	A41, N of Pingle Drive	74.6	74.9	0.3
5	Middleton Stoney Rd, W of Kings End	74.7	74.9	0.2
6	Middleton Stoney Rd, W of Kings End	71.7	72.0	0.3
7	Middleton Stoney Rd, W of Howes Lane	70.0	73.2	3.2
8	Howes Lane, N of Middleton Stoney Rd	72.0	72.2	0.2
9	Howes Lane, E of Shakespeare Drive	71.9	72.4	0.4
10	Lords Lane, E of Bucknell Road	72.5	73.0	0.4
11	Lords Lane, W of Banbury Road	72.9	73.3	0.4
12	Bucknell Road, N of Lords Lane	61.7	61.6	-0.1

Link Number	Road Link	dB L <sub>A10,18hr</sub> BNL		Change
		2024 Reference Case Flow	2024 Interim Scenario	
13	Bucknell Road, S of Lords Lane	66.2	65.5	-0.6
14	Banbury Road, N of Lords Lane	69.6	69.9	0.3
15	A4095 E of Banbury Road	74.5	74.7	0.2
16	Banbury Road, S of A4095	66.6	66.9	0.3
17	Buckingham Road, S of Skimmingdish Lane	67.6	67.8	0.2
18	Queens Avenue, S of Bucknell Road	70.8	70.4	-0.3
19	A41 E of A41 Oxford Road	73.0	73.1	0.1
20	A4421 Neunkirchen Way	69.0	69.0	0.1
21	A41, E of London Road roundabout	72.1	72.0	-0.1
22	A4421, E of Skimmingdish Lane	70.2	70.3	0.1
23	Shakespeare Drive, S of Howes Lane	58.2	54.2	-4.0
24	M40 J10 northbound off slip road	74.1	74.2	0.1
25	Ardley Road (E of B430)	68.9	68.8	-0.2
26	M40 J10 southbound on slip road (from A43)	74.1	73.8	-0.2
27	B430 M40 over bridge	74.4	74.4	0.0
28	A4095 N of Chesterton	65.5	65.8	0.3
29	Shakespeare Drive, E of Middleton Stoney Road	67.3	68.7	1.4
30	The Approach, W of Bucknell Road	63.2	65.1	1.9
31	A41 East of Pioneer Road	72.1	72.0	-0.1
32	Bicester Road, E of A4421 junction	66.5	66.5	0.0
33	A4421 N of Skimmingdish Lane	69.7	69.7	0.0
34	Fringford Road, N of Caversfield	58.9	58.9	0.0
35	B4100 Banbury Road, N of Bainton Road	73.8	74.7	0.9
36	Ardley Road, N of Bucknell	68.9	67.5	-1.4
37	Middleton Road, W of Bucknell	64.7	65.8	1.1
38	B4030 Middleton Stoney Road, NW of NWB	71.3	71.8	0.5
39	Green Lane, W of Chesterton	70.4	70.3	-0.1
40	Wendlebury Road, E of M40	59.4	59.7	0.4
41	M40 northbound (mainline only), S of J9	81.2	81.2	0.0
42	M40 southbound (mainline only), S of J9	81.3	81.3	0.0
43	M40 northbound (mainline only), S of J10 / N of J9	83.2	83.1	-0.1
44	M40 southbound (mainline only), S of J10 / N of J9	82.9	82.9	0.0
45	M40 northbound (mainline only), N of J10	82.5	82.4	-0.1
46	M40 southbound (mainline only), N of J10	82.1	82.1	0.0

## Mitigation Measures and Residual Effects

#### Road Traffic Noise

- 4.8. Mitigation is not proposed as a result of the predicted change in noise levels for the interim year of 2024, which are predominantly less than 1dB and therefore insignificant.
- 4.9. For Scenario A, four road links are predicted to experience an increase in noise levels of less than 3dB which is an adverse effect of minor significance. As discussed, this is unlikely to be perceptible and mitigation is not proposed.
- 4.10. For Scenario B, three road links are predicted to experience an increase in noise levels of less than 3dB which is an adverse effect of minor significance. As previously discussed a gradual increase in environmental noise of less than 3dB is generally imperceptible. One road link (ID 7 Middleton Stoney Road) is predicted to experience an increase in noise of 3.2dB in the interim year of 2024 Scenario B. For a gradual increase in environmental noise this is only just perceptible. On this basis mitigation is not proposed.
- 4.11. The residual effects for the interim year 2024 are therefore predominantly **insignificant** with some **minor adverse** effects and potentially a **moderate adverse** effect on one link.

#### Summary and Conclusion

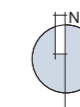
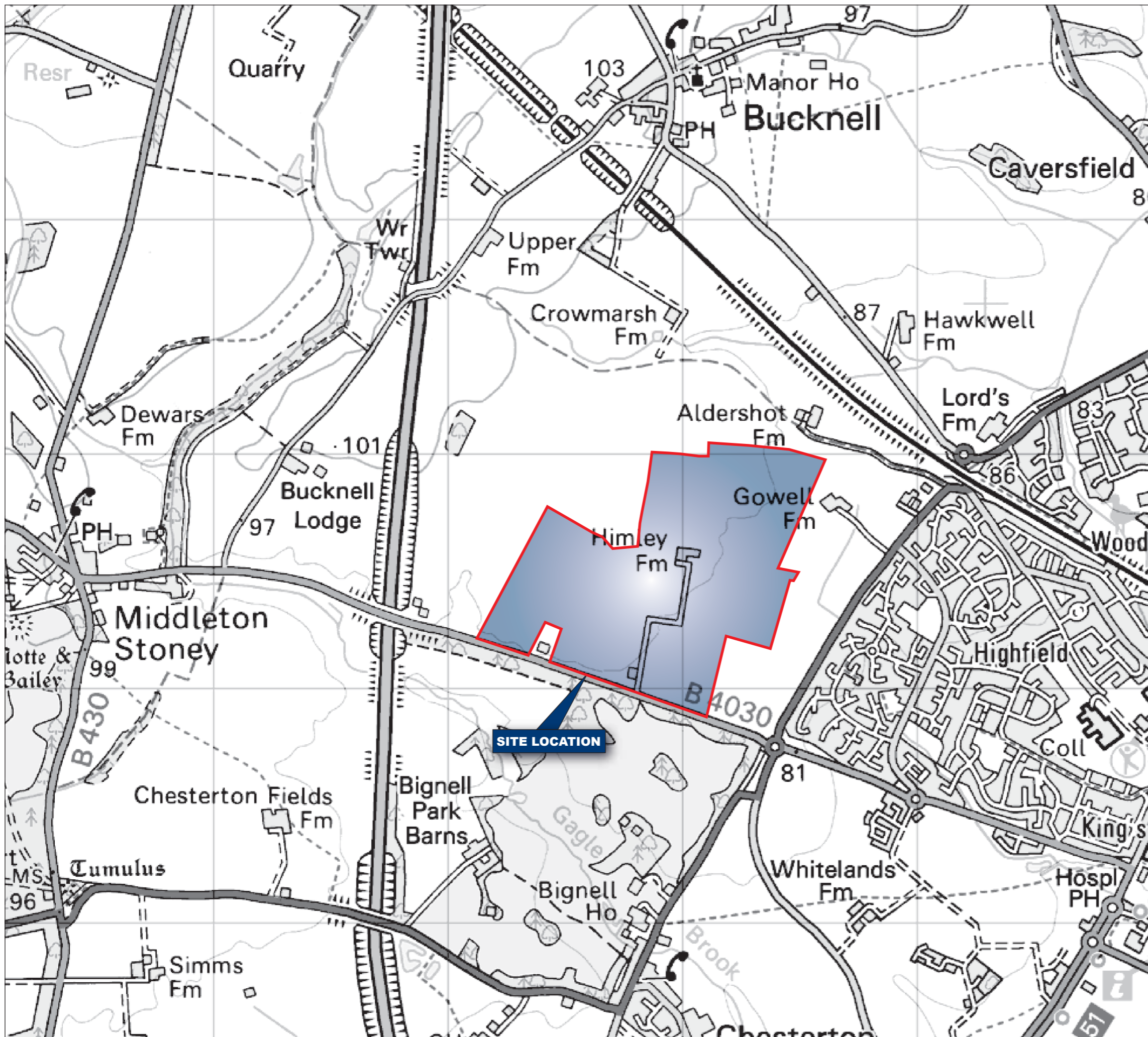
- 4.12. The predicted change in road traffic noise levels for the interim year 2024 as a result of the proposed Development is predominantly less than 1dB and therefore insignificant. This is comparable to the results presented within the 2014 ES. Mitigation is not proposed as although several road links are predicted to experience an increase in noise of **minor adverse** significance, this is likely to be imperceptible. There is the potential for one road link to experience an increase in noise of +3.2dB which is an **adverse effect** of **moderate** significance, but this is only just above the threshold of perceptibility for a gradual change in environmental noise.

## **FIGURES**

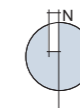
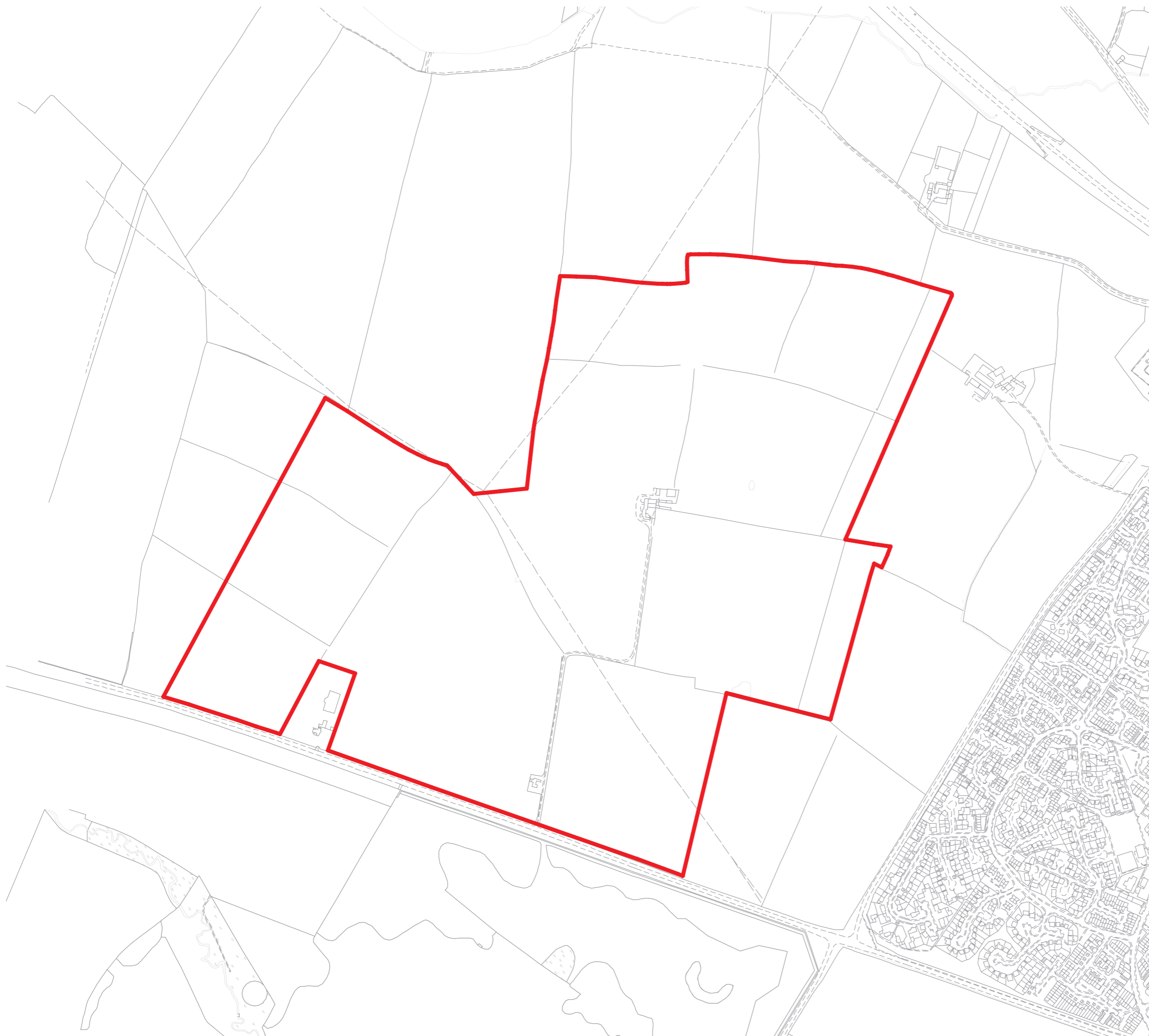
**Figure 1.1 Site Location Plan**

**Figure 1.2 Application Boundary**





Project Details	WIE12039-100: Himley Village
Figure Title	Figure 1.1: Site Location
Figure Ref	WIE12039-100_GR_ESA_1.1A
Date	2016
File Location	\\nt-incs\weed\projects\wie12039\100\graphics\esa\issued figures



Project Details	WIE12039-100: Himley Village
Figure Title	Figure 1.2: Existing Site Plan
Figure Ref	WIE12039-100_GR_ESA_1.2A
Date	2016
File Location	\\nt-lncs\weed\projects\wie12039\100\graphics\esa\issued figures



## APPENDICES



## Appendix 3.1 Air Quality Modelling Study

- 1.1 This Appendix presents the technical information and data upon which the air quality assessment is based.

### Model

- 1.2 In urban areas, pollutant concentrations are primarily determined by the balance between pollutant emissions that increase concentrations, and the ability of the atmosphere to reduce and remove pollutants by dispersion, advection, reaction and deposition. An atmospheric dispersion model is used as a practical way to simulate these complex processes; which requires a range of input data, which can include pollutant emissions rates, meteorological data and local topographical information.
- 1.3 The effect of the Development on local air quality was assessed using the advanced atmospheric dispersion model ADMS-Roads, taking into account the contribution of emissions from forecast road-traffic on the local road network and from the heating plant by the completion year.
- 1.4 The ADMS-Roads model is a comprehensive tool for investigating air pollution in relation to road networks, and can also take into account point sources such as emissions from heating plants. On review of the Site, and its surroundings, ADMS-Roads was considered appropriate for the assessment of the long and short term effects of the proposals on air quality. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions of air pollutant concentrations. It can predict long-term and short-term concentrations, including percentile concentrations. The use of the ADMS-Roads model was agreed with the air quality Environment Health Officer (EHO) at Cherwell District Council (CDC).
- 1.5 ADMS-Roads model is a formally validated model, developed in the United Kingdom (UK) by CERC (Cambridge Environmental Research Consultants). This includes comparisons with data from the UK's air quality Automatic Urban and Rural Network (AURN) and specific verification exercises using standard field, laboratory and numerical data sets. CERC is also involved in European programmes on model harmonisation, and their models were compared favourably against other EU and U.S. EPA systems. Further information in relation to this is available from the CERC web site at [www.cerc.co.uk](http://www.cerc.co.uk).

### Model Scenarios

- 1.6 In order to assess the effect of the Development on local air quality, future baseline '2024 Reference Case', '2024 Reference Case Plus Himley Village' and 'an Interim Scenario were assessed. The Interim Scenario year is 2024 and therefore this is the year in which these future scenarios were modelled. The year 2013 was modelled in the 2014 ES to establish the existing baseline situation because it was the year for which available monitoring data surrounding the Site was available against which the air quality model could be verified (discussed further below). The same verification as undertaken in the 2014 ES has been used in this ES addendum.
- 1.7 Taking into account recent analyses by Defra<sup>18</sup> showing that historical NO<sub>x</sub> and NO<sub>2</sub> concentrations are not declining in line with emission forecasts, as outlined in main chapter, a sensitivity analysis has been undertaken on the basis of no future reductions in NO<sub>x</sub>/NO<sub>2</sub> concentrations (i.e. considering the potential effects of the Development against the current baseline 2013 conditions by applying the 2024 road traffic data to 2013 background

18 <http://laqm.defra.gov.uk/faqs/faqs.html>: Measured nitrogen oxides (NO<sub>x</sub>) and/or nitrogen dioxide (NO<sub>2</sub>) concentrations in my local authority area do not appear to be declining in line with national forecasts.

concentrations and road traffic emission rates). The results for this sensitivity analysis are presented further below.

## Traffic Data

- 1.8 Traffic flow data comprising Annual Average Daily Traffic (AADT) flows, traffic composition (% HDVs – Heavy-Duty Vehicles) and speeds (kph) were used in the model as provided by Alan Baxter Limited for the surrounding road network. Table A1.1 presents the traffic data used within the air quality assessment.

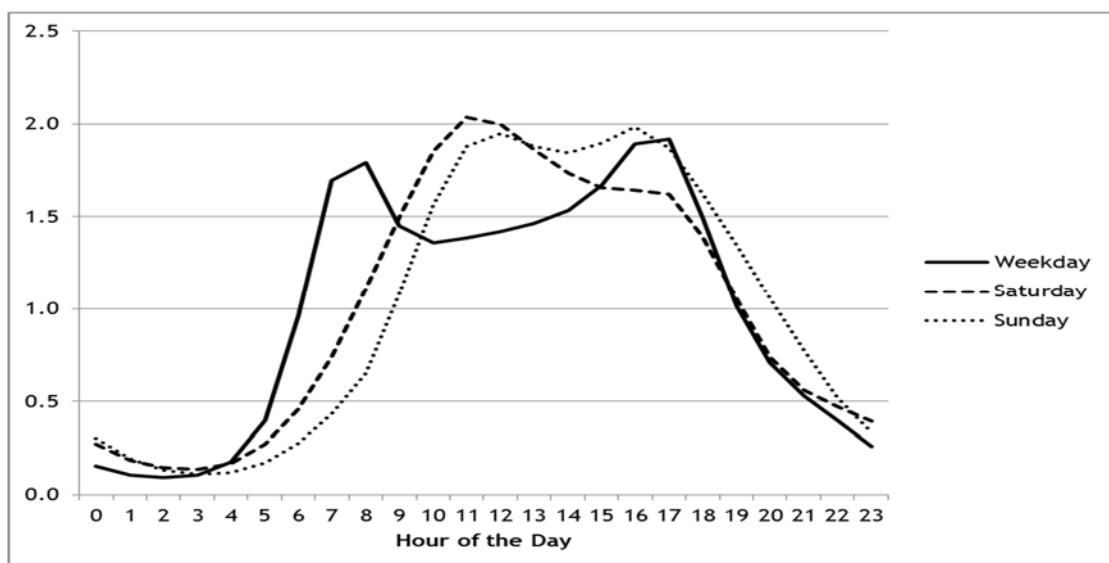
## Vehicle Speeds

- 1.9 To take into account the presence of slow moving traffic near junctions and at roundabouts, the speed on each road was reduced using the following criteria recommended within LAQM.TG(16)<sup>19</sup>:
- Traffic pulling away from the lights, e.g. 40-50 kph;
  - Traffic approaching the lights when green, e.g. 20-50 kph; and
  - Traffic on the carriageway approaching the lights when red, e.g. 5-20 kph, depending on the time of day and how congested the junction is.

## Diurnal Profile

- 1.10 The ADMS-Roads model uses an hourly traffic flow based on the daily (AADT) flows. Traffic flows follow a diurnal variation throughout the day and week. Therefore, a diurnal profile was used in the model to replicate how the average hourly traffic flow would vary throughout the day and the week. This was based on data collated by Waterman from the Department for Transport (DfT) statistics Table *TRA0307: Traffic distribution by time of day on all roads in Great Britain, 2012*<sup>20</sup>. Figure A1.1 presents the diurnal variation in traffic flows that has been used within the model.

Figure A1.1: Diurnal Traffic Variation



<sup>19</sup> Defra, 2016, Local Air Quality Management Technical Guidance LAQM.TG(16)

<sup>20</sup> Department for Transport (DfT) Statistics, [www.dft.gov.uk/statistics/series/traffic](http://www.dft.gov.uk/statistics/series/traffic)

Table A1.1: 24 hour AADT Data Used within the Assessment

Link Name	%HDV	2024 Reference Case	2024 Reference Case Plus Himley Village	Interim Scenario
A41 northbound, N of M40 J9	6.8	16459	16701	16793
A41 southbound, N of M40 J9	6.8	14756	15033	15114
A41 Oxford Rd, S of A41 junction	6.8	40020	40806	40929
Vendee Drive, W of A41 junction	6.8	15085	15923	16202
A41, N of Pingle Drive	6.8	20997	21827	21960
Middleton Stoney Rd, W of Kings End	6.8	10440	11106	11244
Middleton Stoney Rd, W of Howes Lane	6.8	7068	13355	14857
Howes Lane, N of Middleton Stoney Rd	6.8	11335	11648	11819
Howes Lane, E of Shakespeare Drive	6.8	11127	11928	12308
Lords Lane, E of Bucknell Road	6.8	12826	13381	14108
Lords Lane, W of Banbury Road	6.8	13991	14541	15312
Bucknell Road, N of Lords Lane	6.8	2545	2540	2477
Bucknell Road, S of Lords Lane	6.8	7102	6671	6120
Banbury Road, N of Lords Lane	6.8	15617	15699	16875
A4095 E of Banbury Road	6.8	20305	20715	21190
Banbury Road, S of A4095	6.8	7818	8079	8394
Buckingham Road, S of Skimmingdish Lane	6.8	9923	10125	10378
Queens Avenue, S of Bucknell Road	6.8	20412	19767	18994
A41 E of A41 Oxford Road	6.8	34190	35017	35148
A4421 Neunkirchen Way	6.8	13527	13681	13706
A41, E of London Road roundabout	6.8	27567	27218	27165
A4421, E of Skimmingdish Lane	6.8	18017	18287	18602
Shakespeare Drive, S of Howes Lane	6.8	1132	654	455
M40 J10 northbound off slip road	14.5	10218	10393	10469
Ardley Road (E of B430)	6.8	4064	3935	3895
M40 J10 southbound on slip road (from A43)	14.5	10179	9801	9647
B430 M40 over bridge	6.8	14132	14200	14190
A4095 N of Chesterton	6.8	2559	2689	2733
Shakespeare Drive, E of Middleton Stoney Road	6.8	9260	12001	12647

Link Name	%HDV	2024 Reference Case	2024 Reference Case Plus Himley Village	Interim Scenario
The Approach, W of Bucknell Road	6.8	3590	5308	5559
A41 East of Pioneer Road	6.8	27567	27218	27165
Bicester Road, E of A4421 junction	6.8	7625	7695	7707
A4421 N of Skimmingdish Lane	6.8	15951	15988	16033
Fringford Road, N of Caversfield	6.8	1335	1335	1335
B4100 Banbury Road, N of Bainton Road	6.8	12458	13851	15245
Ardley Road, N of Bucknell	6.8	4064	3990	2927
Middleton Road, W of Bucknell	6.8	1524	1913	1974
B4030 Middleton Stoney Road, NW of NWB	6.8	7068	7698	7842
Green Lane, W of Chesterton	6.8	5709	5635	5607
Wendlebury Road, E of M40	6.8	450	479	489
M40	14.5	62836	62150	61873

## Street Canyon Effect

- 1.11 Narrow streets with tall buildings on either side have the potential to create a confined space, which can interfere with the dispersion of traffic pollutants and may result in pollutant emissions accumulating in these streets. In an air quality model these narrow streets are described as street canyons.
- 1.12 ADMS-Roads includes a street canyon model to take account of the additional turbulent flow patterns occurring inside such a narrow street with relatively tall buildings on both sides. LAQM.TG(16) identifies a street canyon “as narrow streets where the height of buildings on both sides of the road is greater than the road width”. However, it also states “...broader streets may also be considered as street canyons where buildings result in reduced dispersion and elevated concentrations”.
- 1.13 Following a review of the road network to be included within the model, it was considered that modelled roads are relatively wide and the majority of existing buildings along these roads are not considered to be tall. The proposed buildings within the Site would not cause any new canyons to be created. Therefore, no street canyons were included within the model for any of the scenarios considered.

## Heating Plant

- 1.14 The proposed heating plant within the Development would comprise a combination of boilers; assumed for this assessment to comprise one gas-fired Combined Heat and Power (CHP) plant, four gas-fired boilers and a biomass boiler which would release emissions through flues at the top of proposed Energy Centre building. The stack parameters used within the ADMS-Roads model for the gas-fired CHP and boilers and biomass boiler, as modelled within the 2014 ES are presented in

Table A1.2 below. A stack height of 20m is now proposed. However, a stack height of 16m was modelled in the 2014 ES. This is considered to represent a worst case scenario.

Table A1.2: Stack Parameters for the Heating Plant

Unit	Number	Grid Reference	Flue Diameter (m)	Release Rate (m/s)	Release Height (m)	Release Temperature (deg °C)	Total Emissions (g/s)
200kW Boiler	1	456054, 222956	0.35	6	16	101	NOx: 0.004
1000kW Boiler	2		0.35	6	16	101	NOx: 0.044
2000kW Boiler	1		0.45	6	16	93	NOx: 0.044
550kW Biomass Boiler	1		0.4	6	16	190	NOx: 0.0011 PM <sub>10</sub> : 0.0004
2MW CHP	1		0.4	27.5	16	120	NOx: 0.36

Note: For gas-fired plants emission factors are not provided for PM<sub>10</sub> because gas-fired plants do not emit any significant level of particulates therefore PM<sub>10</sub> emission factors are only provided for the biomass boiler

## Road Traffic Emission Factors

- 1.15 ADMS-Roads version 4.0.1 (September 2014) has been used. This includes a number of UK emission factor datasets. The UK Emission Factor Toolkit (EFT) version 6.0.1 published July 2014 and included with the ADMS-Roads model has been used in the assessment. This allows comparison to the 2014 ES results.
- 1.16 The EFT uses traffic flow, %HDV, speed and road type information as input data and calculates outputs as total emissions as g/km and g/km/s for the selected pollutant(s).

## Background Pollutant Concentrations

- 1.17 The ADMS-Roads model requires background pollutant concentration data (i.e. concentrations due to the contribution of pollution sources not directly taken into account in the dispersion modelling), that correspond to the year of assessment, which is added to contributions from the modelled pollution sources.
- 1.18 Background monitoring is undertaken by CDC using two diffusion tubes, located at Villiers Road approximately 2.0km south east of the Site and at Tarnarisk Gardens approximately 2.7km northeast. Table A1.3 shows the annual mean NO<sub>2</sub> concentrations measured at these locations. More recent monitoring data is available from CDC, however 2013 is presented here as this was used in the 2014 ES.

Table A1.3: Annual Mean NO<sub>2</sub> Concentrations at the CDC Urban Background Diffusion Tubes (µg/m<sup>3</sup>)

Pollutant	2010	2011	2012	2013
Villiers Road	26.8	19.0	20.5	19.8
Tarnarisk Gardens	22.3	22.3	17.6	17.4



Source: CDC Progress Report 2014

- 1.19 Table A1.3 shows that at the annual mean NO<sub>2</sub> concentrations are below the annual mean objective of 40µg/m<sup>3</sup> at both diffusion tube locations between 2010 and 2013.
- 1.20 In addition to the urban background monitoring at the two diffusion tube locations, background concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are available from the Defra Air Quality Archive for 1x1km grid squares for assessment years between 2013 and 2030. Table A1.4 presents the Defra background concentrations for the year 2013 for the grid square the Site is located within (455500, 223500).

**Table A1.4: Defra Background Maps in 2013 for the Grid Squares at the Location of the Site**

Pollutant	Annual Mean Concentration (µg/m <sup>3</sup> )
NO <sub>x</sub>	18.3
NO <sub>2</sub>	13.9
PM <sub>10</sub>	18.0
PM <sub>2.5</sub>	11.9

- 1.21 The data in Table A1.3 and A1.4 shows that the 2013 monitored urban background NO<sub>2</sub> concentrations at the Villiers Road diffusion tube (19.8µg/m<sup>3</sup>) and Tarnarisk Gardens diffusion tube (17.4µg/m<sup>3</sup>) are higher than the total Defra background map (13.9µg/m<sup>3</sup>). For a conservative assessment, background annual mean NO<sub>2</sub> concentrations have been obtained from the Villiers Road diffusion tube, this was agreed with the EHO at CDC.
- 1.22 Background concentrations data used within the assessment are presented in Table A1.5.

**Table A1.5: Background Concentrations (µg/m<sup>3</sup>) Used within the Assessment**

Pollutant	Source	2013	2024
NO <sub>x</sub>	Defra background maps	18.3	11.6
NO <sub>2</sub>	CDC Diffusion Tube	19.8	12.3*
PM <sub>10</sub>	Defra background maps	16.2	14.7
PM <sub>2.5</sub>	Defra background maps	11.9	10.1

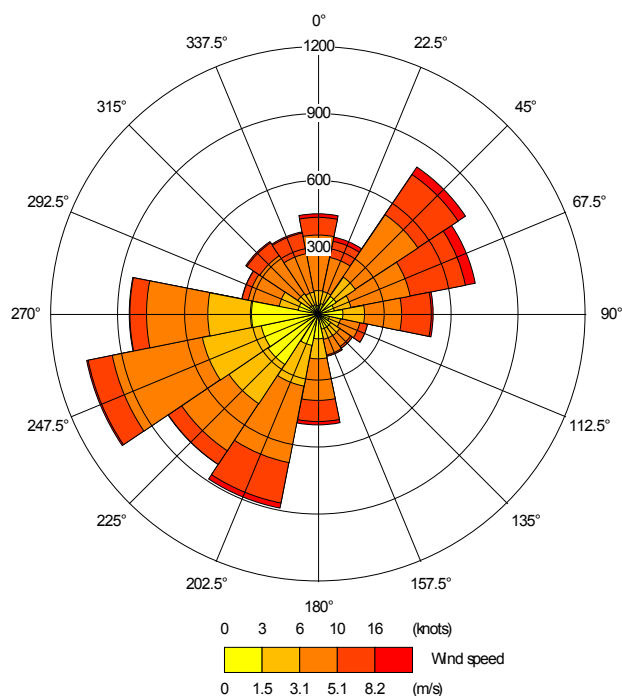
Notes: \* 2013 concentration multiplied by 0.621 (ratio obtained from the Defra background map)

## Meteorological Data

- 1.23 Local meteorological conditions strongly influence the dispersal of pollutants. Key meteorological data for dispersion modelling include hourly sequential data for wind direction, wind speed, temperature, precipitation and the extent of cloud cover for each hour of a given year. As a minimum ADMS-Roads requires wind speed, wind direction, and cloud cover.
- 1.24 Meteorological data to input into the model were obtained from the Brize Norton Meteorological Station, which is the closest to the Site and considered to be the most representative. The 2013 data were used to be consistent with the base traffic model verification year. It was also used for the 2024 scenarios for the air quality assessment. Figure A1.2 presents the wind-rose for the meteorological data.

- 1.25 Most dispersion models do not use meteorological data if they relate to calm winds conditions, as dispersion of air pollutants is more difficult to calculate in these circumstances. ADMS-Roads treats calm wind conditions by setting the minimum wind speed to 0.75 m/s. It is recommended in LAQM.TG(16) that the meteorological data file be tested within a dispersion model and the relevant output log file checked, to confirm the number of missing hours and calm hours that cannot be used by the dispersion model. This is important when considering predictions of high percentiles and the number of exceedances. LAQM.TG(16) recommends that meteorological data should only be used if the percentage of usable hours is greater than 85%. 2013 meteorological data from Brize Norton include 8,728 lines of usable hourly data out of the total 8,760 for the year, i.e. 99.6% of usable data. This is above the 85% threshold, and is therefore adequate for the dispersion modelling.

Figure A1.2: 2013 Wind Rose for the Brize Norton Meteorological Site



## Model Data Processing

- 1.26 The modelling results were processed to calculate the averaging periods required for comparison with the AQS objectives.
- 1.27 NO<sub>x</sub> emissions from combustion sources (including vehicle exhausts) comprise principally nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). The emitted nitric oxide reacts with oxidants in the air (mainly ozone (O<sub>3</sub>)) to form more NO<sub>2</sub>. Since only NO<sub>2</sub> is associated with effects on human health, the air quality standards for the protection of human health are based on NO<sub>2</sub> and not total NO<sub>x</sub> or NO.
- 1.28 ADMS-Roads was run without the Chemistry Reaction option to allow verification (see below). Therefore, a suitable NO<sub>x</sub>:NO<sub>2</sub> conversion needed to be applied to the modelled NO<sub>x</sub> concentrations.

There are a variety of different approaches to dealing with NO<sub>x</sub>:NO<sub>2</sub> relationships, a number of which are widely recognised as being acceptable. However, the current approach was developed for roadside sites, and is detailed within Technical Guidance LAQM.TG(16).

- 1.29 The LAQM Support website provides a spreadsheet calculator<sup>21</sup> to allow the calculation of NO<sub>2</sub> from NO<sub>x</sub> concentrations, accounting for the difference between primary emissions of NO<sub>x</sub> and background NO<sub>x</sub>, the concentration of O<sub>3</sub>, and the different proportions of primary NO<sub>2</sub> emissions, in different years. This approach is only applicable to annual mean concentrations.
- 1.30 LAQM.TG(16) paragraph 7.89 states that where stacks are included within models representing wider urban areas and where the annual mean concentrations are the main focus (as is the case in this assessment) then the spreadsheet calculator, described above, can be used for the conversion of total annual mean NO<sub>x</sub> to annual average NO<sub>2</sub> concentrations. This guidance was followed for the assessment NO<sub>x</sub> concentrations due to the heating plant emissions.
- 1.31 Research<sup>22</sup> undertaken in support of Local Air Quality Management Technical Guidance has indicated that the 1-hour mean AQS objective for NO<sub>2</sub> is unlikely to be exceeded at a roadside location where the annual-mean NO<sub>2</sub> concentration is less than 60µg/m<sup>3</sup>. The 1-hour mean objective is, therefore, not considered further within this assessment where the annual mean NO<sub>2</sub> concentration is predicted to be less than 60µg/m<sup>3</sup>.
- 1.32 In order to calculate the number of PM<sub>10</sub> 24-hour means exceeding 50µg/m<sup>3</sup> the relationship between the number of 24-hour mean exceedences and the annual mean PM<sub>10</sub> concentration from LAQM.TG (16)<sup>1</sup> was applied as follows:

$$\text{Number of Exceedances} = -18.5 + 0.00145 \times (\text{annual mean}^3) + \frac{206}{\text{annual mean}}$$

### Other Model Parameters

- 1.33 There are a number of other parameters that are used within the ADMS-Roads model which are described here for completeness and transparency:
- The model requires a surface roughness value to be inputted. A value of 1.0 was used, which is representative of the study area (Site and the meteorological station);
  - The model requires the Monin-Obukov length (a measure of the stability of the atmosphere) to be inputted. A value of 30m (representative of mixed urban) was used for the modelling;
  - The model requires the Road Type to be inputted. 'England [Urban]' was selected and used for the modelling.

### Model Verification

- 1.34 Model verification is the process of comparing monitored and modelled pollutant concentrations for the same year, at the same locations, and adjusting modelled concentrations if necessary to be consistent with monitoring data. This increases the robustness of modelling results.
- 1.35 Discrepancies between modelled and measured concentrations can arise for a number of reasons, for example:
- Traffic data uncertainties;
  - Background concentration estimates;
  - Meteorological data uncertainties;

<sup>21</sup> AEA, NO<sub>x</sub> to NO<sub>2</sub> Calculator, <http://laqm1.defra.gov.uk/review/tools/monitoring/calculator.php> Version 4.1, 19 June 2014

<sup>22</sup> AEA, 'Analysis of the relationship between annual-mean nitrogen dioxide concentration and exceedences of the 1-hour mean AQS Objective', 2008.

- Sources not explicitly included within the model (e.g. car parks and bus stops);
  - Overall model limitations (e.g. treatment of roughness and meteorological data, treatment of speeds); and
  - Uncertainty in monitoring data, particularly diffusion tubes.
- 1.36 Verification is the process by which uncertainties such as those described above are investigated and minimised. Disparities between modelling and monitoring results are likely to arise as result of a combination of all of these aspects.
- 1.37 The model verification from the 2014 ES has been used within this assessment and is presented below for completeness.

### Nitrogen Dioxide

- 1.38 The ADMS-Roads model was run to predict annual mean NO<sub>x</sub> concentrations at five roadside CDC diffusion tube locations.
- 1.39 As highlighted above, the NO<sub>2</sub> concentrations are a function of NO<sub>x</sub> concentrations. Therefore, the roadside NO<sub>x</sub> concentration predicted by the model was converted to NO<sub>2</sub> using the NO<sub>x</sub> to NO<sub>2</sub> calculator provided by Defra on the air quality archive. The background data for 2013, as presented in Table A1.5 were used.
- 1.40 The modelled and equivalent measured roadside NO<sub>2</sub> concentrations at the diffusion tube sites were compared as shown in Table A1.6 below.

**Table A1.6: 2013 Annual Mean NO<sub>2</sub> Modelled and Monitored Concentrations**

Site ID	Monitored Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Modelled Total Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )	% Difference (modelled – monitored)
DT3 Kings End South	48.5	32.0	-34.1
DT4 Kings End North	35.8	26.5	-26.0
DT5 Field Street	38.6	35.0	-9.3
DT6 North Street	42.7	34.2	-19.9
DT7 Queens Avenue	41.0	30.5	-25.7

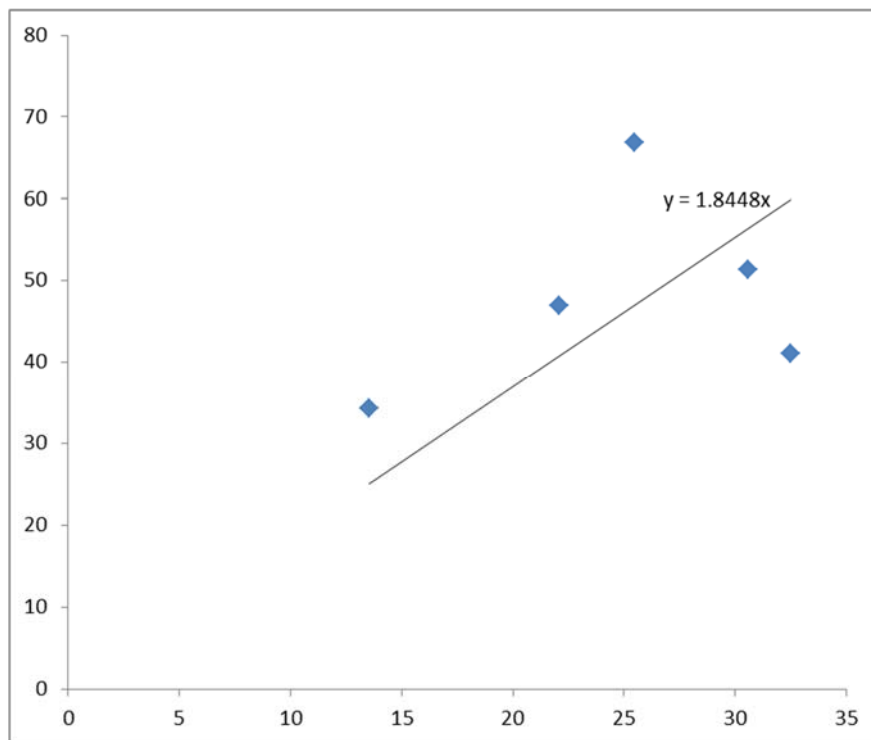
- 1.41 Table A1.6 indicates that the model under predicts annual mean NO<sub>2</sub> concentrations at the five diffusion tube locations. Technical Guidance LAQM.TG(16) suggests that where there is disparity between modelled and monitored results, particularly if this is by more than 25%, appropriate adjustment should be undertaken.
- 1.42 Box 4.4 of LAQM.TG(16) provides guidance on approaching model verification and adjustment. This requires the roadside NO<sub>x</sub> contribution to be calculated. In addition, monitored NO<sub>x</sub> concentrations are required, which have been calculated from the annual mean NO<sub>2</sub> concentration at the diffusion tube sites using the NO<sub>x</sub> to NO<sub>2</sub> spreadsheet calculator as described above. The verification process applied here, shown in Table A1.7, has been based on Box 4.4.

Table A1.7: Model Verification Result for Adjustment NO<sub>x</sub> Emissions (µg/m<sup>3</sup>)

Site ID	Monitored NO <sub>2</sub>	Monitored NO <sub>x</sub>	Monitored Road NO <sub>2</sub>	Monitored Road NO <sub>x</sub>	Modelled Road NO <sub>x</sub>	Ratio of Monitored Road Contribution NO <sub>x</sub> /Modelled Road Contribution NO <sub>x</sub>
DT3	48.5	85.4	28.7	66.9	25.5	2.6
DT4	35.8	52.8	16.0	34.3	13.6	2.5
DT5	38.6	59.5	18.8	41.0	32.5	1.3
DT6	42.7	69.8	22.9	51.3	30.6	1.7
DT7	41.0	65.5	21.2	47.0	22.1	2.1
<b>Adjustment Factor</b>						<b>1.8448</b>

1.43 Figure A1.3 shows the mathematical relationship between modelled and monitored roadside NO<sub>x</sub> (i.e. total NO<sub>x</sub> minus background NO<sub>x</sub>) in a scatter graph (data taken from Table A1.7), with a trendline passing through zero and its derived equation.

Figure A1.3: Unadjusted Modelled versus Monitored Annual Mean Roadside NO<sub>x</sub> at the Monitoring Sites (µg/m<sup>3</sup>)



1.44 Consequently, in Table A1.8 the adjustment factor (1.8448) obtained from Figure A1.3 is applied to the modelled NO<sub>x</sub> Roadside concentrations to obtain improved agreement between monitored and modelled annual mean NO<sub>x</sub>. This has been converted to annual mean NO<sub>2</sub> using the NO<sub>x</sub>:NO<sub>2</sub> spreadsheet calculator.

Table A1.8: Final Adjusted Annual Average NO<sub>2</sub> Concentrations Compared to Monitored Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>)

Site ID	Adjusted Modelled Road NO <sub>x</sub>	Adjusted Modelled Total NO <sub>x</sub>	Modelled Total NO <sub>2</sub>	Monitored Total NO <sub>2</sub>	% Difference
DT3	47.0	65.5	41.0	48.5	-15.5
DT4	25.0	43.5	31.8	35.8	-11.3
DT5	59.9	78.4	46.0	38.6	19.1
DT6	56.5	75.0	44.7	42.7	4.6
DT7	40.8	59.3	38.5	41.0	-6.1

- 1.45 The data in Table A1.8 indicates an improved agreement between monitored and modelled annual mean NO<sub>2</sub> results compared to the unadjusted/unverified model.
- 1.46 The NO<sub>x</sub> adjustment process was subsequently applied to all of roadside NO<sub>x</sub> modelling for all the 2024 scenarios, at the specific receptors locations assessed, before heating plant concentrations were added and before the predicted concentrations were converted to NO<sub>2</sub>.

### Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

- 1.47 PM<sub>10</sub> and PM<sub>2.5</sub> monitoring data is not available for the Site area. Therefore, the roadside modelled NO<sub>x</sub> adjustment factor of 1.8448 was applied to all the roadside PM<sub>10</sub> and PM<sub>2.5</sub> modelling results, before adding on the background concentrations, for the study area for all of the 2024 scenarios, at the specific receptors locations assessed, and before the number of daily exceedences was calculated.

### Verification Summary

- 1.48 Any atmospheric dispersion model study will always have a degree of inaccuracy due to a variety of factors. These include uncertainties in traffic emissions data, in the differences between available meteorological data and the specific microclimate at each receptor location, simplifications made in the model algorithms that describe the atmospheric dispersion and chemical processes. There will also be uncertainty in the comparison of predicted concentrations with monitored data, given the potential for errors and uncertainty in sampling methodology (technique, location, handling, and analysis) as well as processing of any monitoring data.
- 1.49 Whilst systematic under or over prediction can be taken in to account through the model verification / adjustment process, random errors will inevitably occur and a level of uncertainty will still exist in corrected / adjusted data.
- 1.50 Model uncertainties arise because of limited scientific knowledge, limited ability to assess the uncertainty of model inputs, for example, emissions from vehicles, poor understanding of the interaction between model and / or emissions inventory parameters, sampling and measurement error associated with monitoring sites and whether the model itself completely describes all the necessary atmospheric processes.
- 1.51 Overall, it is concluded that with the adjustment factors applied to the ADMS-Roads model, it is performing well and modelled results are considered to be suitable to determine the effects of the Development on local air quality.

## NO<sub>2</sub> Sensitivity Test

1.52 Whilst this air quality assessment was based on current guidance, i.e., with reduced emission rates and background concentration for the year of 2024, to take into account the trend that NO<sub>x</sub> and NO<sub>2</sub> concentrations are not declining as expected, a sensitivity test has been carried out, on the basis of no future reductions in road traffic emission rates and background concentrations (i.e. considering the potential effect of the Himley Village Development against the 2013 baseline, conditions within the 2014 ES). Modelled results of this additional scenario are presented in Table A1.9.

Table A1.9: Results of the ADMS-Roads Modelling at Sensitive Receptors, Assuming No Improvement in NO<sub>x</sub> and NO<sub>2</sub> for 2024

Receptor ID	Reference case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
1	23.6	24.7	1.1	23.5	-0.1
2	24.3	25.4	1.1	25.1	0.8
3	23.9	24.6	0.8	24.5	0.7
4	26.8	28.7	1.9	27.1	0.3
5	24.2	25.3	1.1	24.5	0.4
6	23.8	28.4	4.7	24.0	0.2
7	26.9	29.2	2.3	28.3	1.4
8	21.9	22.7	0.8	22.2	0.3
9	22.3	23.2	1.0	22.7	0.4
10	27.6	29.5	1.8	27.8	0.2
11	25.3	26.8	1.4	25.6	0.2
12	29.4	32.0	2.7	29.8	0.5
13	30.1	32.6	2.5	31.1	1.0
14	25.6	27.3	1.8	26.5	0.9
15	25.2	27.1	2.0	26.5	1.3
16	27.3	29.4	2.1	28.4	1.2
17	30.8	33.5	2.7	32.4	1.5
18	21.9	23.1	1.2	22.5	0.6
19	29.0	30.5	1.5	29.9	1.0
20	28.2	30.0	1.8	29.6	1.4
21	28.4	30.2	1.8	31.6	3.2
22	26.7	28.1	1.4	27.2	0.5
23	<b>44.0</b>	<b>47.4</b>	3.4	<b>42.9</b>	-1.1
24	23.0	24.0	0.9	23.0	0.0
25	<b>53.1</b>	<b>57.5</b>	4.5	<b>51.6</b>	-1.5

Receptor ID	Reference case	2024 Reference Case Plus Himley Village	2024 Reference Case Plus Himley Village Change	2024 Interim Scenario	2024 Interim Scenario Change
26	26.1	25.4	-0.8	26.2	0.1
27	<b>43.5</b>	<b>47.0</b>	3.4	<b>42.0</b>	-1.5
28	38.5	<b>41.2</b>	2.7	37.5	-0.9
29	<b>42.5</b>	<b>45.7</b>	3.2	<b>41.4</b>	-1.1
30	33.9	36.7	2.8	34.1	0.2
31	25.3	27.5	2.3	25.5	0.2
32	25.2	26.6	1.4	25.4	0.2
33	25.4	27.1	1.7	26.6	1.2
34		25.3		24.9	
35		24.7		24.0	

Note: Exceedences of the AQS objective highlighted in **Bold**

The 2024 Reference Case Plus Himley Village Change and 2024 Interim Scenario Change is calculated against the 2024 Reference Case

For accuracy, the changes arising from the Development have been calculated using the exact output from the ADMS-Road model rather than the rounded numbers within Table A1.9.



## Appendix 4.1 Traffic Noise Assessment 2024 Interim Scenario

The significance criteria for Short-Term (interim year with and without Development) assessment are presented in Table A.4.1. The significance criteria have been derived from advice contained within Design Manual for Road and Bridges (DMRB), Volume 11, Part 3, Section 7, Noise (2011).

DMRB details that a change in road traffic noise of 1dB  $L_{A10,18h}$  in the short term (e.g. when a project is opened) is the smallest that is considered perceptible. In the long-term (typically 15 years after project opening), a 3dB  $L_{A10,18h}$  change is considered perceptible.

Table A.4.1: Change in Noise Level and Significance of Effect

Change in Noise Level Short Term Assessment	Significance of Effect
0.0 – 0.9	Insignificant
1.0 – 2.9	Minor
3.0 – 4.9	Moderate
≥5	Substantial

Table A.4.3 presents the results for the interim year 2024 based on Scenario B '2024 Interim Scenario Flows' and Table 10.1.2 presents the results for the interim year 2024 based on Scenario A '2024 Reference Case Plus Himley Village Flows'.

Table A.4.2: Development Traffic Noise Assessment Interim Year 2024 (Short-Term Assessment) Scenario A

Himley Village		Assessment of $L_{A10}$ 18-hour Basic Noise Levels at 10m from Road									
Road		2024 Reference Case			2024 Reference Case Plus Himley Village Flows			% Flow Change	No Development	With Development	Change
		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
1	A41 northbound, N of M40 J9	7	97	17394	7	97	17650	1.5	75.0	75.1	0.1
2	A41 Oxford Rd, S of A41 junction	7	97	15595	7	97	15888	1.9	74.5	74.6	0.1
3	Vendee Drive, W of A41 junction	7	97	42295	7	97	43125	2.0	78.9	79.0	0.1
4	A41, N of Pingle Drive	7	97	15942	7	97	16828	5.6	74.6	74.9	0.2
5	Middleton Stoney Rd, W of Kings End	7	81	22190	7	81	23068	4.0	74.7	74.9	0.2
6	Middleton Stoney Rd, W of Kings End	7	81	11034	7	81	11737	6.4	71.7	71.9	0.3
7	Middleton Stoney Rd, W of Howes Lane	7	81	7470	7	81	14114	88.9	70.0	72.7	2.8
8	Howes Lane, N of Middleton Stoney Rd	7	81	11980	7	81	12310	2.8	72.0	72.1	0.1
9	Howes Lane, E of Shakespeare Drive	7	81	11760	7	81	12606	7.2	71.9	72.2	0.3
10	Lords Lane, E of Bucknell Road	7	81	13555	7	81	14141	4.3	72.5	72.7	0.2
11	Lords Lane, W of Banbury Road	7	81	14787	7	81	15368	3.9	72.9	73.1	0.2
12	Bucknell Road, N of Lords Lane	7	48	2689	7	48	2685	-0.2	61.7	61.7	0.0
13	Bucknell Road, S of Lords Lane	7	48	7506	7	48	7050	-6.1	66.2	65.9	-0.3
14	Banbury Road, N of Lords Lane	7	48	16505	7	48	16591	0.5	69.6	69.6	0.0
15	A4095 E of Banbury Road	7	81	21459	7	81	21892	2.0	74.5	74.6	0.1
16	Banbury Road, S of A4095	7	48	8263	7	48	8538	3.3	66.6	66.7	0.1

Himley Village		Assessment of L <sub>A10</sub> 18-hour Basic Noise Levels at 10m from Road									
Road		2024 Reference Case			2024 Reference Case Plus Himley Village Flows			% Flow Change	No Development	With Development	Change
		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
17	Buckingham Road, S of Skimmingdish Lane	7	48	10487	7	48	10701	2.0	67.6	67.7	0.1
18	Queens Avenue, S of Bucknell Road	7	48	21572	7	48	20890	-3.2	70.8	70.6	-0.1
19	A41 E of A41 Oxford Road	7	48	36134	7	48	37007	2.4	73.0	73.1	0.1
20	A4421 Neunkirchen Way	7	48	14296	7	48	14458	1.1	69.0	69.0	0.0
21	A41, E of London Road roundabout	7	48	29134	7	48	28765	-1.3	72.1	72.0	-0.1
22	A4421, E of Skimmingdish Lane	7	48	19041	7	48	19327	1.5	70.2	70.3	0.1
23	Shakespeare Drive, S of Howes Lane	7	48	1196	7	48	691	-42.2	58.2	55.8	-2.4
24	M40 J10 northbound off slip road	15	97	10799	15	97	10984	1.7	74.1	74.1	0.1
25	Ardley Road (E of B430)	7	97	4295	7	97	4159	-3.2	68.9	68.8	-0.1
26	M40 J10 southbound on slip road (from A43)	15	97	10758	15	97	10358	-3.7	74.1	73.9	-0.2
27	B430 M40 over bridge	7	97	14935	7	97	15007	0.5	74.4	74.4	0.0
28	A4095 N of Chesterton	7	81	2705	7	81	2842	5.1	65.5	65.8	0.2
29	Shakespeare Drive, E of Middleton Stoney Road	7	48	9786	7	48	12683	29.6	67.3	68.4	1.1
30	The Approach, W of Bucknell Road	7	48	3794	7	48	5610	47.9	63.2	64.9	1.7
31	A41 East of Pioneer Road	7	48	29134	7	48	28765	-1.3	72.1	72.0	-0.1
32	Bicester Road, E of A4421 junction	7	48	8058	7	48	8133	0.9	66.5	66.5	0.0
33	A4421 N of Skimmingdish Lane	7	48	16858	7	48	16897	0.2	69.7	69.7	0.0

Himley Village		Assessment of L <sub>A10</sub> 18-hour Basic Noise Levels at 10m from Road									
Road	2024 Reference Case			2024 Reference Case Plus Himley Village Flows			% Flow Change	No Development	With Development	Change	
	% HGV	Speed kph	Flow	% HGV	Speed kph	Flow					
34	Fringford Road, N of Caversfield	7	48	1411	7	48	1411	0.0	58.9	58.9	0.0
35	B4100 Banbury Road, N of Bainton Road	7	97	13166	7	97	14639	11.2	73.8	74.3	0.5
36	Ardley Road, N of Bucknell	7	97	4295	7	97	4217	-1.8	68.9	68.9	-0.1
37	Middleton Road, W of Bucknell	7	97	1611	7	97	2021	25.5	64.7	65.7	1.0
38	B4030 Middleton Stoney Road, NW of NWB	7	97	7470	7	97	8136	8.9	71.3	71.7	0.4
39	Green Lane, W of Chesterton	7	97	6033	7	97	5956	-1.3	70.4	70.4	-0.1
40	Wendlebury Road, E of M40	7	97	476	7	97	506	6.5	59.4	59.7	0.3
41	M40 northbound (mainline only), S of J9	15	113	77269	15	113	77269	-0.3	81.2	81.2	0.0
42	M40 southbound (mainline only), S of J9	15	113	77269	15	113	77269	-0.5	81.3	81.3	0.0
43	M40 northbound (mainline only), S of J10 / N of J9	15	113	77269	15	113	77269	-1.1	83.2	83.1	0.0
44	M40 southbound (mainline only), S of J10 / N of J9	15	113	77269	15	113	77269	-0.5	82.9	82.9	0.0
45	M40 northbound (mainline only), N of J10	15	113	57700	15	113	56757	-1.6	82.5	82.5	-0.1
46	M40 southbound (mainline only), N of J10	15	113	51953	15	113	52055	0.2	82.1	82.1	0.0

Table A.4.3: Development Traffic Noise Assessment Interim Year 2024 (Short-Term Assessment) Scenario B

Himley Village		Assessment of $L_{A10}$ 18-hour Basic Noise Levels at 10m from Road									
Road		2024 Reference Case			2024 Interim Scenario			% Flow Change	No Development	With Development	Change
		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
1	A41 northbound, N of M40 J9	7	97	17394	7	97	17747	2.0	75.0	75.1	0.1
2	A41 Oxford Rd, S of A41 junction	7	97	15595	7	97	15973	2.4	74.5	74.6	0.1
3	Vendee Drive, W of A41 junction	7	97	42295	7	97	43256	2.3	78.9	79.0	0.1
4	A41, N of Pingle Drive	7	97	15942	7	97	17123	7.4	74.6	74.9	0.3
5	Middleton Stoney Rd, W of Kings End	7	81	22190	7	81	23208	4.6	74.7	74.9	0.2
6	Middleton Stoney Rd, W of Kings End	7	81	11034	7	81	11883	7.7	71.7	72.0	0.3
7	Middleton Stoney Rd, W of Howes Lane	7	81	7470	7	81	15702	110.2	70.0	73.2	3.2
8	Howes Lane, N of Middleton Stoney Rd	7	81	11980	7	81	12491	4.3	72.0	72.2	0.2
9	Howes Lane, E of Shakespeare Drive	7	81	11760	7	81	13007	10.6	71.9	72.4	0.4
10	Lords Lane, E of Bucknell Road	7	81	13555	7	81	14910	10.0	72.5	73.0	0.4
11	Lords Lane, W of Banbury Road	7	81	14787	7	81	16183	9.4	72.9	73.3	0.4
12	Bucknell Road, N of Lords Lane	7	48	2689	7	48	2618	-2.7	61.7	61.6	-0.1
13	Bucknell Road, S of Lords Lane	7	48	7506	7	48	6468	-13.8	66.2	65.5	-0.6
14	Banbury Road, N of Lords Lane	7	48	16505	7	48	17834	8.1	69.6	69.9	0.3
15	A4095 E of Banbury Road	7	81	21459	7	81	22395	4.4	74.5	74.7	0.2
16	Banbury Road, S of A4095	7	48	8263	7	48	8871	7.4	66.6	66.9	0.3
17	Buckingham Road, S of Skimmingdish Lane	7	48	10487	7	48	10967	4.6	67.6	67.8	0.2
18	Queens Avenue, S of Bucknell Road	7	48	21572	7	48	20074	-6.9	70.8	70.4	-0.3
19	A41 E of A41 Oxford Road	7	48	36134	7	48	37146	2.8	73.0	73.1	0.1
20	A4421 Neunkirchen Way	7	48	14296	7	48	14485	1.3	69.0	69.0	0.1

Himley Village		Assessment of L <sub>A10</sub> 18-hour Basic Noise Levels at 10m from Road									
Road		2024 Reference Case			2024 Interim Scenario			% Flow Change	No Development	With Development	Change
		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
21	A41, E of London Road roundabout	7	48	29134	7	48	28709	-1.5	72.1	72.0	-0.1
22	A4421, E of Skimmingdish Lane	7	48	19041	7	48	19659	3.2	70.2	70.3	0.1
23	Shakespeare Drive, S of Howes Lane	7	48	1196	7	48	481	-59.8	58.2	54.2	-4.0
24	M40 J10 northbound off slip road	15	97	10799	15	97	11065	2.5	74.1	74.2	0.1
25	Ardley Road (E of B430)	7	97	4295	7	97	4116	-4.2	68.9	68.8	-0.2
26	M40 J10 southbound on slip road (from A43)	15	97	10758	15	97	10195	-5.2	74.1	73.8	-0.2
27	B430 M40 over bridge	7	97	14935	7	97	14996	0.4	74.4	74.4	0.0
28	A4095 N of Chesterton	7	81	2705	7	81	2889	6.8	65.5	65.8	0.3
29	Shakespeare Drive, E of Middleton Stoney Road	7	48	9786	7	48	13365	36.6	67.3	68.7	1.4
30	The Approach, W of Bucknell Road	7	48	3794	7	48	5875	54.9	63.2	65.1	1.9
31	A41 East of Pioneer Road	7	48	29134	7	48	28709	-1.5	72.1	72.0	-0.1
32	Bicester Road, E of A4421 junction	7	48	8058	7	48	8145	1.1	66.5	66.5	0.0
33	A4421 N of Skimmingdish Lane	7	48	16858	7	48	16944	0.5	69.7	69.7	0.0
34	Fringford Road, N of Caversfield	7	48	1411	7	48	1411	0.0	58.9	58.9	0.0
35	B4100 Banbury Road, N of Bainton Road	7	97	13166	7	97	16111	22.4	73.8	74.7	0.9
36	Ardley Road, N of Bucknell	7	97	4295	7	97	3093	-28.0	68.9	67.5	-1.4
37	Middleton Road, W of Bucknell	7	97	1611	7	97	2086	29.5	64.7	65.8	1.1
38	B4030 Middleton Stoney Road, NW of NWB	7	97	7470	7	97	8288	11.0	71.3	71.8	0.5
39	Green Lane, W of Chesterton	7	97	6033	7	97	5926	-1.8	70.4	70.3	-0.1
40	Wendlebury Road, E of M40	7	97	476	7	97	516	8.6	59.4	59.7	0.4

Himley Village		Assessment of L <sub>A10</sub> 18-hour Basic Noise Levels at 10m from Road									
		2024 Reference Case			2024 Interim Scenario			% Flow Change	No Development	With Development	Change
Road		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
41	M40 northbound (mainline only), S of J9	15	113	77269	15	113	77269	-0.5	81.2	81.2	0.0
42	M40 southbound (mainline only), S of J9	15	113	77269	15	113	77269	-0.8	81.3	81.3	0.0
43	M40 northbound (mainline only), S of J10 / N of J9	15	113	77269	15	113	77269	-1.5	83.2	83.1	-0.1
44	M40 southbound (mainline only), S of J10 / N of J9	15	113	77269	15	113	77269	-0.7	82.9	82.9	0.0
45	M40 northbound (mainline only), N of J10	15	113	57700	15	113	56371	-2.3	82.5	82.4	-0.1
46	M40 southbound (mainline only), N of J10	15	113	51953	15	113	52096	0.3	82.1	82.1	0.0

# UK and Ireland Office Locations

