

Appendix 6.2 – Model Input Parameters

Table 6.2A: Summary of ADMS-Roads Input Parameters

Parameter	Model Verification	Impact Assessment and Exposure
ADMS-Roads Model Version	5.0	5.0
Vehicle Emission Factors	EFT v13 for 2023	EFT v13 for 2023
Meteorological Data	Hourly sequential data from Brize Norton (2023)	Hourly sequential data from Brize Norton (2023)
Surface Roughness	0.5m	0.5m
Monin-Obukhov Length	30m	30m

Figure 6.2A: Modelled Road Links

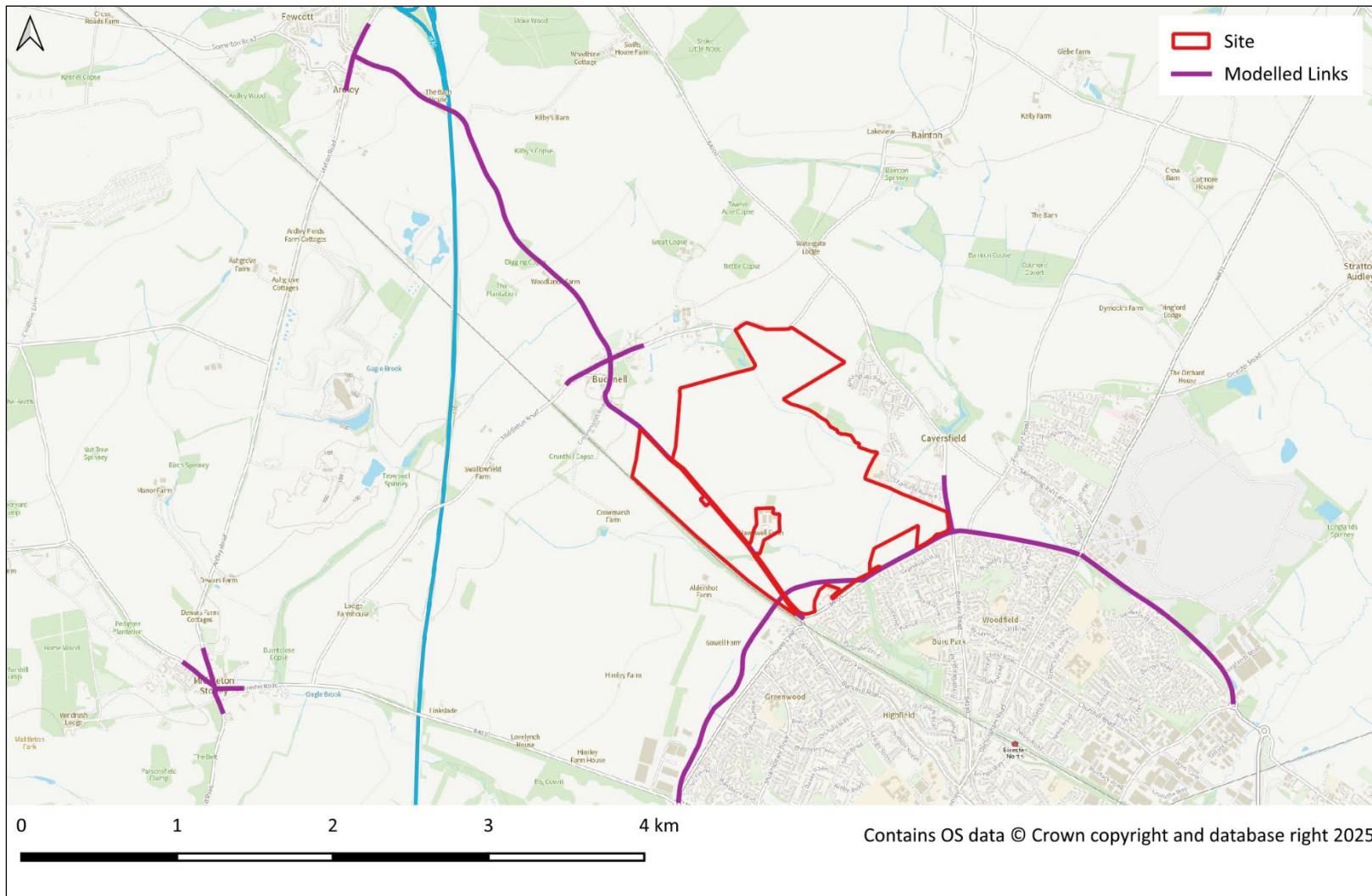


Table 6.2B: Summary of 2023 Traffic Data for Model Verification

Road Link	AADT (a)	HGV	Average Speed (kph)(g)
B430 Station Road (Ardley)	8,600	4.7% (b)	48
Link 25 (Bucknall Road)	2,600	4.7% (c)	16
B430 Oxford Road	8,303	3.9% (d)	24
B4030 Bicester Road	7,000	4.4% (e)	24
B4030 Heyford Road	6,251	4.4% (e)	24
B430 Ardley Road (M Stoney)	8,600	4.7% (b)	24
B4100 London Road	7,700	4.5% (f)	32
(a) Oxfordshire County Council 2023 automatic traffic counts (ATC) (b) DfT ATC 945834 for 2019 (c) No data, therefore assumed the same as B430 (d) DfT ATC 916464 for 2009 (e) DfT ATC 945856 for 2008 (f) DfT ATC 945866 for 2008 (g) Traffic speeds based on speed limit with lower speeds assumed at junctions to account for queueing/ slowing traffic.			

Table 6.2C: Summary of 2031 Traffic Data for Operational Traffic Impact Assessment

Road Link	Do Nothing		Do Something		Average Speed (kph)
	AADT	HGV	AADT	HGV	
Howes Lane, N of Middleton Stoney Rd	13,395	4.9%	15,538	4.9%	32
Lords Lane, E of Bucknell Road	12,813	4.3%	13,732	4.3%	32
Lords Lane, W of Banbury Road	12,713	4.3%	15,729	4.3%	72
Bucknell Road, N of Lords Lane	1,523	5.8%	3,089	5.8%	64 24 (Bucknell)
Banbury Road, N of Lords Lane	1,639	4.9%	1,679	4.9%	64
A4095 E of Banbury Road	20,706	5.8%	21,533	5.8%	72
A4421, E of Skimmingdish Lane	23,988	5.8%	25,015	5.8%	72
Ardley Road (E of B430)	5,255	5.8%	6,575	5.8%	16
Ardley Road, N of Bucknell	5,254	5.8%	6,575	5.8%	24
Middleton Road, W of Bucknell	3,276	5.8%	3,864	5.8%	32
B430 Station Road (Ardley)	11,253	4.7%	12,573	4.7%	48
Bainton Road	3,276	5.8%	3,864	5.8%	32

Appendix 6.3– Model Verification

Most nitrogen dioxide (NO₂) is produced in the atmosphere by the reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions. Verification of concentrations predicted by the ADMS-Roads model has followed the methodology presented in LAQM.TG22.

Modelled 2023 annual mean concentrations of NO₂ have been compared with the concentrations measured by the following roadside diffusion tubes:

- 20 – Ardley
- 21 – Middleton Stoney
- 34 – Bicester London Road

The measured NO₂ concentration has been converted into an equivalent measured Road-NO_x (i.e., the component of total NO_x coming from road traffic) concentrations using the Defra NO_x from NO₂ calculator (v8.1). The conversion has used the calibrated mapped background NO₂ concentration for each location (see Table 5.5 of the ES Addendum).

The measured Road-NO_x concentrations are compared with the modelled Road-NO_x concentrations in Figure 5.5A.

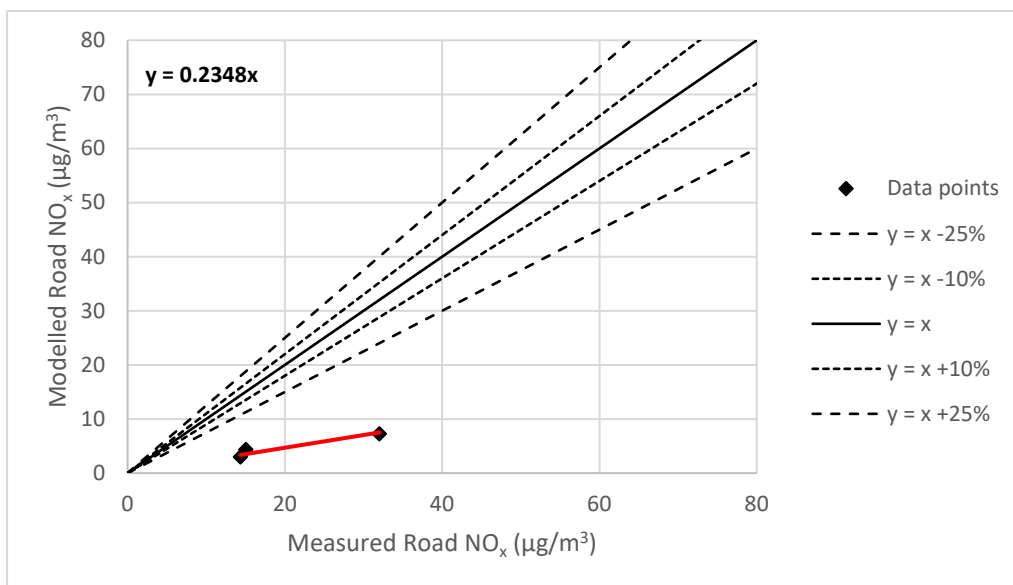


Figure 6.3A: Comparison of Measured Road-NO_x Concentrations with Modelled Road-NO_x Concentrations

A primary adjustment factor is determined as the ratio between the measured road-NO_x contribution and the modelled Road-NO_x contribution, forced through zero ($1/0.2348 = 4.26$). This factor is then applied to the modelled Road-NO_x concentration for each monitoring location to provide an adjusted modelled Road-NO_x concentration. The equivalent Road-NO₂ concentration is then determined using the Defra NO_x from NO₂ calculator and added to the background NO₂ concentration, for comparison with the measured NO₂ concentration (see Figure 5.5B).

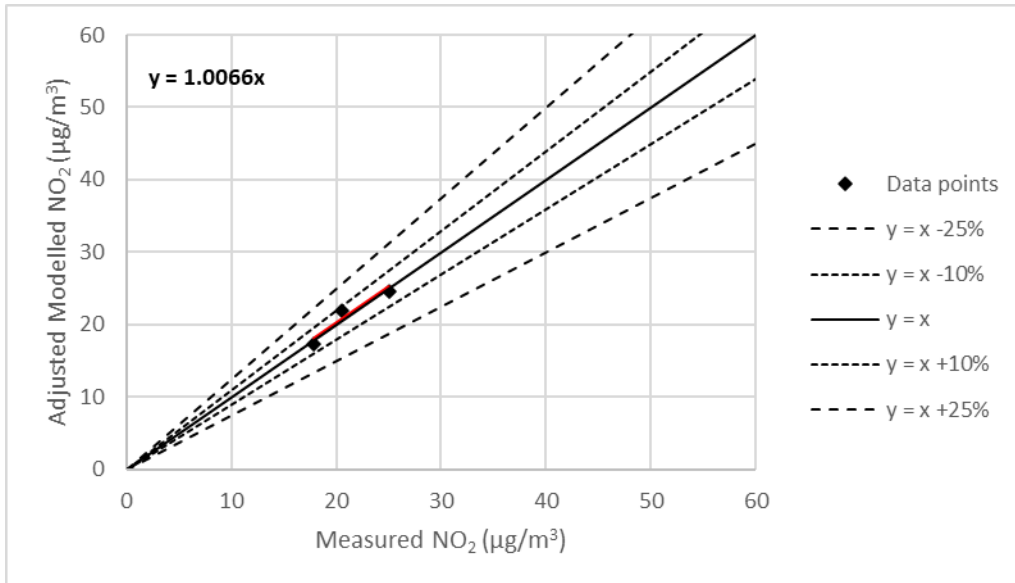


Figure 6.3B: Comparison of Measured NO₂ Concentrations with the Adjusted Modelled NO₂ Concentrations

The average performance of the model can be expressed as the Root Mean Square Error (RMSE), which in accordance with LAQM.TG22 should ideally be less than 10% and not more than 25% of the relevant air quality standard (in this case, the annual mean NO₂ objective of 40 µg/m³). The RMSE for the comparison of the adjusted modelled and measured NO₂ concentrations is 0.94 µg/m³, 2.3% of the air quality objective and therefore the modelled concentrations with primary adjustment are considered to provide an acceptable estimate of local air quality.

In the absence of a particulate monitoring site for verification purposes, the derived primary adjustment factor has also been applied to the modelled Road-PM₁₀ and Road- PM_{2.5} concentrations, in accordance with LAQM.TG22.

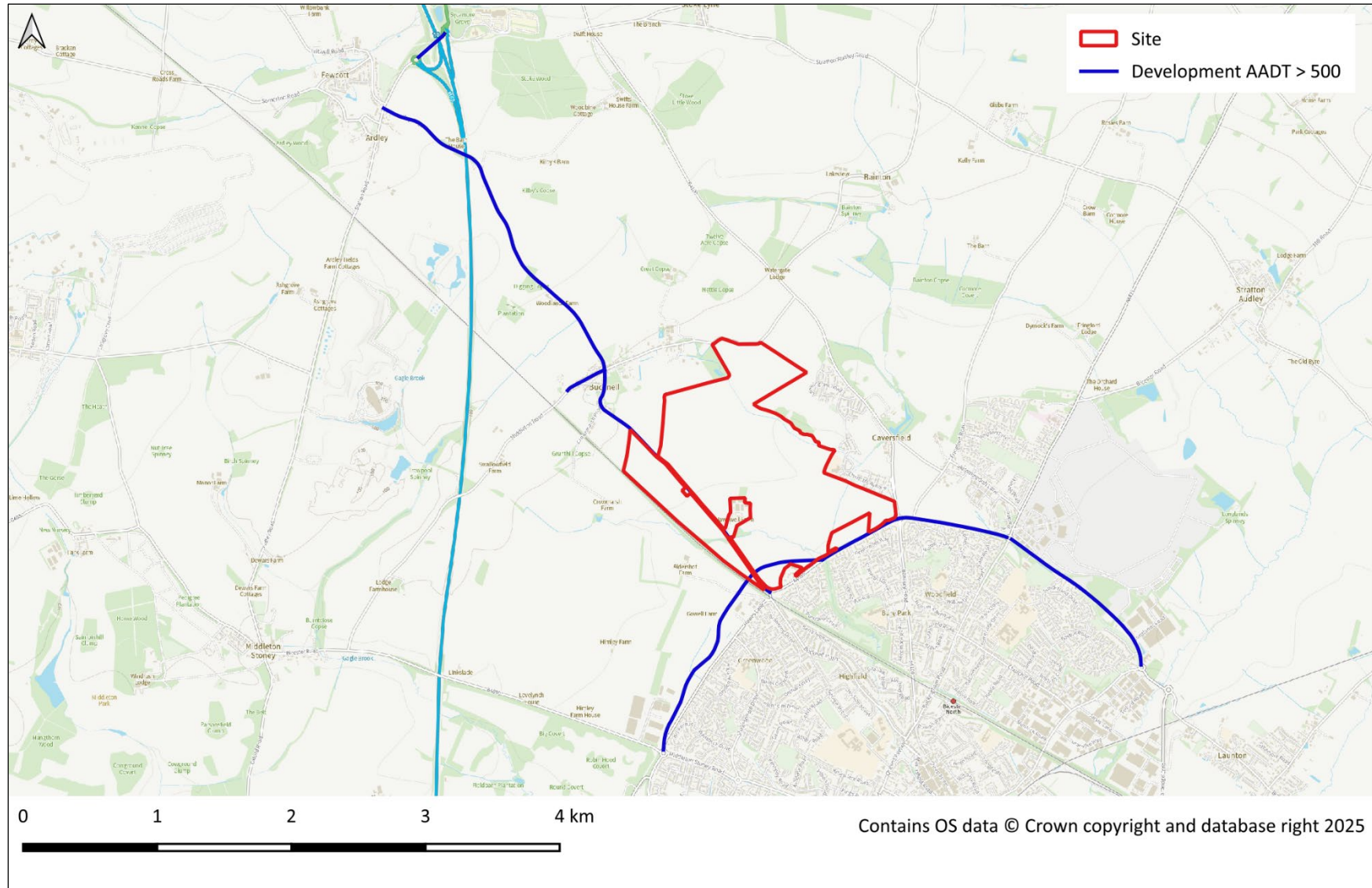
Appendix 6.4 – Traffic Data

Table 6.4A: Summary of 2031 Baseline and Development Traffic Data

Link ID	Road Link	Do Nothing		Do Something		Change	
		AADT	HGV (%)	AADT	HGV (%)	LGV	HGV
1	A41 northbound, N of M40 J9	11155	681	11079	677	-77	-5
2	A41 southbound, N of M40 J9	8683	530	8705	532	22	1
3	A41 Oxford Rd, S of A41 junction	28969	1769	29150	1780	181	11
4	Vendee Drive, W of A41 junction	10633	649	10983	671	351	21
5	A41, N of Pingle Drive	26254	1604	26263	1604	9	1
6	Middleton Stoney Rd, W of Kings End	14370	878	14474	884	105	6
7	Middleton Stoney Rd, W of Howes Lane	16311	1253	16241	1247	-70	-5
8	Howes Lane, N of Middleton Stoney Rd	12737	658	14775	764	2038	105
9	Howes Lane, E of Shakespeare Drive	-1219	-74	1109	68	2328	142
10	Lords Lane, E of Bucknell Road	12258	555	13137	595	879	40
11	Lords Lane, W of Banbury Road	12162	551	15048	681	2885	131
12	Bucknell Road, N of Lords Lane	1435	88	2912	178	1476	90
13	Bucknell Road, S of Howes Lane	1558	81	1597	83	38	2
14	Banbury Road, N of Lords Lane	14528	1295	14969	1334	441	39
15	A4095 E of Banbury Road	19514	1192	20294	1239	780	48
16	Banbury Road, S of A4095	7436	337	7343	332	-93	-4
17	Buckingham Road, S of Skimmingdish Lane	8350	510	8343	510	-7	0

18	Queens Avenue, S of Bucknell Road	20062	949	19803	936	-260	-12
19	A41 E of A41 Oxford Road	26343	2392	26315	2389	-28	-3
20	A4421 Neunkirchen Way	11660	712	11689	714	28	2
21	A41, E of London Road roundabout	18171	1324	18209	1327	38	3
22	A4421, E of Skimmingdish Lane	22608	1381	23575	1440	968	59
23	Shakespeare Drive, S of Howes Lane	1710	81	1822	86	113	5
24	M40 J10 northbound off slip road	13668	2760	13664	2759	-3	-1
25	Ardley Road (E of B430)	4952	302	6196	378	1244	76
26	M40 J10 southbound on slip road (from A43)	15309	3827	15387	3847	78	20
27	B430 M40 over bridge	25403	1552	25903	1582	500	31
28	A4095 N of Chesterton	7125	435	7100	434	-25	-2
29	Shakespeare Drive, E of Middleton	8459	400	8549	404	91	4
30	The Approach, W of Bucknell Road	3628	172	3791	179	163	8
31	A41 East of Pioneer Road	24212	1764	24234	1766	22	2
32	Bicester Road, E of A4421 junction	7886	482	7946	485	60	4
33	A4421 N of Skimmingdish Lane	18491	1201	18880	1227	389	25
34	Fringford Road, N of Caversfield	2746	168	2281	139	-465	-28
35	B4100 Banbury Road, N of Bainton Road	14134	863	14080	860	-54	-3
36	Ardley Road, N of Bucknell	4952	302	6196	378	1244	76
37	Middleton Road, W of Bucknell	3087	189	3641	222	554	34
38	B4030 Middleton Stoney Road, NW of NWB	13434	1032	13202	1014	-232	-18
39	Green Lane, W of Chesterton	6553	400	6634	405	82	5
40	Wendlebury Road, E of M40	4215	257	4244	259	30	2

Appendix 6.5 – Roads Links Requiring Detailed Assessment



Appendix 6.6 – Sensitive Receptors

Figure 6.6A: All Receptors

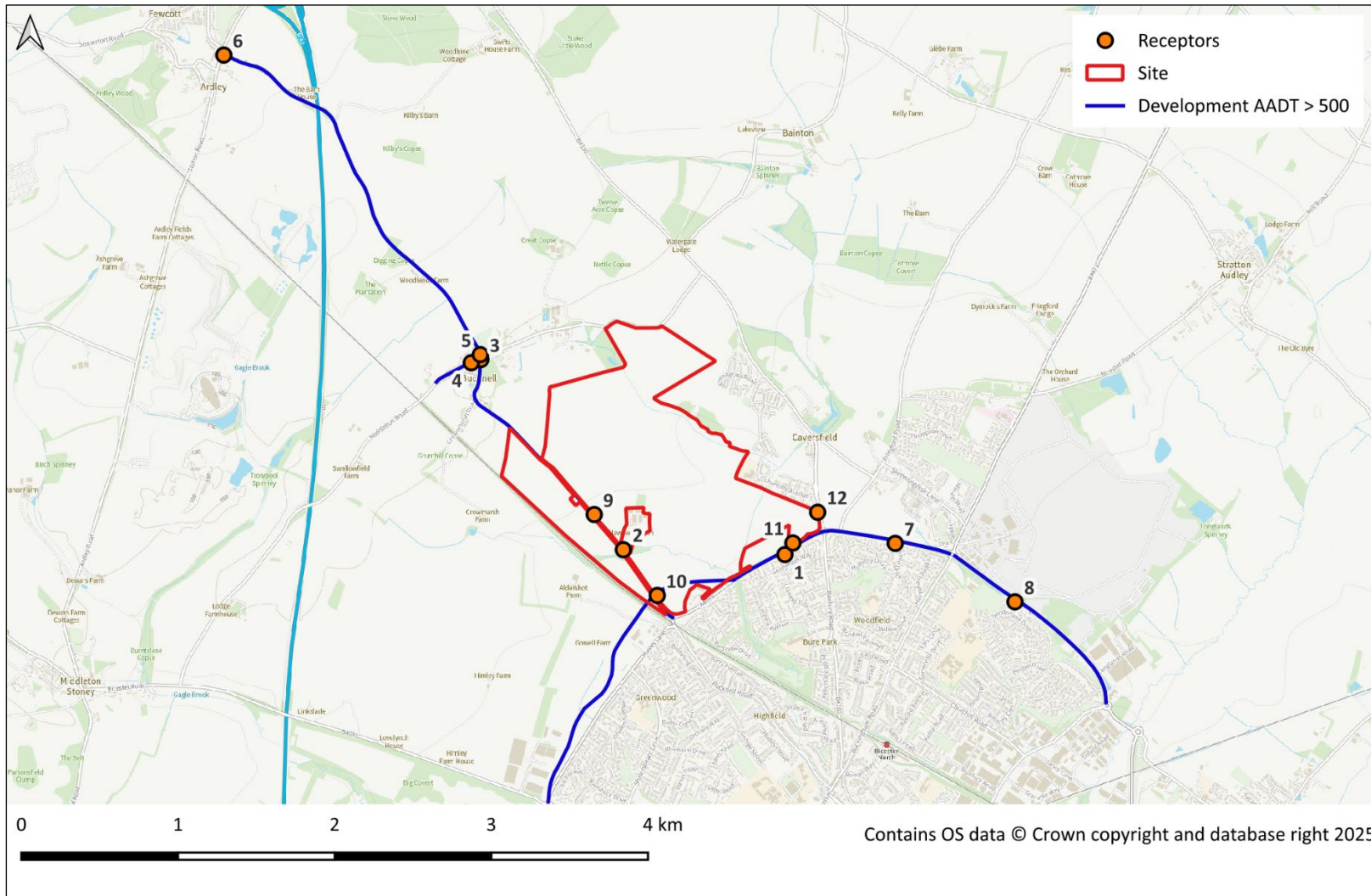


Figure 6.6B: Bicester Receptors



Figure 6.6C: Bucknall Receptors



Figure 6.6D: Ardley Receptors



Appendix 6.7 – Monitoring Locations

Figure 6.7A: Diffusion Tube Monitoring Locations

