

# **Noise Technical Appendix**

inc Baseline Noise Report and Traffic Data,

February 2024

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# Issue and Revision Record

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# 1 Introduction

This technical appendix presents information in support of Chapter 11 Noise and Vibration for proposed Oxford United Football Club stadium development. This appendix presents the report on baseline noise measurements conducted by Mott MacDonald around the site and traffic data on which calculated changes in noise level have been conducted. A Glossary of acoustic terminology is also provided.

# A. Baseline Noise Survey



# 1 Introduction

The baseline report has been prepared in relation to a new stadium development at Land to the east of Stratfield Brake and west of Oxford Parkway Station, known as The Triangle (The Site). This report documents the findings of the baseline noise monitoring undertaken for the Oxford United scheme. This report details the monitoring methodology, any assumptions and limitations associated with the monitoring, and documents the results of the baseline monitoring.

The report will be used to inform the ongoing environmental impact assessment process and acoustic design of the proposed stadium development. The data has been processed in accordance with the requirements of BS5228-1:2009 (+A1:2014) *Code of practice for noise and vibration control on construction and open sites. Noise* for assessment of construction noise and BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* in order to set criteria for mechanical plant in the ES chapter.

The data has also been used to set criteria for match day noise in the ES Chapter associated with the Proposed Development.

## 2 Methodology

### 2.1 Measurement procedure

A noise survey was undertaken from 30th September to 4th October 2023. The survey comprised both unattended, continuous long-term (LT) measurement and attended, short-term measurements (ST).

Measurement positions were selected to be representative of the baseline noise levels at the most affected sensitive receptors potentially subject to temporary construction noise and operational noise as a result of the Scheme.

All equipment used for baseline noise measurements complied with Class 1 requirements given in British Standard (BS) EN 61672<sup>1</sup>. The sound level meters were fitted with a microphone and windshield which is suitable for outdoor measurement. Short term (ST) measurements were taken at a height of 1.5m above local ground. The long term (LT) measurement was located 1.5m above ground on the subject site near its eastern boundary.

The ST measurement locations were 'free-field' meaning they were made at least 3.5m from an acoustically reflective façade. Measurements were completed by Mott MacDonald acousticians competent in environment noise monitoring and completed in accordance with the principles of BS7445<sup>2</sup>.

The calibration level of all equipment was checked before and after the measurement periods and no significant changes were noted.

Equipment was configured to measure using the fast time weighting and A-frequency weighting in 15-minute intervals for both the LT and ST measurements.

Noise levels were measured in decibels for a range of stated descriptors that are defined below.

- $L_{Amax}$  – the highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event.
- $L_{Aeq,T}$  – also referred to as the continuous equivalent noise level, it is the A-weighted sound pressure level that has the same amount of sound energy as the time varying noise over the same period of time (T).
- $L_{A10,T}$  – the A-weighted sound pressure level that is exceeded for 10% of a given time interval (T).
- $L_{A90,T}$  – also referred to as the background noise level, it is the A-weighted sound pressure level that is exceeded for 90% of a given time interval (T).

A-weighting – As seen in the parameters above, this is a frequency weighting designed to mimic the frequency response of the human ear at normal speech levels by providing a correction for the frequencies which the human ear is less sensitive to.

### 2.2 Measurement locations

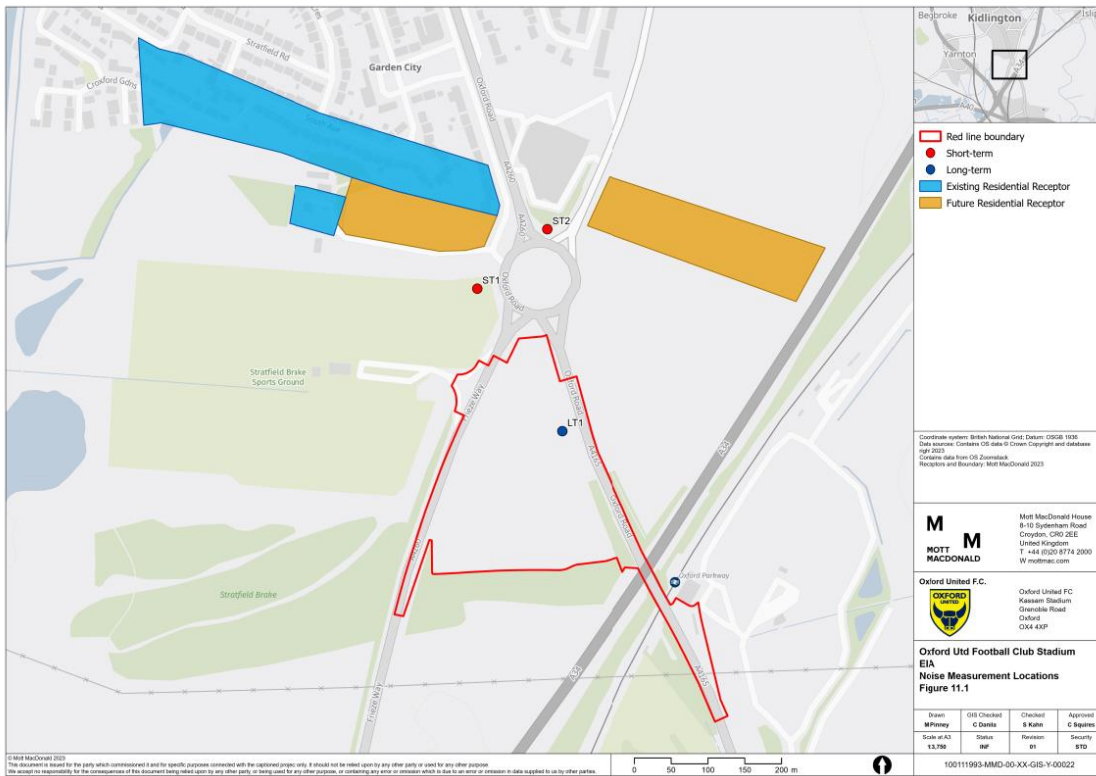
Measurement locations and details are provided in **Error! Reference source not found.** and **Error! Reference source not found.** Photographs of each of the positions during daylight are shown in Section 5 of this report.

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<sup>1</sup> BS EN 61672-1:2013 'Electroacoustics-Sound level meters Part 1: Specifications.'

<sup>2</sup> British Standards Institution BS 7445 Description and measurement of environmental noise. Part 1: Guide to quantities and procedures, 2003,

**Figure A.1: Noise Measurement Locations**



Sources: Contains OS data © Crown Copyright and database right 2023. Contains data from OS Zoomstack. With Mott MacDonald mark-up

**Table A.1: Noise Measurement Location Details**

Measurement ID	'what3words' <sup>3</sup> location reference	Measurement type	Microphone height from existing ground (m)
LT1	asked.holidays.landmark	Free field	1.5
ST1 Weekend	migrate.entrusted.stunt	Free field	1.5
ST2 Weekend	florists.fixture.gazette	Free field	1.5
ST1 Weekday	migrate.entrusted.stunt	Free field	1.5
ST2 Weekday	florists.fixture.gazette	Free field	1.5

Source: Mott MacDonald and <https://what3words.com>

### 2.3 Equipment

A full inventory of all equipment used during the baseline noise surveys is shown in **Error! Reference source not found.**

**Table A.2: Inventory of Noise Measurement Equipment**

Item	Model	Serial Number	Calibrated until
LT	Rion NL-52	898306	20/09/2025
ST1	Rion NL-52	01176427	21/02/2024

<sup>3</sup> <https://what3words.com> - Location referencing system that is based on dividing the globe into 3 metre squares and assigning a unique combination of three words to each square

Item	Model	Serial Number	Calibrated until
ST2	Rion NL-52	898309	20/09/2025
Calibrator	Rion NC75	34913591	06/03/2025

Source: Mott MacDonald

## 2.4 Weather conditions

The weather conditions during the survey (ST measurements and installation and collection of LT measurement) were considered suitable for undertaking noise measurements. Historic meteorological data have been supplied by the Met Office, at <https://www.metoffice.gov.uk/> from Tackley PWS observation site. Actual wind speeds at the site would be expected to be lower than those recorded at the meteorological station as the microphone was located closer to the ground. **Error! Reference source not found.** presents details of the weather conditions.

**Table A.3: Weather Summary**

Date	Condition	Wind Speed range (m/s)	Temperature range (°C)
30/09/2023	Dry and mostly cloudy (100% during ST surveys)	0.0-1.7	8.1-17.0
01/10/2023	Dry and cloudy	0.0-1.7	16.8-22.4
02/10/2023	Dry and mostly cloudy with fog	0.0-2.6	13.2-20.1
03/10/2023	Dry and partially cloudy	0.0-1.7	11.1-20.0
04/10/2023	Dry and mostly cloudy (70% during ST surveys)	0.0-1.7	10.5-18.5

Source: <https://www.metoffice.gov.uk/> (Met Office © Crown copyright 2022) and site notes

## 2.5 Uncertainty

Inevitably there is a degree of variation in measured noise levels which contribute to measurement uncertainty. Contributory factors to this variation include tolerances in instrumentation readings, meteorological conditions, and the inherent difference in the acoustic environment during the course of the day and indeed over longer periods as the noise sources influencing a given location vary. Every effort has been made to limit variation in the measurements reported. The following efforts have been made in order to reduce measurement uncertainty.

- Undertaking surveys with appropriately qualified and trained acoustic engineers;
- Use of measurement equipment calibrated to appropriate standards by accredited bodies and checked on site using calibrated reference sound sources;
- Following best practice methodology for environmental noise measurement set out in BS7445;
- Measuring under appropriate meteorological conditions;
- Measuring at times and locations that are representative of the noise climate at any particular location; and
- Analysing the data to notice trends and anomalies, ensuring the data is representative for the location.

## 3 Measurement results

This section presents the full data results for both Long-Term (LT) and Short-term (ST) noise measurements and vibration measurements.

LT  $L_{Aeq}$  noise measurements are shown for daytime (12hr), evening (4hr), night-time (8hr) and weekend values in accordance with guidance provided by BS 5228-1:2009 (+A1:2014) *Code of practice for noise and vibration control on construction and open sites. Noise*.

LT  $L_{A90}$  noise measurements have been analysed to determine a value which is considered to be the representative background noise level during the relevant assessment periods in accordance with guidance provided by BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. In this instance the lowest 10<sup>th</sup> percentile value was considered most representative.

### 3.1 Long Term (LT)

Position LT1 was located in a field south of Kidlington Roundabout along the Oxford Road, the microphone position was free field, 1.5m above the ground. The LT setup photos are given in Photo 5.1.

Road traffic noise (RTN) from Oxford Road and the A34 dominated the noise climate. Other noise sources including noise from vegetation (tree rustling) and airplane noise was also heard.

LT1 was installed on 30 September 2023 h14:45 and collected on 04 October 2023 h18:22.

The levels relevant to the construction and operational assessments are summarised in Table A.4 and **Error! Reference source not found.5** below. **Error! Reference source not found.2** shows the time history of the measurement.

All levels have been rounded to the nearest whole number. Partial measurement periods at the start and end of the survey have been included (shown with one asterisk). Values presented are the lowest 10<sup>th</sup> percentile.

**Table A.4 LT1 Measurement Results (free field measurement)**

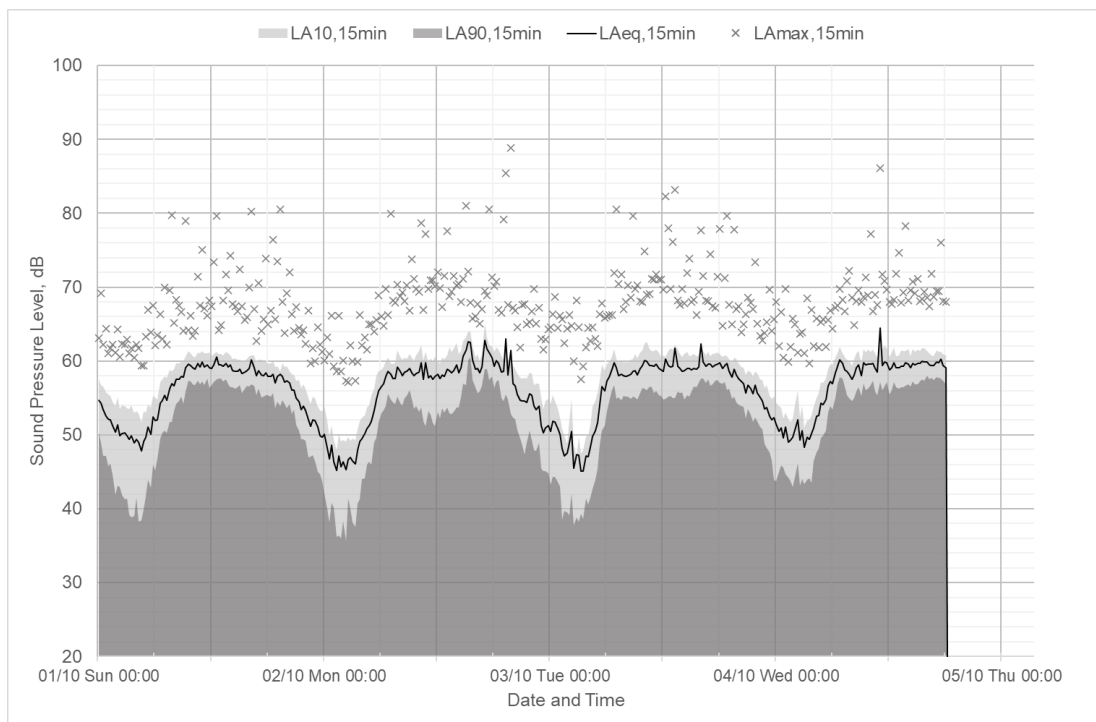
Date	Average $L_{Aeq, T}$ dB			Lowest 10 <sup>th</sup> percentile $L_{A90, T}$ dB	
	Day (07:00- 19:00)	Evening (19:00- 23:00)	Night (23:00- 07:00)	Day (07:00- 23:00)	Night (23:00- 07:00)
Saturday, 30th September 2023	60*	57	52	51*	39
Sunday, 1st October 2023	59	56	52	49	36
Monday, 2nd October 2023	59	57	53	49	39
Tuesday, 3rd October 2023	59	57	54	52	43
Wednesday, 4th October 2023	60*	-	-	55*	-

\* Partial measurement period

**Table A.5: LT1 measurement results for weekend (free field measurement)**

Date	Average $L_{Aeq, T}$ dB	
	Weekend (07:00-13:00)	Weekend (Sat: 13:00-23:00) (Sun: 07:00-23:00)
Saturday, 30th September 2023	-	59
Sunday, 1st October 2023	-	58

**Figure A.2: LT1 Plot of Results**



### 3.2 Short Term (ST)

The noise climate of the site was dominated by road traffic noise (RTN) on the Kidlington Roundabout and distant consistent A34 RTN. The photos of each location are given Photo 5.2 and Photo 5.3. Short term noise measurements were completed at two locations on Saturday 30<sup>th</sup> September 2023 between 15:15 and 20:00 and on Wednesday 4<sup>th</sup> October 2023 between 19:00 and 22:30. The supplementary ST noise levels and main noise source and comments are summarised in **Error! Reference source not found.6** and **Error! Reference source not found.A.7** for ST1 and **Error! Reference source not found.8** and **Error! Reference source not found.9** for ST2.

**Table A.6: Summary of ST1 measurements on a weekend (15 minutes for each measurement)**

ST1	Date	Start time	$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A10, T}$	$L_{A90, T}$	Main noise source and comments
week end	30 Sep 23	15:15	58	69	60	55	Major noise source: RTN from Kidlington Roundabout
	30 Sep 23	15:30	59	74	60	55	

ST1	Date	Start time	L <sub>Aeq, T</sub>	L <sub>Amax, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Main noise source and comments
	30 Sep 23	15:45	58	68	60	56	Other: vegetation noise, distant and consistent A34 RTN, aeroplane and helicopter noise, noise from sports games until around 5pm, occasional emergency vehicles, occasional bird noise, people walking past and talking (denoted with *).
	30 Sep 23	16:00	58	66	60	56	
	30 Sep 23	16:15	59	69	61	56	
	30 Sep 23	16:30	62	85*	60	56	
	30 Sep 23	16:45	59	69	61	56	
	30 Sep 23	17:00	59	76	61	56	
	30 Sep 23	17:15	59	79*	60	57	
	30 Sep 23	17:30	58	67	60	56	
	30 Sep 23	17:45	58	66	60	56	
	30 Sep 23	18:00	58	65	59	56	
	30 Sep 23	18:15	58	65	60	55	
	30 Sep 23	19:15	56	69	58	53	
	30 Sep 23	19:30	56	66	59	52	
	30 Sep 23	19:45	56	68	58	52	
	30 Sep 23	20:00	57	74	58	53	

**Table A.7: Summary of ST1 measurements on a weekday evening (15 minutes for each measurement)**

ST1	Date	Start time	L <sub>Aeq, T</sub>	L <sub>Amax, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Main noise source and comments
week day	04 Oct 23	19:00	57	71	59	54	Major noise source: RTN from Kidlington Roundabout Other: vegetation noise, distant and consistent A34 RTN, aeroplane and helicopter noise, occasional emergency vehicles, occasional bird noise, people walking past and talking (denoted with *).
	04 Oct 23	19:15	57	73*	59	53	
	04 Oct 23	19:30	56	66	58	52	
	04 Oct 23	19:45	56	74	58	52	
	04 Oct 23	20:00	57	69	59	53	
	04 Oct 23	20:15	56	66	59	52	
	04 Oct 23	20:30	56	64	58	51	
	04 Oct 23	20:45	55	69	58	50	
	04 Oct 23	21:00	54	68	56	49	
	04 Oct 23	21:15	55	64	56	50	
	04 Oct 23	21:30	54	63	57	48	
	04 Oct 23	21:45	54	65	57	49	
	04 Oct 23	22:00	53	69	56	48	
	04 Oct 23	22:15	54	66	56	47	

**Table A.8: Summary of ST2 measurements on a weekend (15 minutes for each measurement)**

ST2	Date	Start time	L <sub>Aeq, T</sub>	L <sub>Amax, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Main noise source and comments
week end	30 Sep 23	15:30	63	77	64	60	Major noise source: RTN from Kidlington Roundabout Other: vegetation noise, Lorry unloading, refrigerator unit noise, distant and consistent A34 RTN, aeroplane and helicopter noise,
	30 Sep 23	15:45	63	75	65	61	
	30 Sep 23	16:00	63	75	64	60	
	30 Sep 23	16:15	66	89	65	61	

ST2	Date	Start time	L <sub>Aeq, T</sub>	L <sub>Amax, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Main noise source and comments
	30 Sep 23	17:00	65	82	66	62	occasional emergency vehicles, occasional bird noise.
	30 Sep 23	17:15	64	74	65	62	
	30 Sep 23	17:30	64	84	65	61	
	30 Sep 23	18:00	63	72	65	60	
	30 Sep 23	18:15	64	85	65	60	
	30 Sep 23	18:30	62	78	64	59	
	30 Sep 23	18:45	63	82	64	58	
	30 Sep 23	19:00	61	75	63	58	
	30 Sep 23	19:15	62	85	63	58	
	30 Sep 23	19:30	62	72	64	58	
	30 Sep 23	19:45	62	83	63	57	

**Table A.9: Summary of ST2 measurements on a weekday evening (15 minutes for each measurement)**

ST2	Date	Start time	L <sub>Aeq, T</sub>	L <sub>Amax, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Main noise source and comments
week day	04 Oct 23	20:00	64	84	64	57	Major noise source: RTN from Kidlington Roundabout Other: vegetation noise, Lorry unloading, refrigerator unit noise, distant and consistent A34 RTN, aeroplane and helicopter noise, occasional emergency vehicles, occasional bird noise.
	04 Oct 23	20:15	63	81	64	56	
	04 Oct 23	20:30	61	74	64	56	
	04 Oct 23	20:45	62	79	64	55	
	04 Oct 23	21:00	59	70	62	53	
	04 Oct 23	21:15	61	78	63	55	
	04 Oct 23	21:30	59	76	62	52	
	04 Oct 23	21:45	59	72	62	52	
	04 Oct 23	22:00	59	67	62	52	
	04 Oct 23	22:15	59	75	62	49	

Based on all of the above the representative values of noise level used in the Noise Assessment are summarised in Table A.10 A.11 and A.12 below.

**Table A.10: LT1 Measurement Results (free field measurement)**

Date	Average L <sub>Aeq, T</sub> dB			L <sub>A90, T</sub> dB	
	Day (07:00-19:00)	Evening (19:00-23:00)	Night (23:00-07:00)	Day (07:00-23:00)	Night (23:00-07:00)
<b>Baseline level for Mechanical Plant noise criteria</b>				49	39



**Table A.11: Summary of ST1 measurements on a weekend**

ST1	Date	Survey Period	Typical $L_{A90, T}$	Main noise source and comments
weekend	30 Sep 23	15:15 -20:00	53	Major noise source: RTN from Kidlington Roundabout  Other: vegetation noise, distant and consistent A34 RTN, aeroplane and helicopter noise, noise from sports games until around 5pm, occasional emergency vehicles, occasional bird noise, people walking past and talking.
weekday	04 Oct 23	19:00 -22:15	49	Major noise source: RTN from Kidlington Roundabout  Other: vegetation noise, distant and consistent A34 RTN, aeroplane and helicopter noise, occasional emergency vehicles, occasional bird noise, people walking past and talking.

**Table A.12: Summary of ST2 measurements on a weekend**

ST2	Date	Start time	$L_{A90, T}$	Main noise source and comments
weekend	30 Sep 23	15:30 -19:45	58	Major noise source: RTN from Kidlington Roundabout  Other: vegetation noise, Lorry unloading, refrigerator unit noise, distant and consistent A34 RTN, aeroplane and helicopter noise, occasional emergency vehicles, occasional bird noise.
weekday	04 Oct 23	20:00-22:55	52	Major noise source: RTN from Kidlington Roundabout  Other: vegetation noise, Lorry unloading, refrigerator unit noise, distant and consistent A34 RTN, aeroplane and helicopter noise, occasional emergency vehicles, occasional bird noise.

## 4 Conclusions

This report documents the findings of the baseline noise monitoring undertaken for new stadium development for Oxford United. This report details the monitoring methodology, any assumptions and limitations associated with the monitoring, and documents the results of the baseline monitoring.

The data has been processed in accordance with the requirements of BS5228-1:2009 (+A1:2014) *Code of practice for noise and vibration control on construction and open sites. Noise for assessment of construction noise* and BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* in order to set criteria for mechanical plant and also for crowd noise associated with the proposed development.

The data presented in this report has been used to inform the ongoing environmental impact assessment process and acoustic design of the proposed development.

# 5 Photographs

Photo 5.1: Position of LT1



**Photo 5.2: Position of ST1**



**Photo 5.3: Position of ST2**



## B. Traffic Data

Calculations of changes of noise level on key road links around the subject Scheme have been conducted based on the following traffic flows which were provided by Ridge Transportation Engineers.

Table B1 shows overall AAWT and AADT used to calculate changes in  $L_{Aeq,18hr}$  levels of traffic noise during construction of the proposed scheme.

Table B2 shows overall AAWT and AADT used to calculate changes in  $L_{Aeq,18hr}$  levels of traffic noise during operation of the proposed scheme.

Table B3 shows overall hourly flows used to calculate changes in  $L_{Aeq,1hr}$  levels of traffic noise specific hours during matchdays either side of the football match.

Traffic Count Locations referred to on Table B1, B2 and B3 are shown in Figure B1.

Table B1 AAWT and AADT Traffic data used in Calculations of changes in LA10,18hr for construction Traffic

Loc	Road Name	Direction	2018 Baseline						2025 Without Construction Traffic						2025 With Construction Traffic					
			24h AADT			18h AAWT			24h AADT			18h AAWT			24h AADT			18h AAWT		
			All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV
1	Access Road	IB	0	0	0	0	0	0	0	0	0	0	0	0	303	250	53	303	250	53
2	Secondary Access Road	IB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Exit	OB	0	0	0	0	0	0	0	0	0	0	0	0	303	250	53	303	250	53
4	A4260 Oxford Road (N)	NB	8,854	8472	382	9,238	8816	422	10,178	9748	430	10,589	10114	474	10,267	9838	430	10,678	10204	474
		SB	9,874	9539	335	10,196	9824	371	11,838	11462	376	12,172	11755	417	11,926	11550	376	12,260	11843	417
5	Bicester Road (N)	NB	5,468	5252	216	5,642	5411	231	8,652	8410	243	8,679	8419	260	8,690	8447	243	8,716	8456	260
		SB	3,492	3318	173	3,582	3395	187	5,441	5246	195	5,493	5283	210	5,477	5283	195	5,530	5320	210
6	Frieze Way (N)	NB	6,321	6202	119	6,560	6433	127	7,836	7702	134	8,055	7912	143	8,140	7954	186	8,359	8164	195
		SB	6,111	6014	97	6,243	6139	104	11,474	11365	109	11,458	11341	117	11,775	11613	162	11,758	11589	169
7	A4165 Oxford Road (S)	NB	8,830	8309	522	9,137	8578	558	14,049	13462	587	14,126	13499	628	14,049	13462	587	14,126	13499	628
		SB	9,072	8625	446	9,279	8798	482	10,958	10456	502	11,157	10616	541	10,958	10456	502	11,157	10616	541
8	A4165 Banbury Road (N)	NB	9,320	8602	718	9,598	8860	738	10,924	10116	808	11,172	10343	829	10,924	10116	808	11,172	10343	829
		SB	9,601	8975	626	10,013	9302	711	12,458	11754	704	12,756	11957	799	12,458	11754	704	12,756	11957	799
9	Elsfield Way	EB	20,490	19263	1,226	21,420	20149	1,272	24,142	22762	1,380	25,045	23616	1,429	24,167	22771	1,396	25,071	23624	1,446
		WB	16,391	15412	978	16,950	15840	1,111	22,802	21702	1,101	22,974	21725	1,248	22,828	21710	1,117	22,999	21734	1,265
10	A4165 Banbury Road (S)	NB	8,007	7362	644	8,274	7612	662	9,246	8521	725	9,509	8765	745	9,250	8525	725	9,513	8768	745
		SB	7,406	6872	534	7,747	7142	605	8,660	8059	601	9,006	8326	680	8,664	8063	601	9,010	8330	680
11	A40 North Way	EB	16,627	15534	1,093	17,475	16340	1,135	20,878	19648	1,230	21,582	20306	1,276	20,899	19660	1,239	21,604	20318	1,286
		WB	13,296	12433	863	13,752	12773	979	17,034	16064	971	17,324	16223	1,101	17,056	16076	980	17,346	16236	1,110
12	A44 Woodstock Road (C)	NB	14,621	13493	1,127	14,761	13560	1,201	17,936	16668	1,268	17,887	16536	1,350	17,982	16696	1,285	17,932	16565	1,367
		SB	18,987	17535	1,452	18,606	17114	1,492	21,671	20037	1,634	21,201	19524	1,677	21,716	20066	1,651	21,246	19553	1,694
13	A44 Woodstock Road (S)	EB	6,431	6092	338	6,493	6136	356	7,942	7561	380	7,913	7513	400	7,947	7567	380	7,919	7518	400
		WB	6,868	6469	400	6,778	6368	410	8,090	7640	450	7,957	7496	460	8,095	7645	450	7,962	7501	460
14	A40 Northern Bypass Road	EB	11,769	10590	1,180	11,983	10725	1,257	14,056	12729	1,327	14,184	12771	1,413	14,072	12738	1,334	14,201	12780	1,420
		WB	12,930	11514	1,415	12,524	11067	1,457	15,800	14207	1,592	15,226	13588	1,638	15,816	14217	1,599	15,242	13597	1,645
15	A44 Woodstock Road (N)	NB	13,213	12618	595	14,556	13929	627	16,720	16050	669	18,016	17311	705	16,790	16108	682	18,087	17369	717
		SB	13,512	12796	715	14,425	13740	685	15,498	14693	805	16,482	15711	770	15,570	14752	817	16,553	15770	783
16	A44 (C)	NB	12,172	11412	760	13,208	12408	800	14,755	13901	855	15,780	14880	900	14,834	13966	867	15,858	14946	912
		SB	14,082	13018	1,063	15,007	13992	1,016	18,880	17684	1,196	19,603	18461	1,142	18,958	17749	1,209	19,680	18526	1,154
17	A34 (S)	NB	26,129	21626	4,503	24,232	19512	4,720	29,815	24749	5,066	27,625	22319	5,306	29,852	24774	5,079	27,662	22344	5,318
		SB	25,004	20643	4,361	22,483	18320	4,163	31,324	26418	4,907	27,864	23185	4,679	31,362	26443	4,919	27,901	23210	4,691

Loc	Road Name	Direction	2018 Baseline						2025 Without Construction Traffic						2025 With Construction Traffic					
			24h AADT			18h AAWT			24h AADT			18h AAWT			24h AADT			18h AAWT		
			All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV	All Veh	LDV	HDV
18	A34 (N)	NB	26,129	21626	4,503	24,232	19512	4,720	31,577	26511	5,066	29,254	23949	5,306	31,600	26523	5,077	29,277	23961	5,316
		SB	25,004	20643	4,361	22,483	18320	4,163	30,712	25806	4,907	27,367	22688	4,679	30,735	25818	4,917	27,389	22700	4,689
19	Godstow Road	NB	1,878	1853	24	1,896	1870	26	2,113	2085	27	2,131	2102	29	2,114	2087	27	2,133	2104	29
		SB	2,111	2084	27	2,083	2056	27	2,375	2345	30	2,341	2310	31	2,384	2354	30	2,350	2320	31

Table B2 AAWT and AADT Traffic data used in Calculations of changes in LA10,18hr for Operational Traffic

Location	Road Name	Direction	2023 Baseline				2026 Without Development				2026 With Development (Average)				2026 With Development (Match Day Only)			
			24h AADT		18h AAWT		24h AADT		18h AAWT		24h AADT		18h AAWT		24h AADT		18h AAWT	
			All Veh	HGV	All Veh	HGV	All Veh	HGV	All Veh	HGV	All Veh	HGV	All Veh	HGV	All Veh	HGV	All Veh	HGV
Site	Access Road	IB	0	0	0	0	0	0	0	0	856	5	748	3	347	21	156	2
	Secondary Access Road	IB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exit	OB	0	0	0	0	0	0	0	0	856	5	748	3	347	21	156	2
1	A4260 Oxford Road (N)	NB	9,560	356	9,865	360	10,029	364	10,323	368	10,436	364	10,699	368	10,228	364	10,437	368
		SB	11,046	395	11,613	404	12,011	404	12,518	412	12,418	404	12,893	412	12,211	404	12,632	412
2	Bicester Road (N)	NB	5,160	294	6,165	410	7,437	301	8,185	419	7,607	301	8,342	419	7,520	301	8,233	419
		SB	3,483	254	3,897	258	5,140	260	5,661	264	5,310	260	5,818	264	5,223	260	5,709	264
3	Frieze Way (N)	NB	4,988	108	5,367	147	5,862	110	6,103	151	6,363	117	6,549	154	6,152	152	6,244	155
		SB	4,527	101	4,873	135	8,670	103	8,501	138	10,451	118	10,066	146	9,479	176	8,876	145
4	A4165 Oxford Road (S)	NB	10,000	480	8,529	447	14,149	491	12,183	457	14,571	495	12,632	460	14,452	512	12,418	459
		SB	10,222	477	8,615	442	11,101	487	9,389	452	11,523	492	9,839	455	11,404	508	9,625	454
5	A4165 Banbury Road (N)	NB	9,163	308	9,326	308	9,972	314	10,096	315	10,394	314	10,545	315	10,275	314	10,331	315
		SB	9,491	324	9,606	313	11,312	331	11,281	320	11,734	331	11,731	320	11,615	331	11,516	320
6	Elsfield Way	EB	20,005	803	19,751	1,001	22,068	821	21,612	1,023	22,196	824	21,743	1,025	22,165	835	21,681	1,025
		WB	18,028	745	17,722	918	21,833	761	21,127	938	21,961	764	21,258	940	21,930	775	21,196	939
7	A4165 Banbury Road (S)	NB	4,806	205	4,445	187	5,257	209	4,887	191	5,312	209	4,939	191	5,299	209	4,922	191
		SB	4,162	167	3,732	147	4,578	171	4,140	150	4,632	171	4,195	150	4,619	171	4,169	150
8	A40 North Way	EB	13,301	833	12,706	762	16,777	851	15,838	779	16,829	855	15,883	781	16,833	866	15,868	780
		WB	13,315	536	12,929	496	15,312	548	14,736	507	15,436	551	14,858	509	15,418	562	14,806	508
9	A44 Woodstock Road (C)	NB	14,169	752	13,802	903	15,924	768	15,390	922	16,077	771	15,524	924	16,166	784	15,528	926
		SB	15,858	855	15,827	1,053	16,614	873	16,544	1,076	16,747	877	16,656	1,078	16,842	890	16,671	1,080
10	A44 Woodstock Road (S)	EB	7,861	312	7,967	320	8,793	318	8,832	327	8,829	318	8,866	327	8,827	318	8,852	327



		WB	8,590	298	8,838	302	9,202	304	9,424	308	9,238	304	9,458	308	9,235	304	9,445	308
11	A40 Northern Bypass Road	EB	10,068	635	10,509	601	11,132	649	11,499	614	11,196	650	11,560	615	11,192	655	11,536	616
		WB	11,839	887	11,417	850	13,721	907	13,100	869	13,785	908	13,161	870	13,781	912	13,137	871
12	A44 Woodstock Road (N)	NB	11,203	252	11,766	274	13,668	258	14,059	280	13,917	261	14,283	283	13,812	273	14,137	283
		SB	12,632	303	13,114	313	13,283	310	13,737	320	13,531	314	13,962	323	13,427	325	13,815	323
13	A44 (C)	NB	12,661	463	13,569	621	13,645	473	14,420	635	13,890	479	14,635	639	13,792	497	14,495	639
		SB	11,991	459	12,544	619	16,772	469	16,733	632	17,033	475	16,966	636	16,930	493	16,817	637
14	A34 (S)	NB	26,129*	4,503*	24,232*	4,720*	27,118	4,601	25,150	4,824	27,234	4,603	25,255	4,825	27,207	4,610	25,201	4,826
		SB	25,004*	4,361*	22,483*	4,163*	28,744	4,457	25,568	4,254	28,859	4,459	25,673	4,255	28,833	4,465	25,618	4,256
15	A34 (N)	NB	26,129*	4,503*	24,232*	4,720*	28,881	4,601	26,780	4,824	28,935	4,603	26,829	4,825	28,923	4,610	26,804	4,826
		SB	25,004*	4,361*	22,483*	4,163*	28,132	4,457	25,071	4,254	28,186	4,458	25,120	4,255	28,174	4,465	25,095	4,256
16	Godstow Road	NB	2,296	22	2,326	23	2,346	23	2,377	24	2,357	23	2,388	24	2,356	23	2,384	24
		SB	2,640	20	2,716	20	2,697	20	2,775	20	2,709	20	2,786	20	2,708	20	2,782	20

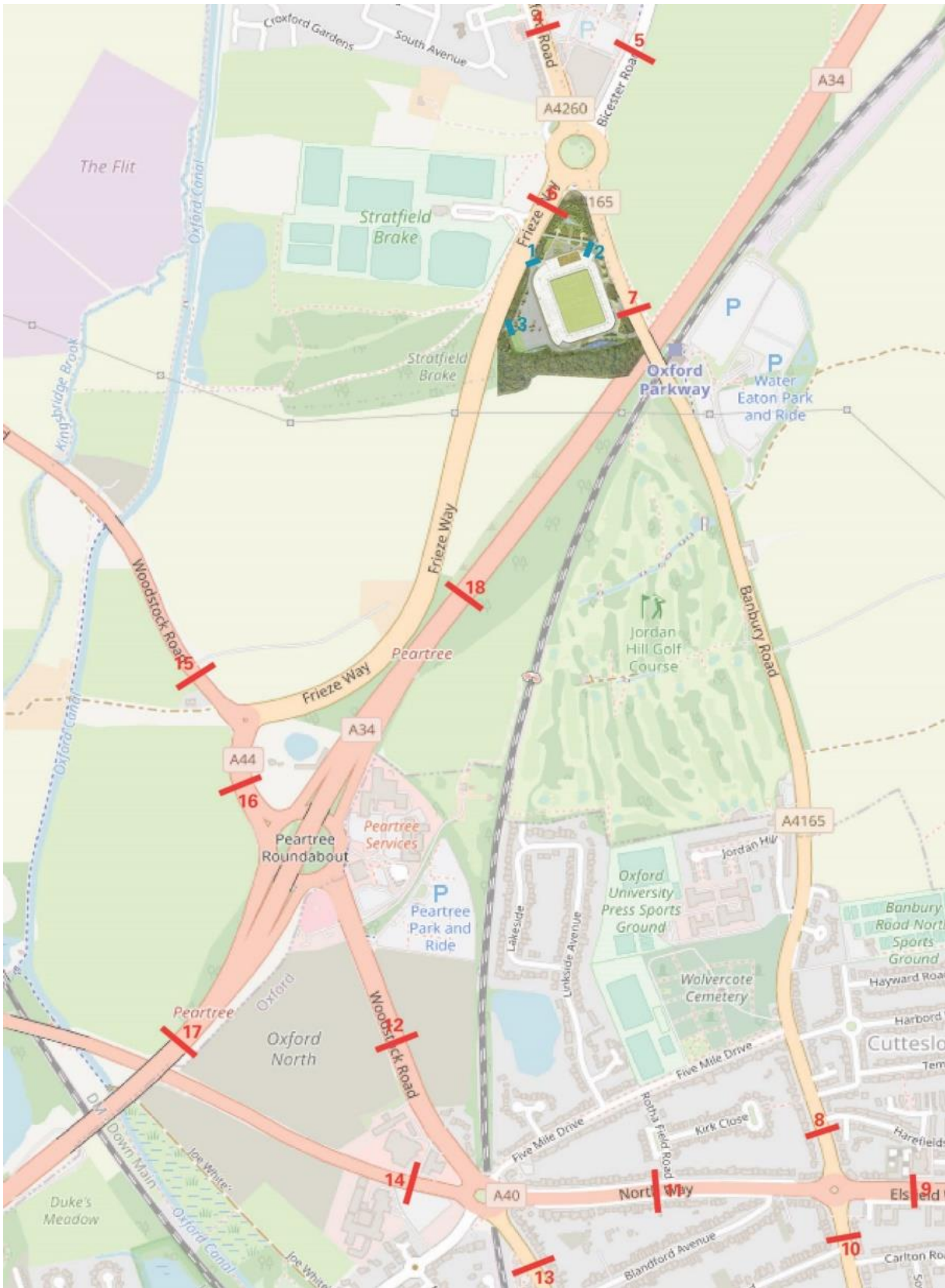
\* Shows 2018 baseline data

Table B3 Hourly Traffic data used in Calculations of changes in LA10,1hr for hours either side of matchday games

Location	Road Name	Direction	Matchday		Baseline		Baseline +Matchday		Matchday		Baseline		Baseline +Matchday		Matchday		Baseline		Baseline +Matchday		Matchday		Baseline		Baseline +Matchday		Matchday		Baseline		Baseline +Matchday		Matchday				
			Weekday 17:00 -18:00								Weekday 18-19								Weekend 14-15								Weekend 17-18										
			All vehicles	Bus / Coach	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise				
4	A4260 Oxford Road (N)	NB	2	2	825	36	827	38	0	5	5	777	29	782	34	0	50	23	474	11	523	34	2	4	4	746	35	750	38	0	25	7	752	31	777	38	0
		SB	15	4	1,117	21	1,132	25	0	43	13	1,118	19	1,161	31	1	6	6	344	7	349	12	1	30	8	939	24	969	32	0	4	4	1,031	20	1,035	23	0
5	Bicester Road (N)	NB	8	2	528	15	536	16	0	5	5	462	8	467	13	0	16	12	262	5	277	17	2	4	4	235	5	238	9	1	10	7	482	13	492	20	1
		SB	1	3	287	8	288	11	0	3	9	352	8	355	17	1	6	6	102	3	108	9	2	9	7	98	3	108	10	2	4	4	318	7	321	11	0
6	Frieze Way (N)	NB	29	0	544	9	572	9	0	90	0	459	2	550	2	1	0	0	304	3	304	3	0	67	0	271	3	339	3	1	0	0	496	8	496	8	0
		SB	1	0	654	5	655	5	0	0	0	609	4	609	4	0	0	0	178	2	178	2	0	0	0	172	2	172	2	0	0	0	550	5	550	5	0
7	A4165 Oxford Road (S)	NB	9	3	902	42	911	45	0	10	10	761	37	771	47	0	23	23	424	13	447	36	2	10	7	724	43	734	50	0	17	14	822	36	839	50	1
		SB	7	7	758	24	765	32	0	22	22	748	25	770	47	1	11	11	264	8	276	19	2	15	15	603	37	618	52	1	7	7	699	23	707	30	0
8	A4165 Banbury Road (N)	NB	169	37	733	26	902	63	2	545	110	705	34	1,250	144	4	25	23	292	22	317	46	2	363	78	631	47	994	125	3	8	7	681	29	689	37	0
		SB	3	3	943	54	947	58	0	10	10	812	47	822	57	0	697	133	460	19	1,157	152	6	10	7	778	69	788	76	0	253	78	853	46	1,106	4	12
9		EB	0	0	1,330	25	1,330	25	0	0	0	1,117	29	1,117	29	0	674	37	651	39	1,325	76	3	0	0	1,123	102	1,123	102	0	230	22	1,236	28	1,466	49	1

Location	Road Name	Direction	Matchday		Baseline				Baseline +Matchday		Matchday		Baseline				Baseline +Matchday		Matchday		Baseline				Baseline +Matchday		Matchday		Baseline				Baseline +Matchday					
			Weekday 17:00 -18:00				Weekday 18-19				Weekend 14-15				Weekend 17-18																							
			All vehicles	Bus / Coach	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise	All vehicles	Bus / Coach	All vehicles	Bus / Coach	overall noise				
10	Elsfield Way	WB	169	10	1,218	39	1,387	49	1	495	31	1,502	47	1,997	78	2	0	4	778	30	778	34	0	301	22	1,539	100	1,840	122	1	0	0	1,101	33	1,101	33	0	
	A4165 Banbury Road (S)	NB	8	7	726	26	734	33	0	28	22	539	31	567	53	1	11	11	251	20	263	31	1	22	15	560	44	582	59	1	11	7	675	28	686	36	0	
		SB	3	3	662	48	665	51	0	10	10	633	48	643	58	0	29	23	356	16	385	39	2	10	7	536	47	546	54	0	26	9	598	41	624	49	1	
11	A40 North Way	EB	18	8	981	21	1,000	29	0	56	56	911	25	966	81	2	14	2	531	34	545	37	0	55	41	841	77	896	118	1	8	0	912	23	920	23	0	
		WB	0	0	1,021	36	1,021	36	0	11	0	1,181	33	1,192	33	0	73	73	631	26	704	99	3	8	0	1,275	85	1,284	85	0	73	50	923	30	996	81	2	
12	A44 Woodstock Road (C)	NB	86	0	996	62	1,081	62	0	267	0	1,050	50	1,317	50	1	267	48	584	40	851	88	3	196	0	1,232	90	1,428	90	0	131	36	1,003	61	1,134	97	1	
		SB	18	15	1,604	95	1,622	110	0	65	45	1,200	74	1,265	120	1	354	0	436	38	791	38	1	25	33	944	98	968	132	1	271	0	1,134	84	1,406	84	1	
13	A44 Woodstock Road (S)	EB	0	0	525	29	525	29	0	0	0	460	23	460	23	0	70	0	257	12	327	12	1	0	0	536	23	536	23	0	23	0	529	28	552	28	0	
		WB	18	0	668	32	686	32	0	53	0	482	32	535	32	0	0	0	159	10	159	10	0	39	0	293	26	332	26	0	0	0	661	28	661	28	0	
14	A40 Northern Bypass Road	EB	23	4	753	54	776	57	0	61	11	768	45	828	57	1	2	2	474	42	476	44	0	45	8	912	100	957	107	0	0	0	759	52	759	52	0	
		WB	0	0	768	86	768	86	0	0	0	851	70	851	70	0	89	0	294	37	383	37	0	0	0	885	96	885	96	0	39	0	878	76	917	76	0	
15	A44 Woodstock Road (N)	NB	0	0	1,478	36	1,478	36	0	0	0	1,310	27	1,310	27	0	90	0	391	7	481	7	1	0	0	1,007	57	1,007	57	0	34	1	1,257	32	1,290	32	0	
		SB	24	1	1,419	29	1,443	30	0	68	2	978	17	1,047	19	0	0	2	273	11	273	14	0	50	1	972	54	1,023	54	0	0	0	1,258	30	1,258	30	0	
16	A44 (C)	NB	22	1	1,233	55	1,255	56	0	70	0	1,204	32	1,274	32	0	65	4	355	8	420	13	1	52	1	1,123	66	1,176	68	0	20	0	1,048	49	1,068	49	0	
		SB	17	0	1,011	50	1,027	50	0	48	0	905	32	954	32	0	90	0	284	17	374	17	1	36	0	972	79	1,008	79	0	50	0	896	50	946	50	0	
17	A34 (S)	NB	35	12	2,260	312	2,296	324	0	102	37	1,905	312	2,008	349	0	0	0	680	192	680	192	0	85	27	1,880	289	1,964	316	0	0	0	2,236	265	2,236	265	0	
		SB	0	0	1,881	211	1,881	211	0	0	0	1,921	211	1,921	211	0	136	48	613	127	749	175	1	0	0	1,723	253	1,723	253	0	80	26	1,989	189	2,068	189	0	
18	A34 (N)	NB	0	0	2,260	312	2,261	312	0	1	0	1,905	252	1,906	252	0	100	0	680	192	780	192	0	0	0	1,880	289	1,880	289	0	39	10	2,236	265	2,275	265	0	
		SB	31	1	1,881	211	1,912	211	0	90	0	1,921	234	2,011	234	0	0	0	613	127	613	127	0	70	0	1,723	253	1,793	253	0	0	0	1,989	189	1,989	189	0	

Figure A.3: Traffic Count Locations



## C. Acoustic Glossary

A-weighting	The human ear also has a non-linear frequency response, being most sensitive in the frequency range 1 kHz to 4 kHz and is less sensitive at higher and lower frequencies. The A-weighting is a frequency function commonly applied to the linear output of a microphone to simulate the subjective response of the ear. A-weighted levels are usually indicated by a subscript A or postscript (A).
Z-weighting	A flat frequency response between 10Hz and 20kHz excluding microphone response.
Decibel	Sound and noise are commonly described using the decibel (dB) scale, which is logarithmic in nature to relate to the response of the human ear. The range of human hearing commonly varies from the threshold of audibility (0 dB) to the threshold of pain (120 dB). Such limits are seldom experienced in practice and typical levels might vary between 30 dB in a quiet bedroom at night to 90 dB at the kerbside of a busy road.
Sound Pressure Level (Lp)	The logarithmic measure of the root mean square sound pressure relative to a reference sound pressure. The reference sound pressure in air is 20 micro Pascals and represents the threshold of hearing in a healthy young person.
Equivalent continuous noise level Leq	The equivalent continuous noise level, $L_{Aeq,T}$ , is the notional level of a steady sound which, at a given position and over the same period of time (T), would deliver the same sound energy as the fluctuating one. Used to quantify time-varying noise from industrial sources.
Maximum sound pressure level L(max)	The maximum sound pressure level reached within the measurement period.
Minimum sound pressure level L(min)	The lowest sound level reached within the measurement period.
$L_n,T$	A statistical parameter where the sound pressure level exceeded for a 'n' percentage of the measurement period.
$L_{A10,T}$	The A-weighted sound pressure level exceeded for 10% of a measurement period, T. This parameter is used to assess traffic noise in the UK.
$L_{A90,T}$	The A-weighted sound pressure level exceeded for 10% of a measurement period, T. This parameter is used to establish a background sound level for BS4142 and other methods.
Fast weighting	The sound pressure level is weighted to the response time of the ear (125ms).
Slow weighting	The sound pressure level is weighted to the response time of 1 second.

