City of Westminster

Soho Noise Survey Reports 2008

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Protective Marking: Not Protectively Marked

Soho Noise Survey – Link Report 2008

Section 1 - Introduction

This report links the two noise measurement surveys carried out as a supporting study in the development of the City Council's emerging Noise Strategy Steering. The survey was made within two areas of Soho. The surveys took place from 21st January to 27th January and 4th August to the early hours of 31st August 2008.

The objectives of this project are:-

- To obtain a representative indication of the current background noise levels being generated in two areas of Soho during the days, evenings and night times (including late nights in August) on certain streets.

- To provide a better understanding as to the main contributing sources of the noise monitored and to identify any trends or particular stressed areas.

- To provide a comparison of the current noise climate and the previous survey in August 2003.

Section 2 – Perception of noise and current guidance

Noise is measured and described in terms of decibels (dB). The term **dB(A)** refers to a weighted sound pressure level, expressed as a decibel, that gives a single measurement of the sound present as perceived by the average human ear.

Changes in noise level of less that 2 dB or 3 dB in noise sources with similar characteristics are not normally perceptible by the human ear. If the character of the noise changes, however, perception is more acute. A change of 5 dB is noticeable with a change of 10 dB being perceived as a doubling or halving of loudness. Typical noise levels are:

Living rooms/bedrooms	30 / 35 dB(A)
Normal Conversations	60 dB(A)
Heavy road traffic @ 10 metres	80 dB(A)
Pneumatic Drill @ 1 metre	100 dB(A)

When trying to interpret measurements and maps for the period of weekend night, current noise guidance can be considered.

In 1993 the European Commission, in a Green Paper entitled “Towards a Future Noise Policy” set a number of targets for noise. (Whilst this paper did not progress it is a useful reference document.) These targets, expressed in terms of L_{Aeq} **(1)** outside living spaces during night-time periods are as follows:

- Exposure of the population to noise levels in excess of 65dB(A) should be phased out.
- At no point in time should a level of 85dB(A) be exceeded.
- The proportion at present exposed to levels between 55 to 65dB(A) should not suffer any increase.
- The proportion of the population at present exposed to levels less than 55dB(A) should not suffer any increase above that level.

(1) LAeq - The equivalent ‘A’ weighted sound pressure level that gives the energy average of fluctuating sound level measured over a specified time duration. Often referred to as the ‘Ambient Noise Level’

The World Health Organisation document for Community Noise (April 2000) indicates that for undisturbed sleep the external ‘ambient’ level should not exceed 45dB L_{Aeq} averaged over an 8 hour period.

The most widespread effect of noise for all times of day or night is annoyance, and annoyance caused in communities by environmental noise has been thoroughly evaluated using social survey techniques. The threshold for annoyance for steady continuous noise is an external L_{Aeq} of 50dB(A), with few people becoming seriously annoyed for exposures less than 55dB(A). The number of people seriously annoyed increases between 55-60 dB(A), and increases rapidly between 60-65 dB(A) (the thresholds for annoyance are a further 10 dB lower for night-time periods).

(2). **L_{90}** - this is the sound pressure level exceeded for 90% of the measurement period. It is widely used to measure background noise levels.

Section 3 – Noise Survey

3.1 Monitoring Sites

There were 40 monitoring sites in total covering the stress area of Soho bordered by Oxford St, Regent St, Charing Cross Road and Orange St. The sites were divided by Wardour Street into East and West sections.

The monitoring was divided into the following three time periods

1) Day – between 7:00 and 19:00
2) Evening – between 19:00 and 23 :00
3) Night – between 23:00 and 1:00
4) Late Night- between 01.00 and 04.00.

Monitoring was carried out on both weekdays and weekends but not on Sundays except where Saturday nights continued into early Sunday morning.

3.2 Measurements

Measurements were taken using a hand held Type 1 sound level meter at street level, 1 metre from building facades to reduce reflection effects. Measurements of the background noise level (L_{A90}) and the equivalent continuous noise level (L_{Aeq}) were taken over 5-minute intervals.

In addition notes were taken of predominate noise sources and the sites were categorised by the type of noise experienced. E.g. road traffic, pedestrians and music from licensed premises or residential locations.

4.1 Data & Analysis

The surveys in January and August totalled five hundred and sixty 5-minute measurements of L_{Aeq} and L_{A90} were taken during six monitoring periods (weekday daytime, evening, nights and late nights and weekend day-time, evening, night and late nights) at forty monitoring sites. The late night measurement period (01.00 to 04.00 hours) was added for the August survey as requested at a presentation of the January survey to the Soho Steering Group. The comparable survey in 2003 was taken during August.

4.2. Trends

4.2.1 Overall, noise levels during evenings and nights at weekends were noisier than weekdays during the same measurement periods. (62.5% of sites).

4.2.2. At sites where this was not the case in the evening, noise was due to pedestrian traffic (presumably office workers) and weekday evening traffic.

4.2.3. Measurements of selected quiet areas were inconsistent with this trend where noise levels were higher on weekday days rather than night time. Surveys at these sites provided a useful baseline for the areas. Results showed noise levels at night for weekdays were lower than noise levels during the day and week-ends rose compared to days and fell sharply at late night.

4.2.4. Monitoring has shown that during the week daytime noise levels were usually greater or equal to that of evening noise (67.5% of sites). Weekday evening noise levels were higher than those at night time and those at late night (62.5% of sites: 10% were at equal noise levels).

4.2.5. At week-ends night time noise levels were higher than evenings at 75% of sites. Noise levels at late night tended to be lower than levels during evening and night measurements (in 87% of sites).

4.2.6. Where this was not the case notes during the surveys indicate that this was primarily due to pedestrian crowds and traffic. It was also noted that significant contribution could be attributed to chatting and shouting by large groups of people and a mechanical street sweeper.

4.2.7. Late night measurements were higher in a few locations during this time span than earlier measurements. Notes showed this was due to pedestrians leaving premises and also due to large numbers of pedestrians passing through towards travel options in major roads such as Charing Cross Road and Strand.

4.2.8. At some road junctions, in addition to traffic noise, there was noise from groups of people chatting in the street outside whilst smoking before re-entering venues.

4.2.9. Noise as a result of traffic congestion ensured that measurements were at similar levels during the day, evening and night time.

4.2.10. Noise levels in streets with much outdoor seating were noisiest during evening and night time surveys. The fall in noise levels between night and late night measurements was significant at 5dB.

4.2.11. On comparison of noise levels from residential, entertainment, traffic and pedestrian sources the following trends were shown.

- Traffic noise, both vehicle and pedestrian, and to a much lesser extent from entertainment are the dominant noise sources in Soho,
- Pedestrian noise and entertainment increases at weekends,
- Non entertainment/commercial areas have the lowest noise levels and these levels reduce at weekends

4.3 Noise Sources

4.3.1 Dominant noise sources were noted as part of the surveys

- Road traffic
- Music from entertainment venues and public houses
- Pedestrians (talking, shouting and singing)
- People eating and drinking at tables and chairs
- People drinking outside premises
- People queuing to enter premises
- Sirens
- Plant noise
- People stationary smoking and talking
- Waste collections
- People eating and drinking at tables and chairs
- People drinking outside premises
- Street incidents involving police intervention
- Road works
- Vehicle horns
- Buskers
- Police motorcycles

5.00 Comparisons

5.1.1 The survey in August 2003 did not use weekend daytime measurements but it is possible to compare the other results with similar time periods in 2008 both January and August.

5.1.2. Comparison of the August 2003 measurements with those of the 2008 surveys showed that 52% were higher than in 2008.

5.1.3. In 18.5% of comparable measurements noise levels were higher in January 2008 than in August 2003 or August 2008.

5.1.4. In 15.5% of measurements noise levels were higher in August 2008 than in August 2003 or January 2008.

5.1.5. In 14% of measurements noise levels were at equal levels to one of the other surveys.

5.1.6. The difference between the highest noise levels measured and the next level was in the range 0.5dB to 2dB in 48% of cases.

5.1.7. In 30% of cases the difference between the highest noise levels measured and the next level was in the range 3dB to 5dB in 48%.
Such a change is likely to be noticeable to an observer.

5.1.8. In 8% of cases the difference between the highest noise levels measured and the next level was in the range 6dB to 9dB. Such a change would be noticeable to an observer and would be a likely source of complaint.

5.1.9. The quiet locations results remained similar in both 2008 surveys and thus remain lower than in the 2003 study. 5.1.8. The overall trend shown within the 2008 surveys compared with those of 2000 and 2003 is a reduction in background noise levels.

5.1.10 However, higher levels were recorded in 2008 than 2003 in some locations. This was particularly so in areas where there are many entertainment venues such as Leicester Square. Causes of higher levels in certain localities could be attributed to predictable causes. In main vehicular traffic locations common noise sources are traffic flows and congestion and in addition large volumes of pedestrians. Sirens from emergency vehicles also contributed to the overall noise climate. There were also incidents of refuse collection vehicles, including where glass was collected, which made a significant contribution to the overall noise climate.

5.1.11 Noise from entertainment venues was not greatly significant from the aspect of noise break out except where door supervision was inadequate. Where noise from customers outside public houses and entertainment venues was evident it appeared that the main purpose for resorting to the exterior was for smoking. This may have had less significance in 2003 than it did in 2008.

5.1.12. In areas where noise levels are greater at night than during the day there were some factors which would affect these. Certainly streets which are restricted to being mainly pedestrian are not affected greatly by vehicle noise but after normal working hours there is a substantial increase in pedestrian traffic and social activity in those areas.
In some instances people were seen waiting in groups on roads or adjoining pavements due to road closures which added to the noise climate at this time. Vehicular traffic at night and during late night surveys includes non black cab taxis and non-motorised rickshaws which all contributed to the overall picture and background noise levels.

6.0 Issues for consideration on further action

6.1.1 Availability of transport information to enable visitors to select best routes to exit Soho and to select a suitable mode of transport.

6.1.2 Protection of quieter streets and areas by selection of preferred and recommended pedestrian routes for visitors.

6.1.3 Noise from queues, outside seating areas and in particular exteriors of public houses and entertainment venues which customers use for smoking

6.1.4 Noise from glass collection vehicles and operations.

6.1.5 Noise from vehicle traffic movements.

Soho Noise Survey Report

August 2008

Section 1 - Introduction

This survey was the second of two noise measurements conducted in conjunction with the Noise Strategy Steering Group carried out within two areas of Soho. The survey took place from 4th August to the early hours of 31st August 2008.

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- To provide a better understanding as to the main contributing sources of the noise monitored and to identify any trends or particular stressed areas.

- To provide a comparison of the current noise climate and the previous survey in January 2008 and also during 2003.

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3.1 Monitoring Sites

There were 40 monitoring sites in total covering the stress area of Soho bordered by Oxford St, Regent St, Charing Cross Road and Orange St. The sites were divided by Wardour Street into East and West sections. Please see 3.3 for site maps and locations.

The monitoring was divided into the following three time periods

5) Day – between 7:00 and 19:00
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In addition notes were taken of predominate noise sources and the sites were categorised by the type of noise experienced. E.g. road traffic, pedestrians and music from licensed premises or residential locations.

3.3 Site Locations

East of Wardour Street

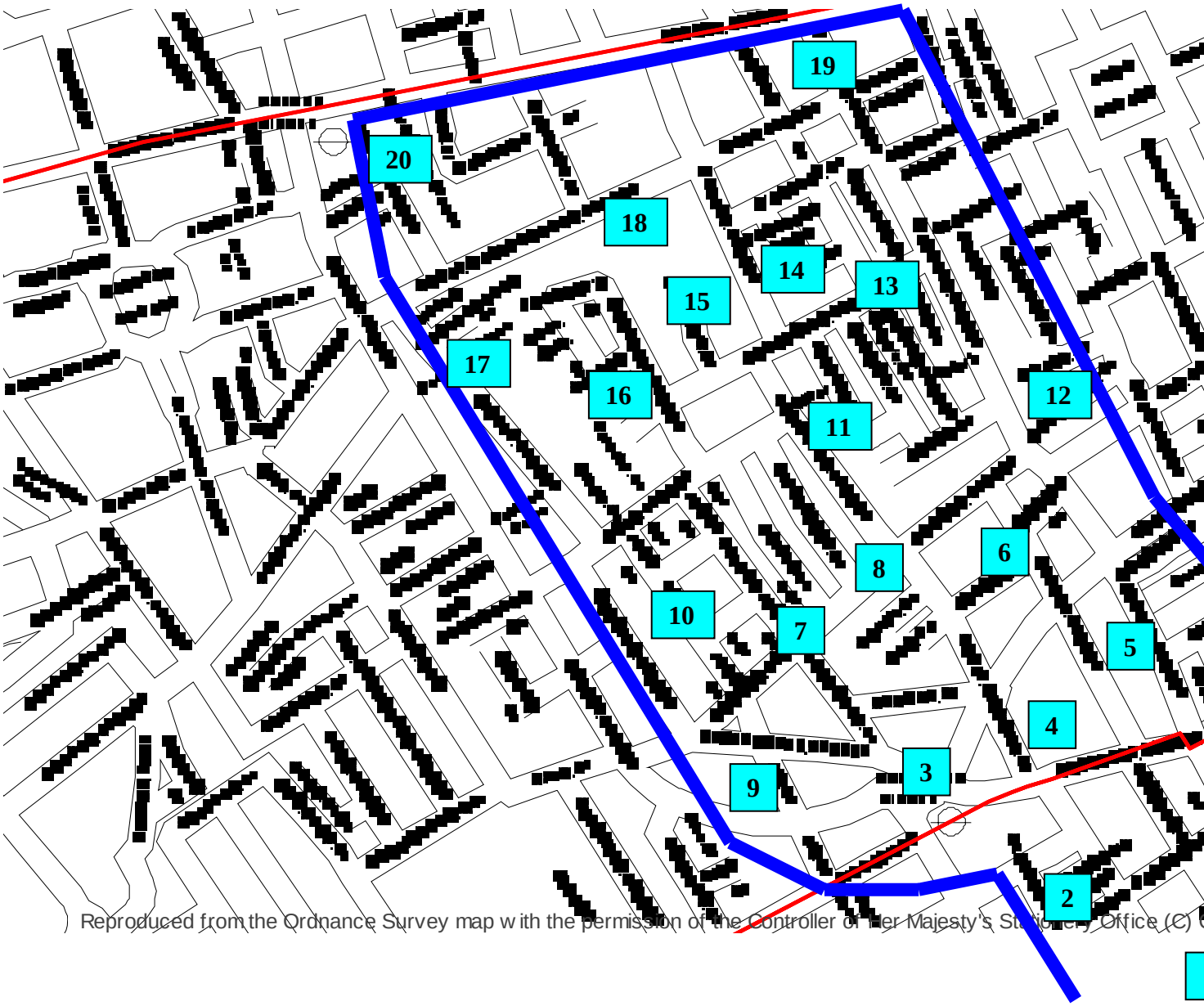
1 Cnr Wardour / Hollen Strs
2 Cnr Wardour St and Meard St
3 Cnr Carlisle / Dean Strs
4 Soho Square
5 Cnr Soho / Oxford Strs
6 Cnr Charing Cross Rd and Oxford St
7 Manette St
8 Cnr Bateman / Frith Strs
9 Meard St
10 Cnr Old Compton / Dean Strs
11 Cnr Old Compton / Frith Strs
12 Cambridge Circus
13 Cnr Shaftesbury Ave / Frith St
14 Cnr Brewer / Wardour Strs
15 Cnr Wardour / Coventry Strs
16 Leicester Square South Side
17 Leicester Square North Side
18 Cnr Gerrard / Macclesfield Strs
19 Bear St
20 Irving St

West of Wardour Street

1 St James Market
2 Piccadilly Circus
3 Sherwood St
4 Shaftesbury Avenue
5 Cnr Archer / Rupert Strs
6 Cnr Brewer / Lexington Strs
7 Golden Square
8 Great Pulteney St
9 Cnr Warwick / Glasshouse Sts
10 Beak St
11 Cnr Lexington / Broadwick Strs
12 Duck Lane
13 Portland Mews
14 Cnr Poland / D'Arblay Strs
15 Marshall St
16 Newburgh St
17 Cnr Kingly / Gt. Marlborough Strs
18 Cnr Ramillies / Gt. Marlborough Strs
19 Cnr Berwick Oxford Strs
20 Oxford Circus

Soho East Sites Map

Soho West Sites Map



Section 4 – Results and Analysis

The analysis of the results that follows includes:

- a summary of the monitoring sites,
- an analysis of the data including a discussion of trends, and anomalies,
- a comparison of the results in relation to previous investigations.

4.1 Site Summary

The following tables (table 4.1.1 and 4.1.2) are a description of the monitoring site street environment, including average L_{A90} for each monitoring period. It includes the identification of the main noise sources resulting from the observation notes taken during the survey.

4.1.1 Soho Survey Sites West of Wardour Street

	Sites – West of Wardour Street		Weekday			Weekend		
			Day	Predominant noise	LA90	Day	Predominant noise	LA90
1	St James's Market - by Haymarket busy traffic	D	Mon	Traffic	66.5	Sat	Traffic, peds, siren	62.0
		E	Tues	Traffic	63.0	Sat	Traffic	64.0
		N	Wed	Traffic	65.0	Sat	Traffic	67.0
		EN	Wed	Traffic, peds	60.0	Sat	Traffic, club noise	69.0
2	Eros, Piccadilly Circus - busy intersection, lots of people	D	Mon	Traffic, peds	66.5	Sat	Peds, traffic	68.5
		E	Tues	Traffic, peds	65.5	Sat	Peds, traffic	68.0
		N	Wed	Traffic	68.5	Sat	Traffic	68.5
		EN	Wed	Traffic, busker	67.0	Sat	Busker, traffic	71.5
3	Sherwood St – theatre + shops	D	Mon	Traffic	67.0	Sat	Traffic, peds	61.0
		E	Tues	Traffic	60.5	Sat	Peds, traffic, alarm	64.0
		N	Wed	Traffic	61.5	Sat	Traffic, peds	67.5
		EN	Wed	Traffic, busker	63.5	Sat	Traffic, sirens	63.5
4	Cnr Denman St & Shaftesbury - busy road, shops, people	D	Mon	Traffic, peds	67.5	Sat	Traffic, peds	65.0
		E	Tues	Traffic, peds	68.0	Sat	Traffic, peds	67.0
		N	Wed	Traffic, peds	65.5	Sat	Traffic, peds	67.5
		EN	Wed	Traffic	62.0	Sat	Traffic, peds	67.0
5	Cnr Archer & Rupert – offices, shops no traffic	D	Mon	Pedestrians	60.0	Sat	Peds, plant	58.5
		E	Tues	Pedestrians	63.5	Sat	Street noise	66.0
		N	Wed	Traffic, peds	61.5	Sat	Traffic, peds	64.0
		EN	Wed	Pedestrians	55.5	Sat	Traffic, peds	61.5
6	Cnr Brewer & Lexington St – busy road, pub opposite	D	Mon	Traffic	66.0	Sat	Peds, traffic	58.0
		E	Tues	Traffic, peds	62.0	Sat	Traffic, peds	62.0
		N	Wed	Traffic	63.5	Sat	Peds, traffic noise	61.5
		EN	Wed	Traffic	54.5	Sat	Peds, traffic	60.0
7	Golden Square – quiet park area with offices around	D	Mon	Distant traffic	53.0	Sat	Peds, wind noise	48.5
		E	Tues	Plant	53.0	Sat	Pedestrians	49.0
		N	Wed	Plant	54.5	Sat	Traffic (light)	51.5
		EN	Wed	Plant	52.5	Sat	Peds, idling car	55.0
8	Gt Pulteney St – quiet street, residential & offices	D	Mon	Distant traffic	53.5	Sat	Pedestrians	51.0
		E	Tues	Patrons (pub)	58.0	Sat	Taxi idling, peds	53.0
		N	Wed	Plant	50.0	Sat	Traffic	51.5
		EN	Wed	Traffic	52.5	Sat	Plant noise, traffic	50.5
9	Cnr Warwick & Glasshouse St – busy junction, bars	D	Mon	Traffic	65.0	Sat	Peds, distant traffic	61.5
		E	Tues	Traffic, peds	62.5	Sat	Traffic, pubs, siren	64.0
		N	Wed	Traffic	62.0	Sat	Music, traffic	67.5
		EN	Wed	Traffic, busker	59.5	Sat	Traffic, music	64.5
10	Cnr Warwick & Beak St – bars, offices, busy road	D	Mon	Traffic	63.0	Sat	Traffic, peds, siren	62.5
		E	Tues	Traffic, peds	62.0	Sat	Noise from club	66.0
		N	Wed	Traffic	60.5	Sat	Music from club	66.0
		EN	Wed	Traffic	55.0	Sat	Traffic, club	63.5
11	Cnr Lexington & Broadwick St – bars, busy road	D	Mon	Traffic,siren	60.0	Sat	Peds, amp music	58.0
		E	Tues	Patrons (pub)	63.5	Sat	Traffic, taxis, peds	61.0
		N	Wed	Peds, plant	58.0	Sat	Peds, traffic	60.5
		EN	Wed	Traffic, plant	52.5	Sat	Traffic, plant	54.0

4.1.1

	Sites – West of Wardour Street		Weekday			Weekend		
			Day	Predominant noise	LA90	Day	Predominant noise	LA90
12	Duck Lane – no thru road, offices with plant servicing	D	Mon	Plant, construction	60.0	Sat	Plant	59.5
		E	Tues	Plant	63.0	Sat	Plant	59.0
		N	Wed	Plant	61.5	Sat	Plant, music	59.0
		EN	Wed	Plant	59.5	Sat	Plant	57.5
13	Portland Mews – no traffic, offices with res above, plant noise	D	Mon	Building, no traffic	49.5	Sat	Drilling, peds	44.0
		E	Tues	Plant	48.5	Sat	Peds	44.5
		N	Wed	Plant, shutter	45.0	Sat	Delivery vehicle	45.5
		EN	Wed	Plant	39.5	Sat	Distant voices	40.0
14	Cnr Poland & D'Arblay St – traffic, shops, business, bars	D	Mon	Traffic, peds	58.5	Sat	Pedestrians	56.5
		E	Tues	Traffic	63.5	Sat	Traffic (queuing)	59.0
		N	Wed	Traffic	58.0	Sat	People	61.5
		EN	Wed	Traffic, plant	56.5	Sat	Plant, voices	57.5
15	Cnr Marshall St & Fouberts Pl – quiet street, office & res	D	Mon	Building, peds	55.0	Sat	Peds, distant plant	52.0
		E	Tues	Rain	54.0	Sat	Pedestrians	51.0
		N	Wed	Plant	49.0	Sat	Peds voices	54.5
		EN	Wed	Plant	47.5	Sat	Plant noise	47.5
16	Newburgh St – shops & licensed prems with res above	D	Mon	Peds, building	57.0	Sat	Peds & pub	58.0
		E	Tues	Patrons (pub)	65.0	Sat	Peds & pub	59.0
		N	Wed	Plant, peds	48.0	Sat	Pedestrians	51.5
		EN	Wed	Plant	45.0	Sat	Voices, plant noise	44.5
17	Cnr Kingly & Gt Marlborough St – busy traffic, shops, offices	D	Mon	Traffic, peds	61.0	Sat	Traffic & peds	65.0
		E	Tues	Traffic	65.5	Sat	Traffic & peds	63.5
		N	Wed	Traffic	62.0	Sat	Traffic & peds	65.5
		EN	Wed	Traffic	57.0	Sat	Traffic	62.0
18	Cnr Ramilies & Gt Marlboro St – traffic, mainly offices/shops	D	Mon	Traffic, peds	60.0	Sat	Traffic, peds	57.0
		E	Tues	Traffic	60.5	Sat	Light traffic	54.5
		N	Wed	Traffic	52.5	Sat	Traffic	60.0
		EN	Wed	Plant	47.0	Sat	Light traffic	50.5
19	Cnr Berwick & Oxford St – offices, shops, lots of people	D	Mon	Traffic, people	66.0	Sat	Peds & traffic	62.5
		E	Tues	Traffic	62.0	Sat	Peds, traffic, horns	63.5
		N	Wed	Pedestrians	55.0	Sat	Peds, traffic	61.5
		EN	Wed	Traffic	53.0	Sat	Traffic, street clean	62.5
20	Oxford Circus – busy traffic intersection, regularly crowded	D	Mon	Traffic	67.5	Sat	Peds, traffic	71.0
		E	Tues	Traffic, peds	70.0	Sat	Peds & traffic	70.0
		N	Wed	Traffic, peds	66.0	Sat	Traffic, peds	69.0
		EN	Wed	Traffic	60.0	Sat	Traffic, street clean	65.0

D=daytime (0700-1900hrs)
E=evening (1900-2300hrs)
N=night (2300-0100hrs)
EN=extended night (0100-0400hrs)

4.1.2 Sites East of Wardour Street.

	Sites – East of Wardour Street		Weekday			Weekend		
			Day	Predominant noise	LA90	Day	Predominant noise	LA90
1	Cnr Wardour & Hollen St – shops, offices, light traffic	D	Wed	Traffic, roadworks	64.0	Sat	Traffic, peds	57.5
		E	Tues	Peds, refuse truck	61.5	Sat	Traffic, music	62.0
		N	Thur	Traffic – diverted	57.0	Fri	Traffic	62.5
		EN	Thur	Traffic (light)	53.5	Sat	Traffic	56.5
2	Cnr Wardour & St Ann's Ct – comm. prems, light traffic	D	Wed	Traffic, peds	62.5	Sat	Traffic, peds	57.0
		E	Tues	Traffic, peds	59.5	Sat	Pedestrians	58.5
		N	Thur	Pedestrians	59.5	Fri	Pedestrians	60.0
		EN	Thur	Traffic	56.5	Sat	Traffic	56.5
3	Cnr Carlisle & Dean St – licensed prems, traffic, some res	D	Wed	Peds/traffic	61.5	Sat	Traffic, peds	56.0
		E	Tues	Peds/traffic	63.0	Sat	Pedestrians	62.0
		N	Thur	Closing restaurant	60.0	Fri	Pub patrons	68.0
		EN	Thur	Traffic	54.0	Sat	Traffic	60.5
4	Soho Square – park surrounded by offices & residential	D	Wed	Roadworks	61.5	Sat	Plant, voices	56.0
		E	Tues	Traffic, peds	57.0	Sat	Traffic, peds	57.0
		N	Thur	Traffic, voices	57.5	Fri	Traffic, car horn	58.0
		EN	Thur	Faint traffic	53.5	Sat	Peds – loud shouts	54.0
5	Cnr Soho & Oxford St – heavy traffic, people, licensed prems	D	Wed	No traffic - blocked	64.5	Sat	Traffic	63.0
		E	Tues	Traffic, peds	65.5	Sat	Traffic	65.0
		N	Thur	Traffic,road blocked	65.0	Fri	Traffic	67.5
		EN	Thur	Q at club	65.0	Sat	Siren	64.5
6	Cnr Oxford St & Charing X Rd – busy junction, commercial	D	Wed	Traffic, construction	68.5	Sat	Traffic	66.5
		E	Tues	Traffic, peds	68.0	Sat	Traffic	67.0
		N	Thur	Traffic	67.0	Fri	Traffic	70.0
		EN	Thur	Traffic	66.0	Sat	Traffic – busker	68.5
7	Manette St – one way st, offices, bars, distant traffic	D	Wed	Distant roadworks	60.0	Sat	Faint traffic	51.5
		E	Tues	Noise from pub	53.5	Sat	Faint traffic	53.0
		N	Thur	Pedestrians	57.0	Fri	Faint traffic	59.5
		EN	Thur	Q at club	57.0	Sat	Faint traffic	56.0
8	Cnr Bateman & Frith St – several licensed prems, busy	D	Wed	Traffic & voices	63.0	Sat	Traffic, peds	57.5
		E	Tues	Peds, traffic, pubs	63.5	Sat	Pedestrians	65.0
		N	Thur	Pedestrians	62.0	Fri	Peds, shouting	71.0
		EN	Thur	Traffic, peds	60.0	Sat	Traffic	59.0
9	Meard St – no traffic, restaurants, offices & res above	D	Wed	Peds/bldg works	56.5	Sat	Faint traffic	50.0
		E	Tues	Peds, distant traffic	51.0	Sat	Pedestrians	52.0
		N	Thur	Pedestrians	50.5	Fri	Pedestrians	54.5
		EN	Thur	Traffic	49.5	Sat	Peds – singing	50.5
10	Cnr Old Compton & Dean St – busy area with licensed prems	D	Wed	Traffic, construction	61.5	Sat	Pedestrians	59.0
		E	Tues	Traffic, street clean	66.0	Sat	Traffic	65.5
		N	Thur	Traffic	63.5	Fri	Traffic	67.0
		EN	Thur	Pedestrians	56.5	Sat	Traffic	62.0
11	Cnr Old Compton & Frith St – very busy area, lots of nightlife	D	Wed	Peds, siren	64.0	Sat	Pedestrians	62.5
		E	Tues	Traffic, peds	63.0	Sat	Traffic, peds	67.0
		N	Thur	Traffic, music	65.0	Fri	Traffic, peds	68.5
		EN	Thur	Traffic	61.5	Sat	Traffic	63.0

4.1.2 Sites East of Wardour Street

	Sites – East of Wardour Street		Weekday			Weekend		
			Day	Predominant noise	LA90	Day	Predominant noise	LA90
12	Cambridge Circus – busy junction, bars & theatre	D	Wed	Traffic, peds	67.5	Sat	Traffic	63.5
		E	Tues	Traffic, peds, siren	63.5	Sat	Traffic	65.5
		N	Thur	Traffic	64.5	Fri	Traffic	71.0
		EN	Thur	Traffic, horns	64.0	Sat	Traffic	66.5
13	Cnr Shaftesbury Ave & Frith St – heavy traffic, comm. prems	D	Wed	Traffic, roadworks	71.0	Sat	Traffic	64.5
		E	Tues	Traffic (buses)	64.5	Sat	Traffic	64.5
		N	Thur	Traffic, pedestrians	64.0	Fri	Traffic	67.5
		EN	Thur	Traffic (diverted)	63.5	Sat	Traffic	66.0
14	Cnr Brewer & Wardour St – licensed prems very busy	D	Wed	Light traffic, peds	62.5	Sat	Pedestrians	59.5
		E	Tues	Peds, traffic	67.0	Sat	Music, peds	68.0
		N	Thur	Traffic, peds	70.0	Fri	Peds – shoutng	71.0
		EN	Thur	Pedestrians	65.0	Sat	Patrons at club	69.5
15	Cnr Wardour & Coventry St – busy traffic & pedestrians	D	Wed	Traffic, construction	70.0	Sat	Traffic, peds	64.5
		E	Tues	Traffic, peds, plant	65.0	Sat	Pedestrians	67.0
		N	Thur	Traffic, peds	67.5	Fri	Traffic	71.0
		EN	Thur	Traffic, horns	64.0	Sat	Traffic – car stereo	69.5
16	Leicester Sq south side – bars, clubs, pedestrianised	D	Wed	Refuse truck, hoist	65.0	Sat	Pedestrians	62.0
		E	Tues	Peds, plant	60.0	Sat	Voices	65.5
		N	Thur	Peds, shouting	66.0	Fri	Event – music	68.5
		EN	Thur	Pedestrians	60.0	Sat	Event – crowd	63.5
17	Leicester Sq north side – bars, clubs, pedestrianised	D	Wed	Construction	65.0	Sat	Pedestrians	62.0
		E	Tues	Plant, peds, siren	63.0	Sat	Pedestrians	66.0
		N	Thur	Pedestrians	68.0	Fri	Event – music	78.0
		EN	Thur	Siren	64.5	Sat	Event – crowd	70.5
18	Cnr Gerrard & Macclesfield St – free of traffic, restaurants	D	Wed	Pedestrians	64.5	Sat	Plant, refuse truck	66.0
		E	Tues	Peds, distant traffic	66.0	Sat	Plant, peds	67.0
		N	Thur	Plant noise	62.5	Fri	Plant	64.5
		EN	Thur	Plant	59.5	Sat	Plant	62.0
19	Bear St – pedestrians only, licensed prems, crowded area	D	Wed	Pedestrians	62.5	Sat	Plant, traffic, music	62.0
		E	Tues	Pub, traffic (buses)	68.0	Sat	Peds, voices	68.0
		N	Thur	Club – music noise	70.0	Fri	Traffic, peds	70.0
		EN	Thur	Club – patrons	66.5	Sat	Traffic, sirens	66.0
20	Irving St – edge of Leicester Sq, busy with bars & people	D	Wed	Horn, hammering	60.5	Sat	Pedestrians	60.5
		E	Tues	Peds, plant, traffic	61.0	Sat	Pedestrians	65.5
		N	Thur	Pedestrians	63.0	Fri	Traffic, peds	67.5
		EN	Thur	Faint traffic	58.0	Sat	Traffic	70.5

D=daytime (0700-1900hrs)
E=evening (1900-2300hrs)
N=night (2300-0100hrs)
EN=extended night (0100-0400hrs)

4.2 Data & Analysis

Three hundred and twenty 5-minute measurements of L_{Aeq} and L_{A90} were taken during eight monitoring periods (weekday daytime, evening, nights and late nights and weekend day-time, evening, night and late nights) at forty monitoring sites. The late night measurement period (01.00 to 04.00 hours) was added for the August survey as requested at a presentation of the January survey to the Soho Steering Group.

4.2.1 Trends

Please refer to the following graphs.

4.2.2 Overall, noise levels during evenings and nights at weekends were noisier than weekdays during the same measurement periods. (62.5% of sites).

4.2.3. At sites where this was not the case in the evening, noise was due to pedestrian traffic (presumably office workers) and weekday evening traffic.

4.2.4. Measurements of quiet areas in Duck Lane and Portland Mews were inconsistent with the trend on this where noise levels were higher on weekday days rather than night time.
However, these site surveys provided a useful baseline showing noise levels at night for weekdays were lower than noise levels during the day and week-ends rose compared to days and fell sharply at late night. The quieter areas gave the lowest figures and these would be more greatly affected by one off anomalies (e.g. shouts, car horns) but these did not greatly occur.

4.2.5. Monitoring has shown that during the week daytime noise levels were usually greater or equal to that of evening noise (67.5% of sites). Weekday evening noise levels were higher than those at night time and those at late night (62.5% of sites: 10% were at equal noise levels).

4.2.6. At week-ends night time noise levels were higher than evenings at 75% of sites. Noise levels at late night tended to be lower than levels during evening and night measurements (in 87% of sites).

4.2.7. However, there were cases where this is not true. The areas around Leicester Square, including the Bear St monitoring site and at the junction with Charing Cross Road were noisiest at night and late night. Notes taken at the time indicate that this was primarily due to pedestrian crowds and traffic.

4.2.8. Crowds within Bear Street were associated with an entertainment venue where entrance doors were pushed open and music could be heard. Traffic in some areas had been held waiting by road-works with the result that horns were sounded.

4.2.9. In Leicester Square on the North side this was due to large groups of people chatting and shouting. A specific noise source in Leicester Square involving use of a balcony and a street sweeper could be discerned against the overall background.

4.2.10. Late night measurements at Irving Street were higher than at night and records show this was due to pedestrians leaving premises but remaining outside until ushered away. There were also large numbers of pedestrians passing through Irving Street from Leicester Square towards travel opportunities in Charing Cross Road and Strand.

4.2.11. On the junction of Wardour Street and Brewer Street in addition to traffic noise there was noise from groups of people outside venues smoking before re-entering.

4.2.12. Measurements at the corner of Great Marlborough St and Kingly St tended to be similarly noisy during day, evening and night time due to traffic congestion on Regent St and pedestrian traffic.

4.2.13. Old Compton Street was noisiest during evening and night. The fall in noise levels between night and late night measurements was notable. Old Compton St tends to have a great deal of pedestrian traffic and there are many cafés and restaurants with outdoor seating which contributed significantly to the noise climate. When these had closed the fall in noise levels was significant at 5dB.

4.2.14. On comparison of noise levels from residential, entertainment, traffic and pedestrian sources the following trends were shown.

- Traffic noise, both vehicle and pedestrian, and from entertainment are the dominant noise sources in Soho,
- Pedestrian noise and entertainment increases at weekends,
- Non entertainment/commercial areas have the lowest noise levels and these levels reduce at weekends

Section 5 - Discussion

5.00 Comparisons

5.1.1 Comparison with the January 2008 survey shows surprisingly similar levels to those obtained in August 2008 in many measurement locations.

5.1.2. In 47.1% of comparable measurements noise levels were higher in January than in August 2008.

5.1.3. In 46.7% of measurements noise levels were higher in August than in January 2008. 6.25% of measurements were equal in January and August 2008.

5.1.4. Most of the increases in noise levels January to August 2008 were small and in the range of 0.5 to 2 dB. (66.4%). Such increases would not usually be discernable to an observer.

5.1.5. 22.4% of increased noise levels between January and August were in the range 3dB to 5dB. These are likely to be noticeable to an observer.

5.1.6. 11.2% of increased noise levels were between 6dB and 9dB which would be noticed and may be sources of complaint.

5.1.7. Where the comparison showed a reduction in measured noise levels from the January 2008 survey with those obtained in August 2008 most of the decreases were small and in the range of 0.5 to 2 dB. (56.7%). Such increases would not usually be discernable to an observer. 34.2% of reduced levels were in the range 3 to 5dB which would be noticed by observers. 9.01% were in the range 6 to 9% which would be clear to most observers.

5.1.8. The quiet locations results remained similar to the measurements in January and thus remain lower than in the 2003 study. The overall trend shown within this survey compared with those of 2000 and 2003 is a reduction in background noise levels. However, there are some locations where higher levels were recorded. This was particularly so in Leicester Square where there were particular incidents and certain locations where traffic (pedestrian and vehicular) was a major factor.

In most instances the values recorded can be attributed to predictable causes. Common noise sources are traffic flows and congestion, volume of pedestrians, and to lesser extent breakout from entertainment venues. There were also incidents of refuse collection vehicles, particularly where glass was collected (Poland and D'Arblay Streets), and sirens from emergency vehicles which contributed to the overall noise climate.

5.1.9. As described in 4.2.8 above Leicester Square is one area where noise levels are greater at night than during the day. This is due to an increase in

pedestrian traffic, street cleaning and social activity in the area after working hours.

Other areas that are relatively noisy at night include Old Compton Street, Shaftesbury Avenue, Oxford St, Piccadilly Circus, and Brewer St. In Old Compton Street elevated noise levels were due to customers leaving and the arrival of police motor-cycles. In Piccadilly Circus and Brewer Street west there was also amplified music from buskers. It was noticeable that significant groups of people were remaining outside premises, such as entertainment venues, to smoke whilst waiting to enter or re-enter. This was notable on the corner of Bateman and Frith Streets where a very large group of people were shouting whilst waiting outside a venue. Due to road closures people were seen waiting in groups on roads or adjoining pavements. Vehicular traffic at night and during late night surveys includes non black cab taxis and rickshaws which all contributed to the overall picture and background noise levels.

5.2. Anomalies

Short-term measurements can produce anomalies due to high-energy noise events, e.g. shouting, car doors slamming, and cars with noisy radios passing by. Sites most affected by “noise incidents” in the 5-minute snap shot were the quieter residential areas. Sites which were least affected were dominated by traffic noise.

All weather was clear and fine. Some proposed dates for monitoring were cancelled where rain or high winds were predicted or had commenced. Dates were then re-arranged accordingly within the same month. One set of readings was abandoned due to a street incident and was repeated on another night.

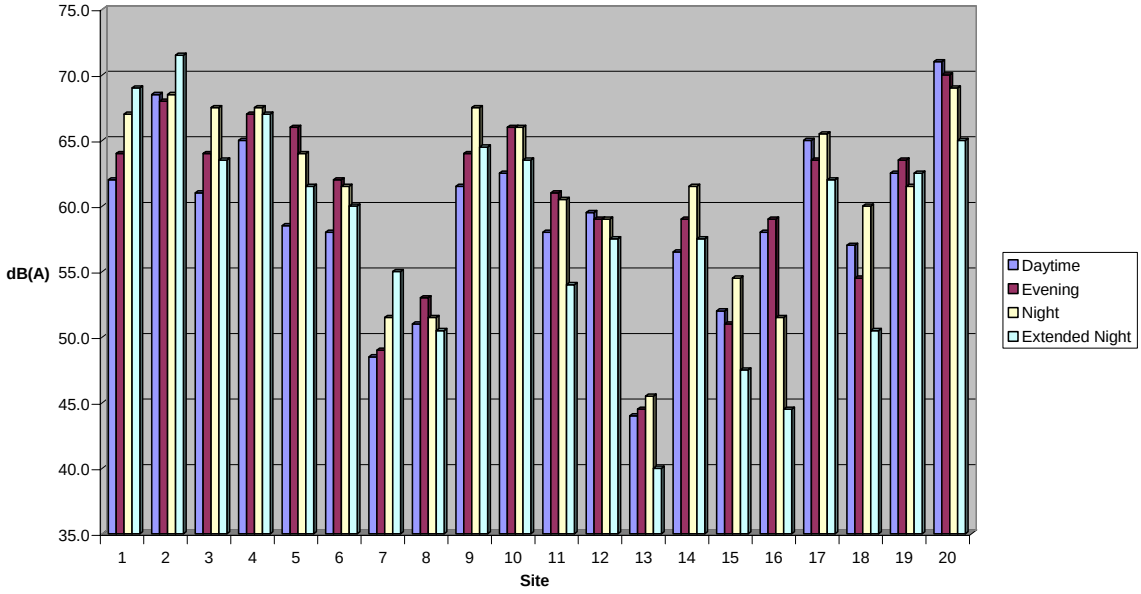
Section 6 - References

1. Community Noise, World Health Organisation, April 2000.

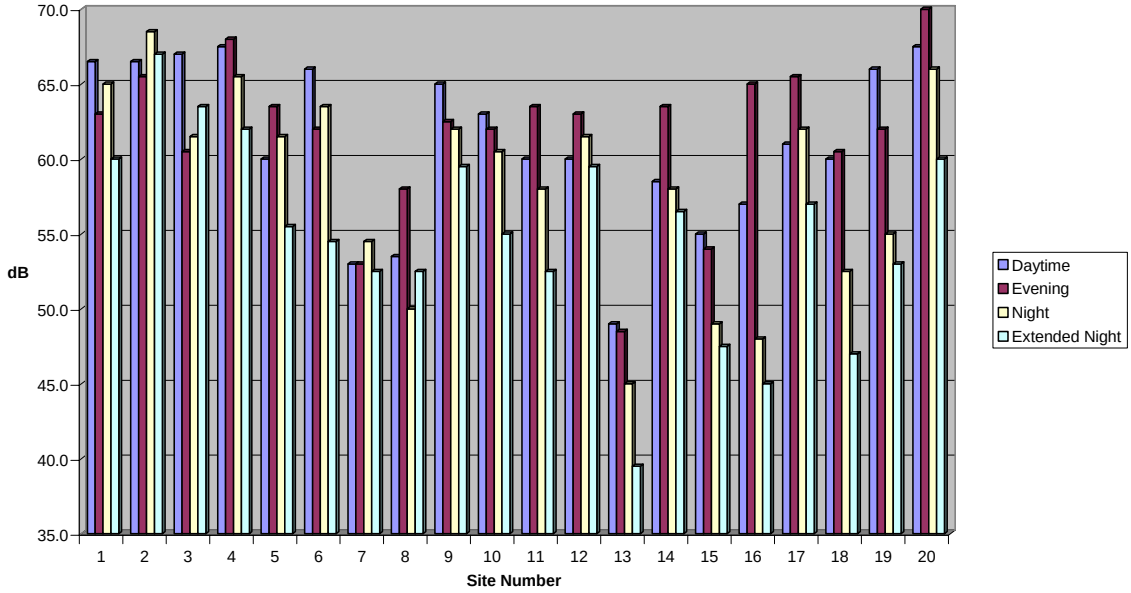
2. Method for rating industrial noise affecting mixed residential and industrial areas, British Standard 4142: 1997.

3. Planning and Noise, Planning Policy Guidance 24, September 1994.

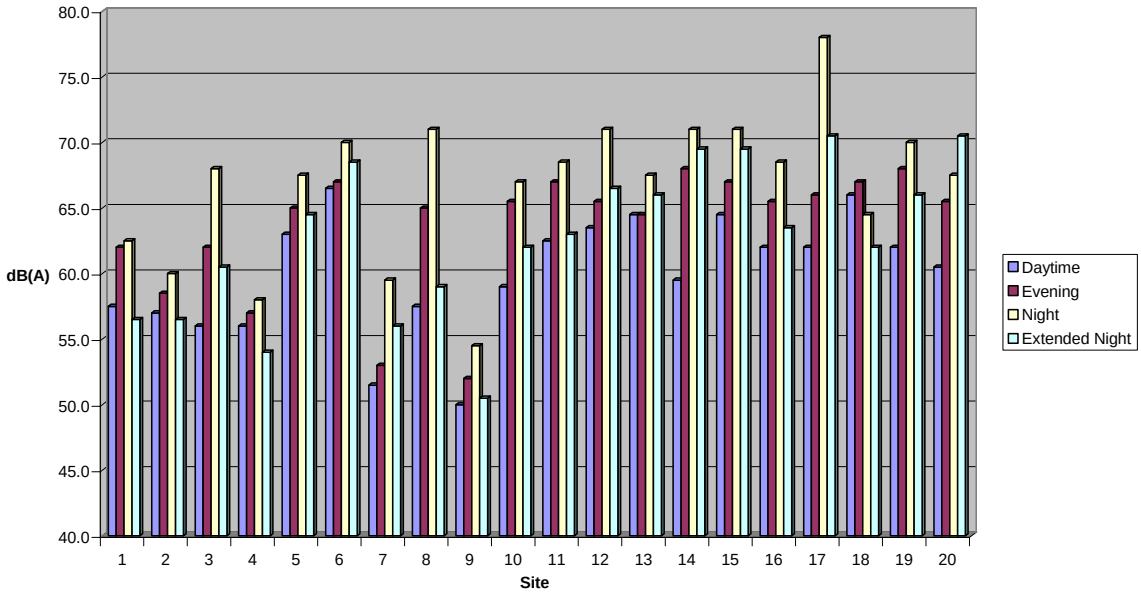
Soho Noise Survey August 2008 - West Sites
Weekend Background Noise (LA90) Results



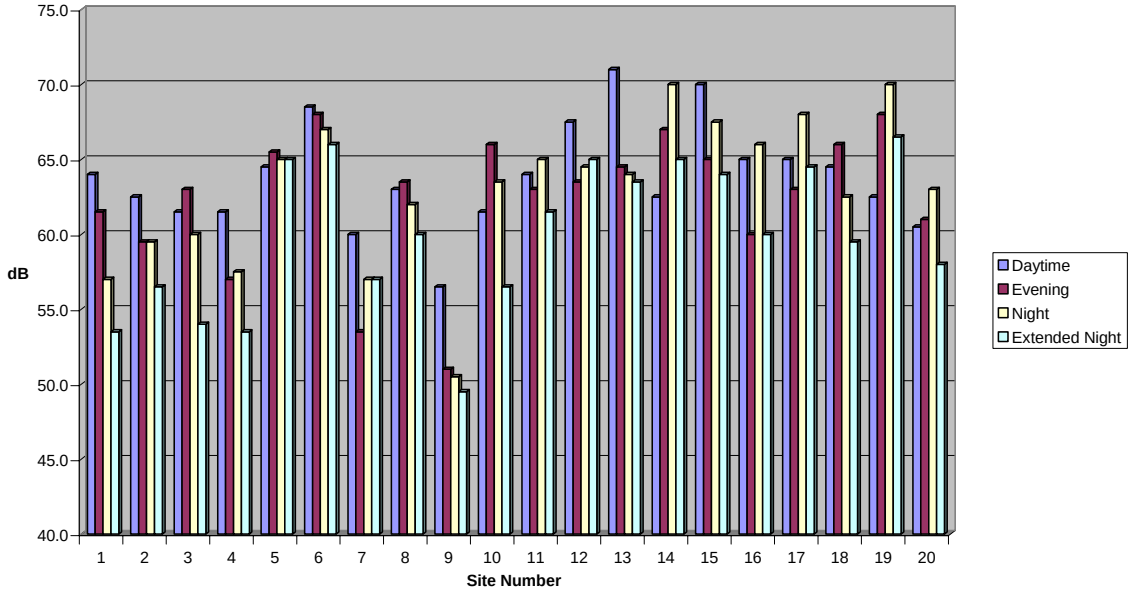
Soho Noise Survey August 2008 - West Sites
Weekday Background Noise (LA90) Results



Soho Noise Survey August 2008 - East Sites
Weekend Background Noise (LA90) Results



Soho Noise Survey August 2008 - East Sites
Weekday Background Noise (LA90) Results



Site	Zone	Full name	Northings	Eastings	Day Weekday LAeq	Day Weekday LA90	Evening Weekday LAeq	Evening Weekday LA90	Night Weekday LAeq	Night Weekday LA90	Extended Night Weekday LAeq	Extended Night Weekday LA90	Day Weekend LAeq	Day Weekend LA90	Evening Weekend LAeq	Evening Weekend LA90	Night Weekend LAeq	Night Weekend LA90	Extended Night Weekend LAeq	Extended Night Weekend LA90
1	West	1 West	529687	180602	70.1	66.5	69.4	63.0	72.5	65.0	69.4	60.0	71.4	62.0	69.8	64.0	71.5	67.0	75.3	69.0
2	West	2 West	529580	180657	71.0	66.5	71.9	65.5	72.7	68.5	72.0	67.0	76.1	68.5	70.8	68.0	73.4	68.5	76.0	71.5
3	West	3 West	529491	180693	69.9	67.0	66.9	60.5	66.7	61.5	69.0	63.5	67.3	61.0	68.2	64.0	72.7	67.5	72.3	63.5
4	West	4 West	529586	180759	72.6	67.5	73.2	68.0	71.8	65.5	70.6	62.0	70.0	65.0	73.2	67.0	81.0	67.5	71.7	67.0
5	West	5 West	529628	180859	64.4	60.0	68.5	63.5	67.6	61.5	59.7	55.5	66.8	58.5	69.2	66.0	69.2	64.0	68.8	61.5
6	West	6 West	529517	180872	73.4	66.0	69.3	62.0	75.3	63.5	64.0	54.5	65.3	58.0	71.7	62.0	67.7	61.5	68.5	60.0
7	West	7 West	529349	180846	57.4	53.0	58.3	53.0	61.8	54.5	57.4	52.5	53.9	48.5	52.0	49.0	57.5	51.5	57.1	55.0
8	West	8 West	529450	180889	60.0	53.5	63.2	58.0	62.1	50.0	53.4	52.5	57.8	51.0	60.4	53.0	64.4	51.5	56.1	50.5
9	West	9 West	529354	180679	70.8	65.0	69.7	62.5	69.3	62.0	71.0	59.5	67.6	61.5	74.6	64.0	72.9	67.5	70.5	64.5
10	West	10 West	529263	180843	67.3	63.0	67.6	62.0	67.6	60.5	63.5	55.0	70.2	62.5	69.3	66.0	71.4	66.0	68.0	63.5
11	West	11 West	529405	181026	66.3	60.0	67.0	63.5	62.0	58.0	62.3	52.5	64.1	58.0	65.8	61.0	66.4	60.5	63.3	54.0
12	West	12 West	529534	181092	64.6	60.0	65.0	63.0	63.5	61.5	62.0	59.5	61.0	59.5	60.5	59.0	61.4	59.0	60.6	57.5
13	West	13 West	529431	181137	53.7	49.0	52.9	48.5	50.0	45.0	42.4	39.5	52.0	44.0	54.5	44.5	49.2	45.5	44.7	40.0
14	West	14 West	529391	181132	65.4	58.5	68.5	63.5	62.1	58.0	62.5	56.5	63.0	56.5	63.5	59.0	65.8	61.5	66.4	57.5
15	West	15 West	529276	181083	60.3	55.0	56.8	54.0	51.7	49.0	50.0	47.5	54.0	52.0	59.4	51.0	65.9	54.5	50.3	47.5
16	West	16 West	529256	181052	62.1	57.0	68.8	65.0	51.7	48.0	47.0	45.0	61.7	58.0	63.3	59.0	58.3	51.5	54.3	44.5
17	West	17 West	529160	181070	67.8	61.0	71.8	65.5	68.5	62.0	63.0	57.0	68.8	65.0	67.4	63.5	73.2	65.5	68.2	62.0
18	West	18 West	529250	181141	68.4	60.0	71.1	60.5	64.6	52.5	58.8	47.0	66.7	57.0	65.9	54.5	68.3	60.0	64.3	50.5
19	West	19 West	529380	181304	73.1	66.0	69.2	62.0	64.5	55.0	61.5	53.0	68.0	62.5	68.6	63.5	68.9	61.5	70.5	62.5
20	West	20 West	529027	181240	71.8	67.5	74.9	70.0	74.6	66.0	68.0	60.0	75.3	71.0	78.6	70.0	75.5	69.0	71.2	65.0
1	East	1 East	529481	181264	70.6	64.0	69.5	61.5	64.0	57.0	63.1	53.5	67.7	57.5	68.3	62.0	67.3	62.5	63.1	56.5
2	East	2 East	529546	181136	68.2	62.5	65.6	59.5	65.6	59.5	63.3	56.5	63.9	57.0	62.8	58.5	67.4	60.0	65.9	56.5
3	East	3 East	529598	181218	65.8	61.5	70.7	63.0	65.6	60.0	58.1	54.0	61.4	56.0	65.6	62.0	72.1	68.0	63.4	60.5
4	East	4 East	529694	181250	63.4	61.5	61.0	57.0	62.1	57.5	62.1	53.5	59.6	56.0	61.2	57.0	62.0	58.0	60.6	54.0
5	East	5 East	529657	181341	71.2	64.5	71.6	65.5	69.2	65.0	69.0	65.0	69.1	63.0	70.7	65.0	71.2	67.5	79.5	64.5
6	East	6 East	529808	181366	72.9	68.5	71.6	68.0	71.3	67.0	70.4	66.0	75.4	66.5	70.8	67.0	72.9	70.0	74.2	68.5
7	East	7 East	529802	181196	66.0	60.0	58.3	53.5	63.8	57.0	60.9	57.0	55.4	51.5	57.8	53.0	63.7	59.5	59.6	56.0
8	East	8 East	529713	181112	68.1	63.0	66.1	63.5	66.6	62.0	63.8	60.0	69.5	57.5	68.8	65.0	72.7	71.0	63.9	59.0
9	East	9 East	529647	181022	62.7	56.5	56.5	51.0	54.5	50.5	53.7	49.5	56.3	50.0	54.2	52.0	57.4	54.5	58.0	50.5
10	East	10 East	529705	180991	67.6	61.5	69.4	66.0	68.0	63.5	61.4	56.5	63.5	59.0	69.6	65.5	72.0	67.0	67.8	62.0
11	East	11 East	529755	181025	67.3	64.0	68.5	63.0	68.7	65.0	66.3	61.5	66.4	62.5	71.2	67.0	71.6	68.5	68.9	63.0
12	East	12 East	529902	181038	71.9	67.5	82.3	63.5	73.4	64.5	72.2	65.0	68.9	63.5	71.6	65.5	74.1	71.0	72.4	66.5
13	East	13 East	529793	180944	74.7	71.0	70.3	64.5	67.3	64.0	66.9	63.5	72.3	64.5	71.7	64.5	69.8	67.5	70.4	66.0
14	East	14 East	529623	180935	70.4	62.5	69.8	67.0	77.5	70.0	69.0	65.0	66.8	59.5	70.6	68.0	73.0	71.0	72.6	69.5
15	East	15 East	529744	180718	73.2	70.0	68.1	65.0	70.8	67.5	69.2	64.0	68.8	64.5	70.6	67.0	73.6	71.0	74.2	69.5
16	East	16 East	529865	180663	70.5	65.0	61.9	60.0	69.0	66.0	61.8	60.0	64.2	62.0	68.2	65.5	71.6	68.5	65.3	63.5
17	East	17 East	529842	180753	68.4	65.0	64.7	63.0	71.0	68.0	71.2	64.5	65.0	62.0	69.2	66.0	80.3	78.0	73.2	70.5
18	East	18 East	529780	180863	70.6	64.5	68.0	66.0	63.9	62.5	61.7	59.5	70.8	66.0	69.6	67.0	67.2	64.5	64.5	62.0
19	East	19 East	529944	180778	64.4	62.5	72.7	68.0	72.6	70.0	70.2	66.5	64.9	62.0	71.4	68.0	73.0	70.0	75.6	66.0
20	East	20 East	529932	180666	70.4	60.5	63.5	61.0	65.5	63.0	61.7	58.0	63.7	60.5	68.8	65.5	69.5	67.5	76.5	70.5

Soho Noise Survey Report

January 2008

Section 1 - Introduction

This survey of noise measurements was conducted in conjunction with the Noise Strategy Steering Group and is the first of two surveys to be carried out within two areas of Soho. The survey took place from 21st January to the 27th January 2008. A further survey will be carried out during August 2008 to provide information during summer. The surveys will be compared with similar surveys taken in 2000-2001 and 2003.

The objectives of this project are:-

- To obtain a representative indication of the current background noise levels being generated in two areas of Soho during the days, evenings and night times on certain streets.

- To provide a better understanding as to the main contributing sources of the noise monitored and to identify any trends or particular stressed areas.

- To provide a comparison of the current noise climate and two previous surveys.

Section 2 – Perception of noise and current guidance

Noise is measured and described in terms of decibels (dB). The term **dB(A)** refers to a weighted sound pressure level, expressed as a decibel, that gives a single measurement of the sound present as perceived by the average human ear.

Changes in noise level of less that 2 dB or 3 dB in noise sources with similar characteristics are not normally perceptible by the human ear. If the character of the noise changes, however, perception is more acute. A change of 5 dB is noticeable with a change of 10 dB being perceived as a doubling or halving of loudness. Typical noise levels are:

Living rooms/bedrooms	30 / 35 dB(A)
Normal Conversations	60 dB(A)
Heavy road traffic @ 10 metres	80 dB(A)
Pneumatic Drill @ 1 metre	100 dB(A)

When trying to interpret measurements and maps for the period of weekend night, current noise guidance can be considered.

In 1993 the European Commission, in a Green Paper entitled "Towards a Future Noise Policy" set a number of targets for noise. (Whilst this paper did not progress it is a useful reference document.) These targets, expressed in terms of L_{Aeq} **(1)** outside living spaces during night-time periods are as follows:

- Exposure of the population to noise levels in excess of 65dB(A) should be phased out.
- At no point in time should a level of 85dB(A) be exceeded.
- The proportion at present exposed to levels between 55 to 65dB(A) should not suffer any increase.
- The proportion of the population at present exposed to levels less than 55dB(A) should not suffer any increase above that level.

(1) LAeq - The equivalent 'A' weighted sound pressure level that gives the energy average of fluctuating sound level measured over a specified time duration. Often referred to as the 'Ambient Noise Level'

The World Health Organisation document for Community Noise (April 2000) indicates that for undisturbed sleep the external 'ambient' level should not exceed 45dB L_{Aeq} averaged over an 8 hour period.

The most widespread effect of noise for all times of day or night is annoyance, and annoyance caused in communities by environmental noise has been

thoroughly evaluated using social survey techniques. The threshold for annoyance for steady continuous noise is an external L_{Aeq} of 50dB(A), with few people becoming seriously annoyed for exposures less than 55dB(A). The number of people seriously annoyed increases between 55-60 dB(A), and increases rapidly between 60-65 dB(A) (the thresholds for annoyance are a further 10 dB lower for night-time periods).

(2). **L_{90} -** this is the sound pressure level exceeded for 90% of the measurement period. It is widely used to measure background noise levels.

Section 3 – Noise Survey

3.1 Monitoring Sites

There were 40 monitoring sites in total covering the stress area of Soho bordered by Oxford St, Regent St, Charing Cross Road and Orange St. The sites were divided by Wardour Street into East and West sections. Please see 3.3 for site maps and locations.

The monitoring was divided into the following three time periods

9) Day – between 7:00 and 19:00
10) Evening – between 19:00 and 23 :00
11) Night – between 23:00 and 1:00

Monitoring was carried out on both weekdays and weekends but not on Sundays.

3.2 Measurements

Measurements were taken using a hand held Type 1 sound level meter at street level, 1 metre from building facades to reduce reflection effects. Measurements of the background noise level (L_{A90}) and the equivalent continuous noise level (L_{Aeq}) were taken over 5-minute intervals.

In addition notes were taken of predominate noise sources and the sites were categorised by the type of noise experienced. E.g. road traffic, pedestrians and music from licensed premises or residential locations.

3.3 Site Locations

East of Wardour Street

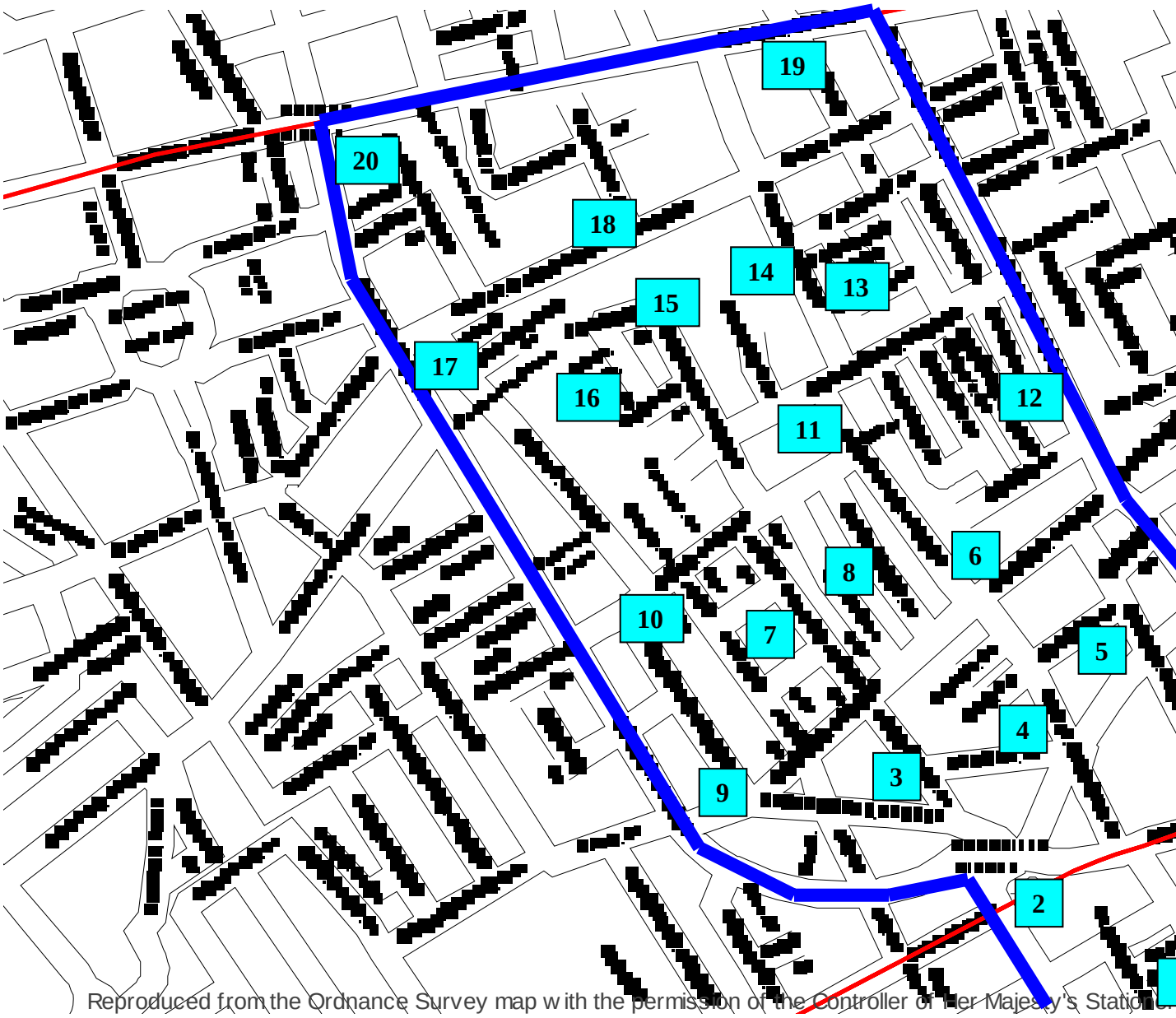
1 Cnr Wardour / Hollen Strs
2 Cnr Wardour St and Meard St
3 Cnr Carlisle / Dean Strs
4 Soho Square
5 Cnr Soho / Oxford Strs
6 Cnr Charing Cross Rd and Oxford St
7 Manette St
8 Cnr Bateman / Frith Strs
9 Meard St
10 Cnr Old Compton / Dean Strs
11 Cnr Old Compton / Frith Strs
12 Cambridge Circus
13 Cnr Shaftesbury Ave / Frith St
14 Cnr Brewer / Wardour Strs
15 Cnr Wardour / Coventry Strs
16 Leicester Square South Side
17 Leicester Square North Side
18 Cnr Gerrard / Macclesfield Strs
19 Bear St
20 Irving St

West of Wardour Street

1 St James Market
2 Piccadilly Circus
3 Sherwood St
4 Shaftesbury Avenue
5 Cnr Archer / Rupert Strs
6 Cnr Brewer / Lexington Strs
7 Golden Square
8 Great Pulteney St
9 Cnr Warwick / Glasshouse Sts
10 Beak St
11 Cnr Lexington / Broadwick Strs
12 Duck Lane
13 Portland Mews
14 Cnr Poland / D'Arblay Strs
15 Marshall St
16 Newburgh St
17 Cnr Kingly / Gt. Marlborough Strs
18 Cnr Ramillies / Gt. Marlborough Strs
19 Cnr Berwick Oxford Strs
20 Oxford Circus

Soho East Sites Map

Soho West Sites Map



Section 4 – Results and Analysis

The analysis of the results that follows includes:

- a summary of the monitoring sites,
- an analysis of the data including a discussion of trends, and anomalies,
- a comparison of the results in relation to previous investigations.

4.1 Site Summary

The following table (table 4.1.1) is a description of the monitoring site street environment, including average L_{A90} for each monitoring period. It includes the identification of the main noise sources resulting from the observation notes taken during the survey.

Table 4.1.1

	Sites – West of Wardour Street		Weekday				Weekend			
			Day	Predominant noise	LAeq	LA90	Day	Predominant noise	LAeq	LA90
1	St James's Market - by Haymarket busy traffic	D	Weds	Traffic -flowing	72.7	66.0	Sat	Couple talking	78.3	67.5
		E	Weds	Traffic – flowing	71.0	63.5	Sat	Traffic	68.7	64.0
		N	Tues	Traffic – flowing	72.7	68.0	Sat	Traffic	68.7	64.0
2	Eros, Piccadilly Circus - busy intersection, lots of people	D	Weds	Traffic, sirens	73.5	68.0	Sat		71.9	66.5
		E	Weds	Traffic, road works	70.5	66.0	Sat	Traffic	73.9	69.5
		N	Tues	Traffic	73.6	66.5	Sat	Traffic	75.6	71.5
3	Sherwood St – theatre + shops	D	Weds	Traffic - jammed	71.4	66.0	Sat	Theatre interval people outside	65.1	59.5
		E	Weds	Plant	63.4	58.5	Sat	Music – from traffic	69.5	63.5
		N	Tues	Traffic – flowing	62.1	56.0	Sat	Traffic	70.2	64.5
4	Cnr Denman St & Shaftesbury - busy road, shops, people	D	Weds	Traffic – jammed	73.1	68.0	Sat	Siren	74.4	64.0
		E	Weds	Traffic, pedestrians	71.2	64.5	Sat	Traffic	85.1	70.0
		N	Tues	Traffic, pedestrians	71.8	66.5	Sat	Traffic	74.8	70.0
5	Cnr Archer & Rupert – offices, shops no traffic	D	Weds	Plant noise (pub)	65.9	63.0	Sat		65.0	62.0
		E	Weds	Plant, faint music	67.3	64.5	Sat	Pedestrians	74.0	69.0
		N	Tues	Plant	65.4	60.5	Sat	Pedestrians	75.8	70.0
6	Cnr Brewer & Lexington St – busy road, pub opposite	D	Weds	School playground	69.5	63.5	Sat		66.2	61.0
		E	Weds	Traffic, pedestrians	73.5	63.0	Sat	Traffic	70.9	65.0
		N	Tues	Traffic	67.4	58.5	Sat	Traffic	73.2	68.0
7	Golden Square – quiet park area with offices around	D	Weds	Voices	56.4	54.0	Sat		53.3	50.5
		E	Weds	Alarm	57.3	52.0	Sat	Pedestrians	59.1	53.5
		N	Tues	Distant traffic	52.9	49.0	Sat	Pedestrians	61.4	55.5
8	Gt Pulteney St – quiet street, residential & offices	D	Weds	Traffic	64.9	58.0	Sat		64.0	50.5
		E	Weds	Voices (pub)	59.1	51.5	Sat	Traffic, pedestrians	61.3	54.5
		N	Tues	Plant	52.6	49.5	Sat	Traffic	61.2	55.5
9	Cnr Warwick & Glasshouse St – busy junction, bars	D	Weds	Traffic – Regent St	69.9	62.5	Sat		67.5	62.0
		E	Weds	Traffic, voices	67.2	61.0	Sat	Traffic & pub	71.6	66.5
		N	Tues	Traffic – Regent St	67.1	59.5	Sat	Traffic	71.4	67.5
10	Cnr Warwick & Beak St – bars, offices & busy road	D	Weds	Building works	68.2	65.0	Sat		68.6	64.0
		E	Tues	Traffic, voices	66.0	60.5	Sat	Traffic & club	70.1	65.0
		N	Tues	Traffic – Regent St	65.4	60.5	Sat	Traffic	67.9	59.5
11	Cnr Lexington & Broadwick St – bars, busy cobbled road	D	Weds	Traffic – cobbled rd	68.4	62.5	Sat	Partial road closed	66.2	61.0
		E	Weds	Drilling & cutting	74.4	70.0	Sat	Traffic & pub	70.1	65.0
		N	Tues	Traffic	65.4	56.0	Sat	Traffic	67.9	59.5
12	Duck Lane – no thru road, offices with plant servicing	D	Weds	Plant noise	62.1	59.0	Sat		59.2	58.0
		E	Weds	Plant	61.1	59.5	Sat	Plant	61.1	58.5
		N	Tues	Low plant noise	58.6	53.5	Sat	Plant	59.7	57.0
13	Portland Mews – no traffic, offices with res above, plant noise	D	Weds	Plant noise	51.9	48.5	Sat	Man on phone nearby	51.4	48.5
		E	Weds	Plant + car parking	50.0	47.0	Sat	Plant	55.7	48.0
		N	Tues	Plant	49.4	47.0	Sat	No noise apparent	48.5	44.0
14	Cnr Poland & D'Arblay St – traffic, shops, business, bars	D	Weds	Traffic, siren	68.4	57.5	Sat		64.1	56.5
		E	Weds	Pedestrians	58.0	55.0	Sat	Pedestrians	63.5	57.5
		N	Tues	Traffic	62.5	56.5	Sat	Traffic	59.3	55.0
15	Cnr Marshall St & Fouberts Pl – quiet street, office & res	D	Weds	Plant , cobbled rd	58.6	53.0	Sat		57.3	53.0
		E	Weds	Voices (pub)	52.9	50.5	Sat	Voices	55.8	52.5
		N	Tues	Plant	52.8	52.0	Sat	Pedestrians	57.2	52.0
16	Newburgh St – shops & licensed prems with res above	D	Weds	Plant & bldg works	63.8	56.0	Sat		59.9	57.0
		E	Weds	Pedestrians	57.4	52.5	Sat	Pedestrians	60.2	55.5
		N	Tues	Faint plant	57.2	54.5	Sat	Pedestrians	57.1	50.5
17	Cnr Kingly & Gt Marlborough St – busy traffic, shops, offices	D	Weds	Traffic & bldg works	72.4	66.0	Sat	Road closed large crane engine idle	68.3	66.5
		E	Weds	Traffic	71.8	63.5	Sat	Pedestrians	68.3	60.0
		N	Tues	Traffic	68.9	63.5	Sat	Pedestrians	70.1	64.0
18	Cnr Ramilies & Gt Marlboro St – traffic, mainly offices/shops	D	Weds	Traffic – flowing	68.6	61.0	Sat	Road closed	62.9	57.0
		E	Weds	Traffic	65.2	61.0	Sat	Pedestrians	61.4	56.0
		N	Tues	Traffic	64.8	53.5	Sat	Pedestrians	63.2	55.0
19	Cnr Berwick & Oxford St – offices, shops, lots of people	D	Weds	Traffic, road works,	73.9	70.0	Sat		73.7	68.0
		E	Weds	Traffic, pedestrians	71.8	66.5	Sat	Traffic	73.0	65.5
		N	Tues	Traffic – flowing	73.3	64.0	Sat	Traffic	74.2	69.0
20	Oxford Circus – busy traffic intersection, regularly crowded	D	Weds	Traffic, siren, pedestrians	75.2	68.0	Sat		73.5	68.0
		E	Tues	Traffic, pedestrians	72.3	67.0	Sat	Traffic	87.0	67.5
		N	Tues	Traffic, crane, siren	82.3	69.5	Sat	Traffic	75.9	70.5

	Sites – East of Wardour Street		Weekday				Weekend			
			Day	Predominant noise	LAeq	LA90	Day	Predominant noise	LAeq	LA90
1	Cnr Wardour & Hollen St – shops, offices, light traffic	D	Tues	Roadworks	74.4	71.0	Sat	Plant	66.7	58.5
		E	Mon	Traffic – flowing	69.4	63.0	Sat	Plant, traffic	69.3	62.5
		N	Weds	Traffic	66.5	59.0	Sat	Plant, distant alarm	65.5	61.0
2	Cnr Wardour & St Ann's Ct – comm. prems, light traffic	D	Tues	Traffic, pedestrians	71.1	63.0	Sat	Building Work Nearby	69.9	57.5
		E	Mon	Traffic, pedestrians	68.5	63.0	Sat	Traffic, pedestrians	69.5	61.5
		N	Weds	Traffic, pedestrians	67.4	57.0	Sat	Traffic, pedestrians	66.5	59.5
3	Cnr Carlisle & Dean St – licensed prems, traffic, some res	D	Tues	Roadworks	75.0	63.0	Sat		61.1	54.5
		E	Mon	Traffic, pedestrians	61.2	55.5	Sat	Traffic, music	64.1	59.5
		N	Weds	Pedestrians, voices	62.4	56.5	Sat	Traffic, pedestrians	70.2	66.0
4	Soho Square – park surrounded by offices & residential	D	Tues	Light traffic	59.2	56.0	Sat		56.0	52.5
		E	Mon	Distant traffic	59.5	54.5	Sat	Traffic, horn	64.6	56.5
		N	Weds	Voices, dist traffic	57.3	52.0	Sat	Music, traffic	63.9	59.5
5	Cnr Soho & Oxford St – heavy traffic, people, licensed prems, busy	D	Tues	Traffic, voices	70.1	66.5	Sat		72.8	64.0
		E	Mon	Traffic, alarm	67.3	62.5	Sat	Traffic, siren	77.2	64.5
		N	Weds	Traffic	73.9	67.0	Sat	Traffic, voices	72.6	67.5
6	Cnr Oxford St & Charing X Rd – busy junction, commercial	D	Tues	Traffic, pedestrians	73.5	69.0	Sat		82.1	65.0
		E	Mon	Traffic	74.1	68.5	Sat	Traffic, pedestrians	75.9	71.0
		N	Weds	Traffic, pedestrians	71.7	67.5	Sat	Traffic, siren	75.9	70.0
7	Manette St – one way st, offices, bars, distant traffic	D	Tues	Reversing beeps	68.1	60.0	Sat		61.8	56.5
		E	Mon	Traffic, voices	66.5	57.0	Sat	Traffic, car alarm	66.2	58.0
		N	Weds	Traffic, sirens	69.8	57.5	Sat	Plant, pedestrians	63.1	59.5
8	Cnr Bateman & Frith St – several licensed prems, busy	D	Tues	Light traffic	63.6	57.5	Sat		58.4	54.5
		E	Mon	Traffic, voices	62.0	56.0	Sat	Voices, music	66.2	58.0
		N	Weds	Voices	70.3	59.0	Sat	Pedestrians, music	71.0	67.0
9	Meard St – no traffic, restaurants, offices & res above	D	Tues	Pedestrians	63.4	56.5	Sat		58.0	51.5
		E	Mon	Footsteps on cobbles	58.4	52.5	Sat	Pedestrians	59.3	54.5
		N	Weds	Alarm, pedestrians	60.2	54.6	Sat	Loud voices	65.4	62.0
10	Cnr Old Compton & Dean St – busy area with licensed prems	D	Tues	Pedestrians, traffic	65.9	61.5	Sat		66.3	57.0
		E	Mon	Traffic, voices	64.8	59.5	Sat	Traffic, music	72.8	67.0
		N	Weds	Traffic, pedestrians	70.5	65.5	Sat	Traffic, pedestrians	72.4	67.5
11	Cnr Old Compton & Frith St – very busy area, lots of nightlife	D	Tues	Pedestrians, traffic	64.6	59.5	Sat	Building work	62.8	58.5
		E	Mon	Traffic, voices	66.8	61.5	Sat	Pedestrian voices	75.2	71.0
		N	Weds	Traffic, pedestrians	71.3	66.0	Sat	Voices, faint music	74.5	72.0
12	Cambridge Circus – busy junction, bars & theatre	D	Tues	Traffic, pedestrians	70.3	66.0	Sat		70.7	63.0
		E	Mon	Traffic	71.9	65.5	Sat	Pedestrians	70.4	67.0
		N	Weds	Traffic – flowing	71.1	65.0	Sat	Traffic, screams	73.4	69.0
13	Cnr Shaftesbury Ave & Frith St – heavy traffic, comm. prems	D	Tues	Roadworks	72.1	69.0	Sat		71.3	63.5
		E	Mon	Traffic – bus route	69.5	63.5	Sat	Shouting	70.4	65.5
		N	Weds	Traffic	72.1	65.0	Sat	Traffic, pedestrians	72.1	64.5
14	Cnr Brewer & Wardour St – licensed prems very busy	D	Tues	Traffic, siren	72.6	64.5	Sat		67.5	58.5
		E	Mon	Traffic, pedestrians	66.0	61.5	Sat	Pedestrians	72.1	69.0
		N	Weds	Alarm	70.7	66.0	Sat	Music, voices	74.4	69.5
15	Cnr Wardour & Coventry St – busy traffic & pedestrians	D	Tues	Pedestrians	75.1	64.5	Sat	Salesman calling out	69.1	64.5
		E	Mon	Traffic, pedestrians	67.7	63.0	Sat	Pedestrians	70.9	67.5
		N	Weds	Traffic, pedestrians	68.2	64.5	Sat	Dist siren, voices	71.7	69.5
16	Leicester Sq south side – bars, clubs, pedestrianised	D	Tues	Roadworks	67.9	59.5	Sat		61.9	59.5
		E	Mon	Pedestrian voices	59.9	57.5	Sat	Pedestrians	65.5	62.5
		N	Weds	Alarm	69.3	66.5	Sat	Shouting voices	68.2	64.5
17	Leicester Sq north side – bars, clubs, pedestrianised	D	Tues	Building works	63.9	60.0	Sat		62.7	60.5
		E	Mon	Alarm, voices	65.3	61.0	Sat	Pedestrians	68.1	65.0
		N	Weds	Pedestrians, alarm	67.1	65.0	Sat	Pedestrian voices	68.9	67.0
18	Cnr Gerrard & Macclesfield St – free of traffic, restaurants	D	Tues	Plant, pedestrians	68.3	66.5	Sat	Plant Noise	68.3	65.5
		E	Mon	Plant noise	67.9	65.0	Sat	Busker	76.8	68.5
		N	Weds	Plant	61.3	60.0	Sat	Busker, ped voices	68.7	66.0
19	Bear St – pedestrians only, licensed prems, crowded area	D	Tues	Traffic	64.0	59.5	Sat	Van engine idle	70.5	66.5
		E	Mon	Alarm, traffic	65.6	61.0	Sat	Pedestrians	73.0	68.5
		N	Weds	Music (loud)	75.2	72.5	Sat	Music, traffic	72.9	70.5
20	Irving St – edge of Leicester Sq, busy with bars & people	D	Tues	Bldg works, traffic	68.5	59.0	Sat	Guy shouting in mic	76.4	60.5
		E	Mon	Traffic, siren	64.2	60.0	Sat	Pedestrians	68.9	66.0
		N	Weds	Alarm (imm vicinity)	78.3	77.0	Sat	Pedestrian voices	72.8	69.0

4.2 Data & Analysis

Two hundred and forty 5-minute measurements of L_{Aeq} and L_{A90} were taken during six monitoring periods (weekday daytime, evening and nights and weekend day-time, evening and nights) at forty monitoring sites.

4.2.1 Trends

Please refer to the following graphs. Overall, weekends were noisier than weekdays both during evenings and nights. At sites where this was not the case in the evening, noise was due to pedestrian traffic (presumably office workers) and weekday evening traffic. Measurements of some quieter areas at night were inconsistent with the general trends. Quieter areas are more greatly affected by one off anomalies (e.g. shouts, car horns) especially at night.

Monitoring has shown that during the week, daytime noise levels were usually greater than evening noise, and noise levels at night tended to be the lowest. However, there were cases where this is not true. The areas around Leicester Square, including the Bear St monitoring site and on Oxford St near the top of Soho Square were noisiest at night. Notes taken at the time indicate that this was primarily due to pedestrian crowds.

The corner of Great Marlborough St and Kingly St tended to be noisiest in the evening because of traffic congestion on Regent St and pedestrian traffic (presumably office workers). Old Compton St was noisiest in the evening, and was louder at night than during the day. Old Compton St tends to have a lot of pedestrian traffic and there are many café and restaurants with outdoor seating.

On comparison of noise levels from residential, entertainment, traffic and pedestrian sources the following trends were shown (refer to graph below):

- Entertainment and traffic noise are the dominant noise sources in Soho,
- Entertainment and pedestrian noise increases on the weekend,
- Non entertainment/commercial areas have the lowest noise levels and these levels reduce at weekends

4.2.2 Comparisons

Comparisons have been compiled by use of graphs with previous surveys in 2000-2001 and 2003. The 2000-2001 survey used LAeq readings and therefore the same units are used from the 2008 survey for comparison. The 2000-2001 survey also used fewer measurement sites (twenty two) than in 2003 and 2008. The survey was conducted during daytime, evening and at night (during similar times) but weekends were not specifically measured. However, these sites were clearly identifiable and may be compared with the sites used in 2008.

The 2003 survey used LA 90 readings and measurements were taken at forty sites which were identical to the sites in this year's survey. The measurements were taken day-time, evening and night-time during weekdays and also were taken at evening and night-time during weekends.
Both LA90 and LAeq have been taken for the January 2008 readings and will also be taken in August 2008.

It should be noted that acoustic assessments submitted with planning applications for external plant use LAeq and LA90 measurements. This is because LAeq unit measurements are used in WHO guidelines for acceptable noise levels. Surveys will demonstrate whether the locality is above or below these guidelines. The LA 90 unit is used to show the lowest background noise level recorded and this figure is used to establish acceptable noise criteria for new plant.

As will be realised from this the 2008 readings can be compared with those from the 2003 survey for the same sites at all at measurement periods save for day-time weekends.

The overall trend shown within this survey compared with those of 2000 is a reduction in background noise levels although there are some locations where higher levels were recorded. The levels were however, in all but one case, less than 3dB. The trend is similar when comparing 2003 with the survey in Soho East for 2008 and also for Soho West 2008 weekdays and weekend evenings. It was notable that Soho West during the weekend night survey there were slightly more measurements higher than 2003. This was predominantly due to heavy traffic in certain measurement locations and sporadic noise in relation to these conditions.

4.2.3 Anomalies

Short-term measurements can produce anomalies due to high-energy noise events, e.g. shouting, car doors slamming, and cars with noisy radios passing by. Sites most affected by "noise incidents" in the 5-minute snap shot were the quieter residential areas. Sites which were least affected were dominated by traffic noise.

All weather was clear and fine except for two sets of measurements which were repeated. Readings tended to be slightly lower when compared with measurements taken in warmer weather conditions.

4.3 Previous Monitoring

A noise survey was conducted over July 2000 - February 2001 of 22 sites in Soho. This survey however used different monitoring periods of midday (11am-2pm), afternoon (2pm-5pm), and evening (5pm-9pm). Many monitoring sites were similar to the current survey.

Section 5 - Discussion

The data in this study has demonstrated that noise levels in Soho are in excess of those identified as ideal by the World Health Organisation Document for Community Noise (April 2000) and the paper produced by the European Commission in 1993 entitled “Towards a Future Noise Policy”.

In most instances the values recorded can be attributed to predictable causes. Common noise sources are traffic flows and congestion, volume of pedestrians, and to lesser extent breakout from entertainment venues.

Leicester Square is one area that is several decibels louder at night than during the day. This is due to an increase in pedestrian traffic, road-works and social activity in the area after working hours. Other areas that are relatively noisy at night include Old Compton St, Shaftesbury Avenue, Oxford St, Piccadilly Circus, and Brewer St. There was a particular situation with road-works (including a crane) which affected results due to increased traffic.

Spot measurements, used in the survey, give levels that are present at the time of monitoring. They are not the ‘average’. Longer-term measurements are required to determine 'an average range’, e.g., 60-65dB(A). However they do give a useful pointer to potential problem areas and support to general assumptions about the impact of noise as a stress factor in the area. Premises specific evidence will require on monitoring for extended periods supported by noise incident data to corroborate the results.

It is essential to realise that this is the first such survey in 2008 and that a further survey will take place in August and which will provide interesting comparisons with this survey in winter and the summer and the previous studies.

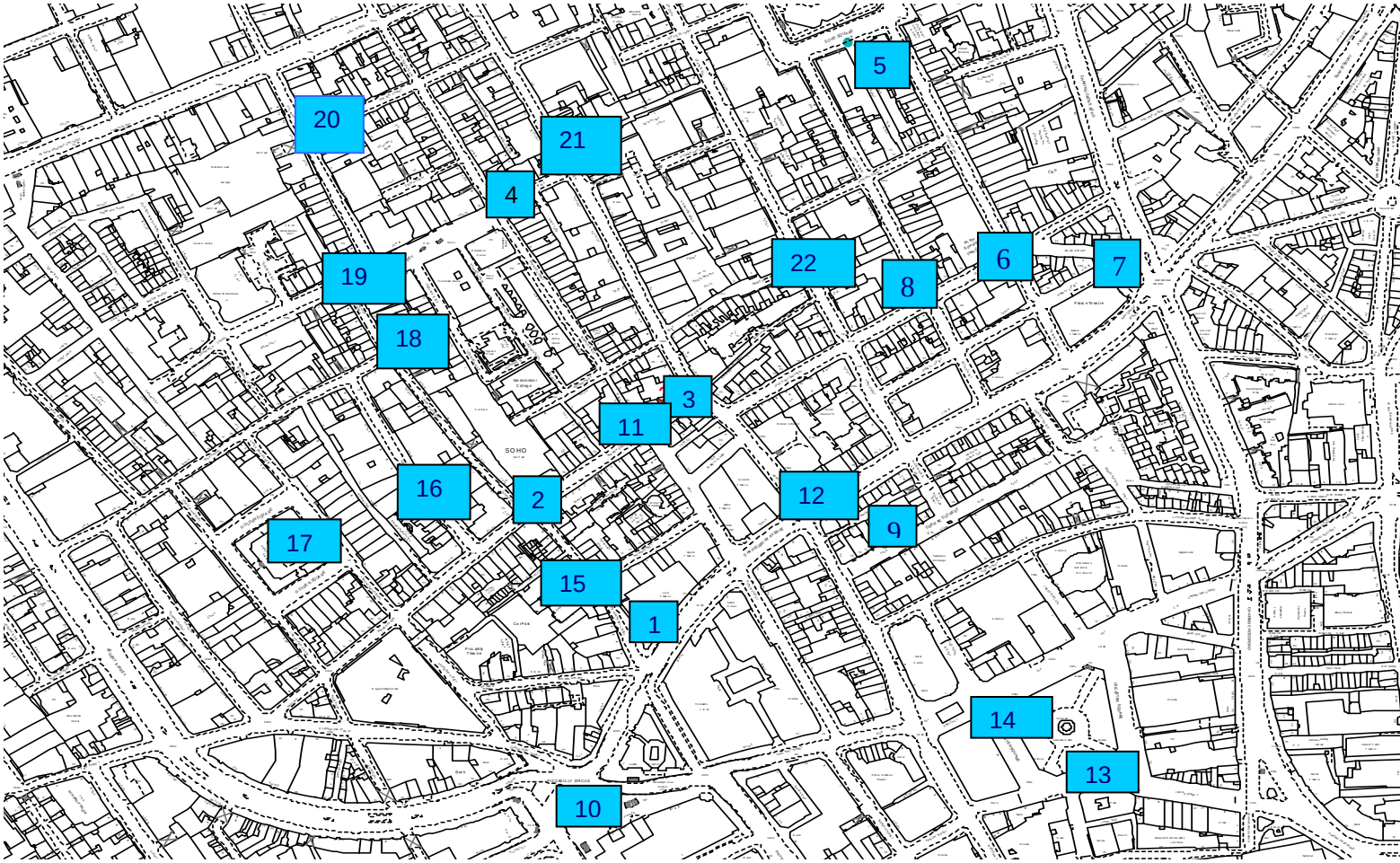
Section 6 - References

4. Community Noise, World Health Organisation, April 2000.

5. Method for rating industrial noise affecting mixed residential and industrial areas, British Standard 4142: 1997.

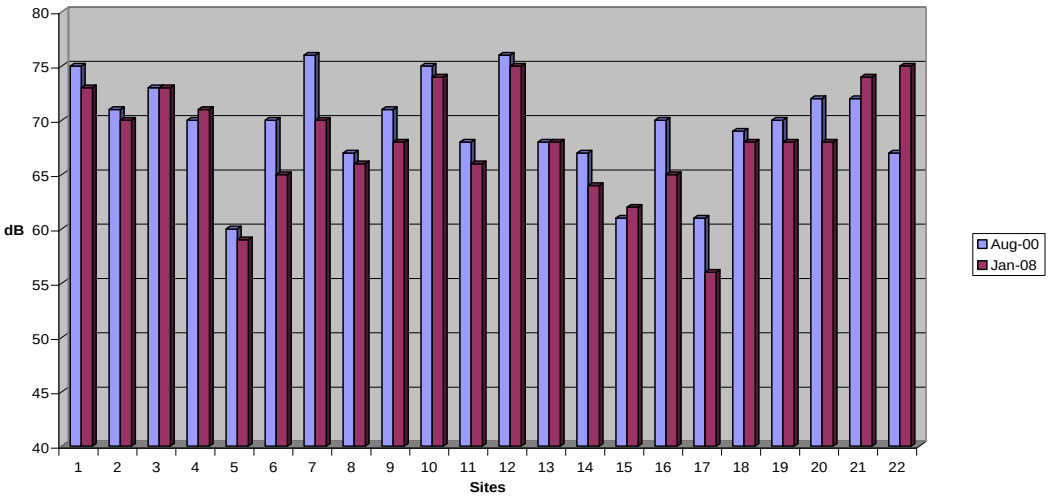
6. Planning and Noise, Planning Policy Guidance 24, September 1994.

Soho Mapping Project 2000 – Site Map

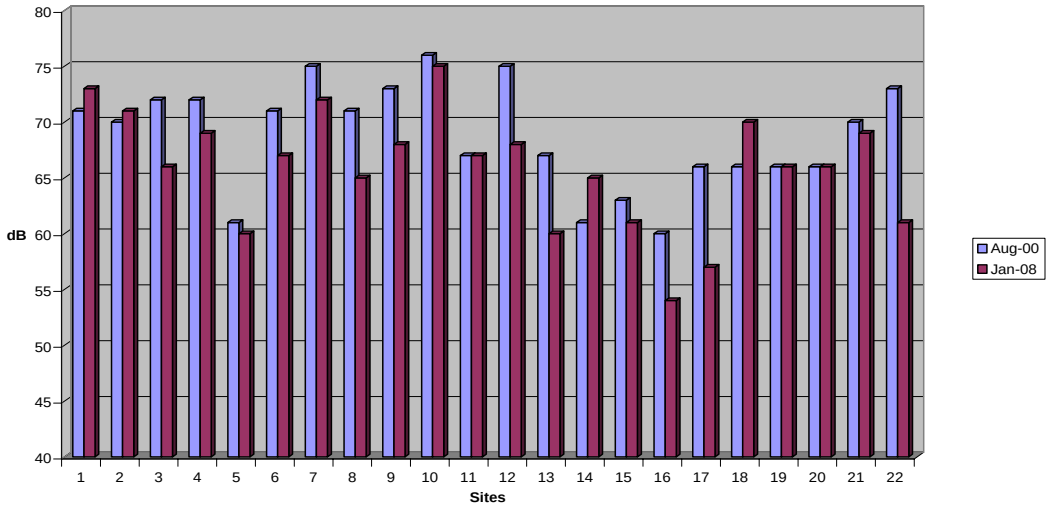


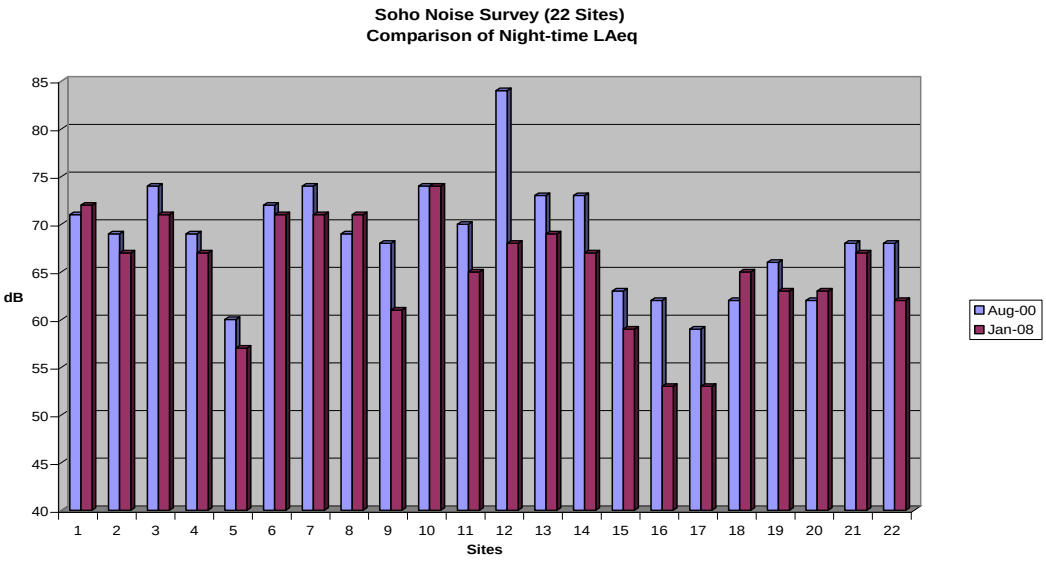
1 Gt Windmill St/Shaftesbury Avenue – opposite Sugar Reef
2 Brewer St/Lexington Street
3 Brewer St (No.4) – Opposite Village Bar
4 Berwick/Broadwick Street corner
5 Soho Square
6 Greek/Old Compton Street corner
7 Cambridge Circus
8 Old Compton/Frith St corner
9 China Town – Gerrard St
10 Eros
11 Rupert/Brewer St corner – opposite Madame JoJo's
12 Shaftesbury Avenue/Wardour St corner
13 Leicester Square – Odeon
14 Leicester Square
15 Ham Yard
16 Great Pulteney St
17 Golden Square
18 Lexington Street
19 Jon Snow Public House
20 Poland/D'Arblay St corner
21 Wardour St – Crazy Salads
22 Dean Street – All Bar One

Soho Noise Survey (22 sites)
Comparison of Daytime LAeq



Soho Noise Survey (22 sites)
Comparison of Evening LAeq




Soho Noise Survey (22 Sites)
Comparison of Night-time LAeq
dB
85
80
75
70
65
60
55
50
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Sites
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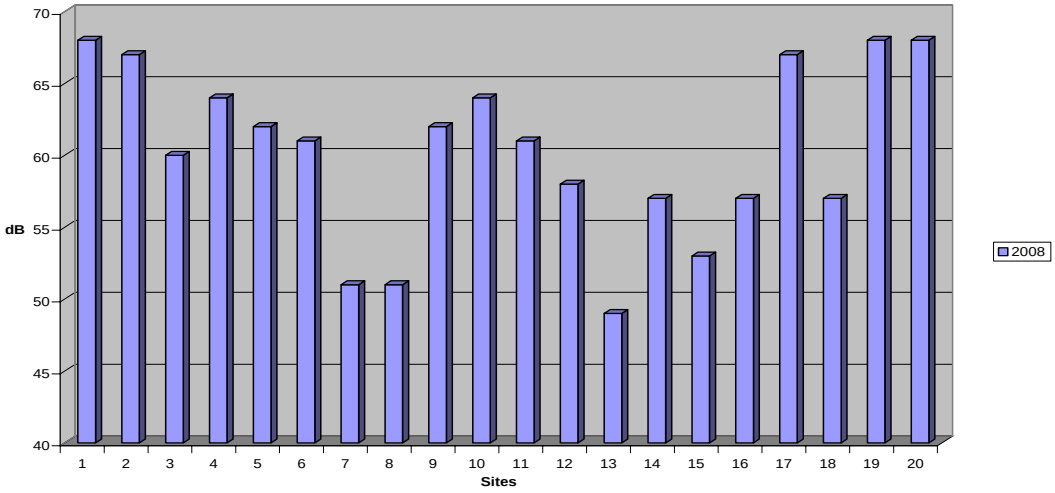
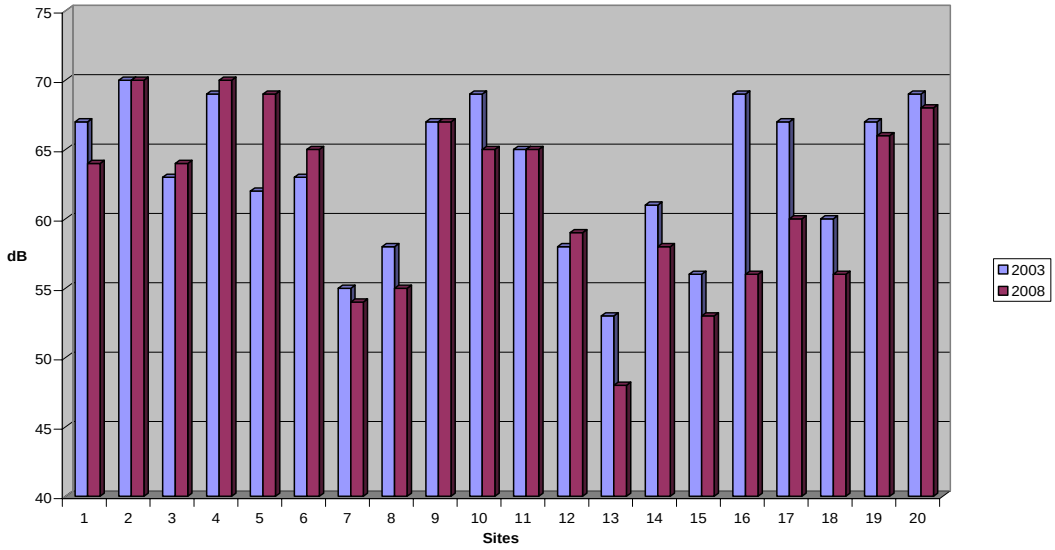
Jan-08

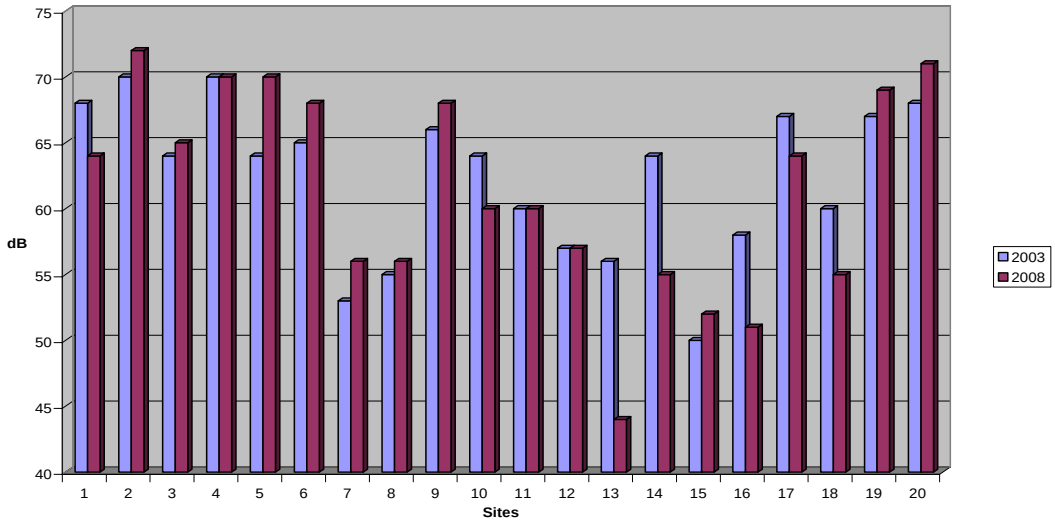
Soho West Noise Survey Weekend Daytime LA90s



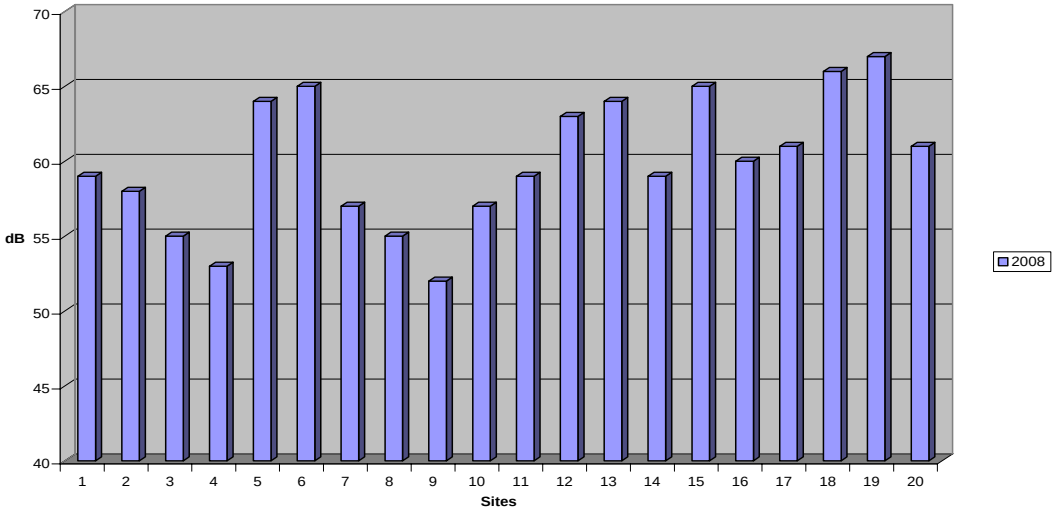
Soho West Sites - Weekend Evening LA90s Comparison



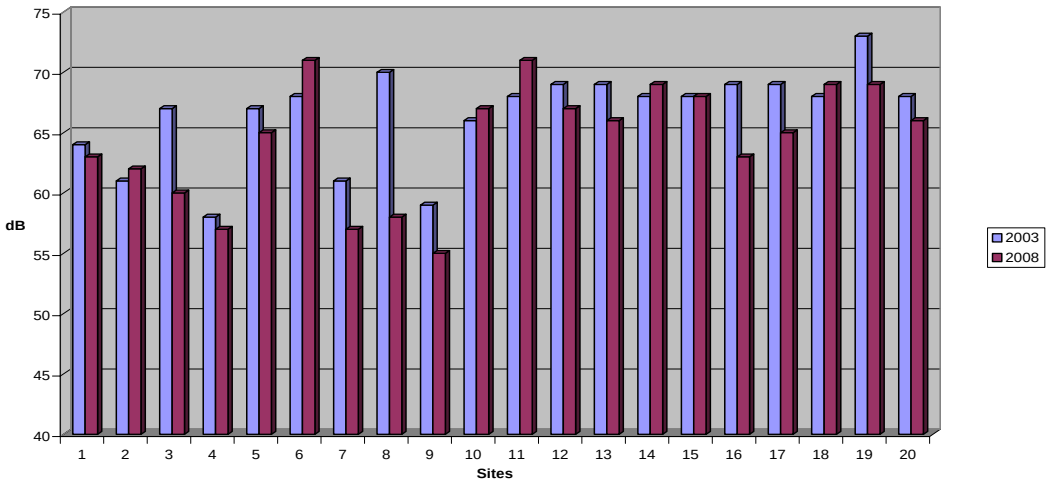
Soho West Sites - Weekend Night-time LA90s Comparison



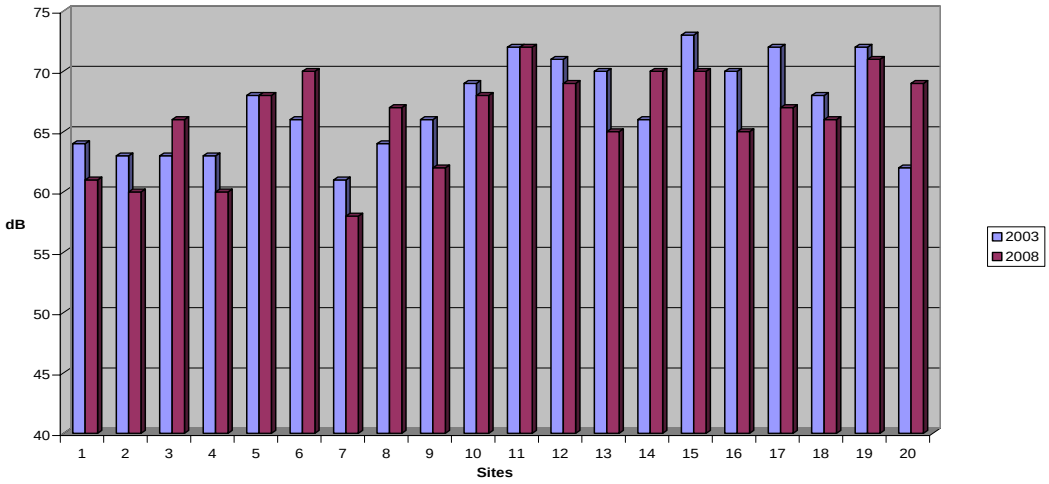
Soho East Noise Survey 2008 Weekend Daytime LA90s



Soho East Sites
Weekend Evening LA90s



Soho East Sites
Weekend Night-time LA90s



Author: Robert Reed
Protective Marking: Not Protectively Marked
Westminster City Council, 2008