NORTHAMPTON BOROUGH COUNCIL

GAMBLING ACT 2005

LICENSING SUB COMMITTEE

A Meeting of the Licensing Sub-Committee will be held at The Council Chamber, St. Giles Square, Northampton, NN1 1DE. on Thursday, 26 September 2013 at 10:00 am

George Candler

Chief Executive

AGENDA

1. VARIATION APPLICATION: PANACHE, 26 BRIDGE STREET, NORTHAMPTON NN1 1NW

PROCEDURES FOR LICENSING SUB-COMMITTEE HEARING

- ***Welcome*** – Chairman welcomes the Applicant, Representors, Responsible Authorities and Interested Parties and introduces members of the sub-committee (+ other officers e.g. Solicitor, Licensing Officer, Democratic Services Officer etc).

- ***Declarations of Interest by Councillors***

- ***Reason for Hearing*** – to be outlined by the **Licensing Officer** or the **Chair**.

- ***Format of the hearing*** – an explanation of the format of the proceedings:

    1. **Applicant** (or his/her representative) will address the sub-committee first and put their case.

    2. **The Chair** leads an examination of the **Applicant's case.** First, the panel may ask questions and then the Chair invites Responsible and Interested Parties to participate. Questions may only relate to the points made by the applicant.

    3. **The Representors/Respondents** (and responsible and Interested Parties) then state their case.

    4. **The Chair** leads an examination of the **Representor's case**.

Each party will be given an equal maximum period of time in which to present their case and may, if given permission by the Chair, question any other party.

- ***Summing Up***

    - By the Representors/Respondents
    - By the Applicant

- ***Sub-committee retires*** – and may call for the Solicitor for advice if required.

- ***Sub-Committee deliver their decision and reasons for their decision at the conclusion of the meeting IF:***

    1. Application for conversion of existing licence
    2. Application for conversion of existing club certificate
    3. Application by holder of justices' licence for grant of personal licence
    4. Application for conversion and variation of premises licence (including variation of DPS)
    5. Application for conversion and variation of club premises certificate
    6. Counter notice following police objection to temporary event notice
    7. Review of Premises Licence following Closure Order

In all other cases, the Sub-committee delivers its decision and reasons for its decision within five working days beginning with the day on which the hearing was held.

If you require any further information regarding this meeting please contact Democratic Services on 01604 837722 or democraticservices@northampton.gov.uk

Agenda Item 1

NORTHAMPTON BOROUGH COUNCIL

Northampton
Application to vary a premises licence
Licensing Act 2003

For help contact
licensing@northampton.gov.uk
Telephone: 01604 838545

* required information

Section 1 of 17

You can save the form at any time and resume it later. You do not need to be logged in when you resume.

System reference: Not Currently In Use — This is the unique reference for this application generated by the system.

Your reference: Panache — You can put what you want here to help you track applications if you make lots of them. It is passed to the authority.

Are you an agent acting on behalf of the applicant?

○ Yes ◉ No

Put "no" if you are applying on your own behalf or on behalf of a business you own or work for.

Northampton Borough Council
- 7 AUG 2013
LICENSING

Applicant Details

* First name: Jon
* Family name: Stephens
* E-mail: [redacted]
Main telephone number: [redacted] — Include country code.
Other telephone number:

☐ Indicate here if you would prefer not to be contacted by telephone

Are you:

◉ Applying as a business or organisation, including as a sole trader
○ Applying as an individual

A sole trader is a business owned by one person without any special legal structure. Applying as an individual means you are applying so you can be employed, or for some other personal reason, such as following a hobby.

Applicant Business

* Is your business registered in the UK with Companies House? ○ Yes ◉ No
* Is your business registered outside the UK? ○ Yes ◉ No

* Business name: Starborne Ventures LTD — If your business is registered, use its registered name.
* VAT number: - 107047150 — Put "none" if you are not registered for VAT.
* Legal status: Private Limited Company

Continued from previous page...

* Your position in the business	General Manager
Home country	United Kingdom

The country where the headquarters of your business is located.

Business Address

If you have one, this should be your official address - that is an address required of you by law for receiving communications.

* Building number or name	26
* Street	Bridge Street
District	Town Centre
* City or town	Northampton
County or administrative area	
* Postcode	NN1 1NW
* Country	United Kingdom

Section 2 of 17

APPLICATION DETAILS

I/we, as named in section 1, being the premises licence holder, apply to vary a premises licence under section 34 of the Licensing Act 2003 for the premises described in section 2 below.

* Premises Licence Number	pl0464

Are you able to provide a postal address, OS map reference or description of the premises?

(•) Address ( ) OS map reference ( ) Description

Postal Address Of Premises

Building number or name	26
Street	bridge street
District	
City or town	Northampton
County or administrative area	
Postcode	NN1 1NW
Country	United Kingdom

Premises Contact Details

Telephone number	[redacted]
Non-domestic rateable value of premises (£)	

Section 3 of 17

Continued from previous page...

VARIATION

Do you want the proposed variation to have effect as soon as possible? (•) Yes ( ) No

If your proposed variation would mean that 5,000 or more people are expected to attend the premises at any one time, state the number expected to attend

Describe briefly the nature of the proposed variation

TO EXTEND THE HOURS OF ALL LICENSABLE ACTIVITIES FROM 03.00 - 06.00.

TO REMOVE THE CONDITION THAT ALL DRINKS MUST BE SERVED IN POLYCARBONATE VESSELLS.

Section 4 of 17

PROVISION OF PLAYS

Will the schedule to provide plays be subject to change if this application to vary is successful?

( ) Yes (•) No

Section 5 of 17

PROVISION OF FILMS

Will the schedule to provide films be subject to change if this application to vary is successful?

( ) Yes (•) No

Section 6 of 17

PROVISION OF INDOOR SPORTING EVENTS

Will the schedule to provide indoor sporting events be subject to change if this application to vary is successful?

( ) Yes (•) No

Section 7 of 17

PROVISION OF BOXING OR WRESTLING ENTERTAINMENTS

Will the schedule to provide boxing or wrestling entertainments be subject to change if this application to vary is successful?

( ) Yes (•) No

Section 8 of 17

PROVISION OF LIVE MUSIC

Will the schedule to provide live music be subject to change if this application to vary is successful?

Continued from previous page... ◉ Yes ○ No

Standard Days And Timings

Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.

MONDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

TUESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

WEDNESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

THURSDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

FRIDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SATURDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SUNDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Will the performance of live music take place indoors or outdoors or both?

◉ Indoors ○ Outdoors ○ Both

Where taking place in a building or other structure select as appropriate. Indoors may include a tent.

State type of activity to be authorised, if not already stated, and give relevant further details, for example (but not exclusively) whether or not music will be amplified or unamplified.

State any seasonal variations for the performance of live music

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Continued from previous page...

Non-standard timings. Where the premises will be used for the performance of live music at different times from those listed, above below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Section 9 of 17

PROVISION OF RECORDED MUSIC

Will the schedule to provide recorded music be subject to change if this application to vary is successful?

(•) Yes ( ) No

Standard Days And Timings

MONDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.

TUESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

WEDNESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

THURSDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

FRIDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SATURDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Continued from previous page...

SUNDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Will the playing of recorded music take place indoors or outdoors or both?

(•) Indoors ( ) Outdoors ( ) Both

Where taking place in a building or other structure select as appropriate. Indoors may include a tent.

State type of activity to be authorised, if not already stated, and give relevant further details, for example (but not exclusively) whether or not music will be amplified or unamplified.

State any seasonal variations for playing recorded music.

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Non-standard timings. Where the premises will be used for the playing of recorded music at different times from those listed above, list below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Section 10 of 17

PROVISION OF PERFORMANCES OF DANCE

Will the schedule to provide performances of dance be subject to change if this application to vary is successful?

(•) Yes ( ) No

Standard Days And Timings

MONDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.

TUESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Continued from previous page...

WEDNESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

THURSDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

FRIDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SATURDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SUNDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Will the performance of dance take place indoors or outdoors or both?

(•) Indoors ( ) Outdoors ( ) Both

Where taking place in a building or other structure select as appropriate. Indoors may include a tent.

State type of activity to be authorised, if not already stated, and give relevant further details, for example (but not exclusively) whether or not music will be amplified or unamplified.

State any seasonal variations for the performance of dance.

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Non-standard timings. Where the premises will be used for the performance of dance at different times from those listed above, list below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Continued from previous page...

Section 11 of 17

PROVISION OF ANYTHING OF A SIMILAR DESCRIPTION TO LIVE MUSIC, RECORDED MUSIC OR PERFORMANCES OF DANCE

Will the schedule to provide anything similar to live music, recorded music or performances of dance be subject to change if this application to vary is successful?

○ Yes ○ No

Section 12 of 17

PROVISION OF LATE NIGHT REFRESHMENT

Will the schedule to provide late night refreshment be subject to change if this application to vary is successful?

◉ Yes ○ No

Standard Days And Timings

MONDAY				Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
TUESDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
WEDNESDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
THURSDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
FRIDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
SATURDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		
SUNDAY				
	Start 12:00	End 06:00		
	Start 12:00	End 06:00		

Continued from previous page...

Will the provision of late night refreshment take place indoors or outdoors or both?

Where taking place in a building or other structure select as appropriate. Indoors may include a tent.

(•) Indoors ( ) Outdoors ( ) Both

State type of activity to be authorised, if not already stated, and give relevant further details, for example (but not exclusively) whether or not music will be amplified or unamplified.

State any seasonal variations.

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Non standard timings. Where the premises will be used for the provision of late night refreshment at different times from those listed above, list below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Section 13 of 17

SUPPLY OF ALCOHOL

Will the schedule to supply alcohol be subject to change if this application to vary is successful?

(•) Yes ( ) No

Standard Days And Timings

MONDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

TUESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

WEDNESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.

Continued from previous page...

THURSDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

FRIDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SATURDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SUNDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

Will the sale of alcohol be for consumption?

○ On the premises ○ Off the premises ◉ Both

If the sale of alcohol is for consumption on the premises select on, if the sale of alcohol is for consumption away from the premises select off. If the sale of alcohol is for consumption on the premises and away from the premises select both.

State any seasonal variations.

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Non-standard timings. Where the premises will be used for the supply of alcohol at different times from those listed above, list below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Section 14 of 17

ADULT ENTERTAINMENT

Highlight any adult entertainment or services, activities, or other entertainment or matters ancillary to the use of the premises that may give rise to concern in respect of children.

Provide information about anything intended to occur at the premises or ancillary to the use of the premises which may give rise to concern in respect of children, regardless of whether you intend children to have access to the premises, for example (but not exclusively) nudity or semi-nudity, films for restricted age groups etc gambling machines etc.

Continued from previous page...

Section 15 of 17

HOURS PREMISES ARE OPEN TO THE PUBLIC

Standard Days And Timings

Provide timings in 24 hour clock (e.g., 16:00) and only give details for the days of the week when you intend the premises to be used for the activity.

MONDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

TUESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

WEDNESDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

THURSDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

FRIDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

SATURDAY

Start 12:00 End 06:00

Start 12:00 End 12:00

SUNDAY

Start 12:00 End 06:00

Start 12:00 End 06:00

State any seasonal variations.

For example (but not exclusively) where the activity will occur on additional days during the summer months.

Continued from previous page...

Non standard timings. Where you intend to use the premises to be open to the members and guests at different times from those listed above, list below.

For example (but not exclusively), where you wish the activity to go on longer on a particular day e.g. Christmas Eve.

Identify those conditions currently imposed on the licence which you believe could be removed as a consequence of the proposed variation you are seeking.

☐ I have enclosed the premises licence

☐ I have enclosed the relevant part of the premises licence

Reasons why I have failed to enclose the premises licence or relevant part of premises licence.

Section 16 of 17

LICENSING OBJECTIVES

Describe the steps you intend to take to promote the four licensing objectives:

a) General – all four licensing objectives (b,c,d,e)

If the club wishes members and their guests to be able to consume alcohol on the premises select on, if the club wishes people to be able to purchase alcohol to consume away from the premises select off. If the club wishes people to be able to do both select both.

DOOR SUPERVISORS WORKING THROUGHOUT PROPOSED TIMES.
CHALLENGE 25 POLICY IN OPERATION
WORKING WITH PUBWATCH

b) The prevention of crime and disorder

c) Public safety

Continued from previous page...

d) The prevention of public nuisance

e) The protection of children from harm

Section 17 of 17

PAYMENT DETAILS

This fee must be paid to the authority. If you complete the application online, you must pay it by debit or credit card.

Variation Fees are determined by the non domestic rateable value of the premises.
To find out a premises non domestic rateable value go to the Valuation Office Agency site at http://www.voa.gov.uk/business_rates/index.htm

Band A - No RV to £4300	£100.00
Band B - £4301 to £33000	£190.00
Band C - £33001 to £8700	£315.00
Band D - £87001 to £12500	£450.00*
Band E - £125001 and over	£635.00*

*If the premises rateable value is in Bands D or E and the premises is primarily used for the consumption of alcohol on the premises then your are required to pay a higher fee

Band D - £87001 to £12500	£900.00
Band E - £125001 and over	£1,905.00

If you own a large premise you are subject to additional fees based upon the number in attendance at any one time

Capacity 5000-9999	£1,000.00
Capacity 10000 -14999	£2,000.00
Capacity 15000-19999	£4,000.00
Capacity 20000-29999	£8,000.00
Capacity 30000-39000	£16,000.00
Capacity 40000-49999	£24,000.00
Capacity 50000-59999	£32,000.00
Capacity 60000-69999	£40,000.00
Capacity 70000-79999	£48,000.00
Capacity 80000-89999	£56,000.00
Capacity 90000 and over	£64,000.00

* Fee amount (£) 315.00

ATTACHMENTS

AUTHORITY POSTAL ADDRESS

Continued from previous page...

Address

Building number or name	
Street	
District	
City or town	
County or administrative area	
Postcode	
Country	United Kingdom

DECLARATION

* I/we understand it is an offence, liable on conviction to a fine up to level 5 on the standard scale, under section 158 of the licensing act 2003, to make a false statement in or in connection with this application.

☐ Ticking this box indicates you have read and understood the above declaration

This section should be completed by the applicant, unless you answered "Yes" to the question "Are you an agent acting on behalf of the applicant?"

* Full name	
* Capacity	
Date (dd/mm/yyyy)	

Add another signatory

One you're finished you need to do the following:
1. Save this form to your computer by clicking to file/save as...
2. Go back to https://www.gov.uk/apply-for-a-licence/premises-licence/northampton/change-1 to upload this file and continue with your application
Don't forget to make sure you have all your supporting documentation to hand.

Licensing Act 2003

Premises Licence Summary

PL0464

LOCAL AUTHORITY

NORTHAMPTON BOROUGH COUNCIL

Licensing Section
The Guildhall
St Giles Square
NORTHAMPTON
NN1 1DE

Premises Details

POSTAL ADDRESS OF PREMISES, OR IF NONE, ORDNANCE SURVEY MAP REFERENCE OR DESCRIPTION

Panache

26-28 Bridge Street, Northampton, Northamptonshire, NN1 1NW.

WHERE THE LICENCE IS TIME LIMITED THE DATES

Not applicable

LICENSABLE ACTIVITIES AUTHORISED BY THE LICENCE

- a performance of live music
- any playing of recorded music
- a performance of dance
- entertainment facilities for making music
- entertainment facilities for dancing
- provision of late night refreshment
- the sale by retail of alcohol

THE TIMES THE LICENCE AUTHORISES THE CARRYING OUT OF LICENSABLE ACTIVITIES

Activity (and Area if applicable)	Description	Time From	Time To
E. Performance of live music (Indoors)			
	Monday	Noon	3:00am
	Tuesday	Noon	3:00am
	Wednesday	Noon	3:00am
	Thursday	Noon	3:00am
	Friday-Saturday	Noon	3:00am
	Sunday	Noon	3:00am
	Non Standard Timings: New Years Eve until 05.45 on 1 January		
F. Playing of recorded music (Indoors)			
	Monday	Noon	3:00am
	Tuesday	Noon	3:00am
	Wednesday	Noon	3:00am
	Thursday	Noon	3:00am
	Friday-Saturday	Noon	3:00am
	Sunday	Noon	3:00am
	Non Standard Timings: New Years Eve until 05:00 on 1st January		
G. Performance of dance (Indoors)			
	Monday	10:00am	11:00pm
	Tuesday	10:00am	11:00pm
	Wednesday	10:00am	11:00pm

Louise Faulkner

From: Bryan David <david.bryan@northants.pnn.police.uk>
Sent: 14 August 2013 14:15
To: Louise Faulkner
Cc: panachenorthampton@yahoo.co.uk
Subject: Panache Variation Application.

Dear Mrs Faulkner,

I act on behalf of the Chief Officer of Police for Northamptonshire, Mr Lee.

I am formally objecting to the variation application for the above premises, this is on the grounds of the Licensing Objective of the Prevention of Crime and Disorder.

Although I am happy to discuss extended hours with the applicant the hours proposed would in Northamptonshire Police's opinion undermine the C&D licensing objective, the premises is situated in the middle of Bridge Street the main thoroughfare for Northampton town centre. This area is a hotspot for alcohol fuelled C&D and Northamptonshire Police have detailed information to support this.

I submit for your attention

Regards

David Bryan Constable 113| Licensing Officer| Northamptonshire Police

☎Telephone 101 Ext 8634 | Facsimile 01604 632645 |

Email david.bryan@northants.police.uk

Address First Floor, 14 Fish Street, Northampton. NN1 2AA

| Working in Partnership for Safer Stronger Communities |

Louise Faulkner

From: Paul Mallard
Sent: 03 September 2013 14:57
To: Licensing; Louise Faulkner
Cc: 'panachenorthampton@yahoo.co.uk'
Subject: Extension of hours – Panache, Bridge Street - WK/201305871
Attachments: Appendix 1 - Northampton TC Night time noise.doc

M3PPRef: WK/201305871
M3PPUnique: 00000000D7CE844D48292C48A3FE2304C2D39DFE0700B7261325C2587B469E6CAA37C311556A0000000CFDED0000FB1932AD4C48954A91F8C638D1C93D3A0000521D316F0000

Dear Louise,

Extension of hours – Panache, Bridge Street

Regulatory Services have concerns regarding this application.

We are aware that residents in the area have made adverse comments about the level of street noise caused by patrons associated with the operation of clubs and bars in the area. The ambient noise levels in the area are known to be significant from surveys carried out in the area into other matters.

Although this application may not in itself lead to a significant deterioration of the situation we have concerns that it will precipitate similar applications from other establishments in the vicinity that will eventually do so.

In view of our concerns a survey has been carried out to assess the noise affecting a flat in the Pinnacle, Woolmonger Street, overlooking the premises on the West side of Bridge Street. This is to the rear of the applicant's premises.

Unfortunately, it has not been possible to fully analyse the results in the time available but preliminary examination indicates that the residents of the flats are affected by significant levels of people noise and loud music. We are not implying that the loud music witnessed is arising from the applicant and further investigation will be required to establish the source.

Therefore, we are objecting to this application on the grounds of the prevention of Public Nuisance due to the likely resultant extension of time that residents will be subjected to noise arising from the operation of clubs and bars in the area.

I also attach a document prepared examining the night time noise climate in the town.

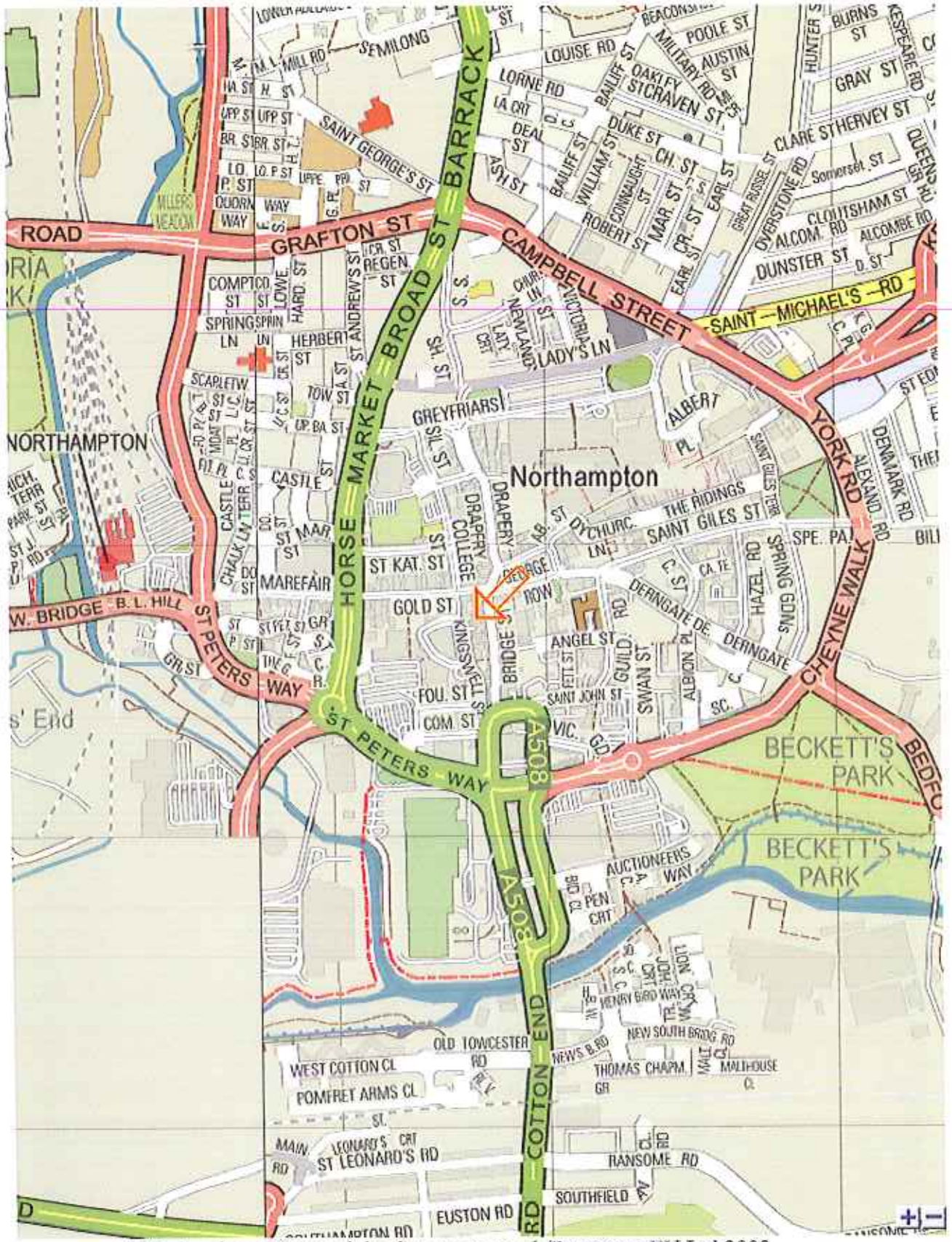
The survey will be more fully appraised and we will review our stance on this matter as soon as possible.

Regards,

Paul Mallard
Senior Environmental Health Officer

Northampton Borough Council
West Bridge Depot
St James Mill Road
NN5 5JW

01604 837649



Print

Louise Faulkner

From: Louise Faulkner
Sent: 11 September 2013 11:28
To: 'panachenorthampton@yahoo.co.uk'
Subject: Variation Premises Licence Application - Panache
Attachments: 20130911111735733.pdf

Licensing Act 2003 - Variation Premises Licence PL0464 - Panache, 26 Bridge Street, Northampton

Please find attached the relevant notice of hearing to consider the above application.

A copy of the notice has also been sent by post.

Kind Regards
Louise Faulkner
Senior Licensing Officer

-----Original Message-----
From: ricscanner@no.smtp.mail [mailto:ricscanner@no.smtp.mail]
Sent: 11 September 2013 10:18
To: Louise Faulkner
Subject:

This E-mail was sent from "RNPDDD854" (Aficio MP C3000).

Scan Date: 11.09.2013 11:17:35 (+0200)
Queries to: ricscanner@no.smtp.mail

.ouise Faulkner

From: Louise Faulkner
Sent: 11 September 2013 12:03
To: panachenorthampton@yahoo.co.uk
Subject: FW: Variation Premises Licence Application - Panache
Attachments: 20130911111735733.pdf; Police Objection Email.pdf; EHO Objection Email.pdf

Further to the notice of hearing, please find attached a copy of the relevant objections.

Kind Regards

-----Original Message-----
From: Louise Faulkner
Sent: 11 September 2013 11:28
To: 'panachenorthampton@yahoo.co.uk'
Subject: Variation Premises Licence Application - Panache

Licensing Act 2003 - Variation Premises Licence PL0464 - Panache, 26 Bridge Street, Northampton

Please find attached the relevant notice of hearing to consider the above application.

A copy of the notice has also been sent by post.

Kind Regards
Louise Faulkner
Senior Licensing Officer

-----Original Message-----
From: ricscanner@no.smtp.mail [mailto:ricscanner@no.smtp.mail]
Sent: 11 September 2013 10:18
To: Louise Faulkner
Subject:

This E-mail was sent from "RNPDDD854" (Aficio MP C3000).

Scan Date: 11.09.2013 11:17:35 (+0200)
Queries to: ricscanner@no.smtp.mail

Northampton Town Centre – Night time Noise

In law there is no recognised standard or level which can be applied to determining if a source of noise is a nuisance or not. Nuisance will be assessed by a number of factors, and the intrusive nature of noise can be determined having regard to such factors including (but not limited to) time of day, the frequency and/or duration of the noise, the character of the neighbourhood , the impact on a person and, the sensitivity of an individual.

There is extensive research which establishes the links between exposure to noise and effects on health (e.g. hearing damage, health effects, stress, loss of sleep). There is no single authoritative standard which seeks to set acceptable limits for community noise, but perhaps the most commonly quoted source of guidance for environmental noise derives from the World Health Organisation's guidelines for community noise.

It is recommended that for a continuous noise source the equivalent sound pressure level should not exceed 30 dB(A) indoors, if negative effects on sleep are to be avoided. If the noise is not continuous, LA_{MAX} are used to indicate the probability of noise induced awakenings. Effects have been observed at individual LA_{MAX} exposures of 45 dB(A) or less. Consequently, it is important to limit the number of noise events with a LA_{MAX} exceeding 45 dB(A).

These WHO guideline figures have been used to make a basic comparison between levels of street noise and the impact (measured or likely) on existing or proposed residential properties within Northampton town centre.

Street noise and antisocial behaviour is a perceived problem associated with the British late night drinking culture, arising from boisterous behaviour associated with drunkenness. This can have unintended consequences on residents of the town centre of Northampton whose expectation of quiet enjoyment of their home can be diminished, leading to poor sleeping conditions or an acceptance that this is just the way things are.

The purpose of this document is to present noise survey evidence gathered from 3 different surveys across different locations of the town centre where there is a mix of late night drinking venues and residential accommodation in close proximity. The survey evidence has been taken from a mix of Borough led investigations and reports prepared by private consultants as part of planning/licensing applications. Therefore the level of detail does vary from survey to survey. By coincidence all surveys were conducted in late September 2012.

Noise directly arising from licensed premises, e,g. music, is considered to be outside the scope of this document. It is considered that regardless of whether an EMRO is implemented to curb the sale of alcohol, the EMRO would not seek to restrict opening hours beyond that already granted through the licensing/planning regime. Therefore venues could still effectively trade until their terminal hour but not sell alcohol. Loud music would continue to be addressed through the statutory nuisance regime or licence review process, whereas noise from the street cannot.

1. Fish Street

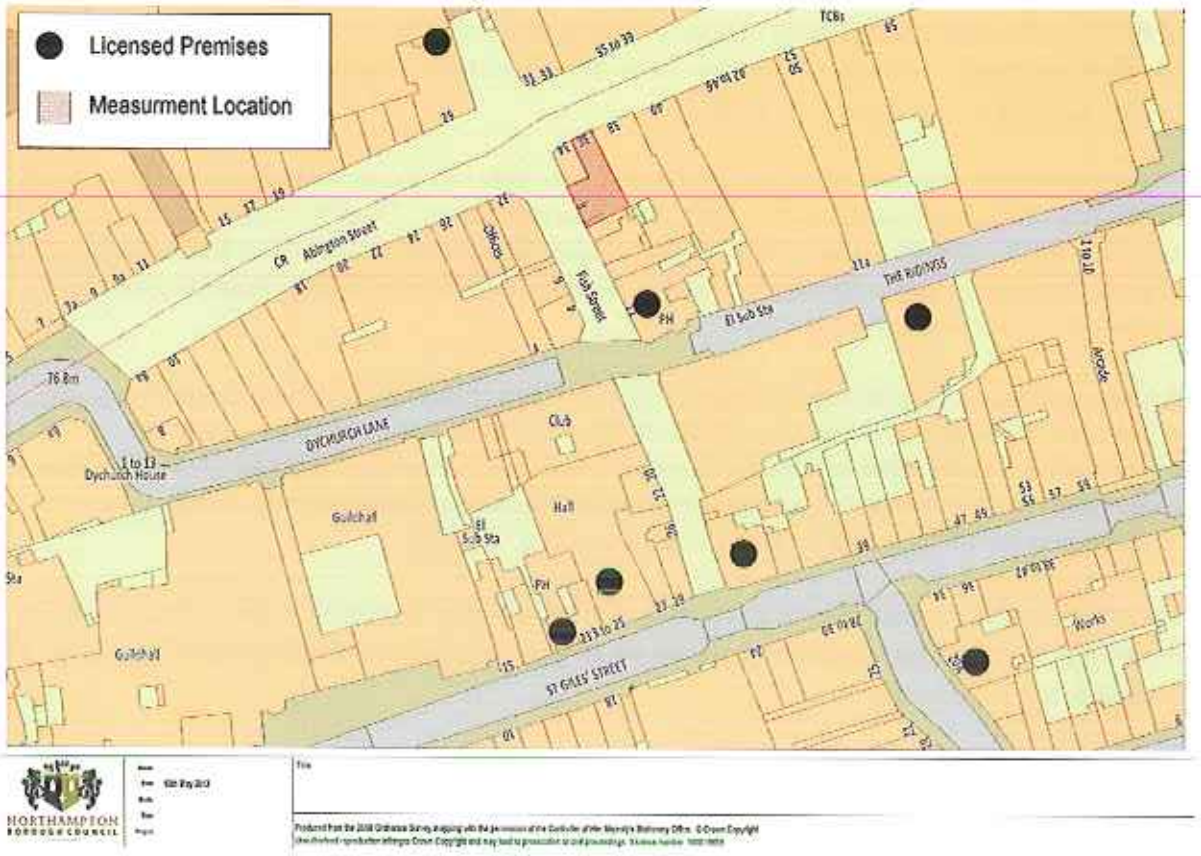


Figure 1: Location Plan of 3 Fish Street and surrounding licensed premises

This assessment was conducted by a private acoustic consultant to support a planning application seeking to change the use of the upper floors of the premises from commercial to residential. A noise survey was undertaken to assess the likely internal noise climate within the proposed units of accommodation.

External measurements were obtained over a Saturday (22nd – 23rd September 2012) night between the hours 22.40 – 04.00 from the 2nd floor window of 3 Fish Street.

The consultant noted that the principal contributors to the ambient noise climate during this period were the night time revellers that tended to walk along Fish Street and tended to congregate at the junction of Fish Street and Abington Street and, the emission of loud amplified music from the Fish Public House.

With reference to the night time revellers it was noted that they were quite boisterous from the start of the measurement period, with frequent bouts of shouting and singing being recorded. The generally boisterous behaviour appeared to increase until around 01.00 hours and this period was coincident with an increased number of inebriated people walking along Fish Street, often singing and shouting as they went. Overall the revellers contribution to the ambient noise climate tended to

reduce from about 01.30 hours onwards, although intermittent noisy events did continue to occur throughout the measurement period.

The consultant reported that the maximum measured L_{Aeq} levels occurred at 01.00 and this coincided with two large groups of very vocal revellers who had congregated at the junction of Fish Street and Abington Street. The highest measured L_{AMax} value occurred at 02.00 and was again a consequence of one inebriated individual shouting very loudly.

In terms of this development an adequate scheme of noise insulation may be provided to address the matter of street noise such that suitable conditions might be achievable. However, in the case of existing residential development within the town centre there is no scope to apply this retrospectively.

Measurement data obtained by the consultant notes high ambient levels continuing until approximately 02.30 hours, where the measured levels were largely found to be in excess of 60 dB(A) as an average level and 75 dB(A) as an L_{AMAX}. It has been assumed that over this period the higher measured levels have continued to be influenced by street noise.

During the winter, the windows on most residential properties will normally remain closed to maintain a comfortable internal temperature. However, in the spring/summer windows will be used for cooling/comfort and ventilation. An open window will allow sound to pass more easily through the building envelope. As a rule of thumb a partially open window will typically provide attenuation ranging from 10 – 15 dB(A), and between 27 – 33 dB(A) for a closed window.

By subtracting the values for a partially open window from those measured by the acoustic consultant (e.g. 60 – 15 = 45 (L_{Aeq}); 75 – 15 = 60 (L_{AMAX})) it can be seen that the WHO guideline limits for restful sleep would not be met as a result of street noise.

2. Abington Street

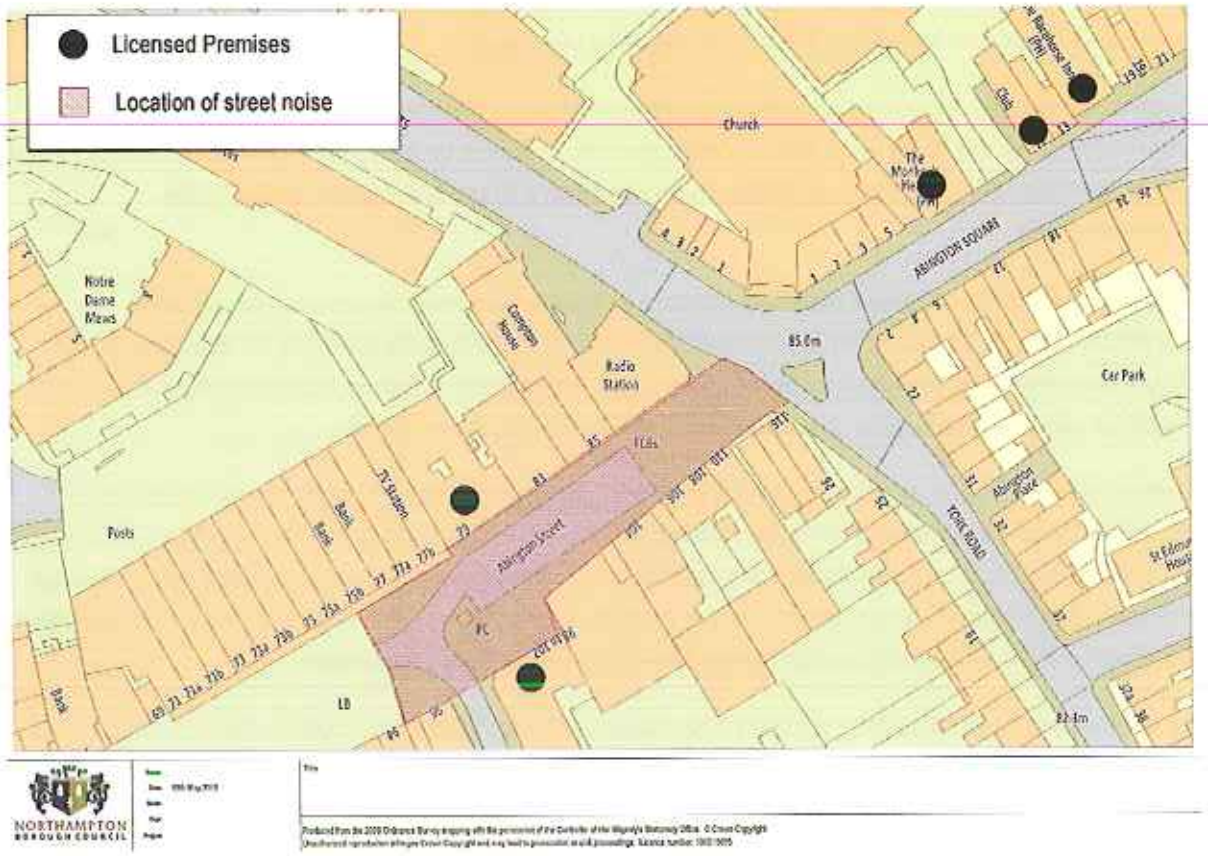


Figure 2: Location Plan for Abington Street and surrounding licensed premises

This assessment was conducted by Regulatory Services at Northampton Borough Council in response to complaints made of loud music arising from a bar located in the vicinity of Abington Street/Abington Square. Measurements were obtained from the complainant's bedroom over 3 consecutive nights between 19th – 22nd September 2012 as part of the complaint investigation. From analysis of the survey evidence it was noted that street noise was an apparent feature of the local environment when the music noise subsided.

Consistent with the observations made by the independent consultant working on 3 Fish Street, there is evidence of drunken and boisterous behaviour arising from night time revellers.

- Wednesday 19th September 2012

It would seem that a Wednesday night in Northampton is Student night. The survey noted that when musical entertainment finished around 02.00 hours, this led to some noticeable incidents of street noise, characterised by events of raised voices (shouting), singing, laughter etc. The trace presented at Figure 3 notes a number of examples of noisy events of street noise, i.e. night time revellers. These events are coded as street noise (SN). It can be noted that these events continued well

beyond the apparent closure of the problem bar suggesting that street noise arises from visitors passing through the town centre.

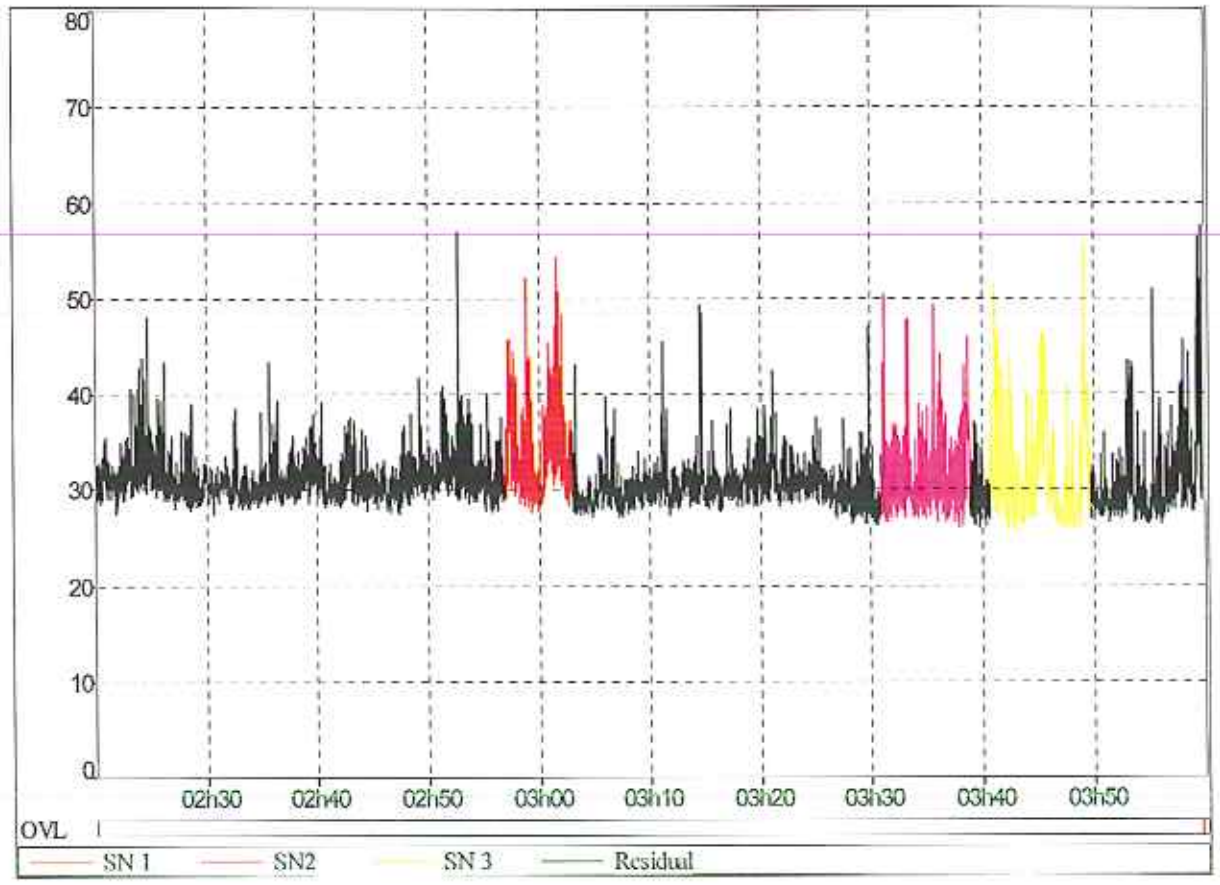


Figure 3: Wednesday 19th September 2012, 02.20 – 04.00

Presented at figure 4 are the results of the coded events of street noise. As measurements were obtained from a bedroom these levels can be directly compared with the WHO guideline values, where it can be noted that street noise exceeds both the recommended L_{Aeq} and LA_{MAX} values for restful sleep.

File	180912 MoMos_120918_220000.CMG		
Location	Ch. 1		
Data type	Leq		
Weighting	A		
Start	18/09/12 22:00:00:000		
End	19/09/12 04:00:00:000		
Source	Leq specific dB	Lmax dB	Duration cumulated h:m:s:ms
SN 1	37.4	58.0	00:05:58:500
SN 2	33.8	54.1	00:08:00:000
SN 3	36.2	57.0	00:09:04:500

Figure 4: Calculated levels for Street Noise

- Thursday 20th September 2012

Street noise can be clearly noted on the recording but this is more pronounced just after 23.00 hours, subsiding around 01.20. This is assumed to be as a result of lower footfall to the town centre compared with busier nights.

The traces presented in Figures 5 and 6 denote incidents that have been coded as Street noise. These have not been directly linked to any one licensed premises in particular.

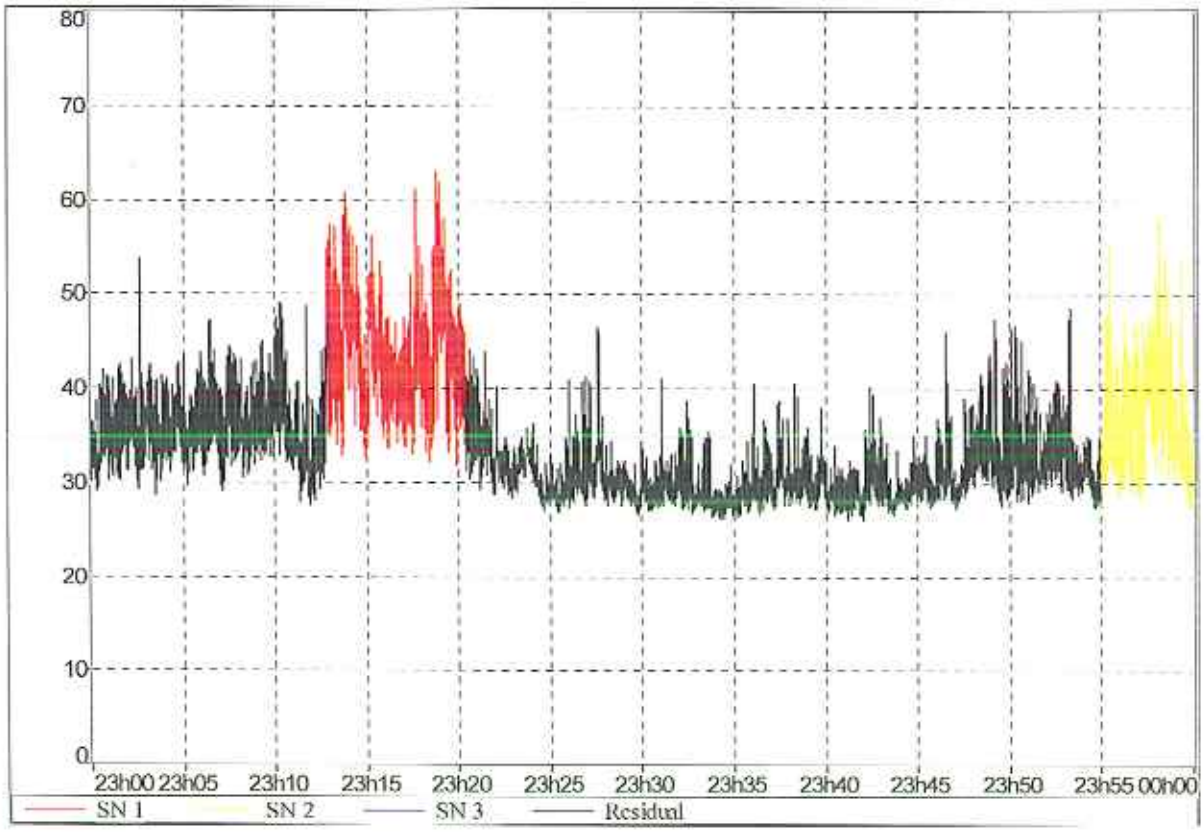


Figure 5: Thursday 20th September 2012, 23.00 – 00.00

Figure 6: Thursday 20th September 2012, 00.00 – 01.00

Presented at Figure 7 are the calculated levels for each event coded as street noise. By directly comparing these with the WHO guideline values, street noise exceeds both the recommended L_{Aeq} and LA_{MAX} values for restful sleep.

File	180912 MoMos_120919_220000.CMG		
Location	Ch. 1		
Data type	Leq		
Weighting	A		
Start	19/09/12 22:00:00:000		
End	20/09/12 04:00:00:000		
Source	Leq specific dB	Lmax dB	Duration cumulated h:m:s:ms
SN 1	48.0	64.1	00:07:35:200
SN 2	40.7	59.7	00:05:00:600
SN 3	33.6	51.3	00:05:34:500

Figure 7: Calculated levels for Street Noise

- Friday 21st September 2012

As a result of loud music on the recording, street noise has been analysed after 02.00 when this ends. Presented at Figure 8 is the audio trace for the period after the music finished. On this trace there can be seen a clear crescendo of noise which gradually falls off in volume reaching a 'background' level at approximately 02.55 hours. A slope has been added to Figure 8, to note the gradual decreasing levels.

Based upon the time that music ends, and the commencement of street noise it is considered likely that street noise is the result of crowd dispersal from the source premises in question which gradually decreases as people vacate the area. This event has been coded as one single, sustained event.

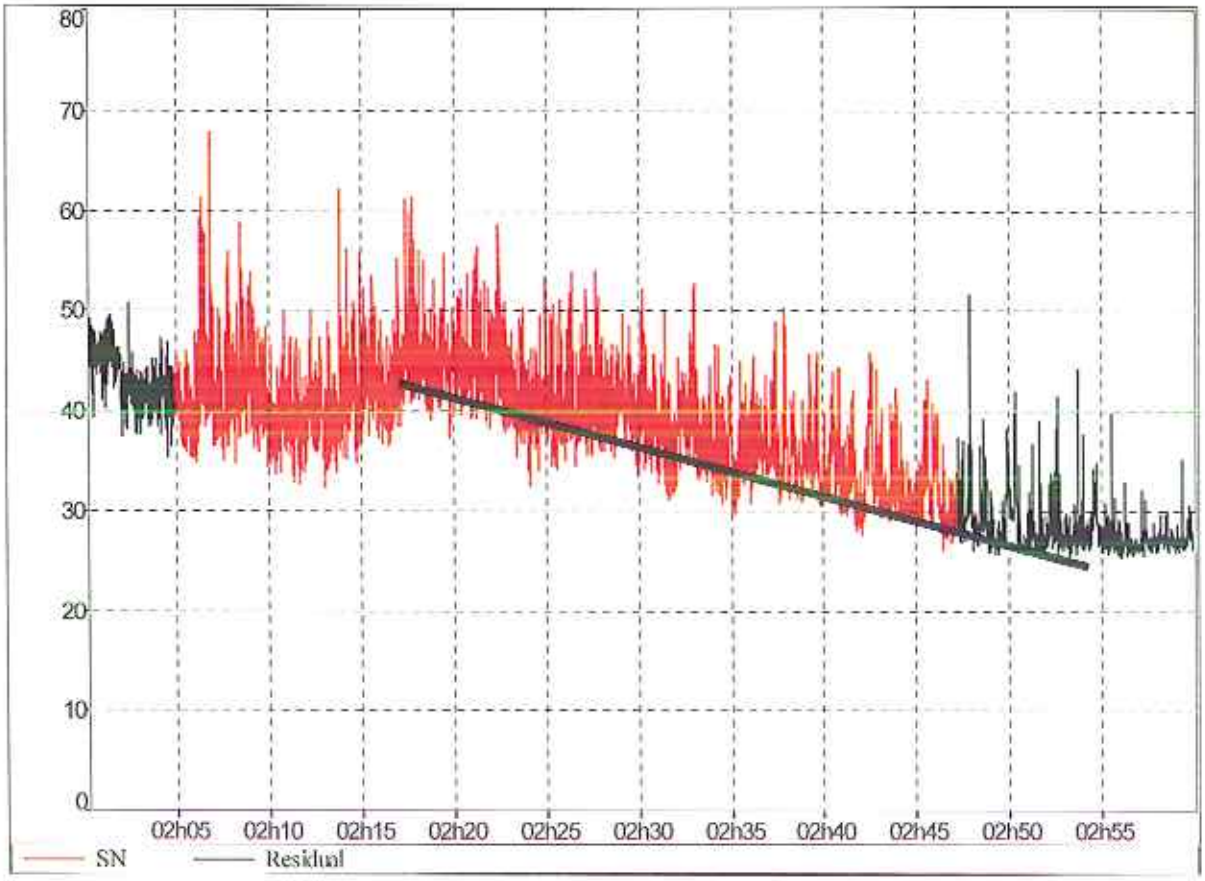


Figure 8: Friday 21st September 2012, 02.00 – 03.00

The levels calculated for street noise are presented at Figure 9. Comparing this with the WHO guideline values, street noise exceeds both the recommended L_{Aeq} and LA_{MAX} values for restful sleep.

File	180912 MoMos_120920_220000.CMG		
Location	Ch. 1		
Data type	Leq		
Weighting	A		
Start	20/09/12 22:00:00:000		
End	21/09/12 04:00:00:000		
Source	Leq specific dB	Lmax dB	Duration cumulated h:m:s:ms
SN	42.9	68.0	00:42:17:100

Figure 9: Calculated levels for Street Noise

3. Bridge Street

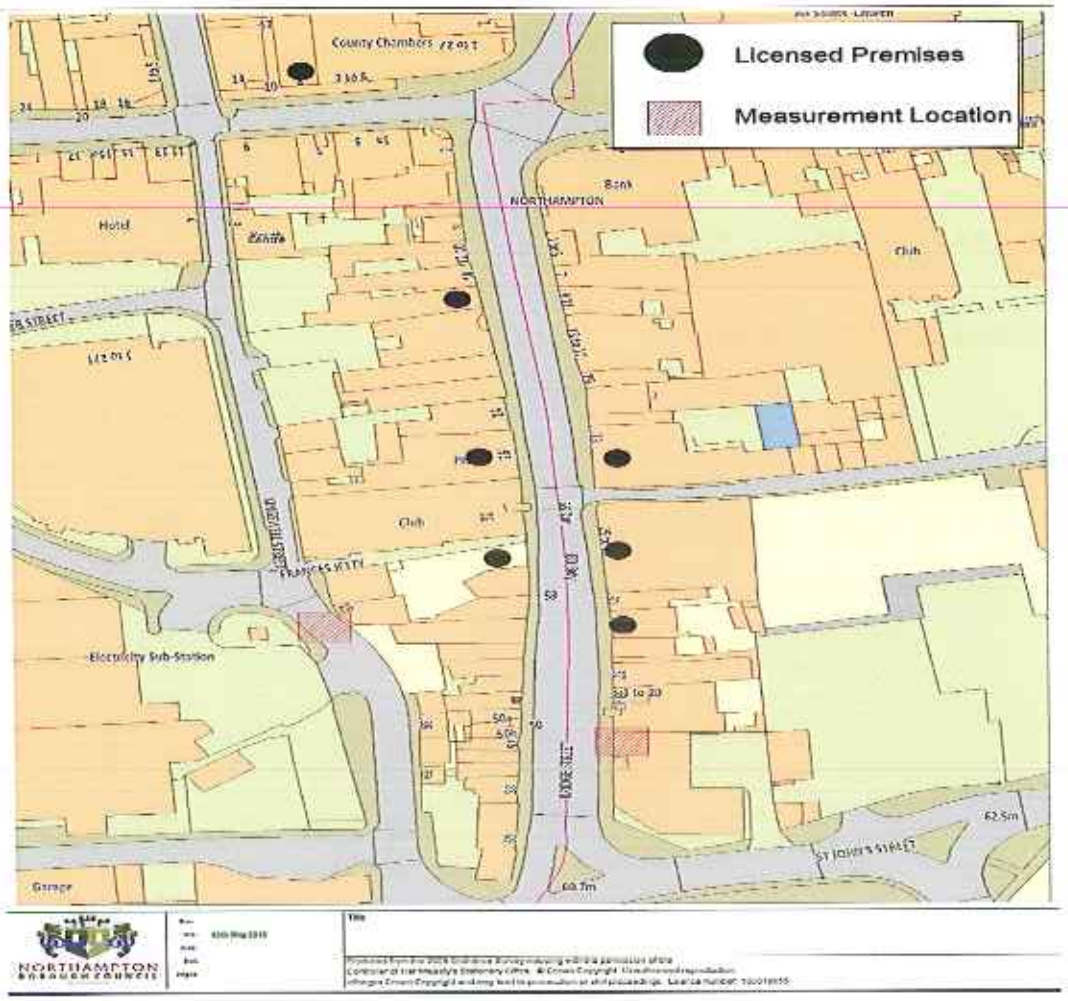


Figure 10: Location Plan for Bridge Street and surrounding licensed premises

This assessment was conducted by a private acoustic consultant to support an application seeking to change the use of the vacant Thai Restaurant at 60 Bridge Street to a bar. A noise survey was undertaken to assess the likely impact of the proposed bar, which included a baseline survey.

Baseline noise measurements were undertaken on Thursday 20th September 2012 between 00.30 – 03.00 hours. Measurements consisted of a number of 5 minute measurements collected from a number of locations near the application site. Those monitoring positions of interest for this report are the measurements conducted from Kingswell Street (overlooked by the Pinnacle) and Bridge Street (overlooked by Clarendon House).

The consultant noted that at Kingswell Street the noise environment was affected by noisy pedestrians using the cut through into Woolmonger Street, plant noise from the rear of buildings on Bridge Street, activity in the service yard and activity from a local taxi-cab company (car doors and vehicle movements).

On Bridge Street it was noted that music break-out from bars, clubs and food take-away venues, and conversation, shouting and singing from people were the predominant sources of noise. The consultant also noted that activity on Bridge Street continued throughout the survey period.

The average measured values for the two locations is summarised in Table 1 below. It is evidenced that the night time noise environment is high. It should also be borne in mind that the survey was conducted on a Thursday night/Friday morning, when Bridge Street would be assumed as operating at a lower capacity than the weekend.

Location	$L_{Aeq,5MIN}$	L_{AMAX}
Kingswell Street	60	72
Bridge Street	64	78

Table 1: Average measured values

As measurements were made externally, the same method for predicting internal bedroom levels as for the Fish Street assessment has been applied. By subtracting a value of 15 dB(A) for a partially open window from those measured by the acoustic consultant with the WHO guideline values, street noise exceeds both the recommended L_{Aeq} and LA_{MAX} values for restful sleep.

Panache Application – Appendices

Appendix 1 – WHO community Noise (extract nighttime noise)

Guidelines for Community Noise

3. Adverse health effects of noise

3.1 Introduction

The perception of sounds in day-to-day life is of major importance for human well-being. Communication through speech, sounds from playing children, music, natural sounds in parklands, parks and gardens are all examples of sounds essential for satisfaction in every day life. Conversely, this document is related to the adverse effects of sound (noise). According to the International Programme on Chemical Safety (WHO 1994), an adverse effect of noise is defined as a change in the morphology and physiology of an organism that results in impairment of functional capacity, or an impairment of capacity to compensate for additional stress, or increases the susceptibility of an organism to the harmful effects of other environmental influences. This definition includes any temporary or long-term lowering of the physical, psychological or social functioning of humans or human organs. The health significance of noise pollution is given in this chapter under separate headings, according to the specific effects: noise-induced hearing impairment; interference with speech communication; disturbance of rest and sleep; psychophysiological, mental-health and performance effects; effects on residential behaviour and annoyance; as well as interference with intended activities. This chapter also considers vulnerable groups and the combined effects of sounds from different sources. Conclusions based on the details given in this chapter are given in Chapter 4 as they relate to guideline values.

[

3.3 Sleep disturbance

Uninterrupted sleep is known to be a prerequisite for good physiological and mental functioning of healthy persons (Hobson 1989); sleep disturbance, on the other hand, is considered to be a major environmental noise effect. It is estimated that 80-90% of the reported cases of sleep disturbance in noisy environments are for reasons other than noise originating outdoors, for example, sanitary needs; indoor noises from other occupants; worries; illness; and climate (e.g. Reyner & Horne 1995). Our understanding of the impact of noise exposure on sleep stems mainly from experimental research in controlled environments. Field studies conducted with people in their normal living situations are scarce. Most of the more recent field research on sleep disturbance has been conducted for aircraft noise (Fidell et al. 1994 1995a,b 1998; Horne et al. 1994 1995; Maschke et al. 1995 1996; Ollerhead et al. 1992; Passchier-Vermeer 1999). Other field studies have examined the effects of road traffic and railway noise (Griefahn et al. 1996 1998).

The primary sleep disturbance effects are: difficulty in falling asleep (increased sleep latency time); awakenings; and alterations of sleep stages or depth, especially a reduction in the proportion of REM-sleep (REM = rapid eye movement) (Hobson 1989). Other primary physiological effects can also be induced by noise during sleep, including increased blood pressure; increased heart rate; increased finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and an increase in body

movements (cf. Berglund & Lindvall 1995). For each of these physiological effects, both the noise threshold and the noise-response relationships may be different. Different noises may also have different information content and this also could affect physiological threshold and noise-response relationships (Edworthy 1998).

Exposure to night-time noise also induces secondary effects, or so-called after effects. These are effects that can be measured the day following the night-time exposure, while the individual is awake. The secondary effects include reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance (Öhrström 1993a; Passchier-Vermeer 1993; Carter 1996; Pearsons et al. 1995; Pearsons 1998).

Long-term effects on psychosocial well-being have also been related to noise exposure during the night (Öhrström 1991). Noise annoyance during the night-time increased the total noise annoyance expressed by people in the following 24 h. Various studies have also shown that people living in areas exposed to night-time noise have an increased use of sedatives or sleeping pills. Other frequently reported behavioural effects of night-time noise include closed bedroom windows and use of personal hearing protection. Sensitive groups include the elderly, shift workers, persons especially vulnerable to physical or mental disorders and other individuals with sleeping difficulties.

Questionnaire data indicate the importance of night-time noise on the perception of sleep quality. A recent Japanese investigation was conducted for 3 600 women (20–80 years old) living in eight roadside zones with different road traffic noise. The results showed that four measures of perceived sleep quality (difficulty in falling asleep; waking up during sleep; waking up too early; feelings of sleeplessness one or more days a week) correlated significantly with the average traffic volumes during night-time. An in-depth investigation of 19 insomnia cases and their matched controls (age,work) measured outdoor and indoor sound pressure levels during sleep (Kageyama et al. 1997). The study showed that road traffic noise in excess of 30 dB LAeq for nighttime induced sleep disturbance, consistent with the results of Öhrström (1993b).

Meta-analyses of field and laboratory studies have suggested that there is a relationship between the SEL for a single night-time noise event and the percentage of people awakened, or who showed sleep stage changes (e.g. Ollerhead et al. 1992; Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). All of these studies assumed that the number of awakenings per night for each SEL value is proportional to the number of night-time noise events. However, the results have been criticized for methodological reasons. For example, there were small groups of sleepers; too few original studies; and indoor exposure was estimated from outdoor sound pressure levels (NRC-CNRC 1994; Beersma & Altena 1995; Vallet 1998). The most important result of the meta-analyses is that there is a clear difference in the dose-response curves for laboratory and field studies, and that noise has a lower effect under real-life conditions (Pearsons et al. 1995; Pearsons 1998).

However, this result has been questioned, because the studies were not controlled for such things as the sound insulation of the buildings, and the number of bedrooms with closed windows. Also, only two indicators of sleep disturbance were considered (awakening and sleep stage changes). The meta-analyses thus neglected other important sleep disturbance effects (Öhrström 1993b; Carter et al. 1994a; Carter et al. 1994b; Carter 1996; Kuwano et al. 1998). For example, for road traffic noise, perceived sleep quality is related both to the time needed to fall asleep and the total sleep time (Öhrström & Björkman 1988). Individuals who are more sensitive to noise (as assessed

by different questionnaires) report worse sleep quality both in field studies and in laboratory studies.

A further criticism of the meta-analyses is that laboratory experiments have shown that habituation to night-time noise events occurs, and that noise-induced awakening decreases with increasing number of sound exposures per night. This is in contrast to the assumption used in the meta-analyses, that the percentage of awakenings is linearly proportional to the number of night-time noise events. Studies have also shown that the frequency of noise-induced awakenings decreases for at least the first eight consecutive nights. So far, habituation has been shown for awakenings, but not for heart rate and after effects such as perceived sleep quality, mood and performance (Öhrström and Björkman 1988).

Other studies suggest that it is the difference in sound pressure levels between a noise event and background, rather than the absolute sound pressure level of the noise event, that determines the reaction probability. The time interval between two noise events also has an important influence of the probability of obtaining a response (Griefahn 1977; cf. Berglund & Lindvall 1995). Another possible factor is the person's age, with older persons having an increased probability of awakening. However, one field study showed that noise-induced awakenings are independent of age (Reyner & Horne 1995).

For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10–15 times per night (Vallet & Vernet 1991), and most studies show an increase in the percentage of awakenings at SEL values of 55–60 dBA (Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). For intermittent events that approximate aircraft noise, with an effective duration of 10–30 s, SEL values of 55–60 dBA correspond to a LAmax value of 45 dB. Ten to 15 of these events during an eight-hour night-time implies an LAeq,8h of 20–25 dB. This is 5–10 dB below the LAeq,8h of 30 dB for continuous night-time noise exposure, and shows that the intermittent character of noise has to be taken into account when setting night-time limits for noise exposure. For example, this can be achieved by considering the number of noise events and the difference between the maximum sound pressure level and the background level of these events.

Special attention should also be given to the following considerations:

- Noise sources in an environment with a low background noise level. For example, night-traffic in suburban residential areas.
- Environments where a combination of noise and vibrations are produced. For example, railway noise, heavy duty vehicles.
- Sources with low-frequency components. Disturbances may occur even though the sound pressure level during exposure is below 30 dBA.

If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with LAmax and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and

the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep.

3.4 Cardiovascular and physiological effects

Epidemiological and laboratory studies involving workers exposed to occupational noise, and general populations (including children) living in noisy areas around airports, industries and noisy streets, indicate that noise may have both temporary and permanent impacts on physiological functions in humans. It has been postulated that noise acts as an environmental stressor (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). Acute noise exposures activate the autonomic and hormonal systems, leading to temporary changes such as increased blood pressure, increased heart rate and vasoconstriction. After prolonged exposure, susceptible individuals in the general population may develop permanent effects, such as hypertension and ischaemic heart disease associated with exposures to high sound pressure levels (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). The magnitude and duration of the effects are determined in part by individual characteristics, lifestyle behaviours and environmental conditions. Sounds also evoke reflex responses, particularly when they are unfamiliar and have a sudden onset.

Laboratory experiments and field quasi-experiments show that if noise exposure is temporary, the physiological system usually returns - after the exposure terminates - to a normal (pre-exposure) state within a time in the range of the exposure duration. If the exposure is of sufficient intensity and unpredictability, cardiovascular and hormonal responses may appear, including increases in heart rate and peripheral vascular resistance; changes in blood pressure, blood viscosity and blood lipids; and shifts in electrolyte balance (Mg/Ca) and hormonal levels (epinephrine, norepinephrine, cortisol). The first four effects are of interest because of noise-related coronary heart disease (Ising & Günther 1997). Laboratory and clinical data suggest that noise may significantly elevate gastrointestinal motility in humans.

By far the greatest number of occupational and community noise studies have focused on the possibility that noise may be a risk factor for cardiovascular disease. Many studies in occupational settings have indicated that workers exposed to high levels of industrial noise for 5–30 years have increased blood pressure and statistically significant increases in risk for hypertension, compared to workers in control areas (Passchier-Vermeer 1993). In contrast, only a few studies on environmental noise have shown that populations living in noisy areas around airports and on noisy streets have an increased risk for hypertension. The overall evidence suggests a weak association between long-term environmental noise exposure and hypertension (HCN 1994; Berglund & Lindvall 1995; IEH 1997), and no dose-response relationships could be established.

Recently, an updated summary of available studies for ischaemic heart disease has been presented (Babisch 1998a; Babisch 1998b; Babisch et al. 1999; see also Thompson 1996). The studies reviewed include case-control and cross-sectional designs, as well as three longitudinal studies. However, it has not yet been possible to conduct the most advanced quantitative integrated analysis of the available studies. Relative risks and their confidence intervals could be estimated only for the classes of high noise levels (mostly >65 dBA during daytime) and low levels (mostly <55 dBA during daytime), rather than a range of exposure levels. For methodological reasons identified in the meta-analysis, a cautious interpretation of the results is warranted (Lercher et al. 1998).

Prospective studies that controlled for confounding factors suggest an increase in ischaemic heart disease when the noise levels exceed 65–70 dB for LAeq (6–22). (For road traffic noise, the difference between LAeq (6-22h) and LAeq,24h usually is of the order of 1.5 dB). When orientation of the bedroom, window opening habits and years of exposure are taken into account, the risk of heart disease is slightly higher (Babisch et al. 1998; Babisch et al. 1999). However, disposition, behavioural and environmental factors were not sufficiently accounted for in the analyses carried out to date. In epidemiological studies the lowest level at which traffic noise had an effect on ischaemic heart disease was 70 dB for LAeq,24h (HCN 1994).

The overall conclusion is that cardiovascular effects are associated with long-term exposure to LAeq,24h values in the range of 65–70 dB or more, for both air- and road-traffic noise. However, the associations are weak and the effect is somewhat stronger for ischaemic heart disease than for hypertension. Nevertheless, such small risks are potentially important because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Furthermore, only the average risk is considered and sensitive subgroups of the populations have not been sufficiently characterized. For example, a 10% increase in risk factors (a relative risk of 1.1) may imply an increase of up to 200 cases per 100 000 people at risk per year. Other observed psychophysiological effects, such as changes in stress hormones, magnesium levels, immunological indicators, and gastrointestinal disturbances are too inconsistent for conclusions to be drawn about the influence of noise pollution.

3.5 Mental health effects

Mental health is defined as the absence of identifiable psychiatric disorders according to current norms (Freeman 1984). Environmental noise is not believed to be a direct cause of mental illness, but it is assumed that it accelerates and intensifies the development of latent mental disorder. Studies on the adverse effects of environmental noise on mental health cover a variety of symptoms, including anxiety; emotional stress; nervous complaints; nausea; headaches; instability; argumentativeness; sexual impotency; changes in mood; increase in social conflicts, as well as general psychiatric disorders such as neurosis, psychosis and hysteria. Large-scale population studies have suggested associations between noise exposure and a variety of mental health indicators, such as single rating of well-being; standard psychological symptom profiles; the intake of psychotropic drugs; and consumption of tranquilizers and sleeping pills. Early studies showed a weak association between exposure to aircraft noise and psychiatric hospital admissions in the general population surrounding an airport (see also Berglund & Lindvall 1995). However, the studies have been criticized because of problems in selecting variables and in response bias (Halpern 1995).

Exposure to high levels of occupational noise has been associated with development of neurosis and irritability; and exposure to high levels of environmental noise with deteriorated mental health (Stansfeld 1992). However, the findings on environmental noise and mental health effects are inconclusive (HCN 1994; Berglund & Lindvall 1995; IEH 1997). The only longitudinal study in this field (Stansfeld et al. 1996) showed an association between the initial level of road traffic noise and minor psychiatric disorders, although the association for increased anxiety was weak and non-linear. It turned out that psychiatric disorders are associated with noise sensitivity, rather than with noise exposure, and the association was found to disappear after adjustment for baseline trait anxiety. These and other results show the importance of taking vulnerable groups into account, because they may not be able to cope sufficiently with unwanted

environmental noise (e.g. Stansfeld 1992). This is particularly true of children, the elderly and people with pre-existing illnesses, especially depression (IEH 1997). Despite the weaknesses of the various studies, the possibility that community noise has adverse effects on mental health is suggested by studies on the use of medical drugs, such as tranquilizers and sleeping pills, on psychiatric symptoms and on mental hospital admission rates.

3.6 The effects of noise on performance

It has been documented in both laboratory subjects and in workers exposed to occupational noise, that noise adversely affects cognitive task performance. In children, too, environmental noise impairs a number of cognitive and motivational parameters (Cohen et al. 1980; Evans & Lepore 1993; Evans 1998; Hygge et al. 1998; Haines et al. 1998). However, there are no published studies on whether environmental noise at home also impairs cognitive performance in adults. Accidents may also be an indicator of performance deficits. The few field studies on the effects of noise on performance and safety showed that noise may produce some task impairment and increase the number of errors in work, but the effects depend on the type of noise and the task being performed (Smith 1990).

Laboratory and workplace studies showed that noise can act as a distracting stimulus. Also, impulsive noise events (e.g. sonic booms) may produce disruptive effects as a result of startle responses. In the short term, noise-induced arousal may produce better performance of simple tasks, but cognitive performance deteriorates substantially for more complex tasks (i.e. tasks that require sustained attention to details or to multiple cues; or tasks that demand a large capacity of working memory, such as complex analytical processes). Some of the effects are related to loss in auditory comprehension and language acquisition, but others are not (Evans & Maxwell 1997). Among the cognitive effects, reading, attention, problem solving and memory are most strongly affected by noise. The observed effects on motivation, as measured by persistence with a difficult cognitive task, may either be independent or secondary to the aforementioned cognitive impairments.

Two types of memory deficits have been identified under experimental noise exposure: incidental memory and memory for materials that the observer was not explicitly instructed to focus on during a learning phase. For example, when presenting semantic information to subjects in the presence of noise, recall of the information content was unaffected, but the subjects were significantly less able to recall, for example, in which corner of the slide a word had been located. There is also some evidence that the lack of "helping behavior" that was noted under experimental noise exposure may be related to inattention to incidental cues (Berglund & Lindvall 1995). Subjects appear to process information faster in working memory during noisy performance conditions, but at a cost of available memory capacity. For example, in a running memory task, in which subjects were required to recall in sequence letters that they had just heard, subjects recalled recent items better under noisy conditions, but made more errors farther back into the list.

Experimental noise exposure consistently produces negative after-effects on performance (Glass & Singer 1972). Following exposure to aircraft noise, schoolchildren in the vicinity of Los Angeles airport were found to be deficient in proofreading, and in persistence with challenging puzzles (Cohen et al. 1980). The uncontrollability of noise, rather than the intensity of the noise, appears to be the most critical variable. The only prospective study on noise-exposed schoolchildren, designed around the move of the

Munich airport (Hygge et al. 1996; Evans et al. 1998), confirmed the results of laboratory and workplace studies in adults, as well the results of the Los Angeles airport study with children (Cohen et al. 1980). An important finding was that some of the adaptation strategies for dealing with aircraft noise, such as tuning out or ignoring the noise, and the effort necessary to maintain task performance, come at a price. There is heightened sympathetic arousal, as indicated by increased levels of stress hormone, and elevation of resting blood pressure (Evans et al. 1995; Evans et al. 1998). Notably, in the airport studies reported above, the adverse effects were larger in children with lower school achievement.

For aircraft noise, it has been shown that chronic exposure during early childhood appears to impair reading acquisition and reduces motivational capabilities. Of recent concern are concomitant psychophysiological changes (blood pressure and stress hormone levels). Evidence indicates that the longer the exposure, the greater the damage. It seems clear that daycare centers and schools should not be located near major sources of noise, such as highways, airports and industrial sites.

3.7 Effects of Noise on Residential Behaviour and Annoyance

Noise annoyance is a global phenomenon. A definition of annoyance is "a feeling of displeasure associated with any agent or condition, known or believed by an individual or group to adversely affect them" (Lindvall & Radford 1973; Koelega 1987). However, apart from "annoyance", people may feel a variety of negative emotions when exposed to community noise, and may report anger, disappointment, dissatisfaction, withdrawal, helplessness, depression, anxiety, distraction, agitation, or exhaustion (Job 1993; Fields et al. 1997 1998). Thus, although the term annoyance does not cover all the negative reactions, it is used for convenience in this document.

Noise can produce a number of social and behavioural effects in residents, besides annoyance (for review see Berglund & Lindvall 1995). The social and behavioural effects are often complex, subtle and indirect. Many of the effects are assumed to be the result of interactions with a number of non-auditory variables. Social and behavioural effects include changes in overt everyday behaviour patterns (e.g. closing windows, not using balconies, turning TV and radio to louder levels, writing petitions, complaining to authorities); adverse changes in social behaviour (e.g. aggression, unfriendliness, disengagement, non-participation); adverse changes in social indicators (e.g. residential mobility, hospital admissions, drug consumption, accident rates); and changes in mood (e.g. less happy, more depressed).

Although changes in social behaviour, such as a reduction in helpfulness and increased aggressiveness, are associated with noise exposure, noise exposure alone is not believed to be sufficient to produce aggression. However, in combination with provocation or pre-existing anger or hostility, it may trigger aggression. It has also been suspected that people are less willing to help, both during exposure and for a period after exposure. Fairly consistent evidence shows that noise above 80 dBA is associated with reduced helping behaviour and increased aggressive behaviour. Particularly, there is concern that high-level continuous noise exposures may contribute to the susceptibility of schoolchildren to feelings of helplessness (Evans & Lepore 1993)

The effects of community noise can be evaluated by assessing the extent of annoyance (low, moderate, high) among exposed individuals; or by assessing the disturbance of specific activities, such as reading, watching television and communication. The relationship between annoyance and activity disturbances is not necessarily direct and

there are examples of situations where the extent of annoyance is low, despite a high level of activity disturbance. For aircraft noise, the most important effects are interference with rest, recreation and watching television. This is in contrast to road traffic noise, where sleep disturbance is the predominant effect (Berglund & Lindvall 1995).

A number of studies have shown that equal levels of traffic and industrial noises result in different magnitudes of annoyance (Hall et al. 1981; Griffiths 1983; Miedema 1993; Bradley 1994a; Miedema & Vos 1998). This has led to criticism (e.g. Kryter 1994; Bradley 1994a) of averaged dose-response curves determined by meta-analysis, which assumed that all traffic noises are the same (Fidell et al. 1991; Fields 1994a; Finegold et al. 1994). Schultz (1978) and Miedema & Vos (1998) have synthesized curves of annoyance associated with three types of traffic noise (road, air, railway). In these curves, the percentage of people highly or moderately annoyed was related to the day and night continuous equivalent sound level, Ldn. For each of the three types of traffic noise, the percentage of highly annoyed persons in a population started to increase at an Ldn value of 42 dBA, and the percentage of moderately annoyed persons at an Ldn value of 37 dBA (Miedema & Vos 1998). Aircraft noise produced a stronger annoyance response than road traffic, for the same Ldn exposure, consistent with earlier analyses (Kryter 1994; Bradley 1994a). However, caution should be exercised when interpreting synthesized data from different studies, since five major parameters should be randomly distributed for the analyses to be valid: personal, demographic, and lifestyle factors, as well as the duration of noise exposure and the population experience with noise (Kryter 1994).

Annoyance in populations exposed to environmental noise varies not only with the acoustical characteristics of the noise (source, exposure), but also with many non-acoustical factors of social, psychological, or economic nature (Fields 1993). These factors include fear associated with the noise source, conviction that the noise could be reduced by third parties, individual noise sensitivity, the degree to which an individual feels able to control the noise (coping strategies), and whether the noise originates from an important economic activity. Demographic variables such as age, sex and socioeconomic status, are less strongly associated with annoyance. The correlation between noise exposure and general annoyance is much higher at the group level than at the individual level, as might be expected. Data from 42 surveys showed that at the group level about 70% of the variance in annoyance is explained by noise exposure characteristics, whereas at the individual level it is typically about 20% (Job 1988).

When the type and amount of noise exposure is kept constant in the meta-analyses, differences between communities, regions and countries still exist (Fields 1990; Bradley 1996). This is well demonstrated by a comparison of the dose-response curve determined for road-traffic noise (Miedema & Vos 1998) and that obtained in a survey along the North-South transportation route through the Austrian Alps (Lercher 1998b). The differences may be explained in terms of the influence of topography and meteorological factors on acoustical measures, as well as the low background noise level on the mountain slopes.

Stronger reactions have been observed when noise is accompanied by vibrations and contains low frequency components (Paulsen & Kastka 1995; Öhrström 1997; for review see Berglund et al. 1996), or when the noise contains impulses, such as shooting noise (Buchta 1996; Vos 1996; Smoorenburg 1998). Stronger, but temporary, reactions also occur when noise exposure is increased over time, in comparison to

situations with constant noise exposure (e.g. HCN 1997; Klæboe et al. 1998). Conversely, for road traffic noise, the introduction of noise protection barriers in residential areas resulted in smaller reductions in annoyance than expected for a stationary situation (Kastka et al. 1995).

To obtain an indicator for annoyance, other methods of combining parameters of noise exposure have been extensively tested, in addition to metrics such as LAeq,24h and Ldn. When used for a set of community noises, these indicators correlate well both among themselves and with LAeq,24h or Ldn values (e.g. HCN 1997). Although LAeq,24h and Ldn are in most cases acceptable approximations, there is a growing concern that all the component parameters of the noise should be individually assessed in noise exposure investigations, at least in the complex cases (Berglund & Lindvall 1995).

3.8 The effects of combined noise sources

Many acoustical environments consist of sounds from more than one source. For these environments, health effects are associated with the total noise exposure, rather than with the noise from a single source (WHO 1980b). When considering hearing impairment, for example, the total noise exposure can be expressed in terms of LAeq,24h for the combined sources. For other adverse health effects, however, such a simple model most likely will not apply. It is possible that some disturbances (e.g. speech interference, sleep disturbance) may more easily be attributed to specific noises. In cases where one noise source clearly dominates, the magnitude of an effect may be assessed by taking into account the dominant source only (HCN 1997). Furthermore, at a policy level, there may be little need to identify the adverse effect of each specific noise, unless the responsibility for these effects is to be shared among several polluters (cf. The Polluter Pays Principle in Chapter 5, UNCED 1992).

There is no consensus on a model for assessing the total annoyance due to a combination of environmental noise sources. This is partly due to a lack of research into the temporal patterns of combined noises. The current approach for assessing the effects of "mixed noise sources" is limited to data on "total annoyance" transformed to mathematical principles or rules of thumb (Ronnebaum et al. 1996; Vos 1992; Miedema 1996; Berglund & Nilsson 1997). Models to assess the total annoyance of combinations of environmental noises may not be applicable to those health effects for which the mechanisms of noise interaction are unknown, and for which different cumulative or synergistic effects cannot be ruled out. When noise is combined with different types of environmental agents, such as vibrations, ototoxic chemicals, or chemical odours, again there is insufficient knowledge to accurately assess the combined effects on health (Berglund & Lindvall 1995; HCN 1994; Miedema 1996; Zeichart 1998; Passchier-Vermeer & Zeichart 1998). Therefore, caution should be exercised when trying to predict the adverse health effects of combined factors in residential populations.

The evidence on low-frequency noise is sufficiently strong to warrant immediate concern. Various industrial sources emit continuous low-frequency noise (compressors, pumps, diesel engines, fans, public works); and large aircraft, heavy-duty vehicles and railway traffic produce intermittent low-frequency noise. Low-frequency noise may also produce vibrations and rattles as secondary effects. Health effects due to low-frequency components in noise are estimated to be more severe than for community noises in general (Berglund et al. 1996). Since A-weighting underestimates the sound pressure level of noise with low-frequency components, a better assessment of health effects would be to use C-weighting.

In residential populations heavy noise pollution will most certainly be associated with a combination of health effects. For example, cardiovascular disease, annoyance, speech interference at work and at home, and sleep disturbance. Therefore, it is important that the total adverse health load over 24 hours be considered and that the precautionary principle for sustainable development is applied in the management of health effects (see Chapter 5).

3.9 Vulnerable groups

Protective standards are essentially derived from observations on the health effects of noise on "normal" or "average" populations. The participants of these investigations are selected from the general population and are usually adults. Sometimes, samples of participants are selected because of their easy availability. However, vulnerable groups of people are typically underrepresented. This group includes people with decreased personal abilities (old, ill, or depressed people); people with particular diseases or medical problems; people dealing with complex cognitive tasks, such as reading acquisition; people who are blind or who have hearing impairment; fetuses, babies and young children; and the elderly in general (Jansen 1987; AAP 1997). These people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects.

Persons with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people typically demonstrate an impaired ability to understand difficult, spoken messages with low linguistic redundancy. Therefore, based on interference with speech perception, a majority of the population belongs to the vulnerable group.

Children have also been identified as vulnerable to noise exposure (see Agenda 21: UNCED 1992). The evidence on noise pollution and children’s health is strong enough to warrant monitoring programmes at schools and preschools to protect children from the effects of noise. Follow up programmes to study the main health effects of noise on children, including effects on speech perception and reading acquisition, are also warranted in heavily noise polluted areas (Cohen et al. 1986; Evans et al. 1998).

The issue of vulnerable subgroups in the general population should thus be considered when developing regulations or recommendations for the management of community noise. This consideration should take into account the types of effects (communication, recreation, annoyance, etc.), specific environments (in utero, incubator, home, school, workplace, public institutions, etc.) and specific lifestyles (listening to loud music through headphones, or at discotheques and festivals; motor cycling, etc.).

4. Guideline Values

4.1 Introduction

The human ear and lower auditory system continuously receive stimuli from the world around us. However, this does not mean that all the acoustical inputs are necessarily disturbing or have harmful effects. This is because the auditory nerve provides activating impulses to the brain that enable us to regulate the vigilance and wakefulness necessary for optimal performance. On the other hand, there are scientific reports that a completely silent world can have harmful effects, because of sensory deprivation. Thus, both too little sound and too much sound can be harmful. For this reason, people should have the right to decide for themselves the quality of the acoustical environment they live in.

Exposure to noise from various sources is most commonly expressed as the average sound pressure level over a specific time period, such as 24 hours. This means that identical average sound levels for a given time period could be derived from either a large number of sound events with relatively low, almost inaudible levels, or from a few events with high sound levels. This technical concept does not fully agree with common experience on how environmental noise is experienced, or with the neurophysiological characteristics of the human receptor system.

Human perception of the environment through vision, hearing, touch, smell and taste is characterized by a good discrimination of stimulus intensity differences, and by a decaying response to a continuous stimulus (adaptation or habituation). Single sound events cannot be discriminated if the interval between events drops below a threshold value; if this occurs, the sound is interpreted as continuous. These characteristics are linked to survival, since new and different stimuli with low probability and high information value indicate warnings. Thus, when assessing the effects of environmental noise on people it is relevant to consider the importance of the background noise level, the number of events, and the noise exposure level independently.

Community noise studies have traditionally considered noise annoyance from single specific sources such as aircraft, road traffic or railways. In recent years, efforts have been made to compare the results from road traffic, aircraft and railway surveys. Data from a number of sources show that aircraft noise is more annoying than road traffic noise, which, in turn, is more annoying than railway noise. However, there is not a clear understanding of the mechanisms that create these differences. Some populations may also be at greater risk for the harmful effects of noise. Young children (especially during language acquisition), the blind, and perhaps foetuses are examples of such populations. There are no definite conclusions on this topic, but the reader should be alerted that guidelines in this report are developed for the population at large; guidelines for potentially more vulnerable groups are addressed only to a limited extent.

In the following, guideline values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect). Guideline values typically correspond to the lowest effect level for general populations, such as those for indoor speech intelligibility. By contrast, guideline values for annoyance have been set at 50 or 55 dBA, representing daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively.

In these Guidelines for Community Noise only guideline values are presented. These are essentially values for the onset of health effects from noise exposure. It would have been preferred to establish guidelines for exposure-response relationships. Such relationships would indicate the effects to be expected if standards were set above the WHO guideline values and would facilitate the setting of standards for sound pressure levels (noise immission standards). However, exposure-response relationships could not be established as the scientific literature is very limited. The best-studied exposure-response relationship is that between Ldn and annoyance (WHO 1995a; Berglund & Lindvall 1995; Miedema & Vos 1998). Even the most recent relationships between integrated noise levels and the percentage of highly or moderately annoyed people are still being scrutinized. The results of a forthcoming meta-analysis are expected to be published in the near future (Miedema, personal communication).

4.2 Specific Effects

4.2.1 Interference with communication

Noise tends to interfere with auditory communication, in which speech is a most important signal. However, it is also vital to be able to hear alarming and informative signals such as door bells, telephone signals, alarm clocks, fire alarms etc., as well as sounds and signals involved in occupational tasks. The effects of noise on speech discrimination have been studied extensively and deal with this problem in lexical terms (mostly words but also sentences). For communication distances beyond a few metres, speech interference starts at sound pressure levels below 50 dB for octave bands centred on the main speech frequencies at 500, 1 000 and 2 000 Hz. It is usually possible to express the relationship between noise levels and speech intelligibility in a single diagram, based on the following assumptions and empirical observations, and for speaker-to-listener distance of about 1 m:

Speech in relaxed conversation is 100% intelligible in background noise levels of about 35 dBA, and can be understood fairly well in background levels of 45 dBA.

Speech with more vocal effort can be understood when the background sound pressure level is about 65 dBA.

A majority of the population belongs to groups sensitive to interference with speech perception. Most sensitive are the elderly and persons with impaired hearing. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people demonstrate impaired ability to interpret difficult, spoken messages with low linguistic redundancy, when compared to people aged 20–30 years. It has also been shown that children, before language acquisition has been completed, have more adverse effects than young adults to high noise levels and long reverberation times.

For speech outdoors and for moderate distances, the sound level drops by approximately 6 dB for a doubling of the distance between speaker and listener. This relationship is also applicable to indoor conditions, but only up to a distance of about 2 m. Speech communication is affected also by the reverberation characteristics of the room, and reverberation times beyond 1 s can produce a loss in speech discrimination. A longer reverberation time combined with background noise makes speech perception still more difficult.

Speech signal perception is of paramount importance, for example, in classrooms or conference rooms. To ensure any speech communication, the signal-to-noise relationship should exceed zero dB. But when listening to complicated messages (at

school, listening to foreign languages, telephone conversation) the signal-to-noise ratio should be at least 15 dB. With a voice level of 50 dBA (at 1 m distance this corresponds on average to a casual voice level in both women and men), the background level should not exceed 35 dBA. This means that in classrooms, for example, one should strive for as low background levels as possible. This is particularly true when listeners with impaired hearing are involved, for example, in homes for the elderly. Reverberation times below 1 s are necessary for good speech intelligibility in smaller rooms; and even in a quiet environment a reverberation time below 0.6 s is desirable for adequate speech intelligibility for sensitive groups.

4.2.2 Noise-induced hearing impairment

The ISO Standard 1999 (ISO 1990) gives a method of calculating noise-induced hearing impairment in populations exposed to all types of occupational noise (continuous, intermittent, impulse). However, noise-induced hearing impairment is by no means restricted to occupational situations alone. High noise levels can also occur in open-air concerts, discotheques, motor sports, shooting ranges, and from loudspeakers or other leisure activities in dwellings. Other loud noise sources, such as music played back in headphones and impulse noise from toys and fireworks, are also important. Evidence strongly suggests that the calculation method from ISO Standard 1999 for occupational noise (ISO 1990) should also be used for environmental and leisure time noise exposures. This implies that long term exposure to LAeq,24h of up to 70 dBA will not result in hearing impairment. However, given the limitations of the various underlying studies, care should be taken with respect to the following:

Data from animal experiments indicate that children may be more vulnerable in acquiring noise-induced hearing impairment than adults.

At very high instantaneous sound pressure levels mechanical damage to the ear may occur (Hanner & Axelsson 1988). Occupational limits are set at peak sound pressure levels of 140 dBA (EU 1986a). For adults, this same limit is assumed to be in order for exposure to environmental and leisure time noise. In the case of children, however, considering their habits while playing with noisy toys, peak sound pressure levels should never exceed 120 dBA.

For shooting noise with LAeq,24h over 80 dB, studies on temporary threshold shift suggest there is the possibility of an increased risk for noise-induced hearing impairment (Smoorenburg 1998).

The risk for noise-induced hearing impairment increases when noise exposure is combined with vibrations, ototoxic drugs or chemicals (Fechter 1999). In these circumstances, long-term exposure to LAeq,24h of 70 dB may induce small hearing impairments.

It is uncertain whether the relationships in ISO Standard 1999 (ISO 1990) are applicable to environmental sounds having a short rise time. For example, in the case of military low-altitude flying areas (75–300 m above ground) LAmax values of 110–130 dB occur within seconds after onset of the sound.

In conclusion, dose-response data are lacking for the general population. However, judging from the limited data for study groups (teenagers, young adults and women), and on the assumption that time of exposure can be equated with sound energy, the risk for hearing impairment would be negligible for LAeq,24h values of 70 dB over a lifetime. To avoid hearing impairment, impulse noise exposures should never exceed a peak sound pressure of 140 dB peak in adults, and 120 dB in children.

4.2.3 Sleep disturbance effects

Electrophysiological and behavioral methods have demonstrated that both continuous and intermittent noise indoors lead to sleep disturbance. The more intense the background noise, the more disturbing is its effect on sleep. Measurable effects on sleep start at background noise levels of about 30 dB LAeq. Physiological effects include changes in the pattern of sleep stages, especially a reduction in the proportion of REM sleep. Subjective effects have also been identified, such as difficulty in falling asleep, perceived sleep quality, and adverse after-effects such as headache and tiredness. Sensitive groups mainly include elderly persons, shift workers and persons with physical or mental disorders.

Where noise is continuous, the equivalent sound pressure level should not exceed 30 dBA indoors, if negative effects on sleep are to be avoided. When the noise is composed of a large proportion of low-frequency sounds a still lower guideline value is recommended, because low-frequency noise (e.g. from ventilation systems) can disturb rest and sleep even at low sound pressure levels. It should be noted that the adverse effect of noise partly depends on the nature of the source. A special situation is for new-borns in incubators, for which the noise can cause sleep disturbance and other health effects.

If the noise is not continuous, LAmax or SEL are used to indicate the probability of noise-induced awakenings. Effects have been observed at individual LAmax exposures of 45 dB or less. Consequently, it is important to limit the number of noise events with a LAmax exceeding 45 dB. Therefore, the guidelines should be based on a combination of values of 30 dB LAeq,8h and 45 dB LAmax. To protect sensitive persons, a still lower guideline value would be preferred when the background level is low. Sleep disturbance from intermittent noise events increases with the maximum noise level. Even if the total equivalent noise level is fairly low, a small number of noise events with a high maximum sound pressure level will affect sleep.

Therefore, to avoid sleep disturbance, guidelines for community noise should be expressed in terms of equivalent sound pressure levels, as well as LAmax/SEL and the number of noise events. Measures reducing disturbance during the first part of the night are believed to be the most effective for reducing problems in falling asleep.

4.2.4 Cardiovascular and psychophysiological effects

Epidemiological studies show that cardiovascular effects occur after long-term exposure to noise (aircraft and road traffic) with LAeq,24h values of 65–70 dB. However, the associations are weak. The association is somewhat stronger for ischaemic heart disease than for hypertension. Such small risks are important, however, because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Other possible effects, such as changes in stress hormone levels and blood magnesium levels, and changes in the immune system and gastro-intestinal tract, are too inconsistent to draw conclusions. Thus, more research is required to estimate the long-term cardiovascular and psychophysiological risks due to noise. In view of the equivocal findings, no guideline values can be given.

4.2.5 Mental health effects

Studies that have examined the effects of noise on mental health are inconclusive and no guideline values can be given. However, in noisy areas, it has been observed that there is an increased use of prescription drugs such as tranquilizers and sleeping pills, and an increased frequency of psychiatric symptoms and mental hospital admissions.

This strongly suggests that adverse mental health effects are associated with community noise.

4.2.6 Effects on performance

The effects of noise on task performance have mainly been studied in the laboratory and to some extent in work situations. But there have been few, if any, detailed studies on the effects of noise on human productivity in community situations. It is evident that when a task involves auditory signals of any kind, noise at an intensity sufficient to mask or interfere with the perception of these signals will also interfere with the performance of the task. A novel event, such as the start of an unfamiliar noise, will also cause distraction and interfere with many kinds of tasks. For example, impulsive noises such as sonic booms can produce disruptive effects as the result of startle responses; and these types of responses are more resistant to habituation.

Mental activities involving high load in working memory, such as sustained attention to multiple cues or complex analysis, are all directly sensitive to noise and performance suffers as a result. Some accidents may also be indicators of noise-related effects on performance. In addition to the direct effects on performance, noise also has consistent after-effects on cognitive performance with tasks such as proof-reading, and on persistence with challenging puzzles. In contrast, the performance of tasks involving either motor or monotonous activities is not always degraded by noise.

Chronic exposure to aircraft noise during early childhood appears to damage reading acquisition. Evidence indicates that the longer the exposure, the greater the damage. Although there is insufficient information on these effects to set specific guideline values, it is clear that day-care centres and schools should not be located near major noise sources, such as highways, airports and industrial sites.

4.2.7 Annoyance responses

The capacity of a noise to induce annoyance depends upon many of its physical characteristics, including its sound pressure level and spectral characteristics, as well as the variations of these properties over time. However, annoyance reactions are sensitive to many non-acoustical factors of social, psychological or economic nature, and there are also considerable differences in individual reactions to the same noise. Dose-response relations for different types of traffic noise (air, road and railway) clearly demonstrate that these noises can cause different annoyance effects at equal LAeq,24h values. And the same type of noise, such as that found in residential areas around airports, can also produce different annoyance responses in different countries.

The annoyance response to noise is affected by several factors, including the equivalent sound pressure level and the highest sound pressure level of the noise, the number of such events, and the time of day. Methods for combining these effects have been extensively studied. The results are not inconsistent with the simple, physically based equivalent energy theory, which is represented by the LAeq noise index.

Annoyance to community noise varies with the type of activity producing the noise. Speech communication, relaxation, listening to radio and TV are all examples of noise-producing activities. During the daytime, few people are seriously annoyed by activities with LAeq levels below 55 dB; or moderately annoyed with LAeq levels below 50 dB. Sound pressure levels during the evening and night should be 5–10 dB lower than during the day. Noise with low-frequency components requires even lower levels. It is emphasized that for intermittent noise it is necessary to take into account the maximum

sound pressure level as well as the number of noise events. Guidelines or noise abatement measures should also take into account residential outdoor activities.

4.2.8 Effects on social behaviour

The effects of environmental noise may be evaluated by assessing the extent to which it interferes with different activities. For many community noises, interference with rest, recreation and watching television seem to be the most important issues. However, there is evidence that noise has other effects on social behaviour: helping behaviour is reduced by noise in excess of 80 dBA; and loud noise increases aggressive behaviour in individuals predisposed to aggressiveness. There is concern that schoolchildren exposed to high levels of chronic noise could be more susceptible to helplessness. Guidelines on these issues must await further research.

4.3 Specific Environments

Noise measures based solely on LAeq values do not adequately characterize most noise environments and do not adequately assess the health impacts of noise on human well-being. It is also important to measure the maximum noise level and the number of noise events when deriving guideline values. If the noise includes a large proportion of low-frequency components, values even lower than the guideline values will be needed, because low-frequency components in noise may increase the adverse effects considerably. When prominent low-frequency components are present, measures based on A-weighting are inappropriate. However, the difference between dBC (or dBlin) and dBA will give crude information about the presence of low-frequency components in noise. If the difference is more than 10 dB, it is recommended that a frequency analysis of the noise be performed.

4.3.1 Dwellings

In dwellings, the critical effects of noise are on sleep, annoyance and speech interference. To avoid sleep disturbance, indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower levels may be annoying, depending on the nature of the noise source. The maximum sound pressure level should be measured with the instrument set at "Fast".

To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB LAeq for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB LAeq. These values are based on annoyance studies, but most countries in Europe have adopted 40 dB LAeq as the maximum allowable level for new developments (Gottlob 1995). Indeed, the lower value should be considered the maximum allowable sound pressure level for all new developments whenever feasible.

At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LAmax, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.

Appendix 2 – Noise Policy Statement for England (extract)

Noise Policy Statement Explanatory Note

Why do we need a Noise Policy Statement for England (NPSE)?

2.1 Noise is an inevitable consequence of a mature and vibrant society. For some the noise of city life provides a desirable sense of excitement and exhilaration, but for others noise is an unwanted intrusion that adversely impacts on their quality of life, affecting their health and well-being.

2.2 The management of noise has developed over many years as the types and character of noise sources have altered and as people's attitude to noise has changed.

The Noise Abatement Act came into law in 1960 and the Report from the Committee on the Problem of Noise was published in 1963 (the Wilson report).

Since then, examples of noise management can be found in many areas including reducing noise at source; the use of the land use and transport planning systems, compensation measures, the statutory nuisance and licensing regimes and other related legislation.

2.3 Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receivers and to minimise noise.

Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as reasonably practical.

This concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of best practicable means in summary statutory nuisance proceedings.

2.4 By describing clear policy vision and aims the NPSE provides the necessary clarity and direction to enable decisions to be made regarding what is an acceptable noise burden to place on society.

What types of noise are addressed by the Noise Policy Statement for England?

2.5 The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise). For the purposes of the NPSE, "noise" includes:

- "environmental noise" which includes noise from transportation sources;
- "neighbour noise" which includes noise from inside and outside peoples homes; and
- "neighbourhood noise" which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.

What will the Noise Policy Statement for England achieve?

2.6 The application of the NPSE should mean that noise is properly taken into account at the appropriate time. In the past, the opportunity for the cost effective management of noise has often been missed because the noise implications of a particular policy, development or other activity have not been considered at an early enough stage.

2.7 In addition, the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications.

2.8 In the longer term, the Government hopes that existing policies could be reviewed (on a prioritised basis), and revised if necessary, so that the policies and any noise management measures being adopted accord with the vision, aims and principles of the NPSE.

How should the Noise Policy Statement for England be used?

2.9 Noise management is a complex issue and at times requires complex solutions.

Unlike air quality, there are currently no European or national noise limits which have to be met, although there can be specific local limits for specific developments.

Furthermore, sound only becomes noise (often defined as unwanted sound) when it exists in the wrong place or at the wrong time such that it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance.

Unlike many other pollutants, noise pollution depends not just on the physical aspects of the sound itself, but also the human reaction to it. Consequently, the NPSE provides a clear description of desired outcome from the noise management of a particular situation.

2.10 The guiding principles of Government policy on sustainable development, (**Error! Reference source not found.**), should be used to assist in its implementation. The development of further principles specifically to underpin implementation of noise management policy will be kept under review as experience is gained from the application of the NPSE.

What does the vision of the Noise Policy Statement for England mean?

2.11 There are several key phrases within the NPSE vision and these are discussed below.

“Health and quality of life”

2.12 The World Health Organisation defines health as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity, and recognises the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being.

2.13 It can be argued that quality of life contributes to our standard of health. However, in the NPSE it has been decided to make a distinction between quality of life which is a subjective measure that refers to peoples emotional, social and physical well being and health, which refers to physical and mental well being.

2.14 It is recognised that noise exposure can cause annoyance and sleep disturbance both of which impact on quality of life.

It is also agreed by many experts that annoyance and sleep disturbance can give rise to adverse health effects.

The distinction that has been made between quality of life effects and health effects recognises that there is emerging evidence that long term exposure to some types of transport noise can additionally cause an increased risk of direct health effects.

The Government intends to keep research on the health effects of long-term exposure to noise under review in accordance with the principles of the NPSE.

"Promote good health and good quality of life"

2.15 This statement expresses the long term desired policy outcome, but in the use of "promote" and "good" recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.

"Effective management of noise"

2.16 This concept confirms that the policy applies to all types of "noise" (environmental, neighbour and neighbourhood) and that the solution could be more than simply minimising the noise.

"Within the context of Government policy on sustainable development"

2.17 Sustainable development is a core principle underpinning all government policy. For the UK Government the goal of sustainable development is being pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment and a just society that promotes social inclusion, sustainable communities and personal wellbeing. The goal is pursued in ways that protect and enhance the physical and natural environment, and that use resources and energy as efficiently as possible.

2.18 There is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focussing solely on the noise impact without taking into account other related factors.

What do the aims of the Noise Policy Statement for England mean?

2.19 There are several key phrases within the NPSE aims and these are discussed below.

"Significant adverse" and "adverse"

2.20 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations.

Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.

It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise.

However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (**Error! Reference source not found.**).

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL.

It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (**Error! Reference source not found.**). This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.25 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (**Error! Reference source not found.**), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

Appendix 3 – Burden of disease from environmental noise

Quantification of healthy life years lost in Europe

ABSTRACT

The health impacts of environmental noise are a growing concern among both the general public and policy-makers in Europe. This publication was prepared by experts in working groups convened by the WHO Regional Office for Europe to provide technical support to policy-makers and their advisers in the quantitative risk assessment of environmental noise, using evidence and data available in Europe.

The chapters contain the summary of synthesized reviews of evidence on the relationship between environmental noise and specific health effects, including cardiovascular disease, cognitive impairment, sleep disturbance and tinnitus.

A chapter on annoyance is also included. For each outcome, the environmental burden of disease methodology, based on exposure–response relationship, exposure distribution, background prevalence of disease and disability weights of the outcome, is applied to calculate the burden of disease in terms of disability-adjusted life-years (DALYs).

With conservative assumptions applied to the calculation methods, it is estimated that DALYs lost from environmental noise are 61 000 years for ischaemic heart disease, 45 000 years for cognitive impairment of children, 903 000 years for sleep disturbance, 22 000 years for tinnitus and 654 000 years for annoyance in the European Union Member States and other western European countries.

These results indicate that at least one million healthy life years are lost every year from traffic related noise in the western part of Europe.

Sleep disturbance and annoyance, mostly related to road traffic noise, comprise the main burden of environmental noise.

Owing to a lack of exposure data in south-east Europe and the newly independent states, it was not possible to estimate the disease burden in the whole of the WHO European Region. The procedure of estimating burdens related to environmental noise exposure presented here can be used by international, national and local authorities as long as the assumptions, limitations and uncertainties reported in this publication are carefully taken into account.

SOURCE – AMBIENT NOISE – WOOLMONGER STREET – BRIDGE STREET

Receiver – The Pinnacle, Woolmonger Street

Officer – P Mallard

Recording equipment used – Symphonie

Analysis equipment used - DB Trait

Survey date – 15 to 19 August 2013

Measurement Location

The measurements were carried out on the 3rd floor of the Pinnacle in a flat on the facade marked red on the plan below.

The microphone was located in the Living room of the flat near the windows. One of the windows was open during the survey. A bedroom in the flat is on the same façade and would be subject to the same noise exposure as the living room.

Object of the survey

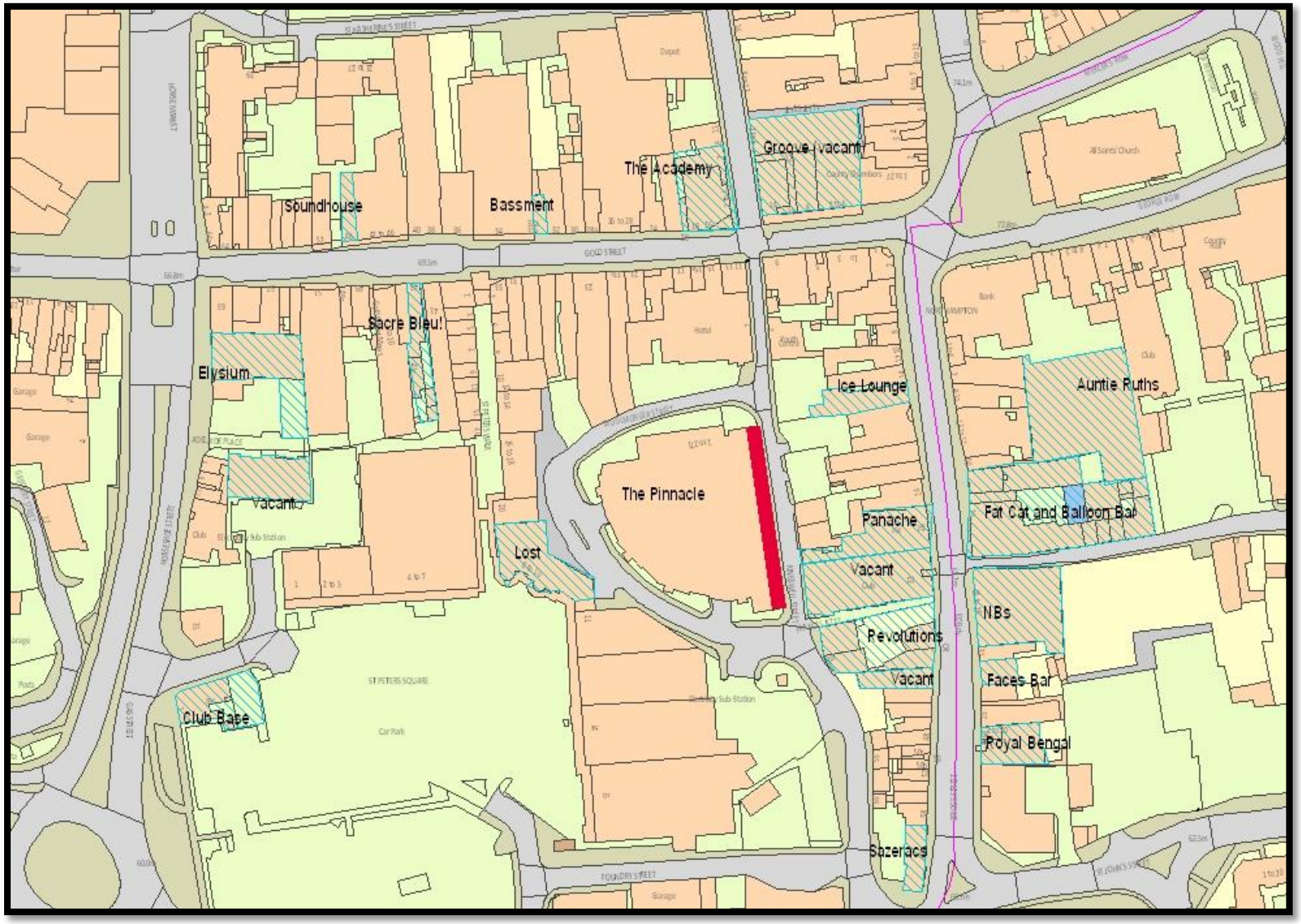
The survey was carried out in connection with an application from Panache, a bar in Bridge Street, to extend their opening hours until 06.00 hours.

We have concerns about the noise exposure currently experienced by residents in the town centre, particularly in Bridge Street and the Pinnacle. Adverse comments have been made by several residents of the Pinnacle relating to the noise from people in the street migrating between the various clubs. There have also been problems with loud music from several establishments that have resulted in the service of noise abatement notices on the premises concerned, where a nuisance has been established.

The survey was set to establish the noise climate on the Eastern façade of The Pinnacle, between midnight and 06.00 hours, over the week-end, when the greatest activity in connection with the operation of Licenced premises in the vicinity takes place, in order to estimate what the effect of extending the Licensing Hours might be.

Our concern is that an extension of hours for Panache will lead to other bars in the area also wishing to increase their hours leading to noise from activity in the Town Centre being extended to all night. We have had a tentative enquiry from another bar in the area regarding an extension of hours to 6.00 am.

Site Plan


Soundhouse
Bassment
The Academy
Groove (vacant)
Sacre Bleu!
Elysium
Vacant
The Pinnacle
Lost
Ice Lounge
Auntie Ruths
Fat Cat and Balloon Bar
Panache
Vacant
NBs
Revolutions
Vacant
Faces Bar
Royal Bengal
Club Base
Sazeracs
GOLD STREET
FOUNDRY STREET
ST PETERS SQUARE

Background

The World Health Organisation (WHO), in its document Guidelines on Community Noise, published in 1999 (text attached), section 3.4, states that the primary sleep disturbance effects are

- difficulty in falling asleep
- awakenings
- alterations of sleep stages or depth, especially a reduction in the proportion of REM sleep

Other physiological effects are

- increased blood pressure
- increased heart rate
- increased finger pulse amplitude
- vasoconstriction
- changes in respiration
- cardiac arrhythmia
- increased body movements

The threshold and response for each of these effects may be different. Different noises have different information content and this could also affect the physiological threshold and noise-response relationships.

Exposure to nighttime noise also introduces secondary effects, or so called after effects. These can be measured the next day, while the individual is awake. These secondary effects include

- reduced perceived sleep quality
- increased fatigue
- depressed mood or wellbeing
- decreased performance

The guidance advises that if the negative effects of sleep disturbance are to be avoided then, for continuous noise, the equivalent sound pressure level (L_{Aeq}) should not exceed L_{Aeq} 30 dB indoors. If the noise is not continuous, sleep disturbance correlates best with the L_{Amax} and effects have been observed at L_{Amax} 45 dB or less. This is particularly true if the background level is low. The WHO consider that it should be possible to sleep with the bedroom window slightly open (giving a reduction of 15 dB from outside to inside). To prevent sleep disturbance one should consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted toward the first part of the night is believed to be effective for the ability to fall asleep.

The measurements obtained below are internal levels and are applicable to the room in which there were measured. In other rooms the amount that the window is opened, the position in the room and the amount of soft furnishings will affect the immission levels.

The methodology for analysing the survey was to examine the first two night's surveys to ascertain the general character of the noise recorded. The main sources of noise were established as

- vehicle noise, which gave rise to obvious peaks,
- people noise arising from loud voices close to the receiver,
- music noise intermingled with distant voices
- noise from bottle and refuse tipping
- residual noise when the above sources were absent
- noise originating within the flat where the survey was located

The vehicle noise and people noise were found to have characteristic noise levels at particular frequencies that enabled them to be coded automatically. This gave an indication when these events occurred. The recordings were then screened to refine the coding. The people noise coding gave rise to numerous incidents and these were consolidated into events. For example over a one minute period there might be 20 separate peaks due to loud voices and shouting, these, and similar events would be consolidated into one event. This was considered to provide a more sensible assessment of the number of incidents.

Noises within the flat on the last night's survey were particularly noticeable and were excluded from the survey results. On other nights they have been included in the Residual measurement as it was considered that they would not affect the background noise level.

The survey shows that noise levels for all sources are considerably above the WHO guideline levels of L_{Aeq} 30 dB for steady levels and above L_{Amax} 45 dB for peak levels and such events take place on numerous times.

The results of the people noise measurements, i.e. the discrete louder incidents, excluding the people noise intermingled with the music noise are as follows.

People noise	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Wed-Thur	68	47	56	58	67	73	00:23:07:700
Thur-Fri	209	50	56	58	65	86	01:06:37:100
Fri-Sat	178	48	59	60	68	84	01:13:28:300
Sat-Sun	140	48	58	60	67	82	00:56:26:700
Sun-Mon	4	47	52	54	63	67	00:01:25:000

It can be seen that the "peak" levels, described by the L_{A10}, L_{A1} and L_{Amax} levels are well in excess of the WHO guideline of 45 dBA and there are a considerable number of incidents over the weekend when the bars and clubs are most active.

When the number of people noise incidents are examined on an hour-by-hour basis it can be seen that they peak around 2.00 to 3.00 am on Wednesday night, 2.00 am on Thursday night and 4.00 am on Friday and Saturday night. There were no events detected after 1.00 am on Sunday night. They appear to generally decrease toward 6.00 am.

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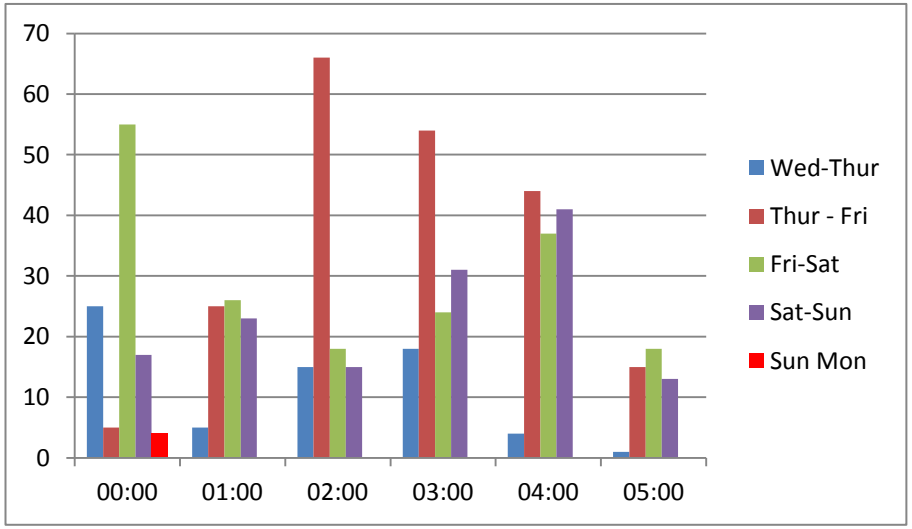


	People noise - number of incidents				
	Wed-Thur	Thur - Fri	Fri-Sat	Sat-Sun	Sun Mon
00:00 - 01:00	25	5	55	17	4
01:00 -02:00	5	25	26	23	0
02:00 - 03:00	15	66	18	15	0
03:00 - 04:00	18	54	24	31	0
04:00 - 05:00	4	44	37	41	0
05:00 – 06:00	1	15	18	13	0

Conclusion

Noise from people in the Town Centre is significant when the bars and clubs are operational and appears to peak around the time the clubs and bars close, decreasing thereafter.

There is also a significant contribution from vehicle noise in Woolmonger Street that also decreases when the bars are less busy.

There is evident music noise from an unidentified source or sources that will require further investigation.

Vehicle pass-by	Count
Wed-Thur	90
Thur - Fri	132
Fri-Sat	162
Sat-Sun	182
Sun Mon	69

The ambient noise in the area and noise generated by people is above guidelines suggested by the WHO that are required for the restorative effects of sleep and could be adversely affecting the health of residents in the area. A general extension of hours to 6.00 am would exacerbate the current situation and is considered contrary to the Licensing Objectives of preventing Public Nuisance and the Government's Noise Policy Statement for England (NPSE) the aims of which are:

1. *Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*
2. *Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*
3. *Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

Therefore, Regulatory Services objects to the application by Panache, or other bars, to extend their hours to 6.00 am.

P Mallard SEHO 16 September 2013

1. 15 August 2013 - Wednesday Night - Thursday Morning

This is traditionally “Student night” in Northampton, although at the time of this survey the universities and colleges were on their Summer Break, so it is assumed that activity is less than in term time.

Vehicle pass-bys in Woolmonger Street are a significant noise source and have been coded separately. There are perhaps other vehicle noise contributions from more distant vehicle sources but these are not readily identifiable and are not considered significant in relation to the other sources. Accordingly they will have been included in the other measurements.

Noise from people in the street is also significant at times producing loud, sporadic incidents.

Between midnight and 3.00 am, the ambient noise is characterised by vehicle pass-bys, noise from people in the street close by or particularly loud and a melange of bassy music and indistinct voices from more distant sources. After 3.00 am there are some sporadic incidents of noise from people in the street until 4.30 am.

Eleven incidents of empty bottles being tipped were noted between midnight and 6.00 am.

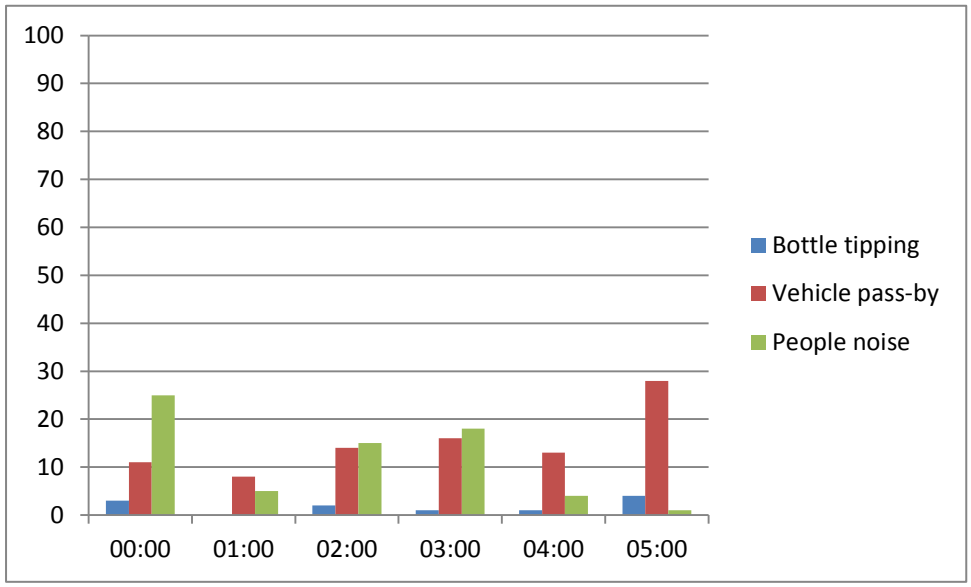
On the time history below;

- the pink peaks are traffic pass-bys
- the yellow peaks are due to people close by speaking loudly or shouting etc.
- the dark blue is the period affected by music and general people noise
- the grey is the residual noise where no obvious activity from bars or people has been noted
- the light blue is due to bottle or refuse tipping

The people noise aspect of the recording falls into two character types.

- Before 3.00 am it is quite ubiquitous and appears to be from sources not in the immediate vicinity of the receiver and are too indistinct and numerous to be identified individually. There are times, however, where the people noise seems to be in close proximity to the receiver and are judged to be intrusive in their own right; these have been coded as “People noise” events.
- After 3.00 am the music is no longer apparent and the general susurration of voices observed earlier has gone. Consequently individual occurrences of people noise, although not necessarily as intrusive as those coded before 3.00 am, have been individually logged as “People noise” where identified.

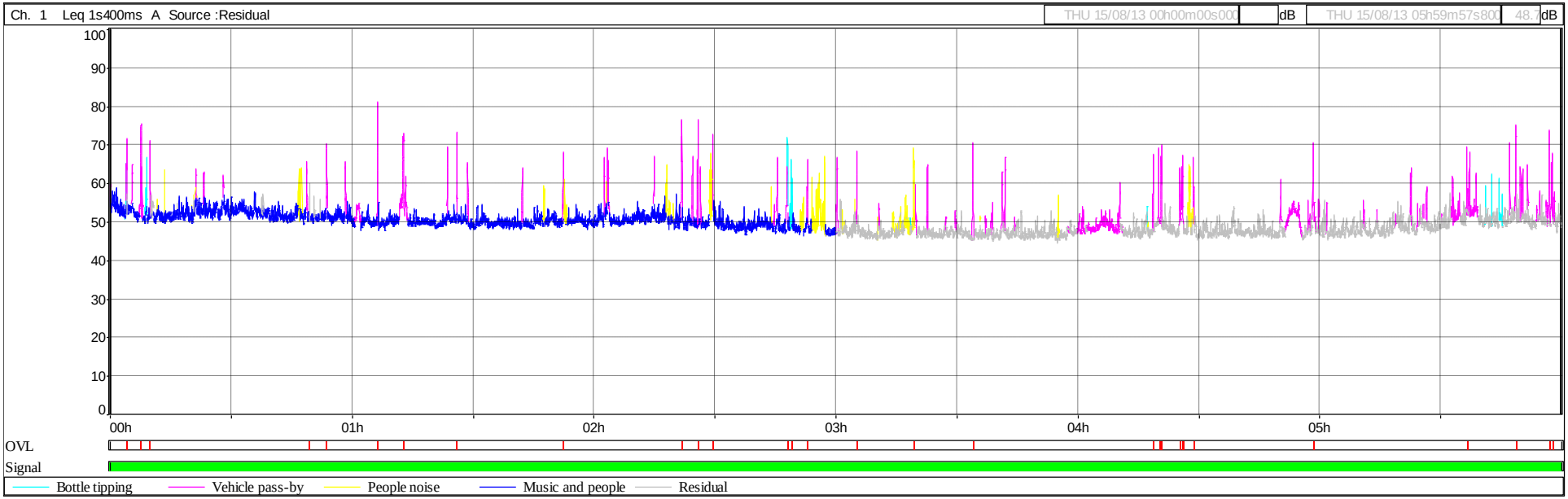
Figure 1 - Wednesday Night - Thursday Morning



Hourly incidence – Wed-Thur			
Source	Bottle tipping	Vehicle pass-by	People noise
Period start	Count	Count	Count
00:00	3	11	25
01:00	0	8	5
02:00	2	14	15
03:00	1	16	18
04:00	1	13	4
05:00	4	28	1
Overall	11	90	68

Wed-Thur	**Count**	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	**Duration**
Source		dB	dB	dB	dB	dB	h:m:s:ms
Bottle tipping	11	48	58	58	70	78	00:01:44:600
Vehicle pass-by	90	48	59	61	71	85	00:49:47:000
People noise	68	47	56	58	67	73	00:23:07:700
Music and people	Midnight to 3.00 am	48	51	53	56	65	02:31:36:900
Residual	**Midnight to 6.00 am - main source of data 3.00 am to 6.00 am**	**46**	49	51	54	69	02:13:43:800

Figure 2 – 15-16 August - Wednesday night - Thursday morning



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2. 16 August 2013 - Thursday Night - Friday Morning

This is not thought to be a night particularly given over to attendance at bars being between the student night and the week-end.

Vehicle pass-bys in Woolmonger Street are a significant noise source and have been coded separately. There are perhaps other vehicle noise contributions from more distant vehicle sources but these are not readily identifiable and are not considered significant in relation to the other sources. Accordingly they will have been included in the other measurements.

Noise from people in the street is also significant at times producing loud, sporadic incidents.

Between midnight and 2.00 am, the ambient noise is characterised by a melange of bass music and indistinct voices. After 2.00 am the music is no longer apparent and there appears to considerably more activity in the streets than the night before tapering off until 5.30 am, an hour later than the night before. Although an attempt has been made to consolidate people noise events into a single occurrence where there are a number of discrete events close together there are still a considerable number of occurrences between 2 and 3.00 am.

The period around 1.30 am and the periods between 3.45 and 5.30 am coded as residual are dominated by noise from within the flat (conversation). It was not possible to distinguish people noise during those periods, although they will provide data on the Background noise level.

Four incidents of empty bottles being tipped were noted between midnight and 6.00 am.

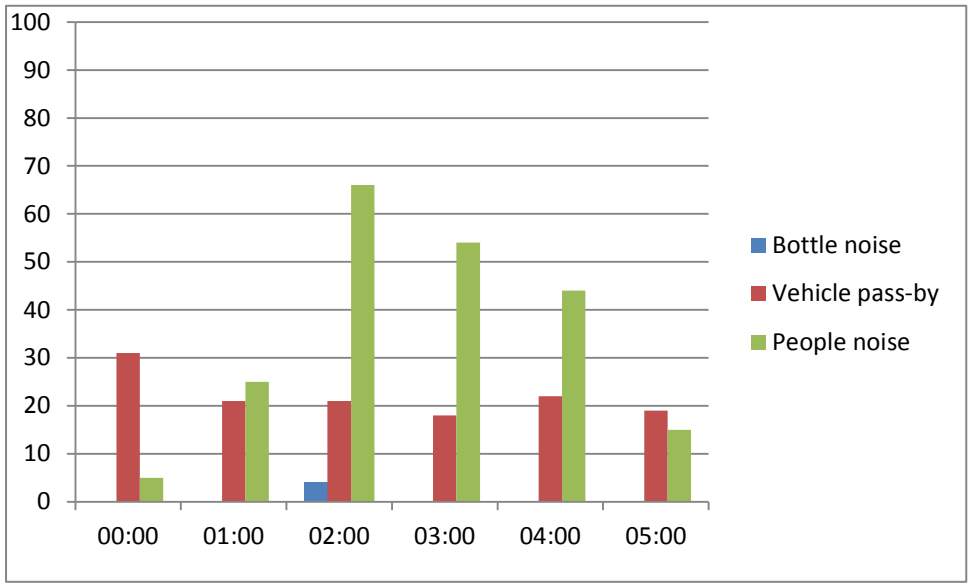
On the time history below;

- the pink peaks are traffic pass-bys
- the yellow peaks are due to people close by speaking loudly or shouting etc.
- the dark blue is the period affected by music and general people noise
- the grey is the residual noise where no obvious activity from bars or people has been noted
- the light blue is due to bottle tipping

The people noise aspect of the recording falls into two character types.

- Before 2.00 am it is quite ubiquitous, is indistinct and appears to be from sources not in the immediate vicinity of the receiver and are too indistinct and numerous to be identified individually. There are times, however, where the people noise seems to be in close proximity to the receiver and are judged to be intrusive in their own right; these have been coded as “People noise” events.

- After 2.00 am the music is no longer apparent and the general susurration of voices observed earlier has gone but there is a noticeable increase in the occurrence and intrusiveness of people noise incidents.

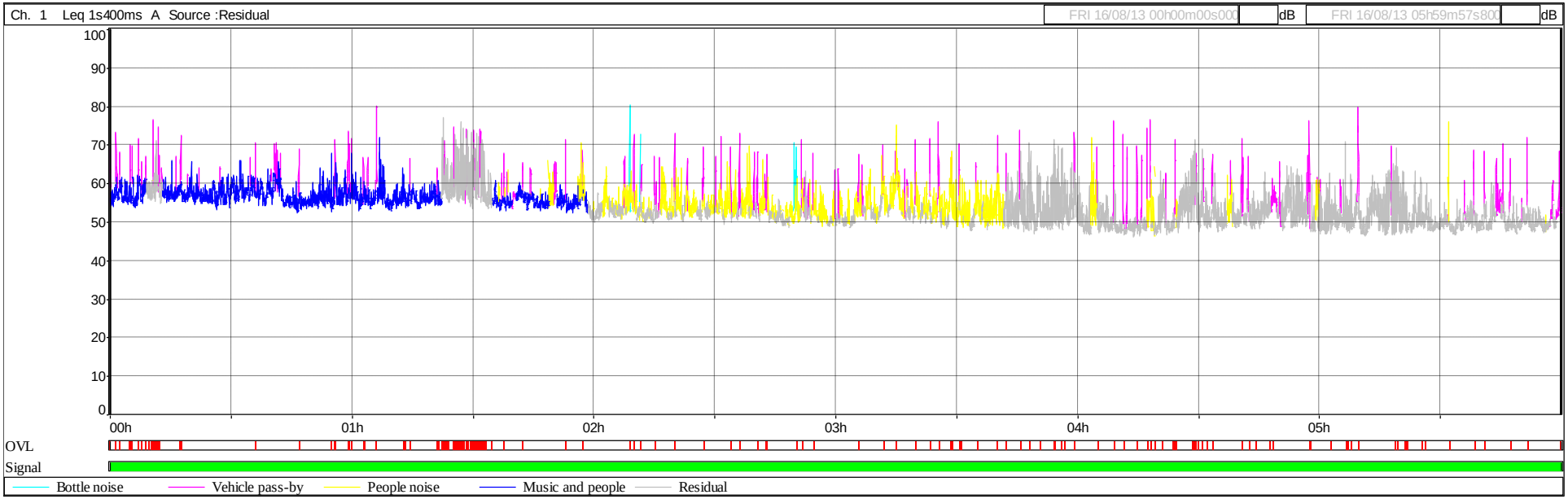


Hourly Incidence – Thur-Fri			
Source	Bottle tipping	Vehicle pass-by	People noise
Period start	Count	Count	Count
00:00	0	31	5
01:00	0	21	25
02:00	4	21	66
03:00	0	18	54
04:00	0	22	44
05:00	0	19	15
Overall	4	132	209

Thur-Fri	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Bottle noise	4	52	67	66	80	85	00:00:51:900
Vehicle pass-by	132	52	64	66	75	88	00:34:50:100
People noise	209	50	56	58	65	86	01:06:37:100
Music and people	Midnight to 2.00 am	54	57	59	63	77	01:30:32:800
Residual	**Midnight to 6.00 am - main source of data 3.00 am to 6.00 am**	**48**	56	57	67	83	02:47:08:100

Figure 3 - Thursday night - Friday morning

Figure 4 - 16 -17 August 2013 - Thursday Night - Friday Morning



3. 17 August – Friday night Saturday morning

Vehicle pass-bys in Woolmonger Street are a significant noise source and have been coded separately. There are perhaps other vehicle noise contributions from more distant vehicle sources but these are not readily identifiable and are not considered significant in relation to the other sources. Accordingly they will have been included in the other measurements.

Noise from people in the street is also significant at times producing loud, sporadic incidents.

Between midnight and 3.50 am, the ambient noise is characterised by vehicle pass-bys, people noise and a melange of bass music and indistinct voices. After 3.50 am the music is no longer apparent and there is continued activity in the streets than the night before tapering off until 5.30 am, similar to the night before. There is a particularly significant incident involving a number of people that appear to be in close proximity to the receiver around 4.45 am. The majority of people noise events take place around midnight and 4.00 am.

Music noise becomes more intrusive between 2.30 am and 3.50 am.

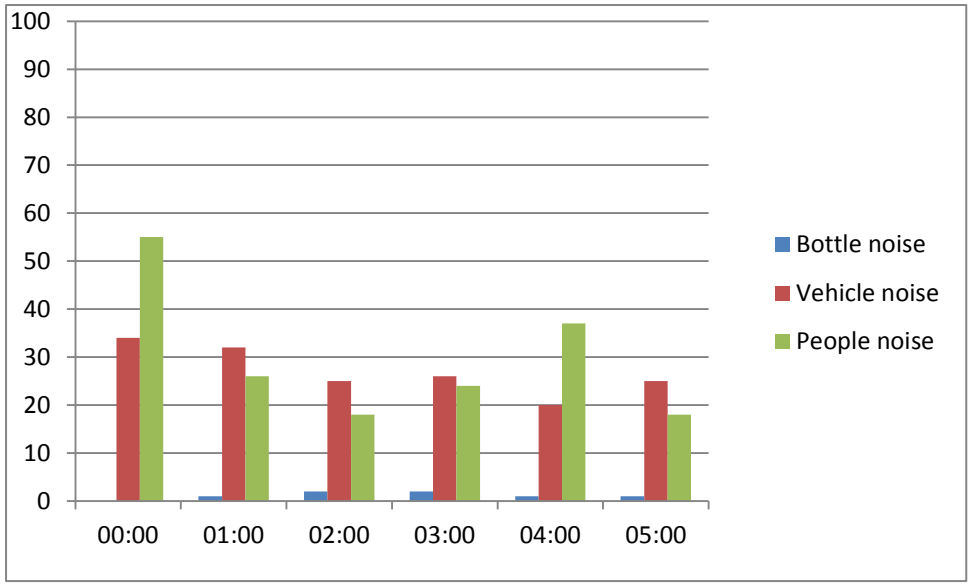
Seven incidents of empty bottles being tipped were noted between midnight and 6.00 am.

On the time history below;

- the pink peaks are traffic pass-bys
- the yellow peaks are due to people close by speaking loudly or shouting etc.
- the dark blue is the period affected by music and general people noise
- the grey is the residual noise where no obvious activity from bars or people has been noted
- the light blue is due to bottle tipping

The people noise aspect of the recording falls into two character types.

- Before 4.00 am it is quite ubiquitous, is indistinct and appears to be from sources not in the immediate vicinity of the receiver and are too indistinct and numerous to be identified individually. There are times, however, where the people noise seems to be in close proximity to the receiver and are judged to be intrusive in their own right; these have been coded as “People noise” events.
- After 4.00 am the music is no longer apparent and the general susurration of voices observed earlier has gone but there is a noticeable increase in the occurrence and intrusiveness of people noise incidents.



Hourly Incidence – Fri - Sat			
Source	Bottle tipping	Vehicle noise	People noise
Period start	Count	Count	Count
00:00	0	34	55
01:00	1	32	26
02:00	2	25	18
03:00	2	26	24
04:00	1	20	37
05:00	1	25	18
Overall	7	162	178

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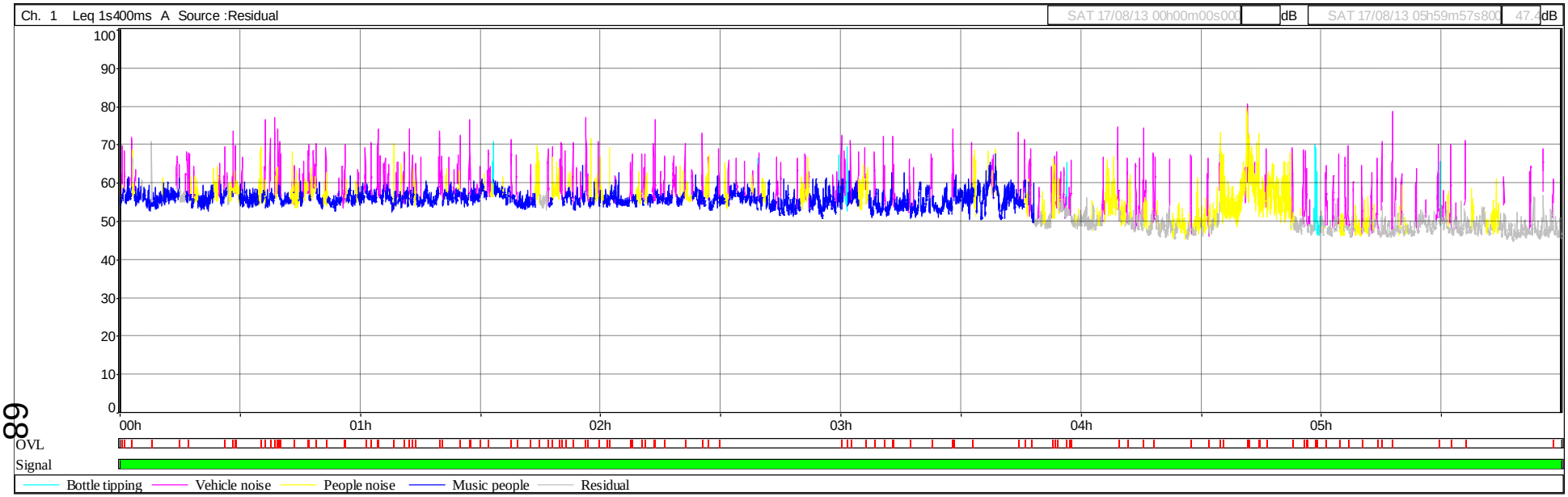
Fri-Sat	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Source		dB	dB	dB	dB	dB	h:m:s:ms
Bottle tipping	7	47	60	60	72	79	00:03:01:800
Vehicle noise	162	52	62	64	72	87	00:56:41:900
People noise	178	48	59	60	68	84	01:13:28:300
Music people	Midnight to 3.50 am	53	56	58	62	71	02:34:15:300
Residual	**Midnight to 6.00 am - main source of data 4.00 am to 6.00 am**	**46**	50	52	57	75	01:12:32:700

•

Figure 5 – 17 – 18 August – Friday night Saturday morning



4. 18 August –Saturday - Sunday morning

Vehicle pass-bys in Woolmonger Street are a significant noise source and have been coded separately. There are perhaps other vehicle noise contributions from more distant vehicle sources but these are not readily identifiable and are not considered significant in relation to the other sources. Accordingly they will have been included in the other measurements.

Noise from people in the street is also significant at times producing loud, sporadic incidents.

Between midnight and 4.00 am, the ambient noise is characterised by vehicle pass-bys, people noise and a melange of bass music and indistinct voices. After 4.00 am the music is no longer apparent and there is continued activity in the streets before tapering off until 6.00 am, similar to the night before.

Music noise becomes more intrusive between 2.30 am and 4.00 am.

Four incidents of empty bottles being tipped were noted between midnight and 6.00 am.

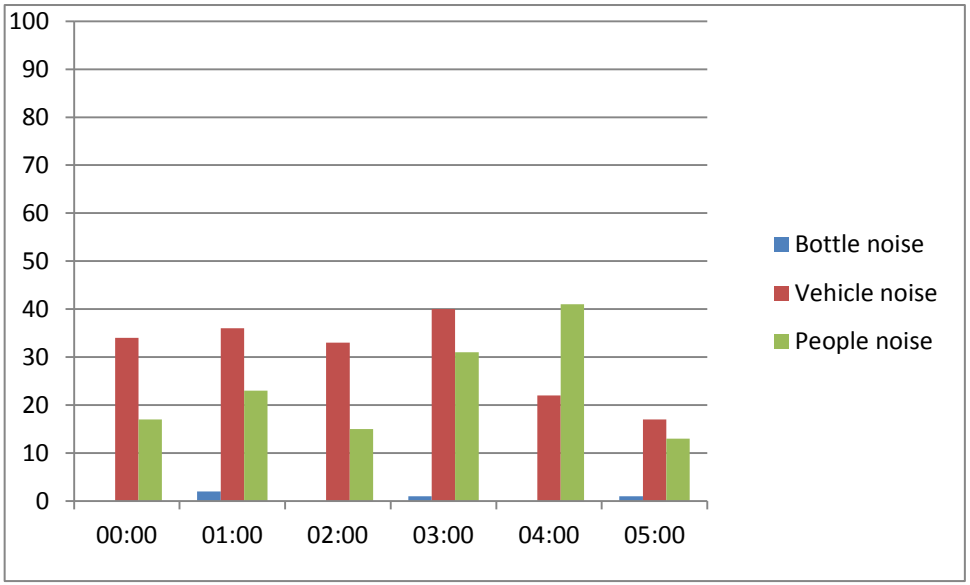
On the time history below;

69

- the pink peaks are traffic pass-bys
- the yellow peaks are due to people close by speaking loudly or shouting etc.
- the dark blue is the period affected by music and general people noise
- the grey is the residual noise where no obvious activity from bars or people has been noted
- the light blue is due to bottle tipping

The people noise aspect of the recording falls into two character types.

- Before 4.00 am it is quite ubiquitous, is indistinct and appears to be from sources not in the immediate vicinity of the receiver and are too indistinct and numerous to be identified individually. There are times, however, where the people noise seems to be in close proximity to the receiver and are judged to be intrusive in their own right; these have been coded as “People noise” events.
- After 4.00 am the music is no longer apparent and the general susurration of voices observed earlier has gone but there is a noticeable increase in the occurrence and intrusiveness of people noise incidents.



Hourly Incidence – Sat - Sun			
Source	Bottle tipping	Vehicle noise	People noise
Period start	Count	Count	Count
00:00	0	34	17
01:00	2	36	23
02:00	0	33	15
03:00	1	40	31
04:00	0	22	41
05:00	1	17	13
Overall	4	182	140

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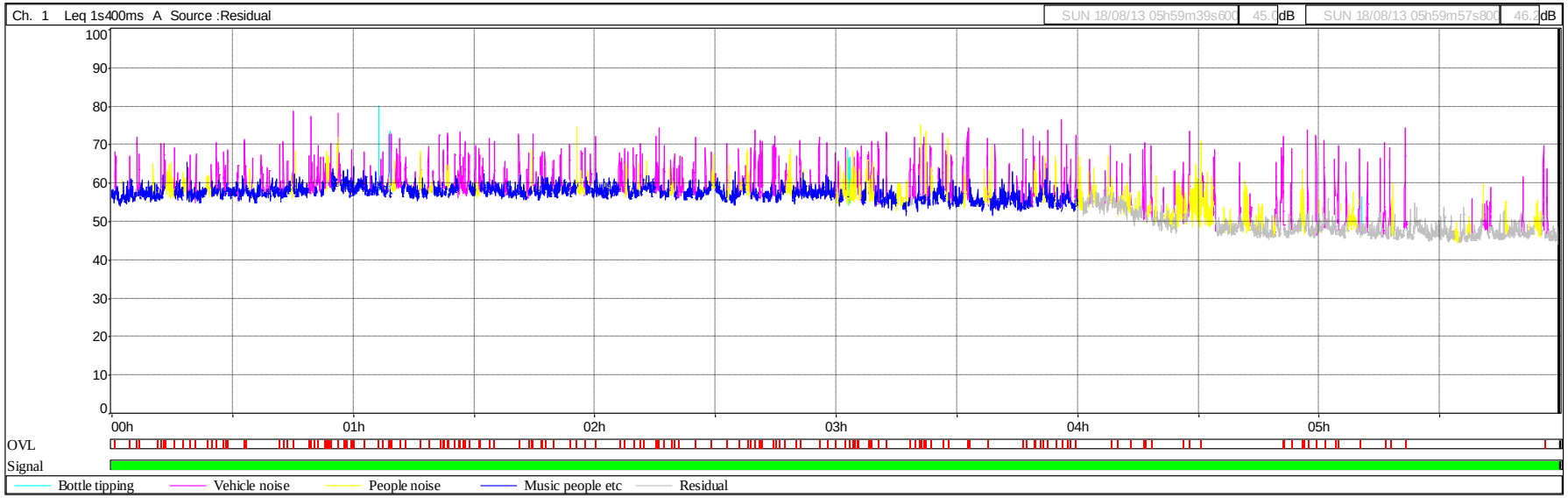
Sat - Sun	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Source		dB	dB	dB	dB	dB	h:m:s:ms
Bottle tipping	4	53	67	69	80	85	00:00:55:400
Vehicle noise	182	53	63	65	72	83	01:14:08:100
People noise	140	48	58	60	67	82	00:56:26:700
Music people etc	Midnight to 4.00 am	55	58	59	62	74	02:30:53:300
Residual	**Midnight to 6.00 am - main source of data 4.00 am to 6.00 am**	**46**	50	53	57	63	01:17:36:500

Figure 6 - 18 August - Saturday Night - Sunday Morning



5. 19 August – Sunday night – Monday morning

Vehicle pass-bys in Woolmonger Street are a significant noise source and have been coded separately. It is noted that the number of vehicle movements is significantly reduced, compare with other nights. There are perhaps other vehicle noise contributions from more distant vehicle sources but these are not readily identifiable and are not considered significant in relation to the other sources. Accordingly they will have been included in the other measurements.

Apart from four minor incidents just after midnight, there was no noise from people in the street detected although some minor incidents might have been masked by noise within the flat. It is understood that the occupant of the flat works nights from time to time.

No music noise was detected on this occasion

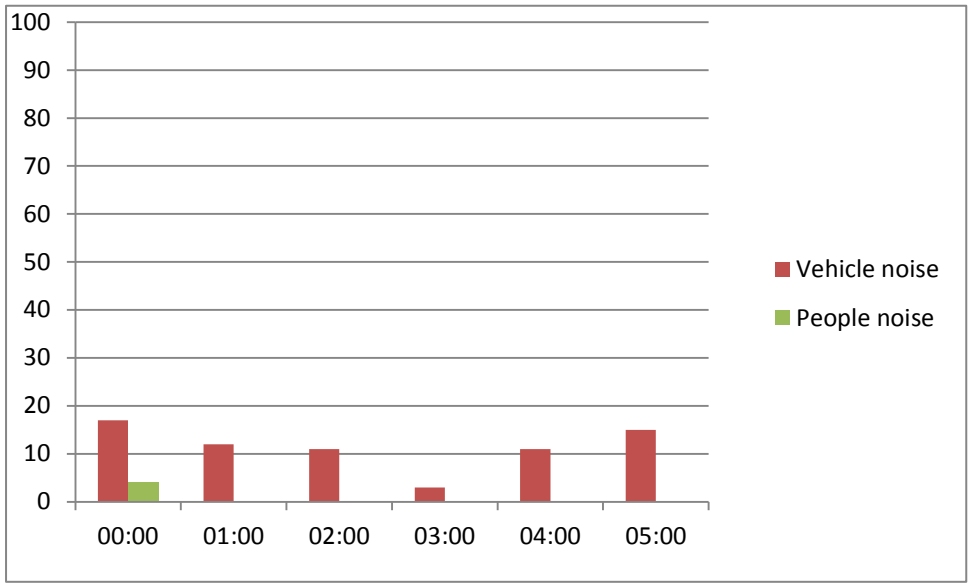
No incidents of empty bottles being tipped were noted between midnight and 6.00 am.

Unfortunately, the occupant of the flat where the survey was carried out chose to watch Lord of the Rings overnight and the noise from the TV is dominant for much of the survey period.

There are probably few venues very active or even trading on Sunday night into Monday morning and this would account for the reduced activity in the area observed during this period.

On the time history below;

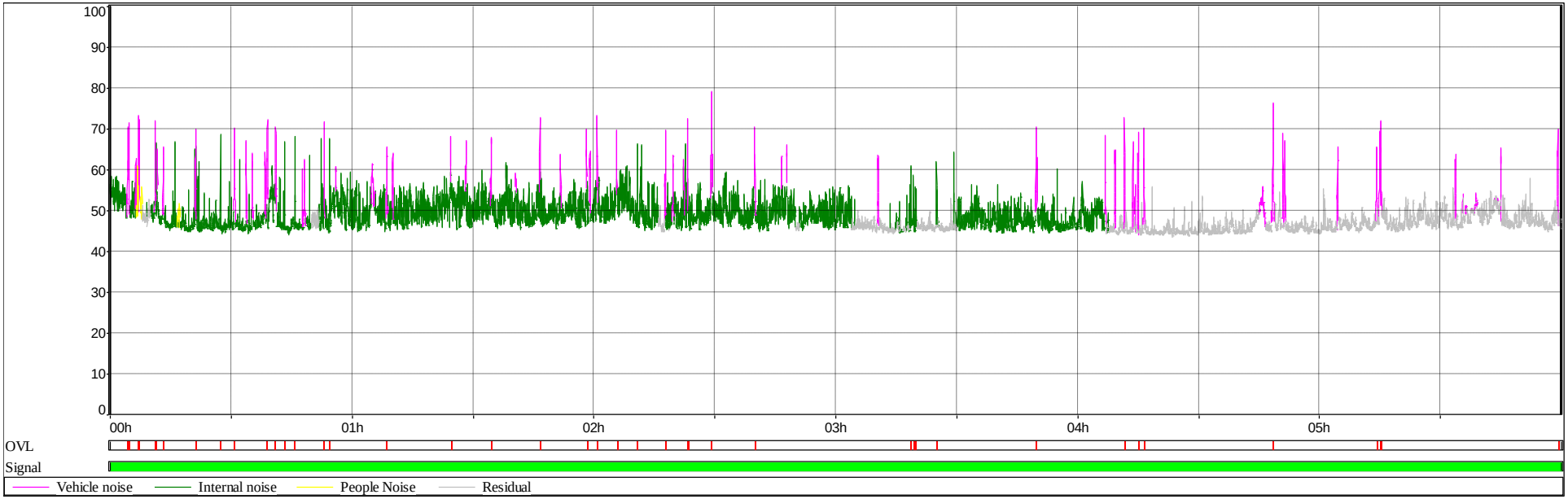
- the pink peaks are traffic pass-bys
- the yellow peaks are due to people close by speaking loudly or shouting etc.
- the dark green is the period affected by noise in the flat
- the grey is the residual noise where no obvious activity from bars or people has been noted



Hourly Incidence – Sun - Mon		
Source	Vehicle noise	People Noise
Period start	Count	Count
00:00	17	4
01:00	12	0
02:00	11	0
03:00	3	0
04:00	11	0
05:00	15	0
Overall	69	4

Sun - Mon	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Source		dB	dB	dB	dB	dB	h:m:s:ms
Vehicle noise	69	48	61	63	71	86	00:22:38:000
People Noise	4	47	52	54	63	67	00:01:25:000
Residual	Midnight to 6.00 am	45	47	49	53	65	02:09:51:400

Figure 7 - Sunday - Monday



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Consolidated results

Bottle tipping	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Wed-Thur	4	52	67	66	80	85	00:00:51:900
Thur - Fri	67	85	4	52	66	80	00:00:51:900
Fri-Sat	7	47	60	60	72	79	00:03:01:800
Sat-Sun	4	53	67	69	80	85	00:00:55:400
Sun Mon	0	NA	NA	NA	NA	NA	NA

Vehicle pass-by	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Wed-Thur	90	48	59	61	71	85	00:49:47:000
Thur - Fri	132	52	64	66	75	88	00:34:50:100
Fri-Sat	162	52	62	64	72	87	00:56:41:900
Sat-Sun	182	53	63	65	72	83	01:14:08:100
Sun Mon	69	48	61	63	71	86	00:22:38:000

People noise	Count	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	Duration
Wed-Thur	68	47	56	58	67	73	00:23:07:700
Thur - Fri	209	50	56	58	65	86	01:06:37:100
Fri-Sat	178	48	59	60	68	84	01:13:28:300
Sat-Sun	140	48	58	60	67	82	00:56:26:700
Sun Mon	4	47	52	54	63	67	00:01:25:000

Music and People	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}		
Wed-Thur	48	51	53	56	65	02:31:36:900	
Thur - Fri	54	57	59	63	77	01:30:32:800	
Fri-Sat	53	56	58	62	71	02:34:15:300	
Sat-Sun	55	58	59	62	74	02:30:53:300	
Sun Mon	NA	NA	NA	NA	NA	NA	

Residual	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}
Wed-Thur	46	49	51	54	69
Thur - Fri	48	56	57	67	83
Fri-Sat	46	50	52	57	75
Sat-Sun	46	50	53	57	63
Sun Mon	45	47	49	53	65

Source	Bottle tipping	Vehicle pass-by	People noise
Wed-Thur	11	90	68
Thur - Fri	4	132	209
Fri-Sat	7	162	178
Sat-Sun	4	182	140
Sun Mon	0	69	4

1. Annex

	Standard description	Possible objective effect	Subjective impression
Increasing severity ↓	Noise inaudible		
	Noise barely audible	Check Frequency content	Noise is difficult to make out.
	Noise audible	≡ Residual ≤ 3dB increase	Noise is definitely there but it is difficult to distinguish by measurement from the residual Bass and beat only?
	Noise clearly audible	Residual +5 dB	Noise is clearly audible and is having a noticeable effect on the residual levels. Bass, beat and vocals – may be able to identify songs.
	Noise intrusive	Residual + 10 dB	Noise excludes a lot of the residual noise. Bass, beat and vocals – songs easily identified.
	Noise dominant	Residual +20 dB	Noise excludes all other residual noise, may be heavy bass with induced resonance effects affecting windows and ornaments etc.

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Ambient Noise

Noise from all sources both near and far. It is usually defined in terms of $\mathbf{L_{Aeq,T}}$.

$L_{eq,T}$

The equivalent continuous level. The sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.

Specific Noise

The noise under investigation. It is usually defined in terms of $L_{Aeq,T}$. When defined as part of a **BS 4142** assessment it may be penalised by adding 5 dB to produce a **Rating Level**. In other circumstances, where no set procedure has been laid down, judgement must be used to determine an appropriate descriptor. For example music, which may have an impulsive quality in the bass beat, the $\mathbf{L_{10}}$ or the $\mathbf{L_1}$ as an **A-weighted level,** or as a level in a particular **Octave** or **Third Octave band,** may be a more appropriate guide to the intrusiveness of the noise.

Residual Noise

This is the **ambient noise** in the absence of the **Specific Noise.**

Background Noise

This is a particular description of the **Residual Noise**. It is defined as the level that is exceeded for 90% of the time and denoted $\mathbf{L_{90}}$.

The terms **Ambient Noise** and **Background Noise** cannot, therefore, be interchanged

$\mathbf{L_{n,T}}$

The **n** subscript denotes the percentage of the time that the following noise level is exceeded for the time **T**. Therefore, $\mathbf{L_{90,10\ minutes}}$ 30 dB means that the noise level at a given location for ten minutes exceeded 30 dB for 90% of the time.

A-weighted level

The human ear does not respond equally to all frequencies. The difference in these responses will also vary depending on how loud a noise is. At quiet listening levels it is more sensitive to frequencies associated with speech than low or high frequencies. As the volume increases the sensitivity to the range of frequencies becomes more even until at levels associated with loud Discos the response is linear.

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In order to provide a single-figure measurement of a noise that takes into account the frequency content, a sound level meter can apply a weighting. There are several weightings that might be applied, depending on the noise level, but historically, the **A-weighting** has come to be the one most commonly used.

Loudness

This is a subjective assessment of noise. How loud a noise sounds does not always correlate well with its **A-weighted** level. This because an **A-weighed** figure does not accurately represent noise if, for example, it has a large amount of energy around a particular frequency, e.g. the bass beat from music or the whine of a circular saw.

How intrusive a noise is will depend on the differences between it and the residual noise. The factors that make it different are its frequency content, its character, how much louder it is than the residual and the absolute noise levels in a given situation. In a quiet environment the noise level difference between the specific noise and the residual noise could be much more significant than the same difference at high noise levels.

Reference Noise levels

World Health Organisation, WHO 1999

Internal steady noise levels

Daytime – L_{Aeq} 35 dB

Night L_{Aeq} 30 dB

Peak levels at night – noise levels should exceed L_{Amax} 45 dB as little as possible

Night Noise offence – between the hours of 23:00 and 07:00

The type of noise that this applies to is not defined and could apply to music, banging shouting, subject to the constraints below.

The permitted level is now set at L_{Aeq},5 min 34 dB if the underlying level of noise is no more than (L_{A90}?) 24 dBA, or 10 dBA above the underlying level of noise where this exceeds 24 dBA. Extraneous noises can be "paused out" of the measurement but the $L_{Aeq,5min}$ must be obtained within a 15 minute window.

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This is measured in the receiving room with the windows shut at least 0.5 m from any wall.

If the noise is music and "continuous", then the underlying level of noise can be obtained by the use of a statistical parameter (such as $L_{A99.8,\ 5min}$, $L_{A99.5,\ 2min}$ or $L_{A99,\ 1min}$) as a proxy for the underlying level of noise.

Low Frequency Noise

The table below contains the low frequency noise threshold from various countries and well as those given by Defra.

1/3-oct centre freq, Hz	25	31.5	40	50	63	80	100
German DIN 45680 curve - sum any exceedences in the bands and compare with limit of 25 dB	63	55.5	48	40.5	33.5	33	33.5

	International Thresholds						
	Germany	Denmark	Sweden	Poland	Netherlands	ISO	DEFRA
8	103						
10	95	90.4		80.4			92
12.5	87	83.4		73.4			87
16	79	76.7		66.7			83
20	71	70.5		60.5	74	78.5	74
25	63	64.7		54.7	64	68.7	64
31.5	55.5	59.4	56	49.3	55	59.5	56
40	48	54.6	49	44.6	46	51.1	49
50	40.5	50.2	43	40.2	39	44	43
63	33.5	46.2	41.5	36.2	33	37.5	42
80	33	42.5	40	32.5	27	31.5	40
100	33.5	39.1	38	29.1	22	26.5	38
125		36.1	36	26.1		22.1	36
160		33.4	34	23.4		17.9	34
200			32	20.9		14.4	
250				18.6		11.4	
315							

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