

# MANAGING NOISE IMPACTS IN BRISBANE'S FORTITUDE VALLEY ENTERTAINMENT PRECINCT

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## Abstract

The construction of residential apartments within Brisbane's inner-city entertainment precinct of Fortitude Valley (known as The Valley) as part of a process of urban renewal, has led to dispute and concern regarding the future of the live music scene in the Valley. New residents expect to be able to sleep and enjoy their living areas without excessive intrusion from noise, and the established venues and musicians expect to be able to continue 'business as usual'. In early 2004 Brisbane City Council released its *Valley Music Harmony Plan*, which proposes a number of actions to manage the potential impacts of music noise while maintaining and enhancing the viability of the music industry and the vibrancy of the Valley. This innovative approach to noise impact management within entertainment precincts undergoing urban renewal, combines planning, regulatory and non-regulatory approaches and challenges the traditional way noise impacts are managed in such areas. This paper will discuss the background research conducted as part of developing the *Valley Music Harmony Plan*, including noise mapping and venue and apartment attenuation assessment. This paper will also discuss the major barriers to the project, including the management of low frequency noise, the lack of low frequency noise guidelines, current town planning (development) principles in Queensland and the traditional manner of music venue noise regulation.

## Introduction

Brisbane's inner city suburb of Fortitude Valley (the Valley) is home to a wide range of uses including entertainment venues, retail and commercial businesses and more recently, new residential development. At night the Valley is considered to be the foremost live music and entertainment precinct in Brisbane, providing a significant contribution to Brisbane's cultural life and economy. There are currently around 30 music venues in the Valley. Since the mid-1990's, inner city urban renewal has attracted many new residents to the Valley, resulting in a current population of over 3,000 residents [1].

The introduction of residential apartments has raised concerns regarding the potential impact of residential development on the future of live music and nightclubs in the Valley.

Although the Queensland Liquor Licensing Division is the regulatory authority for music venues, Brisbane City Council (BCC) is responsible for planning and development. Since 1998 there has been a shift in Queensland planning laws, from prescriptive town planning laws (based on separating incompatible land uses via zoning), to the current performance based system that allows mixed use development (relying on the achievement of performance criteria).

BCC therefore sought to address the concerns and conflict created by the convergence of mixed land uses in the Valley by initiating in 2002, the development of a management plan titled the Valley Music Harmony Plan (VMHP).

The Brisbane City Council's aim in developing the VMHP is to:

- Manage the impacts of music noise upon residents and businesses in an integrated way, without compromising the viability of the entertainment industry in the Valley or the vibrancy of the Valley, and
- Promote and enhance the Valley as a valuable incubator for the development of the live music and entertainment industry [1].

The principles underlying BCC's aim include:

- Live music and the night-time economy in the Valley are important for a creative and prosperous Brisbane,
- Mixed use development is supported in the Valley,
- Residents in the Valley will experience a higher outdoor ambient noise environment than expected in suburban or semi-rural locations, therefore residents cannot expect quiet internal noise levels with their windows open, and
- Residents expect to be able to sleep and enjoy their living areas without excessive intrusion from noise [1].

## Development of the Management Plan

This section will outline the process followed and the analysis that went into developing the VMHP.

### Issue Identification and Problem Solving

The process to identify the key issues involved:

- Analysing complaint data between 1998 and 2003,
- Reviewing the licensing and planning laws,

- Conducting workshops with Brisbane City Council and State Government representatives, including the Liquor Licensing Division, and
- Conducting face to face interviews with representatives from music venues, the music industry, development industry, commercial businesses and residents groups.

From the above, the key issues were outlined in a *Discussion Paper for External Consultation – Valley Music Harmony Plan, May 2003* [2], which was made available to stakeholder groups, to encourage debate and discussion regarding the key issues and possible solutions.

Feedback from stakeholders highlighted the following issues:

- The need to address the strong concern (almost an atmosphere of fear) amongst music industry and venue representatives that a single complaint or complainant could result in the closure of a music venue,
- The need to improve the way in which Brisbane City Council and the Liquor Licensing Division communicate and work together, to integrate and collectively address the management of music noise,
- The need to formally recognise the entertainment precinct values of the Valley,
- The need to review the way in which noise limits for music venues are made and measured,
- The need for a consistent approach to regulating venues and new development, that provides certainty and clarity for the music industry, developers and residents,
- Improved recognition of first occupancy rights of existing venues (and residents where relevant), including an onus on new development to attenuate noise, and
- The need for improved communication between Brisbane City Council and the Liquor Licensing Division, venue operators, existing and future residents and other businesses within the Valley [2].

The feedback on the discussion paper and the issue analysis formed the basis for the *Draft Valley Music Harmony Plan* [1] released in early 2004. This process was essential in gaining stakeholder support and ownership and to ensure stakeholders had the opportunity to contribute to problem solving. Thus, the VMHP was largely developed from the ground up, rather than from the top down.

In addition to the above, a review of the various management approaches of other Australian and international cities was undertaken. This included looking at how the issue is addressed in Australian State capitals, as well as New Zealand, United States, United Kingdom and European cities [2].

The following sections will expand upon the complaint and legislative analysis components of the issue identification process.

### **Noise Complaint Analysis**

The initial interviews and workshops found a perception amongst the music industry and the community that new residents are making a large number of complaints about music noise in the Valley. However, the actual number of official complaints in the Valley is quite small (between 5 and 15 each year). Not all of these complaints were made by residents, as a significant number of the complaints were made by other businesses (eg. restaurants and cafes) affected by noise from music venues [1] [2].

Many of the complaints were made by residents in the older residential fringe of the Valley. Only a minor number of complaints were made by the residents of new development in the heart of the Valley. The complaints generally involve new venues or venues that change their activities (eg. venues that start going until 4am or later where they previously operated until midnight or 2am, and venues that change from a live band venue to an electronic dance music venue, etc) after the residents moved in [1] [2].

Almost all complaints from residents related to people not being able to sleep or being woken between midnight and 5am, due to the high level of music noise from a venue. Almost no complaints were received prior to midnight [1] [2].

Despite the small number of complaints, the media has been successful in creating the perception in the community that there is conflict involving lots of complaints by new residents (generally referred to as yuppies) about existing venues.

The primary concern of music venues is their fear that just one complaint or complainant can cause the closure of a venue or create major difficulties for a venue. Music venue and music industry stakeholders sought a review of the regulatory laws to provide greater certainty for venues, transparent processes, improved communication with regulators and mediation options [2].

### **Review of Licensing and Planning Laws**

A number of workshops were held between Brisbane City Council, Liquor Licensing Division, Environmental Protection Agency and Division of Workplace Health and Safety officers, with respect to analysing the regulatory and technical issues associated with managing entertainment noise in the Valley.

Music venues where alcohol is consumed are licensed by the Liquor Licensing Division under the *Liquor Act 1992* [3] and *Liquor Regulation 2002* [4], while music venues where alcohol is not consumed are issued a permit by Brisbane City Council under the *Local Law (Entertainment Venues and Events)* [5].

Specific noise limits for music venues are prescribed by the *Liquor Regulation*. In simple terms, a venue can create  $L_{A10}$  10dB(A) above the background noise level

( $L_{A90}$ ) when measured at the closest affected residence (or business) before 10pm, and 8dB (in each octave frequency band) after 10pm. Therefore the actual noise level a venue can make will vary from venue to venue depending on how close the venue is to a residence, the construction standard of the venue, the time of day or night the venue operates, and the background noise level in the vicinity [3] [4].

This approach works effectively in static neighbourhood situations (ie. as existed under the old zoning approach to planning prior to 1998), but creates some difficulties in urban redevelopment/mixed use development scenarios such as the Valley.

The current noise laws are also based on the assumption that 10pm is the start of the night time period in all parts of Queensland, which isn't the case in inner-city areas such as the Valley.

The outcome of this current system is that as new residential buildings are constructed in the Valley, the noise limits for existing venues become stricter, (because the noise limits for a venue depend upon how close they are to residences). This means there is no certainty for venue operators, as noise limits for music venues is a 'moving goal post'. It also means the cost of noise attenuation is borne by the existing venue instead of the new development. This was found to be the factor causing the greatest impact upon the future viability of music venues in the Valley.

## Research

A number of research projects were undertaken to fill information gaps and to assist in the development of the VMHP.

The first research project involved gaining an understanding of the existing acoustic environment in the Valley. Environmental Resources Management (ERM) was engaged to undertake an ambient noise study involving the development of noise contour maps and conducting noise logging throughout the Valley.

The noise contour maps were based on manned noise monitoring undertaken at over 330 grid points throughout the Valley. Noise monitoring rather than modelling was considered the most suitable approach to the noise mapping as it would provide a more accurate picture of noise levels in the Valley at a given point in time, given the variability of the noise sources and limited digital terrain/ building data [6].

Measurements were taken during the day (5am to 6pm), evening (6pm-12MN) and night (12MN –5am) periods. These time periods were nominal only and were selected to reflect the Valley's specific circumstances. A-weighted and C-weighted  $L_{max}$ ,  $L_{10}$ ,  $L_{eq}$ ,  $L_{90}$  and  $L_{min}$  parameters were measured. Noise contour maps were produced to provide an indication of typical noise levels for the  $L_{eq}$  and  $L_{90}$  parameters for each weighting network and time period. Indicative music noise levels were also recorded in the vicinity of existing venues. Measurement outside venues was coordinated to correspond with typical music activity [6].

Noise logging was conducted at six locations to provide continuous noise level data to provide an indication of daily variation in noise levels over a week.

The study found that background ( $L_{A90}$ ) and ambient noise levels ( $L_{Aeq}$ ) (ie. noise due to traffic, patrons, music, construction, etc) vary greatly throughout the Valley, with the heart of Valley experiencing the highest noise levels. This area has the greatest concentration of music and entertainment venues [6].

Traffic dominates the ambient noise in much of the Valley during the day and evening with  $L_{Aeq}$  levels of up to 75dB(A) in the vicinity of major roads.

Music noise levels measured directly outside operating music venues ranged from  $L_{Aeq}$  65 to 90dB(A), with the majority of venues emitting under or around  $L_{Aeq}$  80dB(A) directly outside the venue [6].

The noise logging data indicated that the Valley experiences high ambient noise levels during the day and evening from around 6am until around 1am in the heart of the Valley, and from around 6am until around 10pm in the fringe areas removed from music venues and major roads [6].

The study showed that even if music noise is removed, the noise from people in the street/mall, rubbish collection, and other sources such as air-conditioning plant and traffic, etc (ie ambient) is substantial [6].

The second research project involved gaining an understanding of the feasibility of treating music venues to reduce noise emissions and the indicative order of cost for treating venues (ie. a cost benefit analysis of retrofitting noise attenuation at existing music venues). Environmental Resources Management (ERM) was engaged to undertake the acoustic investigations and to gather information on the costs of treatments at four venues. The noise attenuation levels were predicted for dB(A) and dB(C). The noise attenuation calculations were based on the internal noise levels measured at each of the venues during typical loud entertainment. The noise attenuation levels are indicative and would vary depending on several factors including the type of music being provided [7].

The cost benefit of retro-fitting existing venues was found to vary considerably depending on the venue. Limiting factors included:

- whether the building was heritage listed,
- structural limitations (particularly the ceiling),
- air-conditioning/ mechanical ventilation requirements, and
- fire safety requirements [7].

The order of cost ranged from approximately \$30,000 for a reduction of 9dB(A)/3dB(C) at one venue to over \$200,000 for a reduction of 3dB(A)/2dB(C) at another venue. Indicative costs to reduce noise emissions by around 15dB(A)/10dB(C) were in the vicinity of between \$100,000 to \$700,000 depending on the venue [7].

This study indicated that significantly increasing the noise attenuation at existing music venues is a complex problem (eg. Installing additional noise attenuation may be easily achievable but the resulting fire safety and air-conditioning requirements may be very difficult and costly to achieve). Many of the existing venues are heritage listed, leased or would require major structural upgrades, which makes achieving significant noise attenuation very costly and in many instances not feasible. Forcing music venues to significantly increase noise insulation would likely result in the closure of many venues. It is therefore unlikely that noise levels currently being emitted by existing venues (ie in the vicinity of  $L_{Aeq}$  80dB(A)) will be significantly reduced. This has implications for the noise attenuation standards for new residential development. It also indicates that time limiting high noise levels (eg. to 1am) may be an appropriate option for protecting residents from excessive noise in the late night/ early morning.

The third research project involved identifying typical noise levels and typical one-third octave band frequency spectrums of live rock band and electronic dance music. David Moore and Associates was engaged to undertake noise measurements inside music venues (at three metres from the speakers) and simultaneously at various locations external to the music venues. The frequency spectrum of live rock band music had a noticeable concentration in the 63Hz to 250Hz one-third octave frequency bands, however there was still a spread across the whole frequency spectrum. The electronic dance music in comparison was very highly concentrated between 31Hz and 125Hz and distinctly impulsive [8]. This has significant implications for setting noise limits for venues and setting noise insulation standards at music venues and at new apartments.

Rock type bands generally go until midnight/1am with noise levels that vary between  $L_{Aeq}$  100 to 110dB(A) (measured 3metres from the speakers) depending on the band/ style of music. Electronic dance music goes all night and into the morning with noise levels that vary between  $L_{Aeq}$  100 to 120dB(A) (measured 3metres from the speakers) depending on the style of music.

The fourth research project involved assessing the structural requirements for the noise attenuation of new apartments. C&J Acoustics was engaged to identify construction materials and specifications that should be incorporated in new residential development in the Valley, in order to protect future residents from unreasonable levels of intrusive music noise. The study considered A-weighted noise attenuation and attenuation at 63 Hz to 125 Hz one-third octave bands, as these frequencies are the most prominent with respect to music noise in the Valley [9]. Residents in the Valley reported at consultation workshops that impulsive low frequency music noise in the late night/ early morning is the most disturbing type of intrusive noise.

This study highlighted a number of limitations in designing buildings to attenuate low frequency noise, including:

- sound transmission losses of building elements are not usually determined for one-third octave band frequencies below 100Hz,
- sound absorption characteristics of various surface treatments are not usually determined below 125Hz [9], and
- there is a lack of national and limited international guidance in regard to recommended low frequency internal noise levels for residential buildings, to protect sleep and minimise annoyance.

The study indicated the difficulty in designing apartments to attenuate music noise at frequencies below 125Hz, with window construction being the limiting factor, particularly where bedrooms face the street and where venues and residential buildings share common walls. The limitations in attenuating low frequency noise will influence the low frequency noise emission limits for music venues. This complex issue has not been resolved at the time of writing this paper and further research is continuing. In addition, the building construction specification options for low frequency attenuation are in the process of being costed to identify economic feasibility.

### Proposed Solutions

Based on the outcomes of the issue analysis, research and consultation, a draft VMHP was developed and released for public consultation in April 2004. The draft VMHP proposed a number of actions to manage the impacts of music noise upon residents and businesses while still ensuring the viability of the music industry and the vibrancy of the Valley [1].

The two core actions proposed are to:

- address the variable ‘moving goal post’ noise limits that apply to music venues under the *Liquor Regulation 2002*, by adopting a new approach to setting noise limits for music venues; and
- place a greater onus on new development to incorporate noise attenuation.

The *Liquor Regulation* currently requires music venues to achieve a ‘background plus’ noise level at the closest residence (or business). The problem with this traditional approach is that the background is variable and in the case of the Valley, the distance to the closest residence also changes frequently, due to urban renewal. This creates a ‘moving goal post’ noise limit for music venues. In order to address this key issue, BCC commenced negotiating with the Liquor Licensing Division to promote an amendment to the current noise laws to allow ‘non-varying’ noise limits for music venues in the Valley. This would mean that the noise limits for a venue would no longer vary depending on how close the venue is to a residence, instead they would remain the same, regardless of new development in their vicinity. This creates certainty for music venues and residents. BCC proposes that an A-weighted noise limit as well as

specific noise limits for one-third octave bands below 125Hz are required [1].

BCC also proposes to use the  $L_{Aeq}$  parameter to assess music noise rather than the  $L_{A10}$  parameter currently used.

At the time of writing this paper new noise limits had not been determined to the satisfaction of all stakeholders. BCC seeks to ensure the new noise limits are set at levels that maintain the viability of live music in the Valley, while still providing some protection for residents during the night (after 1am) [1].

There are a number of difficulties and challenges in doing this. For example, the noise limits in the *Liquor Regulation* apply across Queensland and any amendments to cater for the Valley's specific circumstances, must be done in a way that does not cause negative State-wide impacts. To address this BCC has proposed to amend the *Fortitude Valley Local Plan* to formerly recognise the area as an entertainment precinct where location specific noise levels can apply [10].

BCC has proposed that the noise limits stated in a music venue's licence in the Valley be based on achieving a  $L_{Aeq}$  level around 80dB(A) outside the venue until 1am. After 1am a lower A-weighted noise limit and limits for low frequency noise below 125Hz are proposed. This approach reflects the research that showed that the background ( $L_{A90}$ ) and ambient ( $L_{Aeq}$ ) noise levels are high in the Valley and that the night period for the Valley starts after 1am rather than 10pm. This also reflects the complaint data and residents feedback, which indicated that there is little problem with high ambient noise levels until around 1am in the heart of the Valley [1] [2].

Determining specific noise limits below 125Hz has proven very difficult, as there is little national and limited international guidance regarding the management of low frequency music noise.

Consultation feedback indicated that the majority of stakeholders felt that Council's role in planning and approving development in the Valley was an essential factor in preventing future problems from arising. Venue operators and patrons argued that Council should have stricter soundproofing requirements for residential development near existing venues [2].

Brisbane City Council has attempted to place the onus on new development to incorporate noise insulation. However, the success in achieving this objective currently has a number of limitations. This is due in part to the existing regulatory framework, which requires venues to achieve noise levels at the closest residence. This can result in the onus for noise attenuation being placed on the pre-existing music venue, when a neighbouring commercial building is converted to apartments [1].

To lessen the potential for constraint that new development can place on existing uses, Brisbane City Council proposes to amend the *Fortitude Valley Local Plan* [10] to strengthen the first occupancy rights of existing uses. This is to be done by prescribing minimum

noise attenuation and construction requirements for new residential buildings and venues [1].

The proposed noise insulation requirements are based on the windows of the residential building being closed. BCC cannot protect internal noise levels within residential buildings when windows are open, due to the high external ambient noise environment that exists in the Valley (however residents can still open windows if they choose).

To address low frequency music noise, it is proposed to require new residential apartments to construct external facades to achieve an A-weighted noise reduction as well as noise reduction at 63Hz and 125Hz.

There is very little guidance in regard to appropriate low frequency noise levels for living rooms and bedrooms when considering what degree of noise reduction is required for a building façade. Existing standards and guidelines for residential building interiors relate to A-weighted noise levels and are therefore not suitable for low frequency music noise situations [11] [12].

Development involving common walls and ceilings/floors between venues and residential buildings poses another specific problem that will require a much higher level of attenuation, in particular with respect to preventing the transmission of low frequency noise.

## Conclusions

The shift from prescriptive town planning laws based on separating incompatible land uses via zoning, to the current performance based system that allows mixed use development (relying on the achievement of performance criteria), creates new challenges for noise management.

In the case of Brisbane's inner-city suburb of Fortitude Valley an urban renewal process has resulted in new residential apartments being built in an existing late night entertainment precinct. The specific problems encountered in trying to manage unreasonable noise impacts upon residents, while still maintaining the vibrancy of the Valley and viability of the music scene, include:

- Old style noise regulations such as the *Liquor Act* and *Liquor Regulation*, (which were designed for static situations, where different uses were separated by zoning), impact upon the viability of existing music venues in an urban renewal context,
- There is a poor relationship between noise management laws and current planning laws,
- There is limited guidance in Australia and internationally regarding appropriate internal low frequency noise levels for designing residential buildings and for regulating low frequency music noise, and
- There is more than one administering authority (BCC and Liquor Licensing Division) with slightly different goals/objectives.

Our noise management laws therefore need to more closely reflect the current town planning and development paradigm and greater research is required into the management of and complaint and sleep disturbance response to, low frequency music noise.

A new approach to managing State/local government relationships and administration of complex issues involving more than one administering authority is also required.

Although a strong community perception has been created by the media that numerous complaints from new residents are causing the closure of existing music venues, this was found not to be the case.

BCC's VMHP attempts an innovative approach to the management of music noise impacts in entertainment precincts, by combining planning, regulatory and non-regulatory approaches. It also challenges the traditional approach to noise management and planning in such areas.

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