

inter.noise 2000

*The 29th International Congress and Exhibition on Noise Control Engineering
27-30 August 2000, Nice, FRANCE*

I-INCE Classification: 5.6

RESPONSES TO ROAD TRAFFIC NOISE IN BRISBANE

W. Renew

Queensland Environmental Protection Agency, 160 Ann Street, 4000, Brisbane, Australia

Tel.: + 61 7 3227 6439 / Fax: + 61 7 3227 7677 / Email: warren.renew@env.qld.gov.au

Keywords:

NOISE, ANNOYANCE, TRAFFIC, BRISBANE

ABSTRACT

This paper describes key results of a combined noise and social survey carried out in Brisbane to determine community response to road traffic noise. It was found that annoyance levels measured on a seven point scale were similar to those reported in a 1976 study carried out in three major Australian cities. The percentage of residents found to be highly annoyed by traffic noise was shown to be higher than that predicted by the Schultz curve at lower noise levels. The relationship determined between dissatisfaction level and L10 (18h) for traffic noise was found to be comparable with the results obtained in the United Kingdom.

1 - INTRODUCTION

An investigation into the effects of traffic on the residents of Brisbane was conducted over the period 1991-1999. The chief aims of the project were to:

- ascertain residents' responses to noise along urban roads
- compare responses to noise, air pollution and vibration
- determine the relationship between traffic noise and house prices.

Preliminary results of the noise survey have been reported by Renew [1]. The present paper provides details of further analysis to obtain relationships between noise levels and a number of responses such as annoyance, dissatisfaction and sleep disturbance.

2 - SURVEY METHOD

After an exhaustive process to identify roads with through traffic, a total of 36 roads were selected for study. Traffic flow rates ranged from 2,000 to 31,000 vehicles per day, while the percentage of heavy vehicles lay in the range 1% to 13%. A noise data logger was employed to carry out a 24-hour noise survey at a representative residence on each road. The traffic noise levels measured as Leq (24h) ranged from 55 to 70 dB(A).

In conjunction with the noise measurements, a comprehensive questionnaire was administered to a total of 1034 residents living along the selected roads. In all, 54 questions were asked, dealing with aspects of the environment, noise sensitivity, demography and building design.

3 - SURVEY RESULTS AND DISCUSSION

The analysis of results from the noise and community surveys responses to noise revealed that the annoyance from noise was similar to that reported by Brown [2] for the cities of Brisbane, Sydney and Melbourne (see Fig. 1). The conclusion could be drawn that the traffic noise annoyance response in Brisbane has not significantly changed over a period of 20 years.

The percentage of residents 'highly annoyed' (those with annoyance levels of six and seven on the seven point response scale) in each road was plotted against the noise level (Fig. 2). The graph indicated higher values of the percentage highly annoyed at lower noise levels than shown in the Schultz curve [3]. It was found that approximately two-thirds of the data points fell inside the 90 per cent lines reported

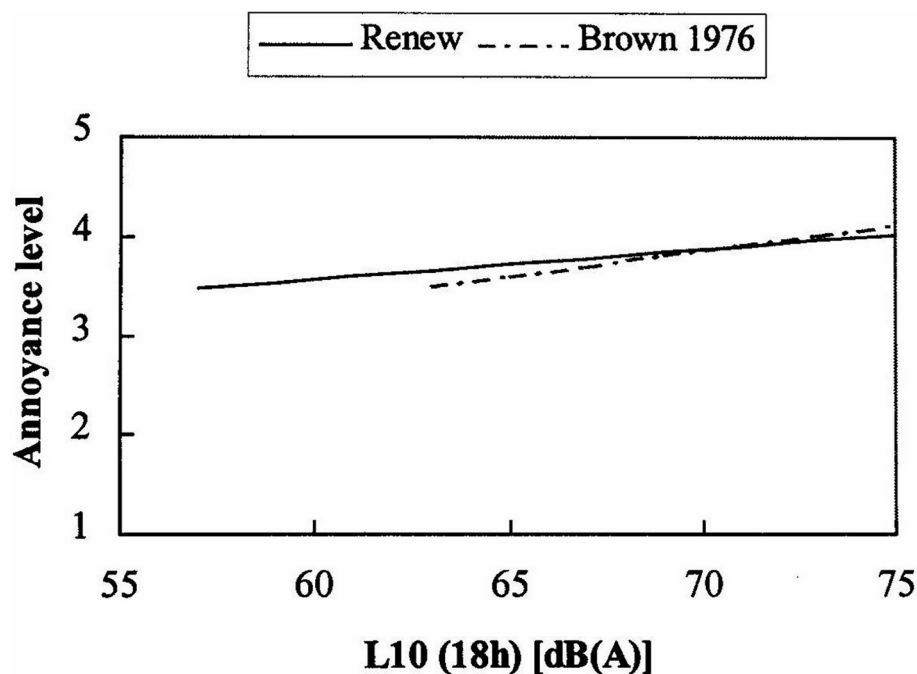


Figure 1: Annoyance level.

by Schultz for data from several surveys. It is likely that, given more data, the median curve would be similar to the Schultz curve but would lie above it.

The dissatisfaction with traffic noise expressed by residents is another measure of response. Results obtained (see Fig. 3) indicate that Brisbane residents are more dissatisfied at lower traffic noise levels than residents of Greater London (see Harland [4], Langdon [5], Griffiths and Langdon [6]). This difference in response could be attributed to the existence of a large proportion of wooden houses in Brisbane and the necessity to open windows in the warmer months for ventilation purposes.

Residents were asked to indicate on a four-point scale (never, sometimes, a lot, nearly all the time) how often traffic noise affected their sleep. Analysis of the responses showed that, of the four descriptors chosen, L1 was the best indicator of response, followed by L10, Ldn and Leq. There was little difference between L1(0100-0600h) and L1(2200-0600h) as a noise response indicator.

4 - CONCLUSIONS

The results described indicate a similarity between responses in Brisbane and in certain other countries. However, responses in Brisbane have been found to be higher at lower levels of traffic noise.

ACKNOWLEDGEMENTS

The author acknowledges the permission of the Environmental Protection Agency, Queensland to publish this paper. The views expressed are not necessarily those of the Agency.

REFERENCES

1. **W.D. Renew**, Attitudes to road traffic noise in Brisbane, In *Noise as a Public Health Problem*, pp. 213-216, 1993
2. **A.L. Brown**, Traffic noise annoyance along urban roadways, *Report No. AIR 206-6, Australian Road Research Board*, 1978
3. **T.J. Schultz**, *Community Noise Rating*, Applied Science Publishers, 1982
4. **D.J. Harland**, Units for exposure and response to traffic noise, *TRRL Report SR 297*, 1977
5. **F.J. Langdon**, Noise nuisance caused by road traffic in residential areas: Part I, *Journal of Sound and Vibration*, Vol. 47(2), pp. 243-263, 1976
6. **I.D. Griffiths and F.J. Langdon**, Subjective response to road traffic noise, *Journal of Sound and Vibration*, Vol. 8, pp. 16-32, 1968

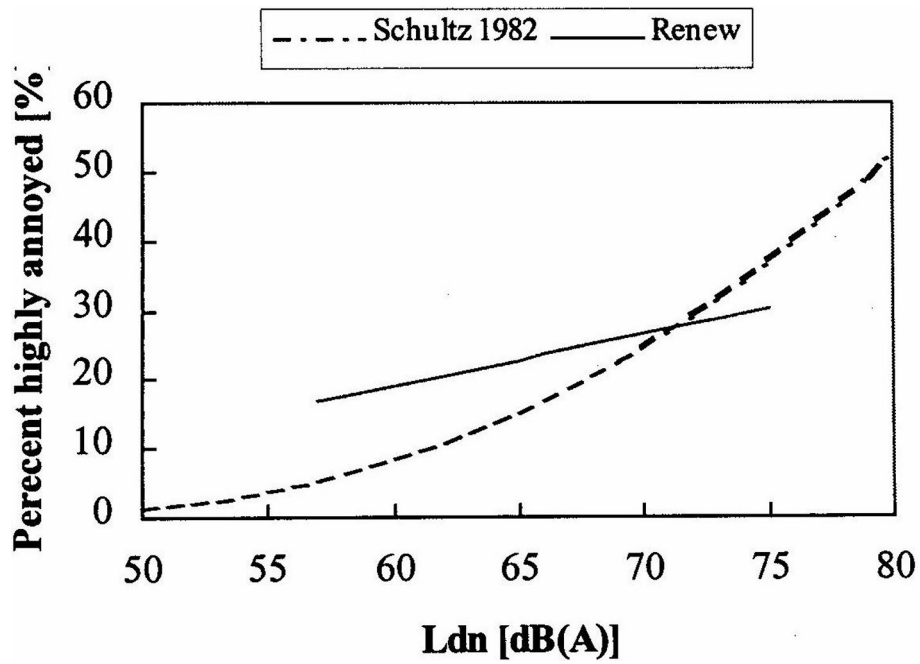


Figure 2: Percent highly annoyed.

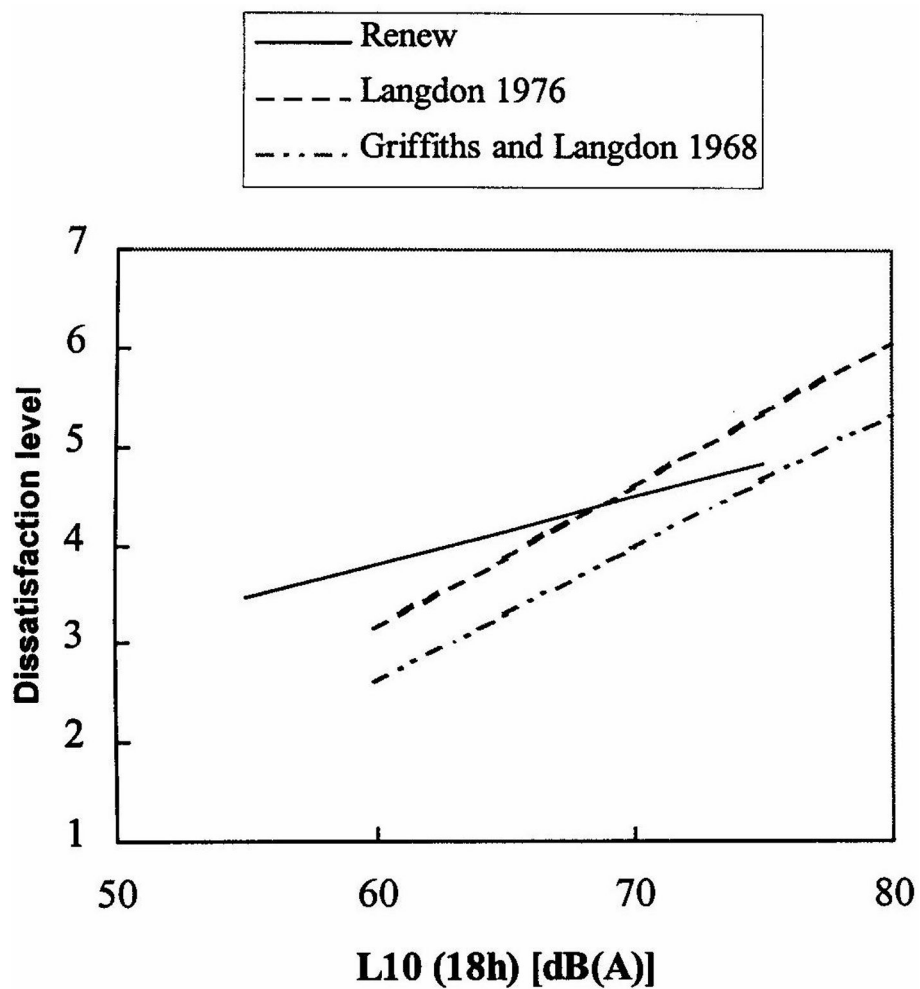


Figure 3: Dissatisfaction with traffic noise.