MEASUREMENT OF NOISE LEVEL AT DIFFERENT LOCATIONS OF RAWALPINDI AND ISLAMABAD

NOVEMBER 2006

Pak-EPA

PEP

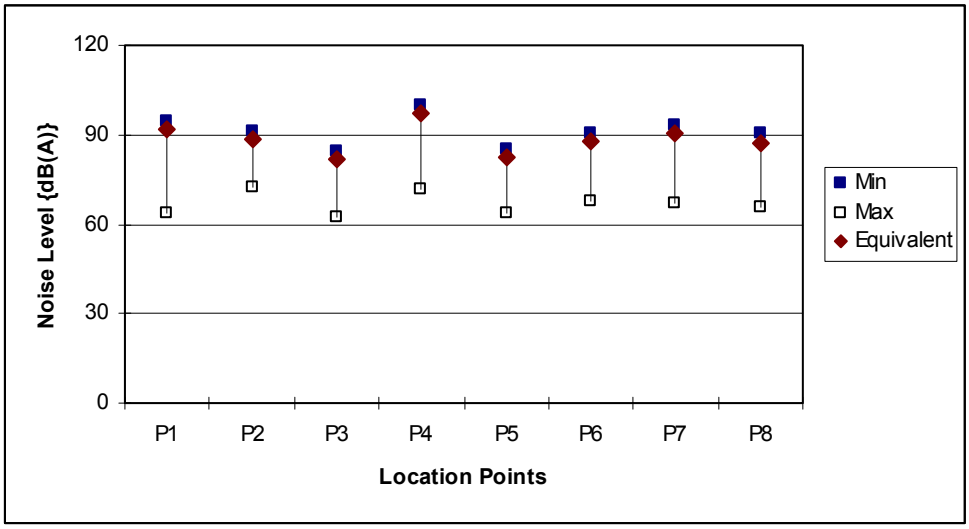
Pakistan Environment Programme

SUMMARY AND CONCLUSION

Noise has always been an important environmental problem. An immense number of cars, motorcycles, auto-rickshaws, trucks and other motorized vehicles are running on the streets and roads of our cities day and night. In comparison to other pollutants, the control of environmental noise has been hampered by insufficient knowledge of its effects on humans and lack of defined criteria. In our cities due to poor planning, road construction and progress work on the development of utility infrastructures along the road; the problem of noise pollution is being aggravated day by day. Even though the present study revealed that some areas of Islamabad are getting noisier due to high traffic density and lack of traffic management. In this perspective, practical action to limit and control the exposure to environmental noise are essential.

Present study has given a fair good idea about the noise level at different areas of the twin cities. Eight locations were selected for noise monitoring purposes in both cities. Keeping in view the traffic and population densities, five locations were selected in Rawalpindi where as three in Islamabad. Figure 5.1 shows the daily maximum, minimum and equivalent noise level at different locations of Rawalpindi and Islamabad.

Figure 5.1 Daily Maximum, Minimum and Equivalent Noise Level at Different Locations of Rawalpindi and Islamabad



Among eight noise measurement locations in twin cities, it is amazing to note that at all locations the daily maximum and daily equivalents are higher than the maximum

permissible limit of 85 dB (A) of National Environmental Quality Standard (NEQS) for motor vehicle noise at 7.5 meters from the source. It showed that 100% of noise measurement locations are exposed to higher noise level. Even though the daily minimum noise level at all locations is more than 60 dB (A), which clearly reflect an aggravated problem of noise on the road sides of the major cities of Pakistan. The highest maximum noise level 98 dB (A) was found near to Pirwadahi General Bus stand, from where inter-city and intra-city heavy traffic operate all time of the day. Here at this location, the daily equivalent noise level 97.1 dB (A) was calculated from the daily recorded maximum and minimum noise levels. The daily equivalent noise figure at this location is extremely higher than the NEQS permissible limit. Law enforcement agencies and regulatory bodies must pay immediate attention to bring down this figure for the betterment of the passengers and nearby residential and commercial areas. The second highest noisy location among the measured locations was near Choare Chowk, Peshawar road Rawalpindi. Here the daily maximum noise level was 97 dB (A). One of the obvious reasons of high noise level at this location is that the Choare Chowk is the busiest intersection of Peshawar road. Although there is four lanes road on either side of dual carriage way, still the driver's bahaviour and lack of traffic management create the chaos at the intersection resulting the frequent use of horns make the situation worst. Bank Road, Saddar Rawalpindi and Melody road, Abpara Chowk Islamabad were found less nosy locations among the others noise measurement locations. At these locations the daily equivalent noise levels were within the permissible limit of NEQS.

An analysis of the statistical distributions of sound levels is a useful tool when assessing noise. The analysis not only provides useful information about the variability of noise levels, but is also prominent in many standards as the basis for assessing background noise. For example, L_{90}, the level exceeded for 90% of the measurement time, is used as an indicator of background noise levels while L_{10} or L_{50} are used to indicate the level of noise events. Table 5.1 shows the statistical distribution of sound level.

Table 5.1 Statistical Distribution of Sound Levels

Locations	Statistical Distribution			Equivalent L_{eq} dB (A)	Maximum Li dB (A)	Minimum Li dB (A)
	L_{90} dB (A)	L_{50} dB (A)	L_{10} dB (A)			
P1	80.0	86.0	94.7	91.6	64.0	94.3
P2	80.9	84.7	90.0	88.4	72.7	91.4
P3	69.6	76.1	82.8	81.6	62.2	84.6
P4	84.1	91.0	100.7	97.1	72.0	100.1
P5	73.3	80.0	86.0	82.4	63.5	85.4
P6	80.4	86.0	90.7	87.8	67.4	90.8
P7	80.3	86.0	94.0	90.3	67.3	93.3
P8	77.0	82.0	90.0	87.3	65.4	90.3

The two most common statistical descriptors used for traffic noise are L_{10} and L_{eq}, L_{10} is the sound level that is exceeding 10% of the time. L_{eq} is the constant, average sound level, which over the period of time contains the same amount of sound energy as the varying levels of traffic noise. L_{eq} for typical traffic conditions is usually about 3 dB (A) less than the L_{10} for the same conditions. Table 5.2 shows statistical analysis of sound levels.

Table 5.2 Statistical Analysis of Sound Levels

Locations	L_{10} - L_{eq}	L_{eq} - L_{50}
P1	3.1	3.1
P2	1.6	1.6
P3	1.2	1.2
P4	3.6	3.6
P5	3.6	2.4
P6	2.9	1.8
P7	3.7	4.3
P8	2.7	5.3

Our observations showed the variation between L_{eq} and L_{10} are between 1.2 and 3.7 dB (A). At six out of eight locations, the values varied between 2.7 and 3.7 dB (A). These values are very closest to the typical traffic conditions. It is also assumed that L_{50} is about 1 – 2 dB than L_{eq}. In the above table, it may be noticed that variations between L_{50} and L_{eq} are 1.2 to 5.3. These values reflect that only at three monitoring locations, typical traffic conditions are being observed. The statistical analysis of our measured data is much closed to the assumed figure. L_{90} is the sound level that is exceeded 90% of the time. L_{90} sound level varied between 69.6 – 84.1 dB (A). The highest sound level 84.1 dB of L_{90} was at Pirwadahi road. The peoples living in the surrounding areas of Pirwadahi are very much exposed to very high noise level throughout the day; which is very much close to the maximum permissible limit of traffic noise under NEQS. Although the least sound level of L_{90}, which is 69.6 dB (A) at Bank road, Saddar Rawalpindi was higher than the limits for road traffic noise set by the developed countries.

Recommendations and Future suggestions

L_{eq} has a very good correlation to the long term effects of noise such as health effects. Therefore by reducing the L_{eq} values in the cities, the annoyance effects by the citizens can be reduced. Once traffic noise is recognized as a serious issue in sustainable transport planning, than the traffic noise can be tackled through a seven parts strategy:

- ✓ Removal of pressure horns from the public transport
- ✓ Setting standards
- ✓ Motor vehicles control
- ✓ Land use control
- ✓ Traffic management
- ✓ Surface design and maintenance
- ✓ Road geometry and design

National standard may be specified for different noise levels and for different zones.