661.993 : 628.51

A NOTE ON CARBONMONOXIDE AND NOISE LEVELS AT COCHIN

Industrialization and the subsequent urbanization have resulted in widespread damages to property and day to day living, notwithstanding its vital importance and basic purpose with which it has been initiated. The impact of urbanization is, sometimes, more severe than that of industrialization, particularly with regard to vehicular traffic. The vehicles (automobiles) not only emit the obnoxious gases such as carbonmonoxide (CO) but also cause lot of noise, especially, when the horns are used. Some studies have been carried out for the measurement of CO and its effect on nearby shop-keepers and the traffic policeman and reported by NIOH (Annual report 1974). Vittal Murthy *et al.* (1979) have measured the CO levels at busy corners in Visakhapatnam. Yennawar *et al.* (1970) have reported the CO levels at Calcutta.

In the present note, the CO concentrations and the noise levels have been measured at selected traffic junctions at Cochin. Their variation with time has been studied. Some remedies have also been suggested.

2. The concentrations of CO were measured by means of CO detector, sensitive to concentrations of 5 ppm and above. This instrument is based on the colourimetric principle and is simple to use. It consists of an aspirator bulb for sucking the air. The detector tube containing the indicating gel should be inserted into the instrument so that the sucked in air would pass through the tube. If CO is present, the colour of the gel changes and the concentration can be read from a precalibrated colour code.

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TABLE 1

Type of vehicle	Noise generated in dB	Type of vehicle	Noise generated in dB
Lorry	100	Tempo Van	84
Motor Bike (Bullet)	90	Auto	84
Jeep	88	Car	84
Bus	86	Loudspeaker	84

The concentration of CO were measured at Kacheripady, a busy traffic junction, at half hourly intervals, from 9.00 AM to 12.00 noon and 4.30 PM to 7.30 PM on a working day, when the weather was fairly dry. The number and type of vehicles passing through in each sampling time have also been noted.

The noise levels were recorded with the help of a noise level recorder. This instrument can be operated with AC/DC. It is to be exposed at the point where the sound is to be recorded. The pointer indicates the level of the sound in decibells (dB). The noise levels were recorded at 5 minute interval on a working day, at Pallimukku and Kacheripady junctions. Pallimukku is an important junction not only because of the busy traffic but also because one of the biggest hospitals, *viz.*, Medical Trust Hospital, is situated very near the junction apart from various other establishments.

3. The maximum concentration of 35 ppm was observed at 9.30 AM and the least of 10 ppm at 9.00 AM. The steep increase from 9 to 9.30 AM is followed by a steepfall of 20 ppm by 10.00 AM and unchanged till 12.00 noon. From 4.30 PM to 6.30 PM the concentration was 20 ppm and from 7.00 to 7.30 PM it was 15ppm. The occurrence of maximum at 9.30 AM can be explained to be not merely due to heavy traffic but also due to the meteorological conditions that are conducive to build up of pollutants at that time because of low mixing and low convective activity or stable conditions. The traffic is heavy between 9 and 10.00 AM and from 4.30 PM onwards till 7.00 PM. The traffic between 4.30 PM and 7.00 PM is heavier than that in the morning. Despite more number of automobiles plying in the afternoon the concentrations were only 20 ppm and below. This is because of the thorough mixing and convective activity of the atmosphere during that part of the day which results in low concentrations even if the emission of CO is high.

The concentration of CO never exceeded the threshold limit value (TLV) of 50 ppm.

The noise levels were recorded at both the junctions. However, as there was no appreciable change in the levels between these two junctions, only the values at Pallimukku are reported here. The arithmetic average of the levels in each hour has been obtained and is taken to represent the noise level at that hour. The variation of the noise levels with time has revealed that there is no *significant variation with time*, the average minimum and maximum being 87 dB and 95 dB respectively. The minimum and maximum *in situ* values are 84 dB and 104 dB with the arithmetic mean and model values being 97.1 dB and 91 dB respectively. The maximum frequency of observed noise is in the range of 89.5 to 84.5 dB, the minimum being in the range of 99.5 to 104.5 dB. More than 65% of the cases recorded noise in between 84.5 and 94 dB. These observed values are found to be more dependant on the type of vehicle rather than the number of vehicles passing through the junction. The levels of noise generated by various types of vehicles have been reported in Table 1. These were observed from a distance of roughly 2 to 3 metres from the vehicle and while the horn was in use. The table shows that lorry generates the maximum noise followed by Motor Bike (Bullet), Bus and Tempo Van. The autorikshaws and cars generate the same amount of noise as a Tempo Van. Incidentally, one loudspeaker which is almost always present at the junction advertising the sale of lottery tickets, generated equal noise as that of a car.

All the values observed were higher than the TLV of 82 dB. It is alarming to find the maximum frequency in the range of 89.5 to 94.5 dB.

4. The CO concentrations are well below the danger limit and as such there is no immediate threat. However, these concentrations can still be brought down by a proper management. It is suggested that nowhere in the city, except in open places like Menaka Junction, the vehicles should be kept in idling conditions for long as it is this idling condition that produces more CO. This can be minimised by streamlining the traffic, especially, at peak hours, by means of a proper automatic signalling system.

The noise levels, observed, were always above the TLV. The use of the present horn system is responsible for the high values. So it is suggested that the horn system may be replaced with bulb type horn system. The heavy vehicles, especially lorries should not be allowed to pass through the juncton during peak hours in general and through hospital zones, in particular. The mode of advertisement for the sale of lottery tickets through loudspeakers should be banned forthwith as this is a great menace being experiecned by all commuters in Cochin as this generated a noise of 2 dB above the TLV.

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