CHAPTER – 8

CONCLUSIONS AND SCOPE FOR FURTHER STUDY

8.1   Conclusions

8.1.1. Major Conclusions

Traffic noise measurement, analysis, prediction models, and visualization are important tools when planning for more environmental friendly highways. The most significant factor for increase in traffic induced noise pollution for the city of Chennai is the privately owned vehicles. Public transportation must be encouraged to replace the personal cars, as each bus can conveniently function instead of 25 personal cars.

This noise survey reveals the not so satisfying position of noise environment of Chennai city as per the standards prescribed by CPCB. The Scenario in the city is deteriorating day by day with exponential increase in population as well as the number of vehicles in city road. Moreover, in appropriate traffic management, lack of parking space and poor road condition has contributed a lot to the noisy environment of the city.

The silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority (The Noise Pollution Regulation and Control Rules, 2000). The study shows the silence zones including hospitals, nursing homes and educational institutions in the cityare in the grip of heavy traffic noise.

The noise assessment of Chennai city indicates escalation in the noise levels of the city at a very fast rate with growing population and heavy traffic accumulation. Noise levels obtained at different locations of the city viz. commercial, residential and silence zones are found to be exceeding the noise. It

was also observed that higher noise levels in the city was seen as a result of rapid and unplanned urbanisation resulting in great influx of people from all parts of the region and country, improper management of city roads and traffics, lack of sufficient parking spaces and exponential growth of both private and public vehicles in the city. The greenery and forest cover decreasing at alarming rate due to unplanned growth and urbanisation has resulted in reducing noise cushion in the city. Narrow linking roads, absence of arterial roads and lack of flyovers and over bridges in some locations of the city are responsible for huge gathering of vehicles resulting in a chaotic and noisy environment. Thus it is felt that noise environment of Chennai city may pose as a great threat to the health of citizens in the long run. This is because high level of noise may not cause serious or immediate effects but if, such noisy environment prevails, it may impact the population in many ways.

The noise map itself provides planners, engineers and others the information needed for planning and execution of their projects. Spatial maps are vital for city planning and traffic engineers for the purpose of zoning, land use, land pricing and traffic management. It is also recommended that online and real time traffic noise based information system must be developed and practiced along with different parameters like humidity, ambient air temperature, rainfall etc.

The important observations are:

- By combining the citywide traffic flow calculation model and the vehicles" sound power calculation model, a new road traffic noise prediction model was developed.
- It is possible to make the citywide noise map by introducing the road map data and the traffic data to the prediction model. Realization of noise map of road traffic in urban environment is an important utility for future development planning.

- In addition, some areas may soon reach the threshold of pains, leading to permanent loss of hearing and, in some cases, death, in addition to the other not too obvious consequences.

- According to the result of this study, it is essential to check the impact of increasing transportation and marketing activities in the study area with respect to noise.

- The assessment shows that the issue of noise pollution is currently ignored in urban regulations concerning environmental quality. Priority should be given to the inspection of traffic vehicles, particularly, public transportation vehicles such as minibuses and buses to prevent the noise pollution at its sources.

- Impact on public health can be substantial in such environments, even when the effect is modest and restricted to middle-aged persons.

- Assessed hypertension and residential histories should be encouraged. The results obtained in the study establish the fact that the city is suffering from severe noise pollution due to high and growing vehicular traffic.

8.1.2 Specific Conclusions

The Noise level / Pollution in commercial areas of the city exceeded80-90 dB (A) whereas in residential areas highest noise level recorded between 65-75 dB (A). In silence zones noise levels exceeded 65-75 dB (A). The following measures may be adopted to reduce noise level.

- Inspection of vehicles such as autos, car/jeeps, buses and trucks to prevent noise at source.

- Providing more public transportation systems to replace private cars and encourage using them.

- Implementing traffic management rules and regulations very effectively and efficiently.

- Tree plantations might help absorb noise to great extent.

- Banning air horns at sensitive places like hospitals and schools and its uncompromising implementation might help reduction in the noise levels.

This study is carried out for Chennai city with total area of 426 ksq.km. The traffic volume is collected in 15 locations with minimum of 886 vehicles/hr and maximum of 1675 vehicles/hr. Similarly spot speed data was collected for Chennai City with minimum speed of 25kmph and maximum speed of 55kmph. Normally evening peak hours extend for longer duration with higher traffic volume and lesser speed in the city.

The noise levels measured using sound level meter with accuracy of 2dB(A) for 15 locations of study area from 6.00am to 9.00pm. During morning hours, noise levels are high compared to evening hours with variation of 35dB(A) to 90dB(A). This indicates that the noise in study area is more than the ambient level during peak hours.

A noise model has been built using multiple linear regressions for the study area by considering speed, traffic volume and distance from the source of noise in both vertical and horizontal directions. There is good inter correlation in road traffic noise levels along with speed and traffic volume. The R^2 value ranges between 0.76 and 0.96 which proves the good correlation. The model for Chennai city is thus built.

Further noise maps are developed using Arc GIS software based on the noise data collected from noise maps. The total area affected due to road traffic noise is also calculated.

8.2   Scope for Further Study

The effects of a range of bituminous road surfaces on road traffic noise needs further exploration. This approach can be studied on the following lines.

The various types of materials used in pavements affect the traffic noise. In this context, the effect of noise on various materials such as dense grade asphaltic concrete, open graded porous asphalt, cement concrete, water bound macadam and earth roads can be studied. Further the 3D Model can be extended beyond first floor level. A separate study for finding the noise levels of slow moving vehicles, suburban trains and metro rails can also be conducted. Noise barrier effect in reducing noise for any particular stretch can also be explored.