



## NOISE POLLUTION ANALYSIS IN THANE CITY OF MAHARASHTRA

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Noise pollution is the disturbing or excessive noise that may harm the activity or balance of human or animal life. Since, roadways has plethora of vehicular traffic, there is so much of air, and land pollution that they can lead to, but, there are indications of it triggering noise pollution. The noise pollution that is being discussed here is not only dependent on the vehicles and their honks, but the hoard of people who gather on the roads and hawkers as well who have a major contribution to it too.

It is more severe and widespread than ever before, and it will continue to increase in magnitude and severity because of population growth, urbanization, and the associated growth in the use of increasingly powerful, varied, and highly mobile sources of noise. The potential health effects of noise pollution are numerous, pervasive, persistent, and medically and socially significant. Noise produces direct and cumulative adverse effects that impair health and that degrade residential, social, working, and learning environments with corresponding real (economic) and intangible (well-being) losses. It interferes with sleep, concentration, communication, and recreation.

The contemporary paper, thus tries to analyse the relationship between noise levels and major traffic signals with the help of an added element- time. This element is imperative because, there are certain peak hours when the crowd on the stations is maximum and certain off hours, when it is the minimum and is based on Primary Data collection

The spatial element will help in comparing the noise levels between the traffic signals as well. A small survey was conducted to know what people residing besides the roads face and think about the noise levels and their problems.

### **Introduction**

Noise pollution is the disturbing or excessive noise that may harm the activity or balance of human or animal life. The source of most outdoor noise worldwide is mainly caused by machines and transportation systems. Poor urban planning may give rise to noise pollution.

Indoor noise can be caused by machines, building activities, and music performances, especially in some workplaces. In Mumbai- the city of dreams, roadways are considered as the 'lifeline of the city' owing to its inexhaustible importance and usage by its citizens. Although it serves the city and its hinterland and has helped in the development of the city and beyond, it has some negative bearings too.

Thane city has total population of 1,886,941.

### **Literature Review**

Continuous movement of vehicle causes traffic noise. It affects not only those who are moving but those too who live near the roads, railway lines, stations and airports. There has been a gradual increase in traffic noise in recent years due to increased density of vehicles. According to some estimates, (Singh et al., 1984), traffic noise level in Delhi is 90 decibels and in Mumbai it is 95 decibels. Average noise level in Delhi, Mumbai and Kolkata is about 95 decibels near the airports, noise levels between 82 decibels and 85 decibels were recorded with an increase of 20-25 decibels during landing and takeoffs. Near railway tracks too, ambient noise level increases up to 10-20 decibels during train movement. In Maharashtra, noise levels in many towns exceed standards in all categories of areas, for both day and night, by wide margins, mainly due to industrial and vehicular noise. The noise levels are much higher during festival times like Ganeshotsav and Navratri.

In sensitive areas; even the higher end of the noise level exceeds acceptable standards (CSO, 2001). Night time noise levels are particularly higher in Mumbai than in other cities, mainly because several activities in the city take place on a round-the-clock basis (Rana et al., 2008). In early days before the development of Environmental jurisprudence, the Common law remedy of nuisance was the only means to provide remedy against noise pollution and the same was wholly based on the discretion of the judges. The people, because most of the people in India do not consider noise as a pollutant but take it as a part of daily routine and of modern life in order to curb noise pollution, it is essential that citizens should first realize it's dangerous consequences and then to take some remedial measures. Available scant rules, regulations and few state laws have however addressed the issue of noise pollution but in part, confined to certain activities.

In the country loudspeakers are extensively used for political meetings, marriages, religious functions, music programmes and advertising. Trucks, buses, heavy vehicles and passenger cars, produce undesirable noise to the annoyance of the people. Aircraft noise is a disturbance to the people living around airports in the country. The noise pollution in the country has

resulted into a noise hazard, leading to permanent hearing loss and nuisance affecting efficiency, comfort and enjoyment.

Urban noise is mostly associated with urban development. Effect of noise can be temporary or permanent.

In Mumbai, where land area is a constraint, various land uses formally demarcated have overlapped and sound levels are observed to be above the permissible limits (**Bhave, Prashant et al., 2013**).

### Objectives of the Study

1. To understand the role of vehicular traffic in noise pollution in a metro city with a case study
2. To give a spatial and temporal reference to the levels of noise.
3. To recommend suggestions to reduce noise pollution

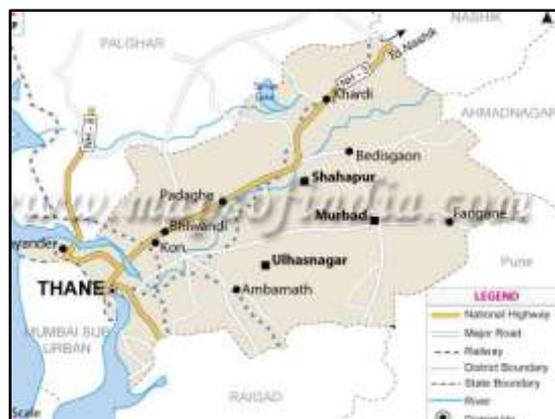
### Location and Justification for the Study Area

The study area chosen is Thane city. Its co-ordinates are 19.218° N, 72.978° E It lies on the Western Coast of the state of Maharashtra and is a part of the Konkan Division of the state. It thus has a coastal location.

Thane also called colloquially as Thana, is one of the most populous metropolitan cities in India. Thane is the headquarter of the taluka and if the district. With a population of 1,841,488 distributed over a land area of about 147 square kilometres (57 sq. miles), Thane city is the 16th most populated city in India.

Located on the north eastern side of the state of Maharashtra, the city is an immediate neighbour of Mumbai city and a part of the Mumbai Metropolitan Region, one of the most populous urban agglomerations in the world.

The city boasts of having 33 lakes in the city and is thus fondly known as 'City of Lakes' among its residents.



Roadways are considered to be the lifeline of the metro city- Mumbai. People belonging to almost all class, travel by bus or other road transport. This is because; it helps door to door service. But it creates heavy traffic on road and is speedy. It is considered the lifeline of the city due to its undoubted importance for the people belonging to the job sector as it is a successful and trustworthy means of travelling to all parts of the city. Its economic nature aggravates the problems of noise pollution.

### **Research Methodology**

Research methods refer to the operational techniques of data collection. The methodology adopted by the researcher is rationalistic one and has been designed in three stages.

#### **Pre-Field Method:**

This includes collection of primary and secondary data on the respective topic from various books, journals and articles from the college library and from those available online. To get a comprehensive knowledge of the study area various internet sources were consulted. Field observation involves qualitative as well as quantitative methods of data acquisition.

#### **Field Method:**

The noise levels had to be recorded during peak -hours and off-hours. The peak hours are from 8:30 am to 10:30 am and 5:00 pm to 7:30 pm. The rest are the off hours for the day. Initially the readings were taken during peak-hours i.e. between 8:30 am to 10:30 and the readings for off hours were taken between 3:30 pm and 5:00 pm. It was found peak hours had maximum noise levels. The day-time is from 6.00 a.m. to 10.00 p.m., while the night time is considered from 10.00 p.m. to 6.00 a.m at Teen Haath Naka, Kapurbawdi and Majiwada junctions.

#### **Post-Field Method:**

The collected data were processed, assimilated and analyzed. Data analysis was done

### **Limitations Of The Study**

Even though a lot of planning and effort was put in to design the research and survey, there are certain limitations which it faces.

This study is only indicative of the levels of noise in the city caused by roadways. Also, people residing along the road were surveyed for the effects of noise pollution on their health. The study can be continued with the analysis of medical cases from nearby hospitals. This also forms base for further research

**Results and Discussions**

The noise pollution was measured by noise meter and questionnaire survey was used to find out effect of Noise pollution. Three major locations of heavy traffic were identified and research was carried out there. The evidence for effects of environmental noise on health is strongest for annoyance, sleep and cognitive performance in adults and children. Occupational noise exposure also shows some association with raised blood pressure.

Perception of control over the noise source may reduce the threat of noise and the belief that it can be harmful. It may also be that noise is more harmful to health in situations where several stressors interact and the overall burden may lead to chronic sympathetic arousal or states of helplessness. Adaptation to long-term noise exposure needs further study. Most people exposed to chronic noise, for instance from major airports, seem to tolerate it.

Yet, questionnaire studies suggest that high levels of annoyance do not decline over time. Another possibility is that adaptation to noise is only achieved with a cost to health

The current ambient noise standards followed in India are in terms of L<sub>day</sub> and L<sub>night</sub> as shown in Table 1. The silence zone is an area comprising not less than 100 m around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority. Mixed categories of areas may be declared as one of the four mentioned categories in Table 1 by the competent authority (Noise Pollution Rules, 2000; CPCB report, 2011–12; NANMN brochure, 2011).

**Table 1. Ambient air quality standards in respect of noise in India (Noise Pollution rules, 2000).**

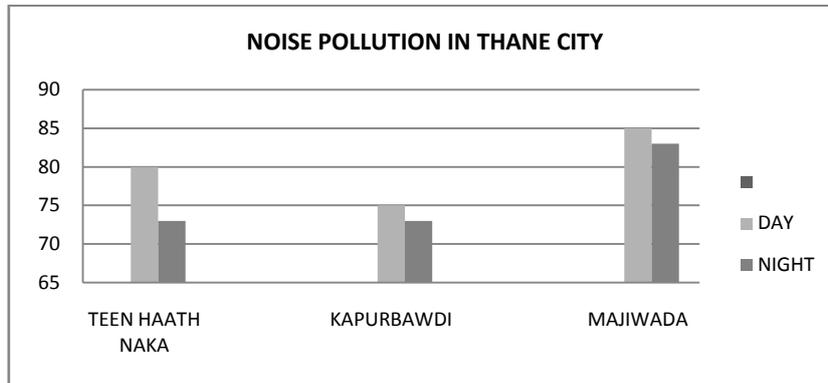
Area code	Category of area/zone	Limits in dB(A) L* Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence zone	50	40

\*Leq denotes the time weighted average of the sound level in decibels in A-weighting.

**FINDINGS:**

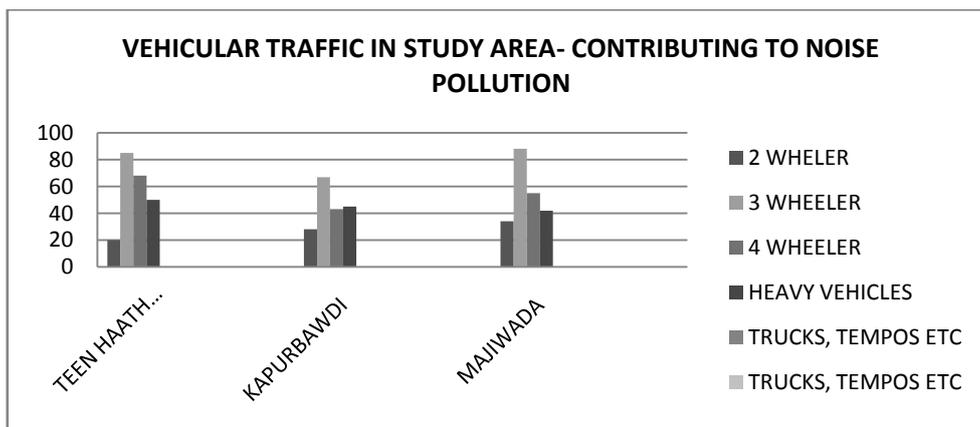
The findings are as follows:

NOISE POLLUTION( IN Db)	TEEN HAATH		
	NAKA	KAPURBAWDI	MAJIWADA
DAY	80	75	85
NIGHT	73	73	83



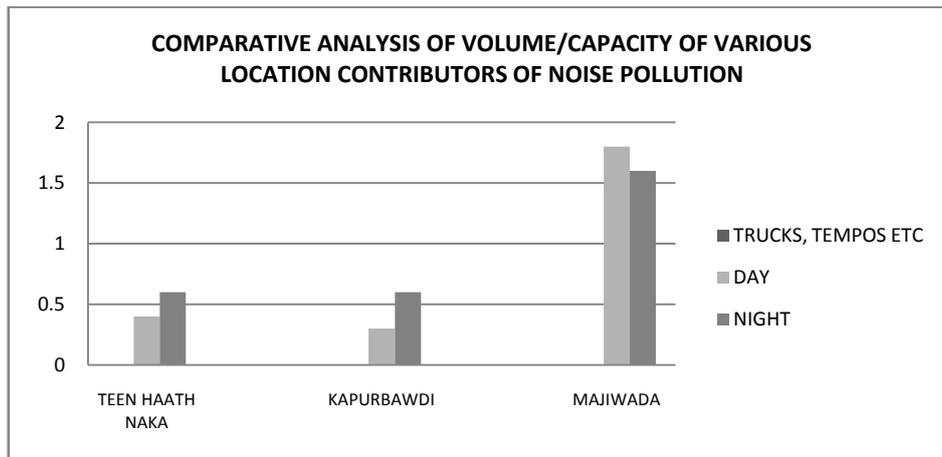
### VEHICULAR TRAFFIC IN THE STUDY AREA

VEHICLES	TEEN HAATH		
	NAKA	KAPURBAWDI	MAJIWADA
2 WHELER	20	28	34
3 WHEELER	85	67	88
4 WHEELER	68	43	55
HEAVY VEHICLES TRUCKS, TEMPOS ETC	50	45	42



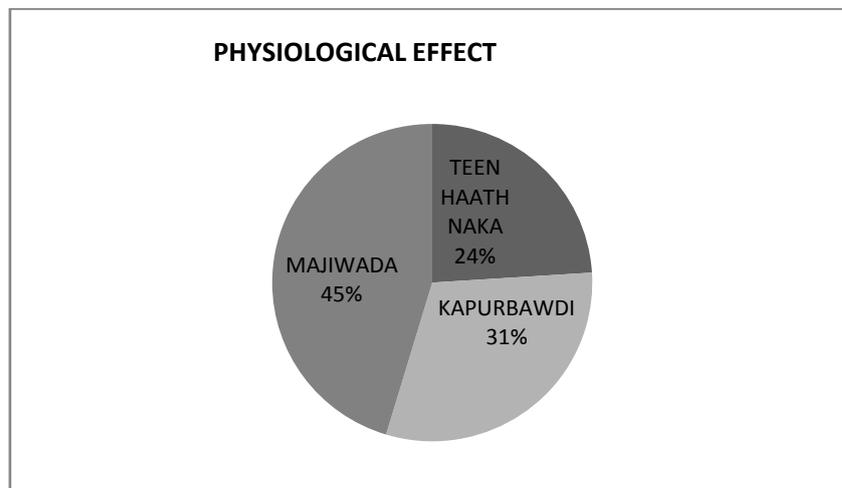
**COMPARATIVE ANALYSIS OF VOLUME/CAPACITY OF VARIOUS LOCATION  
 CONTRIBUTORS OF NOISE POLLUTION**

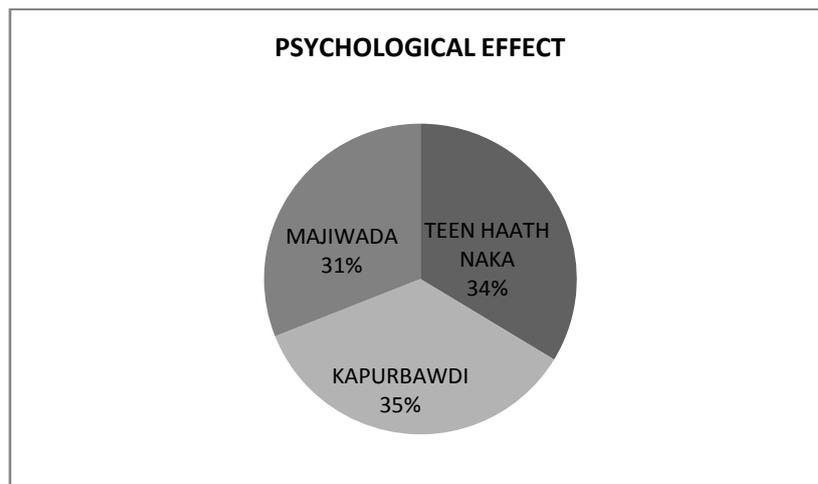
Volume/Capacity	TEEN HAATH NAKA		
	KAPURBAWDI	MAJIWADA	
DAY	0.4	0.3	1.8
NIGHT	0.6	0.6	1.6



**ANALYSIS**

1. Noise pollution levels are higher than the prescribed values during the peak hours from 8.00 to 10.am and 7.00 pm to 10.pm at all locations
2. The noise levels exceeds the permissible level at all locations by 1.5 times
3. Majiwada turns out to be highest in all scores - contributors to noise pollution.
4. Majiwada has more volume of vehicles than its capacity also.





5. Health effects- physiological and psychological were studied with questionnaire survey.
6. Physiological Effect of Noise pollution is seen at Majiwada 45%, Teen Haath Naka- 24%, and Kapurbawdi- 31%
7. Psychological Effect of Noise pollution is seen at Majiwada 31%, Teen Haath Naka- 34%, and Kapurbawdi- 35%

### **Observations**

While collecting the readings, some observations were made. They are as follows:

The trees which act as buffer zone for noise mitigation were less in number.

The structures along the tracks were road facing thus inviting more noise indoor.

It is not only the honk that creates noise, but, fights, talks, hawkers, etc. also contribute to the noise.

### **Results and Discussions**

From the study, it can be concluded that noise pollution does exist in the city of Thane. Transportation or traffic noise especially, is not a negligible factor and thus needs to be taken care of. Special care needs to be taken particularly in the cases where there are hospitals and educational institutes. This hinders early recovery and concentration respectively. The study highlights upon the spatial and temporal facets of noise pollution in Mumbai. It shows that, there is much temporal difference, and also a considerable spatial difference in the levels of noise in the city.

Noise pollution limits are being breached in India's cities and the violations are the worst in Mumbai, a Central Pollution Control Board (CPCB) analysis has found.

Delhi is the fourth noisiest Indian city, while Bengaluru and Kolkata have seen the fewest violations of noise rules.

In Mumbai, Navi Mumbai and Thane, all stations show prescribed norms to have been exceeded and four stations installed at Vashi Hospital, Bandra and at the Maharashtra Pollution Control Board headquarters showed 100% exceedance of the prescribed limits, noted the analysis released last week.

The Noise Pollution (Regulation and Control) Rules, 2000, were last amended in January 2010 to reduce noise levels at night and from public address systems.

The government is now working on devising new noise pollution standards ([www.mintne.ws/1POYKF8](http://www.mintne.ws/1POYKF8)).

Activists said the implementation of rules holds the key to reducing noise pollution.

“Even though we have started noise pollution monitoring in some cities, there are no city-wise noise pollution mitigation plans. So, most of the time, the focus is on specific sources that need to be addressed, like loudspeakers and firecrackers. But there is absolutely no clarity on monitoring ambient noise levels 24X7, like what we do with air quality. Thus, now is the time for the state pollution control boards to come up with that kind of planning. In addition, we also need to assess the current noise standards from the different sources of noise such as vehicles,” said Anumita Roy Chowdhury, executive director, research and advocacy, at Delhi-based Centre for Science and Environment, an environmental organization.

### **Conclusion**

As a society, our history is filled with failures to recognize the agents that cause disease; once the causes have been recognized, we have responded reluctantly, slowly, and often inadequately.

Noise represents an important public health problem that can lead to hearing loss, sleep disruption, cardiovascular disease, social handicaps, reduced productivity, impaired teaching and learning, absenteeism, increased drug use, and accidents. It can impair the ability to enjoy one's property and leisure time and increases the frequency of antisocial behavior. Noise adversely affects general health and well-being in the same way as does chronic stress. It adversely affects future generations by degrading residential, social, and learning environments with corresponding economic losses. Local control of noise has not been successful in most places. This points out the need for improved methods of local control that

should include public education, enlightened legislation, and active enforcement of noise ordinances by local law enforcement officials.

### **Recommendations**

After the study, following can be recommended:

1. The number of trees all along the roads and in the campuses of the buildings must be increased.
2. The material used for construction may include some sound proof ingredients.
3. A Decibel Meter can be installed at major junctions. This will help timely monitoring of noise levels and will help to reduce the same.
4. Construction of soundproof rooms for noisy machines in industrial and manufacturing installations must be encouraged. This is also important for residential building—noisy machines should be installed far from sleeping and living rooms, like in a basement or garage.
5. Use of horns with jarring sounds, motorbikes with damaged exhaust pipes, noisy trucks to be banned.
6. Noise producing industries, airports, bus and transport terminals and railway stations to be sighted far from where living places.
7. Community law enforcers should check the misuse of loudspeakers, worshippers, outdoor parties and discos, as well as public announcements systems.
8. Community laws must silence zones near schools / colleges, hospitals etc.
9. Vegetation (trees) along roads and in residential areas is a good way to reduce noise pollution as they absorb sound.
10. There should be proper planning so as to avoid noise pollution in the city.

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