

STUDY OF NOISE POLLUTION FOR HEAVY TRAFFIC ZONES OF AHMEDABAD AND ITS MITIGATION STRATEGIES

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Abstract: As vehicular population increases in Ahmedabad city the sound of environmental pollution is getting louder in terms of Air and Noise. If we will focus on Noise factor, Unnecessary Honking becomes the irritating clause for the surrounding. This paper gives a predictive study of noise pollution due to heavy traffic congestion and strategies to overcome or reduce the noise effects to defined study areas. Noise survey has been done at regular and heavy traffic zones of the Ahmedabad City and various undefined strategies have been defined in the paper. This study also reflects the criticality of the situations at the traffic congested areas and effective control measures to be taken.

Index Terms—Noise pollution, Traffic, Mitigation Aspects

I. INTRODUCTION

Sound that is unnecessary or disrupts the surrounding called as noise. If the uncertainty of noise in the environment is beyond the limit, it is termed as noise pollution. Sound becomes annoying when it disturbs the activities in our day to day life. World Health Organization- WHO (Report 2001) declared that noise must be recognized as a major threat to human being. The urban environmental excellence of developing countries is deteriorating at drastic level, which includes air, water and noise pollution. This noise pollution recognized as a new threat to the inhabitants of the environment. Noise pollution is increased by an unlimited increase in use of vehicles, infrastructure, and population. Consequently, the gradually increase in intensity of vehicular traffic noise level due to the population has degraded urban quality of life. Vehicular traffic noise becomes the toughest challenge for urban planners and environmental engineers to easymise the road traffic noise in the urban areas. Continuous high threshold noise may cause serious stress on the auditory and non-auditory, and nervous system of the city dwellers. It is also causes of greater annoyance for the crowd due to the poor conditions of engine, exhaust etc. In addition, various studies have been carried out on vehicular traffic pollution, which fertile severe health problems such as, irritation, physical and psychological, hypertension, human performance and actions, tiredness, headache, heart problems. The effects of noise pollution have been studied on humans, animals and plants and buildings and various adverse effects have been iterated. Noise should be the major parameter that should be considered while designing and constructing the updated transportation systems, also improvements is to be made to existing systems. In favour to that, local government authorities and environmentalists state the importance of monitoring trends in noise pollution when establishing the mitigating aspects. As present, there is striking need to measure and model noise pollution.

Managing noise of surrounding is hectic for enhancing the living conditions of dwelling. Noises are transmitted through building formations from sound sources like vehicular or foot traffic, objects being fallen on floor and can be related with vibrations.

CAUSES& EFFECTS OF NOISE POLLUTION

1. Industrialization: Most of the industries are using large scale machines which are the cause of generation of large amount of noise. Also, various machine parts such as air compressors, no maintained generators, exhaust fans in chimneys, grinding mills also contributing in.
2. Poor Urban Planning: In most of the developing countries, fortuneless urban planning also acts a major role. Congested housing, large size families sharing small space, disputes for the less parking space, and frequent quarrel over basic amenities leads to noise pollution which disrupting the environment of the surrounding.
3. Social Events: Noise is at its crest in many of the social events like marriage, parties, pub & disc or place of worship, people normally mock rules given by the local administration and create nuisance in the area. Involved public runs songs at high volume.

4. Transportation: Quantified number of aeroplanes, Road vehicles, and underground transportation system generates high threshold noise and surrounding gets difficult to accustom with that.

5. Construction Activities: Ongoing construction activities at larger scale such as mining, construction of bridges, dams, buildings, roads and flyovers etc... take place in almost every part of the world. At down the point is that these construction equipments are also too noisy.

6. Household Chores: As current crowd is surrounded by many electronic gadgets and use them extensively in daily life. Electronic gadgets like washing machine with dryer, mobile, mixer grinder, pressure cooker, Television, vacuum cleaners, cooler, and air conditioners are major contributors to the large amount of noise being generated also it affects the quality of life of your neighborhood adversely.

There are many effects of noise pollution such as;

Continuous exposure to loud levels of noise can easily result in the damage of ear drums and loss of hearing. It also reduces sensitivity to sounds that ears catches unconsciously to regulate body's movement. Major exposure to in working areas such as construction sites, bars and even in house which are heaving larger amount of noise levels can influence psychological health. Studies indicate that constant stress, disturbance in sleep, fatigue and hypertension, occurrence of aggressive behavior can be chained to excessive noise levels. These can cause more severe and chronically health issues post life.

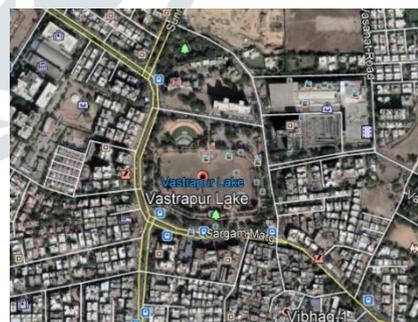
Communication gaps: High decibel noise can make communication gap between persons communicating each other. This may lead to misunderstanding and you may get difficult understanding the other person.

Cardiovascular Diseases: Blood pressure levels and stress related heart problems are on the rise.

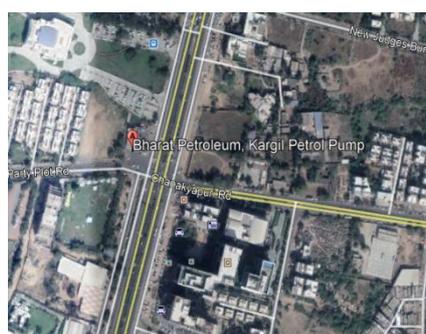
Effect on Wildlife: Wildlife defenses far more problems due to noise pollution since they are more dependent on sound. Animals blessed with an incredible sense of listening than humans; since their survival depends on it. Pets react more effectively and aggressively in households where there is constant disturbing noise. By nature, due to heavy exposure to noisy areas animals may suffer from hearing loss, which makes them easy prey and leads to dwindling populations. Other faces difficulties in hunting which somehow disturbs the balance of the eco-system.

PROPOSED STUDY AREA:

According to the frequent traffic congestion; major three study area has been defined. These are densely populated and major land use junctions.



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SURVEY AND DATA COLLECTION:

The proposed study areas are having denser traffic comparative to the other city areas. Sound Level Meter - P5055 was used to get the accurate readings. Survey had been conducted on above mentioned three study areas during weekend (Sunday) and week start (Monday). Data collection was done during peak hours and off peak hours; three times a day that is Morning (8:00 – 9:00 A.M), afternoon (1:00 – 2:00 P.M) & Evening (6:00 – 7:00 P.M) at the interval of every 10 minutes. Readings at maximum hold was noted for the duration of 1 hour.

OBSERVATIONS:

During survey many observations had been noted down which was causing interference in the traffic and while loading the reading in instrument such as, Bursting noise of engine of auto rickshaw, Bullet vehicle passing just near by the instrument, Nuisance of Heavy duty vehicles (HDVs) during maximum hold, Road and Tire friction, Whistling of traffic police, etc.

RESULTS & ANALYSIS: The following results had been obtained from the study.

Table 1 Noise analysis at defined study areas

STUDY AREA	SUNDAY			MONDAY		
	MORNING (dB)	AFTERNOON (dB)	EVENING (dB)	MORNING (dB)	AFTERNOON (dB)	EVENING (dB)
AKHBARNAGAR	90.81	93.11	95.03	94.06	87.25	87.30
KARGIL CHOWK	95.85	92.45	92.68	95.88	93.08	96.46
VASTRAPUR	87.85	91.20	95.45	85.76	82.36	88.23

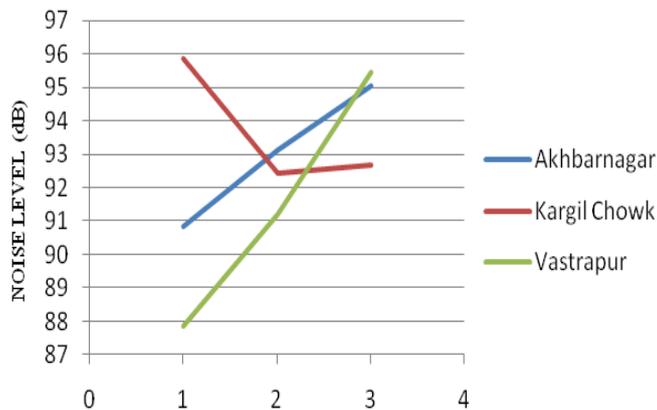


Figure 1 Comparative representation of noise level at different study areas on weekend (Sunday)

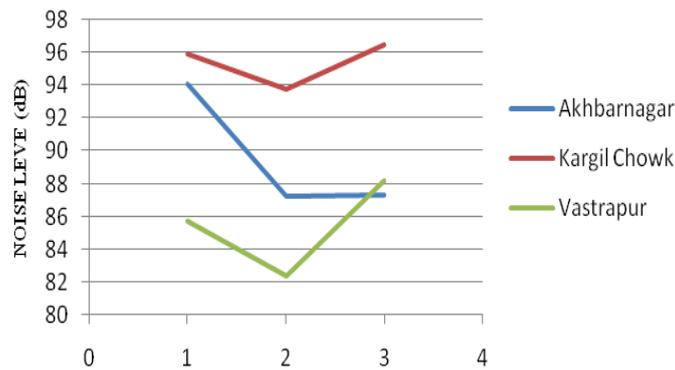


Figure 2 Comparative representation of noise level at different study areas on weekstart (Monday)

MITIGATION STRATEGIES / CONCLUSION

As the most common greenery at every household level is of ashoka tree (*Polyalthias longifolia*), it is the most effective to absorb the noise of all surroundings. Further studies can be done using this. The most visually appealing way to block noise is with a dense growth of plants. Noise blocking plants are especially useful in urban areas where refracted noise from hard surfaces, such as buildings and pavement, are problematic. An advantage to using plants as noise blockers is that they absorb sounds best in the high frequencies that people find most annoying. Let's take a closer look at using noise reducing plants. Attractive trees are the best for the effective absorbance of noise.

Evergreen shrubs make the best plants for noise because they provide year-round noise reduction. Broadleaf evergreens are more effective than narrow-leaf plants and conifers. Choose trees and shrubs with dense branches that reach all the way to the ground. Plants, such as hollies and junipers that have thick branches at ground level provide excellent noise reduction. Additionally, a solid wall is more effective at blocking noise than plants. Combine form and function by using plants along a wall.

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