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"ANALYSIS NOISE POLLUTION DUE TO TRAFFIC IN VADODARA CITY"

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Abstract*: Noise pollution may be defined as the state of discomfort and restlessness caused to humans by unwanted high intensity sound. Due to rapid growth in pollution there is a fast growth in vehicles, and change in the travel pattern. Road traffic is a complete system which wide comprises of varieties of road user, vehicle and environment interact the congestion of road intersections is due to motorization from & increase in single occupancy vehicle. The study is carried out to understand the noise and traffic pattern in the city. Therefore proper planning of road is required to be done & proper laws should be available. The study area was select busy urban street of Vadodara city has twelve wards out of which is very highly densely populated is selected for the study to know the impact due to noise pollution also a study is made to residential, industrial, commentarial & silence zone area and result are described in this following chapters & conclusions.*

Key Words: sound level meter, traffic, noise pollution, road pattern, decibel scale.

1: INTRODUCTION

1.1 General Introduction:

India is the second most populated country in the world with more than 125 million populations. India is one of the most developing countries in southern Asia. The rapid growth of urbanization and rise of megacities with many millions of inhabitants cause tremendous challenges to the developing countries with global economic growth and development has leaded India to go under high urbanization in last some decades. The growth of population has tremendous demand for infrastructure. One side government promoting to use of public transport like Bus, Metro, Rail etc., and other side constructing Flyovers and Express ways. In between this trend the city area are going to increased more and more with causing a high noise. Even transport planning provide restriction for the noise but it ignores by the vehicle users. It becomes very harmful for the residential areas. There is hardly any effort to make resident life safe, comfortable, convenient and enjoyable.

The environmental rule for traffic says that unpleasant sound must be avoided in the residential and educational area. Every person has to right in leave peace and calm full environment. So planner has to provide extensive planning within their cities. However, completely opposite is happening now days and residents needs are neglected. In urban areas, a significant proportion of noise is high. Moreover, every vehicle movement in city area are creates production of unpleasant sound. Also due to higher in density the intensity of sound increases rapidly. As it also increase with the traffic. In the last decade both vehicular and pedestrian traffic in most of the major cities in India have increased exponentially. This has created major traffic bottle necks along arterial roads, especially at major intersections. This phenomenon leads the unwanted sound

and reduces the livable condition for the people in those areas. The broad objectives for the study are shown below.

1.2 Introduction Of Traffic Noise : Due to rapid urbanization of Vadodara city there is huge increase of vehicular traffic and transportation demand so there is a change in travel pattern Resulting the need & control and to regulate noise pollution the ministry of environment and forest government of India have notified noise level standard and guidelines rules 1986 grown as noise pollution act 2000.

Important Facts Of Noise Generation :-

- Due to motorcycles and scooter
- Due to large horsepower of diesel engines
- Due to old vehicles

2: OBJECTIVE

2.1 Objective

Objective of project or study outline of the project.

To Noise survey in the different wards or land uses.

To study noise peaks due to traffic road in morning to evening .

To carry out noise survey and their level of intensity.

To setup relationship between traffic intensity and noise.

To find out most noise able area for the city.

To find noise pollution level in CBD i.e. ward no-1 area in heart of city it comprises of Commercial area, residential area, and silent zone. It comprised of Padmavati shopping centre, bhadra kacheri, jubeli baug New bazaar mandavi, Mangal bazaar , Pani gate Darwaza, Nyay Mandir, Sursagar.

Establish a model for the survey data.

3: LITERATURE REVIEW

3.1 Sound: The word "sound" is derived from the Latin word "sinus". Sounds are mechanic waves of pressure that are transmitted through solid, liquid, gas or plasma. The matter that supports the sound are known as medium, however sound cannot travel through vacuum.

3.2 Noise: Noise pollution may be defined as the state of discomfort and restlessness caused to humans by unwanted high intensity sound known as noise.It can be defined as any unwanted electromagnetic signal that produces displeasing effect and which interferes with human, communication, comfort and health.It is unwanted sound, dumped into the environment, without regard to the adverse effect, it may have.

3.2.1 Noise Categories: Noise may be descried as sound without agreeable quality, or as an unwanted or undesired sound. It is evident from this description that even a pure musical tone may be perceived as noise if it s very high or very loud.

In actual practice, a noise rarely consists of a single frequency. Usually it is a combination of a number of frequencies. Such a noise is commonly classified into the following two categories:

1. Wide-band noise (comprising a wide range of frequencies)
2. Narrow-band noise(incorporating only a few frequencies)

3.2.2 Prevention And Control Of Noise Pollution

It is, however, impossible to have a total elimination of annoying sound. Noise pollution can however be minimized by taking the following important measures

A. Reduction of noise at source.
B. Reduction of path of sound propagation.
C. Duration of noise exposure etc.

The sounds that generated and transmitted in air directly to human ear are called air borne sounds. The air borne noise possesses less power, continuous for long duration and is confined to places near the origin.

3.2.2.1 Hearing Mechanism: Sound is a form of energy, consisting of wave motion. It requires medium like gas, liquid or solid for propagation. Sound waves travel through the medium from the source where the sound is produced to the recipient. Sound waves consist of variations in oscillations of medium in which they travel. The rate of oscillation is called frequency of sound. It is measured in cycles/ second or hertz.

The human ear consist of three parts

The outer, middle and inner ear as shown in figure:

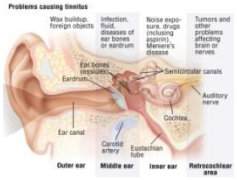

Fig 3.1 Three parts of human ear

Outer Ear: The outer ear includes the pinna , the visible part of the ear, as well as the ear canal which terminates at the eardrum, also knows the tympanic membrane. The pinna serves focus sound waves through the ear canal toward the eardrum. Because of the asymmetrical character of the outer ear of most mammals, sound is filtered differently on its way into the ear depending on what vertical location it is coming from. The eardrum is an airtight membrane, and when sound waves arrive there, they cause it to vibrate following the wave form of the sound.

1) **Middle Ear: The middle ear consists of a small air-filled chamber that is located medial to the eardrum. They aid in the transmission of the vibrations from the eardrum to the inner ear. While the middle ear may seem unnecessarily complex, the purpose of its unique construction is to overcome the impedance mismatch between air and water, by providing impedance matching. Also located in the middle ear are the stupendous and tensor tympani muscles which protect the hearing mechanism through a stiffening reflex.**

2) **Inner Ear: The inner ear consists of the cochlea, which is a spiral-shaped, fluid-filled tube. It is divided lengthwise by the organ of coati, which is the main organ of mechanical to neural to neural transduction. Inside the organ of Coati is the basilar membrane, a structure that vibrates when waves from the middle ear propagate through the cochlear fluid endolvmph. The basilar membrane is ton topic, so that each frequency has a characteristic place of resonance along it. Characteristic frequencies are high at the basal entrance to the cochlea, and low at the apex. Basilar membrane motion causes depolarization of the hair cells, specialized auditory receptors located within the organ of Coati.**

3.3 Typical Features Of Digital Sound Level Meter

- **Metravi Sl-4005 User's Manual Sound Level Meter**

Fig 3.2 sound level meter

3.3.1 Noise Control: The noise pollution can be controlled at the source of generation itself by employing techniques like: reducing the noise levels from domestic section sectors and maintenance of auto mobiles.

Control Of Other Types Of Noises: Our home environment is also full of noise. Ex : TV ,vcr, cleaning and washing operation, games, garbage disposal etc, create noise ranging from 75db to even 120db. * Construction noise must be controlled by local ordinance. Town and country planning aid in the reduction of transmission of noise. * Medical colleges and other research laboratories must take up the study of injurious effects of noise and control of noise pollution.

4 Methodology

4.1 Survey Images :

CONCLUSIONS: It is observed from the study that, the noise levels were exceeding the permissible limit during the months December to march 2016. From ward wise study of the noise level of vadodara city it was observed city it was observed that ward 1 is having maximum noise level observed Lmax=79.1db(A),Lmin=56.3db(A)

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