

STUDY OF TRAFFIC NOISE POLLUTION: A CASE STUDY OF ANAND CITY

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ABSTRACT

The major contribution of the traffic noise, towards overall noise scenario, is a well known established fact. Traffic noise from roadways creates problems like effects on life quality and health including increased risk of hypertension, sleep disturbance, hearing problems etc. for surrounding areas, especially when there are high traffic volumes. Vehicular traffic noise problem is contributed by various kinds of vehicles like heavy, medium trucks/buses, automobiles and two wheelers, rickshaws.

The present study work indicates that Anand city suffering from noise pollution as compared to standard stipulated by Central Pollution Control Board (CPCB), New Delhi. The main sources of noise pollution in Anand city due to transportation activities. For this purpose present study was carried out at 3 different locations of Bhalej Road, Anand with use Sound Level Meter (SL-1350) to assess the day sound level in Anand City. A large number of sets of data were recorded for 15 minutes duration at different dates in a random manner.

Keyword: - Noise pollution, source of noise, Traffic noise, Traffic noise effects

1. INTRODUCTION

Traffic is generally defined as the movement of people, goods or vehicles between spatially separated points, and thus includes pedestrians and all types of vehicles mechanized, motorized or non motorized. Today man and his transport vehicles occupy a large share of the urban space. Traffic congestions, air pollution and noise pollution and the resultant ill effects and frustration have become the order of the day. The demand for traffic survey and analysis is likely to increase for future development of Transport Network. Traffic noise exposure is not a new phenomenon. Today traffic noise is much more intense and an increasing problem in urban areas worldwide.

New associations between traffic noise exposure at the residence and various types of health effects have been established. These effects include interference with speech communication, disturbance of rest and sleep. Effects on residential behavior, hospital patients etc. and annoyance as well as interference with intended activities. "Noise pollution is unwanted human created sound that has the effect of being annoying, distracting, painful, or physically harmful. The word noise comes from the Latin word nausea meaning seasickness." A form and level of environmental sound that is generally considered likely to annoy, distract or even harm other people. Most industrial plants and transportation vehicles operated by a business located near a residential area will need to be respectful of others residing within earshot regarding their production of noise pollution, also called sound pollution. Traffic noise is the collective sound energy emanating from motor vehicles. It consists chiefly of road surface, tyre, engine/transmission, aerodynamic, and braking elements. In developed and developing countries, roadway noise contributes a proportionately large share of the total societal noise pollution. It including air traffic, road traffic, and sea shore and inland water traffic amount and type of noise produced by traffic is largely dependent upon type of traffic.

2. EFFECTS OF TRAFFIC NOISE ON HUMAN BEINGS

Traffic Noise is considered a serious threat to the health. Some of the adverse effects of traffic noise pollution are given below:

1. It interferes in communication with speech. In the presence of noise we may not be able to listen, what the other person is saying.
2. Traffic Noise leads to behavioral stress. A person may feel disturbed in the presence of loud noise such as produced by beating of drums.
3. Traffic Noise may cause damage hearing. A sudden loud noise can cause severe damage to the eardrum. Mostly shows this effect on 60 year above people.
4. Traffic Noise increases the chances of occurrence of diseases such as headache, blood pressure, heart failure, etc.
5. Noise is a problem especially for patients who need rest.
6. Traffic Noise may cause sleep disturbance during night. Mostly traffic cause near to residential area or Hospitals etc

2.1 SOURCE OF TRAFFIC NOISE

Table- 1 Major source of traffic noise

Vehicle Sources	Non- Vehicle Sources
Engine	Traffic conditions
Exhaust	Road type and condition
Tire/ Road Interaction	Site condition
Aerodynamic effects	Other infrastructures
Air intake and cooling fan	Weather and climate

3. STUDY AREA PROFIL

Anand is a city in the Indian state of Gujarat. Anand is known as the Milk Capital of India. It became famous for Amul dairy and its milk revolution. This city hosts the National Dairy Development Board of India and Anand Agricultural University. Vallabh Vidhyanagar and Karamsad, an educational suburb of Anand is located within Anand urban agglomeration. Anand is located between Ahmedabad and Vadodara on the Western Railway, 101 km from state capital Gandhinagar. It is a railway Junction and a Broad Gauge Line from here runs to Godhra, covering Dakor, a major Hindu pilgrimage en route. The National Express highway from Ahmedabad to Vadodara also passes through Anand. Anand city situated in Kheda, Gujarat, India, its geographical coordinates are 22° 34' 0" North, 72° 56' 0" East and its original name (with diacritics) is Anand. In the year 1901 the population of the city was around 10,010 and at present it is 1,98,282. (As shown in Chart-1)

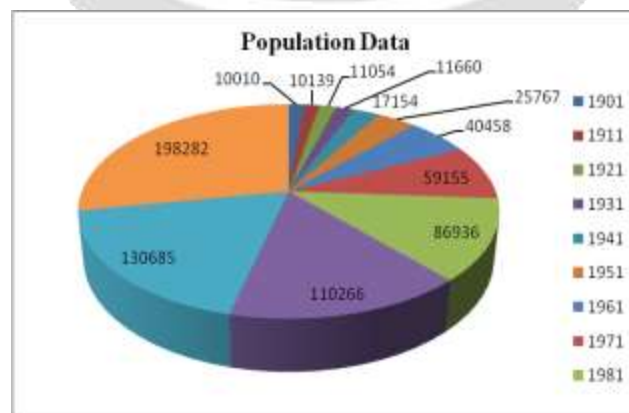


Chart -1 Centennial population growth of Anand City

4 VEHICULAR GROWTH OF ANAND CITY

The rate of growth of vehicle registrations will be increases day by day. Increase in population its cause increase of vehicles also. One possible reason for this was that the number of vehicles per household was approaching saturation there are only many vehicles that anand city households need or want. At the time of 2004-2005, there were just 2309 vehicles in the anand city. By 2014-2015 the numbers of vehicles increase are 45440 vehicles are registered by the RTO Anand. Below table 2 shows the numbers of total register vehicles during the year or time of 2004-2005 to 2015-2016.

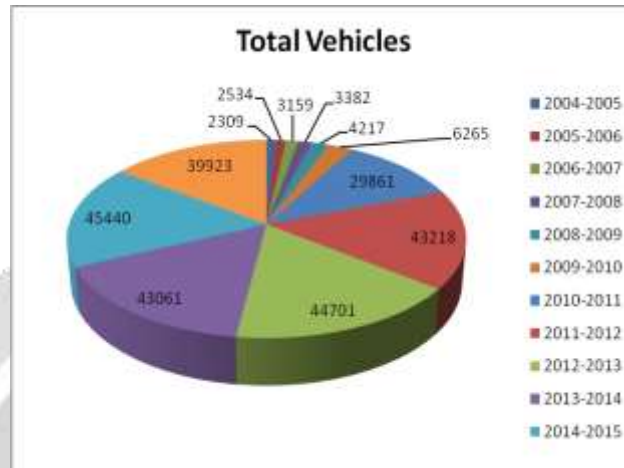


Chart-2 Vehicular Growth of Anand City

5 MATERIALS AND METHODOLOGY

The sound level meter used for this study was model no SL-1350. The step wise procedure followed in the study has been illustrated below.

Profile of the road and its surroundings was prepared i.e. length of road, median height; breadth of median, open space along the road. Traffic noise effects on human beings in the Anand city.

The noise levels were measured at rush hours (8AM-8PM). The readings were taken on 3 major places of Bhalej Road-Anand city viz. (I) Mahendra Shah Hospital (ii) New Bus Stand (iii) Grid Choked. The readings were taken at an interval of 1.5kma total 96 readings (48 on each side) were taken on 1 place. Following this procedure a total of 288 readings were taken on the three places.

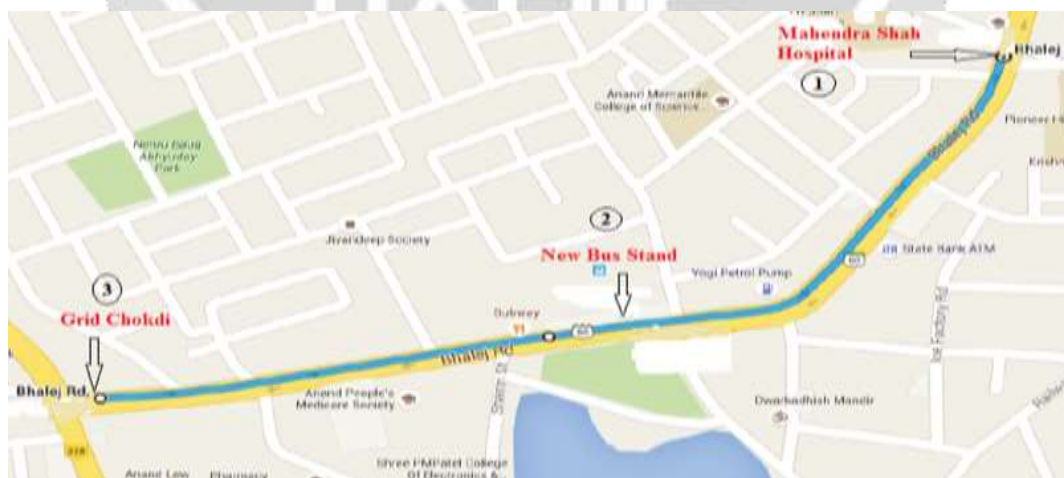


Chart- 3 Map of study area

5.1 Result

Maximum noise was observed on Bhalej road , the reason for this that on this road way many business and educational activities take place in addition to that big shopping centers and hospitals are located. Average noise is highest on bhalej road due to educations and their related to traffic movement. On all study of this three places the maximum noise limits were ranging between (82-100.8) db. The minimum noise level values were ranging between (65-79) db. Chart 4 shows the various noise data.

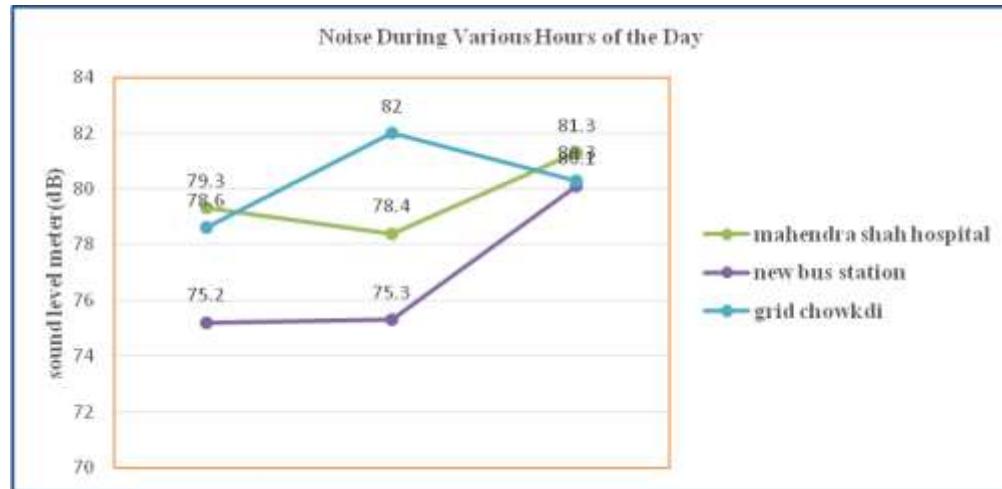


Chart- 4 Noise level data

4. CONCLUSIONS

The study revealed that noise level reached an alarming level in Bhalej road anand city. Traffic noise found to be interfering with daily activities. To reduced noise pollution servable measure can be implemented such as proper maintenance of road and vehicles, proper cheking of vehicles, poor and old vehicles should be banned and plantation of trees.

- The noise level increases with increased total number of vehicles.
- The noise level increases with increase in speed of vehicles.
- The noise level decreases with increased atmospheric temperature.
- The noise level decreases with increased surface temperature.
- The noise level increases with increased humidity..

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