

# Noise Mapping as a Method for Depicting Industrial and Commercial Noise Pollution

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## **ABSTRACT:**

India is leading to vehicles overcrowding as the number of vehicles are increasing manifolds day by day. The World Health Organization (WHO) has classified traffic noise, including road, rail and air traffic, as the second most important cause of ill health. This project comprises a survey about the noise pollution in industrial and commercial areas of Chandigarh. The levels of noise pollution were measured seven times in a day. In Industrial area, it was found that the noise levels were beyond the prescribed limit from 8am to 2pm. On the contrary, the commercial area showed the noise level exceeding the prescribed limit during the whole day. The study indicated if the effective steps are not taken, the noise levels will cross the limits in the near future, severely affecting the city.

**Keywords:** Noise, Health, Commercial, Industrial.

## **INTRODUCTION**

Industrial and commercial activities play a vital role in driving economic growth and development, but they often come at a cost to the environment and public health. One such cost is the pervasive issue of noise pollution, which arises from a myriad of sources in industrial and commercial settings. Noise comes devastatingly from the on-road vehicles in urban areas. Noises can be continuous or irregular. The Number of vehicles is increasing day by day in India. The World Health Organization (WHO) has classified traffic noise, including road, rail and air traffic, as the second most important cause of ill health in Western Europe, behind only air pollution caused by very fine particulate matter. In the European Union (EU), problems with noise pollution have often been given similar concern ratings as those for global warming. Traffic noise was ranked second among the selected environmental stressors evaluated in terms of their public health impact in six European countries (WHO and JRC, 2011, Hanninen et al., 2014 and WHO 2018). Awareness among the general public about noise pollution as an environmental issue should be the priority of every nation. Under the Noise Pollution (Regulation and Control) Rules, 2000, the CPCB provides noise norms for four different types of zones - industrial, commercial, residential and silence. Industrial zones are allowed 75 decibels noise during daytime and 70 decibels during the night. Commercial zones can be 65 decibels loud during the day and 55 decibels at night. According to standards set by the Bureau of Indian Standards, 125 decibels is the maximum limit for horns used in commercial vehicles, while 105 decibels is the maximum limit for two wheelers. In India, few studies on traffic noise level have been carried out. CSE (Centre for Science and Environment) researchers say: "India lacks monitoring capacity – and therefore, data - on noise - controlling noise must be part of this endeavor.

## **METHODOLOGY**

This project comprises a survey about the noise pollution in industrial and commercial areas of Chandigarh. The objective of the study is to report the existing status of noise levels in the study area by recording the noise intensity at various locations. Noise levels were measured systematically in different areas (sector-wise as the city is divided into sectors) with Sound Level Meter. At each spot, the measurements were taken at an interval of 2- hours during daytime (8 AM–8 PM). During the measurements in a particular slot, the average of 5 frequent readings noted at a pause of 5 minutes. The average is taken as the representative of the noise level of that slot. Chandigarh Administration in exercise of powers conferred under sub rule (2) of rule (3) read with clause (b) of rule 2 of the Noise Pollution (Regulation & Control Rules) 2000 has categorize the area of the UT Chandigarh into industrial commercial, residential or silence areas/zones.

As per schedule of the above rules Ambient Air Quality Standards in respect of Noise in different areas is as below.

Category of Area	Locations in Chandigarh	Limit in dB (A)	
		Day Time	Night Time
Industrial area	Industrial Area of Chandigarh comprising of Industrial Area Phase-I and Industrial Area Phase-II. Industrial Area Phase -I bounded by Madhya Marg on the North, Purv Marg on the West, Chandigarh-Ambala road on the South and Sukhna Choe in the East. Industrial Area Phase -II bounded by Chandigarh-Ambala road in the North, Purv Marg in the West, road to 3 BRD in the South and land reserved for Chandigarh-Ludhiana railway line in the East.	75	70
Commercial Area	Commercial Areas comprising of the City Centre-Sector 17, Sub City Centre-Sector 34-A and B, proposed Sub City Centre-Sector 43-C and D, Motor Market of Manimajra & Shopping Complex around Bus Stand.	65	55

- Day time shall mean from 6.00 a.m. to 10.00 p.m.
- Night time shall mean from 10.00 p.m. to 6.00 a.m.
- Loud speaker or a public address system should not be used except after obtaining written permission from authority. A loud speaker or public address system shall not be used at night (between 10.00 p.m. to 6.00 a.m.) except in closed places – Houses, Auditoriums etc.

**RESULTS AND DISCUSSION**

In India, vehicle population is increasing at an alarming rate, population of cities are facing severe environmental problems from road traffic. Noise from road traffic is major source of environmental pollution.

**Analysis of Observed Data:**

Noise levels were measured in following areas (Table A).

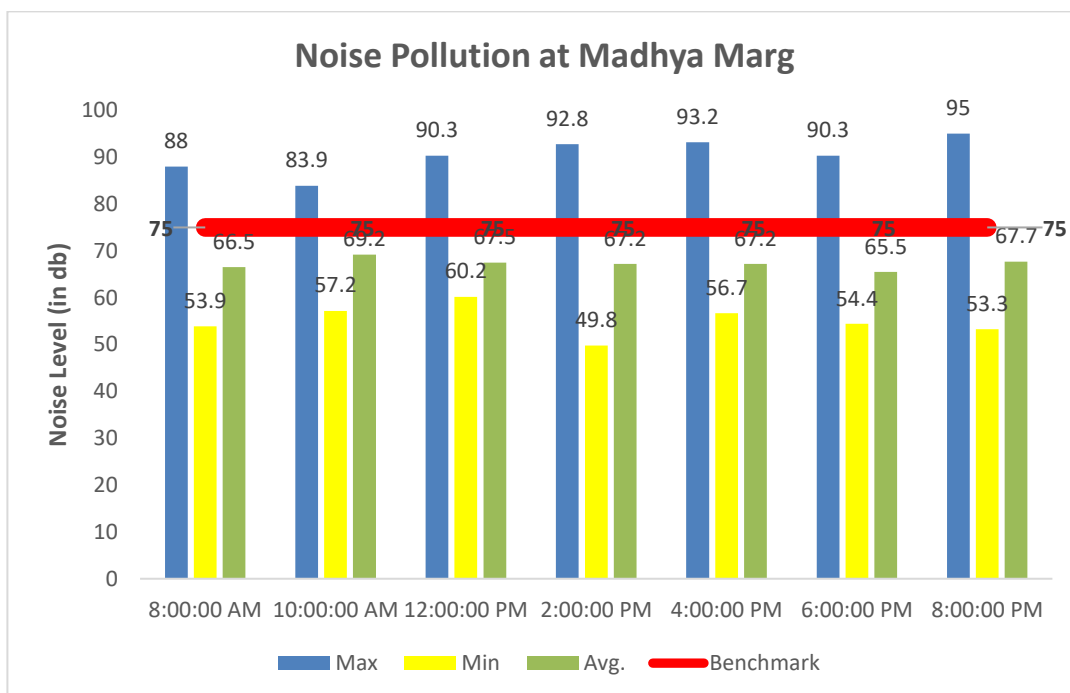
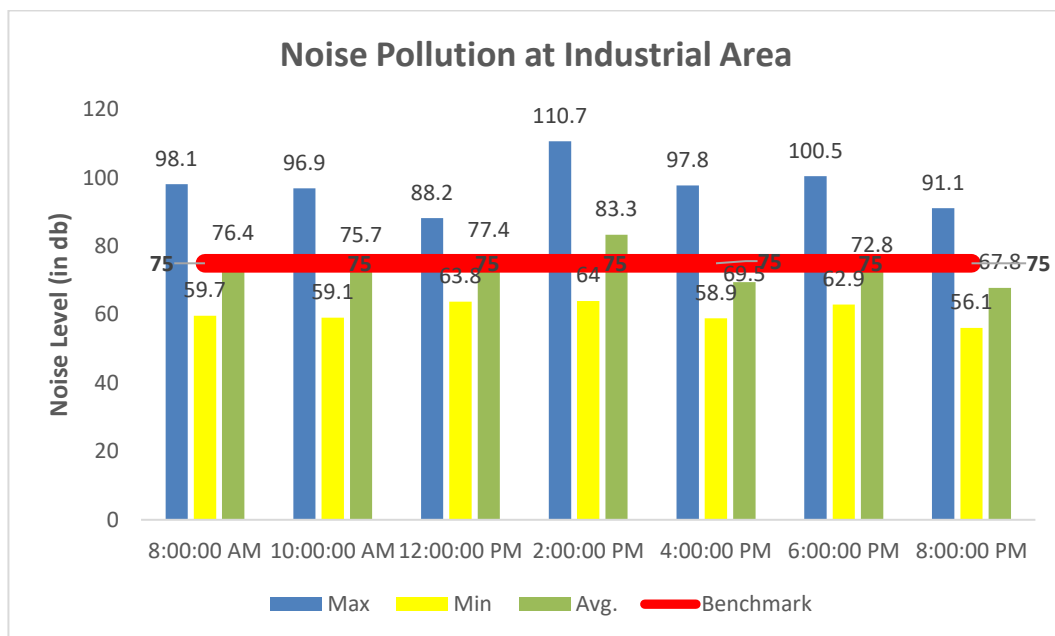
Category of Area	No. of Locations covered	Name of Locations	Total Shifts Monitored
Industrial area	2	Industrial Area Phase	7
		Madhya Marg	7
Commercial Area	2	Sector 17	7
		Sector 43	7

**Noise Levels in Industrial Areas:**

Levels of noise pollution were measured seven times in a day. In Industrial area Phase-I, it was found that the noise levels were beyond the prescribed limit from 8.00 to 2.00. The values lie in the prescribed limit from 4.00 pm to 8.00 pm.

In case of Madhya Marg, sector 26, noise levels remained in limits but maximum levels vary during time.

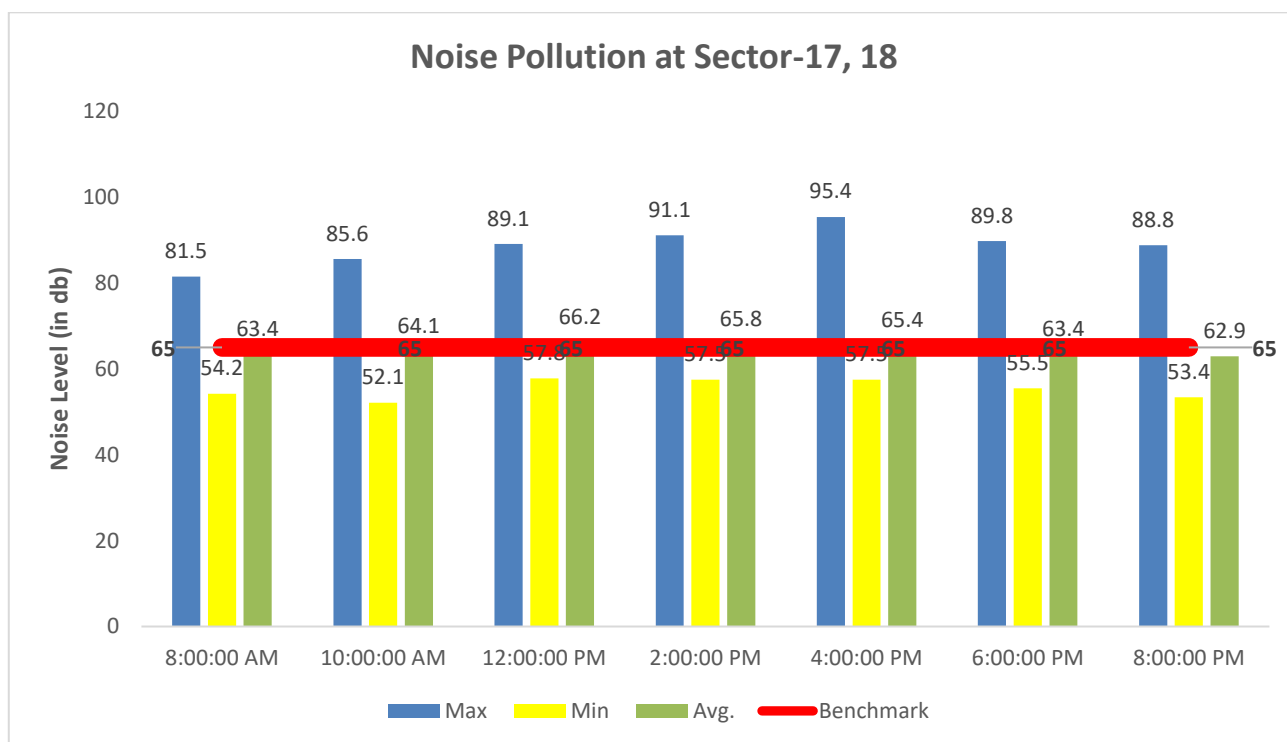
INDUSTRIAL AREA			MADYA MARG		
8.00	MAX	98.1	8.00	MAX	88
	MIN	59.7		MIN	53.9
	AV.	76.4		AV.	66.5
10.00	MAX	96.9	10.00	MAX	83.9
	MIN	59.1		MIN	57.2
	AV.	75.7		AV.	69.2
12.00	MAX	88.2	12.00	MAX	90.3
	MIN	63.8		MIN	60.2
	AV.	77.4		AV.	67.5
2.00	MAX	110.7	2.00	MAX	92.8
	MIN	64.0		MIN	49.8
	AV.	83.3		AV.	67.2
4.00	MAX	97.8	4.00	MAX	93.2
	MIN	58.9		MIN	56.7
	AV.	69.5		AV.	67.2
6.00	MAX	100.5	6.00	MAX	90.3
	MIN	62.9		MIN	54.4
	AV.	72.8		AV.	65.5
8.00	MAX	91.1	8.00	MAX	95.0
	MIN	56.1		MIN	53.3
	AV.	67.8		AV.	67.7

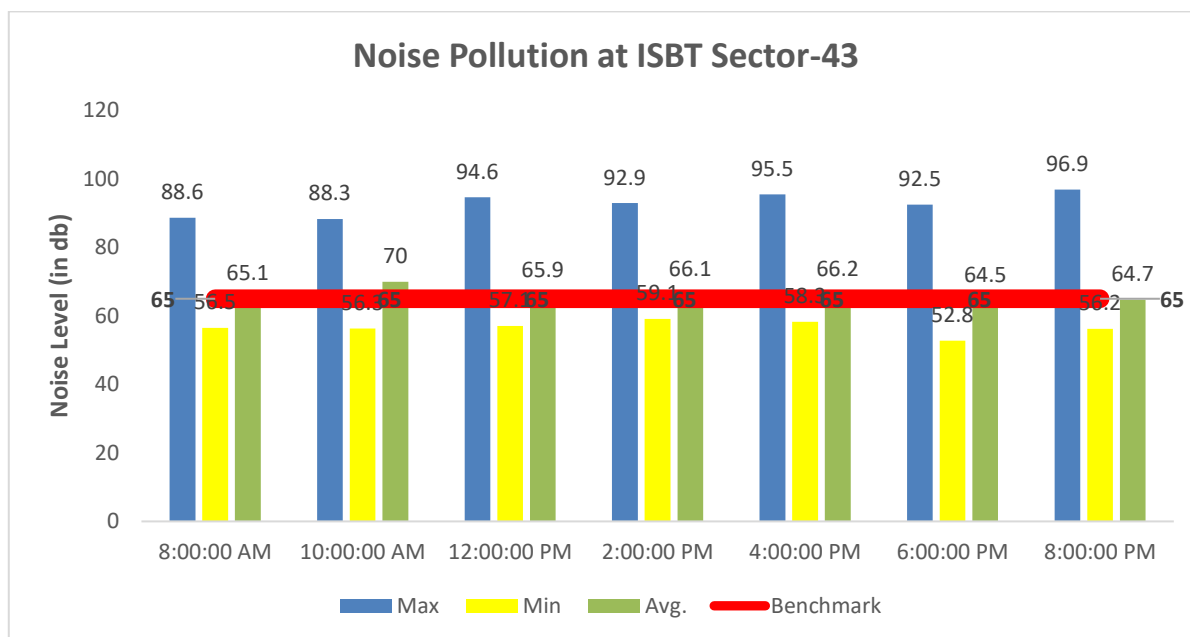


**Noise Level in Commercial Areas:**

Commercial areas of sector 17 -18 did fairly well as the noise levels were equal or below the prescribed limit. If the effective steps are not taken, the noise levels will cross the limits in the near future. On the contrary, the commercial area near ISBT, Sector 43 showed the noise level exceeding the prescribed limit during the whole day.

SECTOR-17-18			ISBT SECTOR-43		
8.00	MAX	81.5	8.00	MAX	88.6
	MIN	54.2		MIN	56.5
	AV.	63.4		AV.	65.1
10.00	MAX	85.6	10.00	MAX	88.3
	MIN	52.1		MIN	56.3
	AV.	64.1		AV.	70.0
12.00	MAX	89.1	12.00	MAX	94.6
	MIN	57.8		MIN	57.1
	AV.	66.2		AV.	65.9
2.00	MAX	91.1	2.00	MAX	92.9
	MIN	57.5		MIN	59.1
	AV.	65.8		AV.	66.1
4.00	MAX	95.4	4.00	MAX	95.5
	MIN	57.5		MIN	58.3
	AV.	65.4		AV.	66.2
6.00	MAX	89.8	6.00	MAX	92.5
	MIN	55.5		MIN	52.8
	AV.	63.4		AV.	64.5
8.00	MAX	88.8	8.00	MAX	96.9
	MIN	53.4		MIN	56.2
	AV.	62.9		AV.	64.7





The noise level was also recorded from roadside offices, organizations, and commercial business centers, which are at distances depending on location of the building from the center of the road, located at different places.

Noise is an underestimated threat that can cause a number of short-term and long-term health problems. It is increasingly becoming a potential hazard to health, physically and psychologically and affects the general well-being of an individual (Goswami et al 2011). Excessive noise interferes with people's daily activities. Monitoring of noise level was done at the 4-sites under present study. Levels of noise had exceeded the acceptable limits as laid down by Central Pollution Control Board. The large traffic and noise created by them is also one among the most critical problems faced by the Chandigarh.

Hence regulation of noise will be more challenging in these sensitive areas where more care is required. It is pollutants that causing the damage silently and always remain undetected. Noise pollution control is overshadowed by other types of pollution such as air, water pollution, largely due to lack of awareness about its health implications. There are two major settings where noise occurs, viz., community noise and industrial noise. Community noise (also called environmental noise, residential noise, or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Major sources of community noise are automobiles, construction work, loudspeakers, recreational activities, fireworks, etc. At a noise level of 50 dB, an adult can get moderately annoyed, and around 55 dB, seriously annoyed (Berglund et al 1999).

There are about 2950 Small Scale and 15 Large and Medium Scale Units in existence in Chandigarh as on date. Growth of industry for the last few years has been limited in Chandigarh as it is not an industry led city because of the limited space envisaged for industrial development at the time of original planning of the city. However, still keeping in view the fact that industry would provide crucial resource base in the city, a limited area of about 1450 acres was planned for development as industrial area mainly for the development of small scale and pollution free industries. Chandigarh administration is also working on traffic congestion due to insufficient capacity of roads, unrestrained demand, or long delays at light-points. In U.T Chandigarh the data will be parameterized about the noise created during the peak hours (when large traffic is on the roads) and the least traffic hours.

## CONCLUSION:

Industrial and commercial noise pollution represents a significant environmental and public health challenge that requires concerted action from policymakers, industry stakeholders, and communities. By understanding its sources, effects, and solutions, work can be done towards creating sustainable, livable spaces where economic development can coexist with environmental protection. The study presented the problem of noise pollution due to road traffic. The present model draws the attention of the administration towards noise pollution and will help the policy makers to take the necessary steps to ease this problem.

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