

A study of Ambient Noise Quality Monitoring of G.I.D.C. Vitthal Udyognagar, Gujarat

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ABSTRACT

Pollution being the most threatfull issue expanding its adverse effects day by day. Noise Pollution whether related to air, soil, water or Noise have been cause due to Urbanization and Industrialization. Noise pollution becomes one of the major environmental pollution issue all over the world. Noise pollution study is usually not carried out in compared with other pollution like air, water, soil, light and radioactive. Noise pollution is dependent on the loudness and frequency of the sound. The noise intensity is measured in decibels (dB). Generally, sound having intensity of more than 30 decibels are called noise.

The objective this study is to identify sources and to measure noise levels at G.I.D.C. Vitthal Udyognagar industrial Estate at Vidyanagar, Anand.

Keywords

Pollution, Noise level, frequency, decibels, Urbanization, Industrialization,

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Introduction

Sound is defined as atmospheric or air borne vibration perceptible to the ear. Noise is unwanted or undesired sound [1]. The Sound which causes harm to others is called noise. Noise is one of the most pervasive pollutants. Noise pollution is unwanted or excessive sound that can have deleterious effects on environmental quality and human health. Continuous exposure of noise pollution leads to a number of hearing impairments, cardiovascular effects, high blood pressure and cognitive difficulties, mental health crisis, behavioral stress, healing of drum, interference in communication with speech, sleep disturbance, loss of concentration in work etc [2] [5]. The combination of noise and air pollution is associated with respiratory ailments, dizziness and tiredness to the people. Environmental noise, caused by traffic, industrial and recreational activities is one of the main local environmental problems. All the sound which makes the mind turbulent or restless comes under noise pollution. Any unwanted noise which has adverse effect on health of the organisms is noise pollution.

Noise pollution is dependent on the loudness and frequency of the sound. When the sound exceeded its limit it becomes fatal for humans and other organisms. The noise intensity is measured in decibels (dB). A human can bear the noise up to average of 85 decibels beyond this limit he may have damaged in his hearing power. All the sound which makes the mind turbulent or restless comes under noise pollution. Any unwanted noise which has adverse effect on health of the organisms is noise pollution. In our daily life, we hear sound of different intensity, whose level ranges from 10 dB to 100 dB. The maximum permissible continuous exposure level to steady noise in a working environment is 90 dB for 8 hours [4]. Scientists have set the maximum sound limit,

ranging from 75 to 85 dB in different country, considering the side effect on human health [6]. For cities the world health organization considers the sound of 45 dB.

Aim

The present study is carried out to investigate the level of noise pollution at G.I.D.C. Vitthal Udyognagar industrial Estate at Vidyanagar, Anand. The degree of annoyance was measured by using Sound Level meter at selected locations of G.I.D.C, V.U. Nagar. Hourly equivalent sound levels (LEQ) were recorded for calculating noise levels.

Objectives

1. To identify different locations for measurement of Noise level.
2. To measure intensity of noise at selected locations.
3. To compare noise level with C.P.C.B guideline

Study Area Profile

Gujarat Industrial Development Corporation (G.I.D.C), Vitthal Udyognagar is located at 22°32'11"N 72°55'48"E in Anand

district of Gujarat State. It was established in 1963 by Dr. H. M. Patel. The notified area of Vitthal Udyognagar is 3sq.km. The population according to census 2011 is 5035 in which 54% is male and 46% is female.



Fig.1 – V.U. Nagar

Sources Of Noise Pollution

Source and Noise Intensity –

Noise levels are measured in terms of decibels (dB).

W.H.O (World Health Organization) has prescribed optimum noise level as 45 dB by day and 35 dB at night. The Sound above 80dB is hazardous.

Table -1: Experiment Result[1]

Sr. No.	Source	Intensity of Noise Produced
1.	Quiet Conversation	20-30 dB
2.	Loud Conversation	60 dB
3.	Lawn Mower	60-80 dB
4.	Aircraft noise	90-120 dB
5.	Beat music	120 dB
6.	Radio music	50-60 dB
7.	Traffic Noise	60-90 dB
8.	Heavy Truck	90-100 dB
9.	Jet Engine	140 dB
10.	Space Vehicle launch	140-179 dB

Effects of noise pollution on Human health

When a known, constant sound pressure is applied, a microphone is distinguishable by the voltage value produced; this is known as the microphone sensitivity. The sensitivity of the particular microphone used should be known by the instrument. The instrument is able to accurately convert the electrical signal to a sound pressure by using this information, and the resulting sound pressure level (decibels dB SPL) should be displayed.

Types:

There are three types of sound measuring instrument specified by IEC 61672-1. They are:

1. Conventional sound level meter
2. Integrating-averaging sound level meter
3. Integrating sound level meter



Fig.2 Sound Level

Table -2: Typical range of noise [1]

Sr. No	Range of Decibel	Effects
1.	< 65 dB	Tolerable
2.	65 dB	Annoyance-Nervous Effects
3.	80 dB	Annoying/irritating
4.	88 dB	Hearing disorder if prolonged exposure
5.	90 dB	Many years of exposure-permanent hearing loss
6.	100 dB	Short periods-temporary impairment: prolonged-irreparable damage to auditory
7.	110 dB	Discomfort & Organs may cause hearing loss
8.	120 dB	Causes the pain in the inner ear
9.	135 dB	Painful
10.	150 dB	Instantaneous hearing loss

Methodology

The main source of noise pollution is number of vehicles and types of industrial activities carried out at G.I.D.C. Vitthal Udyog Nagar.

A sound level meter is used for measuring the sound passing from air (acoustic). It is commonly a portable instrument with a microphone. To change in air pressure caused by sound waves responded by the diaphragm of the microphone. Therefore the instrument is sometimes also referred as a Sound Pressure Level (SPL) Meter. The sound pressure deviation (Pascal Pa) is the movement of the diaphragm, which is converted into an electrical signal. Noise pollution survey was conducted in the study zone. The anticipated noise sources were industrial activities, which are likely to be increased due to proposed activity [3]. Hourly equivalent sound levels (LEQ) were also recorded for calculating noise levels at the selected positions at V.U. Nagar.

Study area and locations

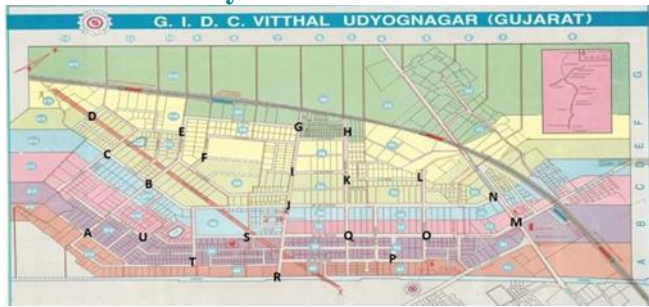


Fig.3 Sampling Locations

Selected locations at G.I.D.C. are described below:

Table -3: Sampling Locations Details

Sr. No	Location & Coordinates	Traffic Conditions	Type of Industries
A.	Near R K Metal Engg. 22°31'27"N, 72°55'15"E	Medium	Casting company.
B.	Near PavanTanay, 22°31'40"N 72°55'12"E	High	Machine Manufacturing companies.
C.	Near Jay Tex. 22°31'39"N 72°55'2"E	Low	Fabrication Industries.
D.	Near MARGEN Impex Ltd., 22°31'38"N 72°54'55"E	Low	production of paint and coating, and other mechanical works.
E.	Near Unique Welding Products, 22°31'50"N 72°55'5"E	Medium	production of CO ₂ wires for welding.
F.	Near Yogi Industrie 22°31'47"N 72°55'22"E	Low	Aluminum merchants.
G.	Near Unique Forgings 22°31'6"N 72°55'12"E	Medium	Forgings industry.
H.	Near Anupam Unit III 22°32'11"N 72°55'16"E	Low	Heavy Crane manufacturing
I.	Near Gayatri Timber 22°32'1"N 72°55'20"E	Medium	Saw mill industries
J.	Near Water Tank 22°31'56"N 72°55'26"E	High Traffic	Powder coating
K.	Near P S Welding 22°32'11"N 72°55'30"E	Low	Welding and Fabrication
L.	Near Shakti Industrie 22°32'15"N 72°55'31"E	Low	Fabrication Industries
M.	Janta Cross Road 22°32'27"N 72°55'50"E	Heavy	Vegetable market, Grocery shops, Hardware, Plumbing
N.	Near Charotar Ga 22°32'19"N 72°55'55"E	Heavy	CNG Gas station, small tools & plants
O.	Near Samarpan Ind., 22°32'17"N 72°55'43"E	Medium	Paint & Adhesive
P.	Near Arindam & Engg. 22°32'4"N 72°55'45"E	Low	storage tanks manuf., & fabrication works.
Q.	Near Pioneer Furnaces 22°32'8"N 72°55'49"E	High	Furnace and foundry
R.	Near IDMC Unit IV 22°31'47"N 72°55'39"E	Medium	Production of poly films.
S.	Near H M Patel School 22°32'7"N 72°55'51"E	Medium	Commercial shops
T.	Near AEP Industry Pvt. Ltd., 22°31'27"N 72°55'27"E	Low	Productions of pump and valve components.
U.	Near Jolly Engg. & Fabricators, 22°31'34"N 72°55'21"E	Low	Fabrication industries

Measurement of Sound

Readings were taken every alternate day per a week during peak hours at selected location for 2 hours in morning (9:00-11:00 a.m.) and 2 hours in evening (4:00-6:00 p.m.) at interval of 15 minutes.

Following are the reading of different Locations:-

Table -4: Noise Level at Sampling Locations

A: Near R K Metal Engineering (22°31'27"N 72°55'15"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	72.3 dB	4:00	72.7 dB
2.	9:15	74.2 dB	4:15	70.6 dB
3.	9:30	71.3 dB	4:30	72.9 dB
4.	9:45	72.5 dB	4:45	73.4 dB
5.	10:00	73.9 dB	5:00	73.7 dB
6.	10:15	68.2 dB	5:15	76.9 dB
7.	10:30	72.9 dB	5:30	69.2 dB
8.	10:45	71.0 dB	5:45	68.8 dB
9.	11:00	72.4 dB	6:00	76.4 dB

B: Near PavanTanay (22°31'40"N 72°55'12"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	78.1 dB	4:00	78.6 dB
2.	9:15	72.8 dB	4:15	75.1 dB
3.	9:30	76.0 dB	4:30	75.4 dB
4.	9:45	77.9 dB	4:45	74.4 dB
5.	10:00	72.7 dB	5:00	75.8 dB
6.	10:15	77.3 dB	5:15	80.5 dB
7.	10:30	72.8 dB	5:30	76.7 dB
8.	10:45	75.2 dB	5:45	75.1 dB
9.	11:00	71.2 dB	6:00	73.7 dB

C: Jay Tex (22°31'39"N 72°55'2"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	82.7 dB	4:00	72.6 dB
2.	9:15	79.5 dB	4:15	69.1 dB
3.	9:30	78.3 dB	4:30	74.6 dB
4.	9:45	77.5 dB	4:45	73.0 dB
5.	10:00	80.9 dB	5:00	87.2 dB
6.	10:15	78.6 dB	5:15	81.2 dB
7.	10:30	75.1 dB	5:30	68.4 dB
8.	10:45	78.5 dB	5:45	70.5 dB
9.	11:00	78.8 dB	6:00	72.2 dB

D: Near MARGEN Impex Ltd.(22°31'38"N 72°54'55"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	65.4 dB	4:00	72.6 dB
2.	9:15	66.5 dB	4:15	68.2 dB
3.	9:30	65.5 dB	4:30	70.0 dB
4.	9:45	68.4 dB	4:45	72.2 dB
5.	10:00	66.6 dB	5:00	65.7 dB
6.	10:15	67.9 dB	5:15	66.9 dB
7.	10:30	70.1 dB	5:30	65.0 dB
8.	10:45	70.9 dB	5:45	61.7 dB
9.	11:00	65.4 dB	6:00	63.7 dB

H: Near Anupam Unit III (22°32'11"N 72°55'16"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	65.4 dB	4:00	84.7 dB
2.	9:15	66.2 dB	4:15	84.4 dB
3.	9:30	65.2 dB	4:30	83.8 dB
4.	9:45	65.7 dB	4:45	83.4 dB
5.	10:00	68.7 dB	5:00	81.7 dB
6.	10:15	67.0 dB	5:15	84.1 dB
7.	10:30	70.8 dB	5:30	83.7 dB
8.	10:45	69.2 dB	5:45	85.0 dB
9.	11:00	70.0 dB	6:00	84.7 dB

E: Near Unique Welding Products(22°31'50"N 72°55'5"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	73.0 dB	4:00	73.6 dB
2.	9:15	75.9 dB	4:15	71.4 dB
3.	9:30	71.5 dB	4:30	74.8 dB
4.	9:45	80.3 dB	4:45	71.0 dB
5.	10:00	69.4 dB	5:00	70.8 dB
6.	10:15	70.5 dB	5:15	70.8 dB
7.	10:30	68.6 dB	5:30	78.9 dB
8.	10:45	77.3 dB	5:45	80.6 dB
9.	11:00	73.0 dB	4:00	73.6 dB

I: Near Gayatri Timbers traders (22°32'11"N 72°55'20"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	76.8 dB	4:00	68.6 dB
2.	9:15	70.2 dB	4:15	67.7 dB
3.	9:30	71.4 dB	4:30	73.1 dB
4.	9:45	72.0 dB	4:45	77.0 dB
5.	10:00	71.5 dB	5:00	73.2 dB
6.	10:15	73.3 dB	5:15	66.7 dB
7.	10:30	71.2 dB	5:30	68.5 dB
8.	10:45	70.9 dB	5:45	70.4 dB
9.	11:00	76.3 dB	6:00	71.5 dB

F: Yogi Industries(22°31'47"N 72°55'22"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	67.6 dB	4:00	66.6 dB
2.	9:15	70.4 dB	4:15	65.9 dB
3.	9:30	73.3 dB	4:30	64.9 dB
4.	9:45	72.7 dB	4:45	65.2 dB
5.	10:00	76.8 dB	5:00	66.9 dB
6.	10:15	75.6 dB	5:15	71.3 dB
7.	10:30	70.5 dB	5:30	66.1 dB
8.	10:45	72.9 dB	5:45	70.2 dB
9.	11:00	67.4 dB	6:00	71.7 dB

J: Near Water Tank (22°31'56"N 72°55'26"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	81.7 dB	4:00	78.2 dB
2.	9:15	77.4 dB	4:15	74.5 dB
3.	9:30	75.7 dB	4:30	73.9 dB
4.	9:45	77.7 dB	4:45	75.5 dB
5.	10:00	79.5 dB	5:00	75.4 dB
6.	10:15	75.6 dB	5:15	77.3 dB
7.	10:30	74.9 dB	5:30	79.5 dB
8.	10:45	79.8 dB	5:45	83.2 dB
9.	11:00	81.5 dB	6:00	72.9 dB

G: Unique Forgings(22°31'6"N 72°55'12"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	77.9 dB	4:00	74.2 dB
2.	9:15	74.9 dB	4:15	79.7 dB
3.	9:30	78.6 dB	4:30	79.2 dB
4.	9:45	79.5 dB	4:45	78.4 dB
5.	10:00	78.4 dB	5:00	76.9 dB
6.	10:15	78.4 dB	5:15	78.7 dB
7.	10:30	74.9 dB	5:30	74.9 dB
8.	10:45	79.2 dB	5:45	77.0 dB
9.	11:00	77.7 dB	6:00	78.3 dB

K: Near P S Welding (22°32'11"N 72°55'30"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	73.5 dB	4:00	69.8 dB
2.	9:15	74.2 dB	4:15	73.1 dB
3.	9:30	70.4 dB	4:30	65.3 dB
4.	9:45	72.9 dB	4:45	64.5 dB
5.	10:00	71.4 dB	5:00	63.6 dB
6.	10:15	70.1 dB	5:15	69.5 dB
7.	10:30	71.8 dB	5:30	64.2 dB
8.	10:45	69.6 dB	5:45	68.4 dB
9.	11:00	73.2 dB	6:00	68.2 dB

L: Near Shakti Industry (22°32'15"N 72°55'31"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	74.9 dB	4:00	74.3 dB
2.	9:15	73.1 dB	4:15	74.5 dB
3.	9:30	72.1 dB	4:30	76.3 dB
4.	9:45	74.1 dB	4:45	68.8 dB
5.	10:00	74.8 dB	5:00	70.3 dB
6.	10:15	75.9 dB	5:15	69.1 dB
7.	10:30	74.1 dB	5:30	72.1 dB
8.	10:45	73.8 dB	5:45	74.1 dB
9.	11:00	77.3 dB	6:00	70.7dB

P: Near Arindam Engineering (22°32'4"N 72°55'45"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	69.9 dB	4:00	68.9 dB
2.	9:15	72.4 dB	4:15	74.6 dB
3.	9:30	71.6 dB	4:30	66.5 dB
4.	9:45	66.3 dB	4:45	68.9 dB
5.	10:00	67.7 dB	5:00	69.1 dB
6.	10:15	69.8 dB	5:15	73.5 dB
7.	10:30	67.5 dB	5:30	65.9 dB
8.	10:45	69.0 dB	5:45	73.1 dB
9.	11:00	72.5 dB	6:00	71.5 dB

M: Janta Cross Road (22°32'27"N 72°55'50"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	80.1 dB	4:00	74.7 dB
2.	9:15	76.4 dB	4:15	75.0 dB
3.	9:30	78.7 dB	4:30	73.6 dB
4.	9:45	80.9 dB	4:45	79.1 dB
5.	10:00	81.1 dB	5:00	78.5 dB
6.	10:15	79.2 dB	5:15	79.8 dB
7.	10:30	79.5 dB	5:30	82.7 dB
8.	10:45	75.5 dB	5:45	76.9 dB
9.	11:00	79.5 dB	6:00	83.2 dB

Q: Near Pioneer Furnaces (22°32'8"N 72°55'49"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	70.4 dB	4:00	72.4 dB
2.	9:15	72.9 dB	4:15	70.0 dB
3.	9:30	79.3 dB	4:30	72.9 dB
4.	9:45	71.9 dB	4:45	70.0 dB
5.	10:00	67.6 dB	5:00	74.1 dB
6.	10:15	75.3 dB	5:15	73.0 dB
7.	10:30	74.2 dB	5:30	69.8 dB
8.	10:45	71.5 dB	5:45	80.0 dB
9.	11:00	70.8 dB	6:00	71.1 dB

N: Near Charotar Gas (22°32'19"N 72°55'55"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	78.2 dB	4:00	82.3 dB	78.2 dB
2.	82.7 dB	4:15	82.7 dB	82.7 dB
3.	79.2 dB	4:30	77.9 dB	79.2 dB
4.	82.3 dB	4:45	79.8 dB	82.3 dB
5.	85.4 dB	5:00	79.5 dB	85.4 dB
6.	78.9 dB	5:15	80.0 dB	78.9 dB
7.	79.2 dB	5:30	82.3 dB	79.2 dB
8.	77.9 dB	5:45	80.3 dB	77.9 dB
9.	82.3 dB	6:00	78.9 dB	82.3 dB

R: Near IDMC Unit IV (22°31'47"N 72°55'39"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	70.8 dB	4:00	67.0 dB
2.	9:15	66.9 dB	4:15	71.0 dB
3.	9:30	69.7 dB	4:30	72.0 dB
4.	9:45	75.0 dB	4:45	70.4 dB
5.	10:00	72.0 dB	5:00	73.6 dB
6.	10:15	72.3 dB	5:15	72.6 dB
7.	10:30	72.1 dB	5:30	70.5 dB
8.	10:45	71.7 dB	5:45	74.1 dB
9.	11:00	69.5 dB	6:00	68.8 dB

O: Near Samarpan Industries (22°32'17"N 72°55'43"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	73.8 dB	4:00	73.0 dB
2.	9:15	76.5 dB	4:15	74.1 dB
3.	9:30	75.7 dB	4:30	74.6 dB
4.	9:45	75.3 dB	4:45	72.1 dB
5.	10:00	72.2 dB	5:00	71.1 dB
6.	10:15	71.1 dB	5:15	73.2 dB
7.	10:30	71.9 dB	5:30	71.9 dB
8.	10:45	72.8 dB	5:45	71.1 dB
9.	11:00	70.5 dB	6:00	69.1 dB

S: Near H M Patel Secondary School (22°32'7"N 72°55'51"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	71.2 dB	4:00	72.9 dB
2.	9:15	72.6 dB	4:15	71.9 dB
3.	9:30	69.8 dB	4:30	74.6 dB
4.	9:45	72.1 dB	4:45	73.1 dB
5.	10:00	70.2 dB	5:00	74.1 dB
6.	10:15	68.7 dB	5:15	75.9 dB
7.	10:30	70.9 dB	5:30	72.7 dB
8.	10:45	72.0 dB	5:45	70.5 dB
9.	11:00	73.2 dB	6:00	70.0 dB

T: Near AEP Ind. Pvt. Lmt. (22°31'27"N 72°55'27"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	69.4 dB	4:00	72.0 dB
2.	9:15	68.7 dB	4:15	71.2 dB
3.	9:30	73.7 dB	4:30	70.3 dB
4.	9:45	74.5 dB	4:45	69.9 dB
5.	10:00	74.1 dB	5:00	74.5 dB
6.	10:15	73.5 dB	5:15	72.6 dB
7.	10:30	72.1 dB	5:30	73.7 dB
8.	10:45	73.1 dB	5:45	70.3 dB
9.	11:00	73.9 dB	6:00	70.2 dB

U: Near Jolly Engineers and fabricator (22°31'34"N 72°55'21"E)				
Sr. No.	Morning		Evening	
	Time	Average Reading	Time	Average Reading
1.	9:00	69.7 dB	4:00	69.4 dB
2.	9:15	65.5 dB	4:15	65.4 dB
3.	9:30	70.1 dB	4:30	68.2 dB
4.	9:45	68.0 dB	4:45	71.8 dB
5.	10:00	69.6 dB	5:00	73.1 dB
6.	10:15	71.4 dB	5:15	72.7 dB
7.	10:30	74.0 dB	5:30	71.3 dB
8.	10:45	70.8 dB	5:45	65.2 dB
9.	11:00	67.0 dB	6:00	65.8 dB

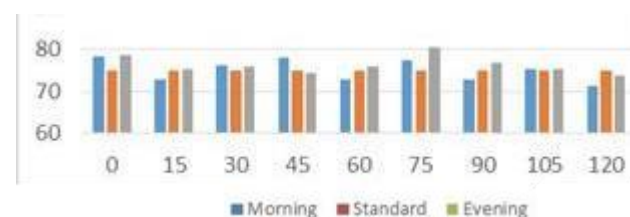
Result and discussion:

A. Near R K Metal Engg. (22°31'27"N 72°55'15"E)



The average noise pollution of the day at NEAR R K METAL ENGINEERING is 72.4 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 2.6 dB which is 3.47% less than standard value.

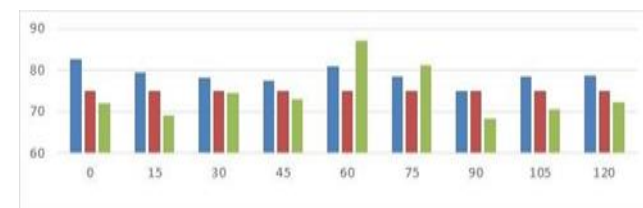
B. Near PavanTanay (22°31'40"N 72°55'12"E)



The average noise pollution of the day at NEAR PAVAN TANAY is 75.53 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise

pollution at this place is studied as 0.53 dB which is 0.007% more than standard value.

C. Near Jay Tex (22°31'39"N 72°55'2"E)



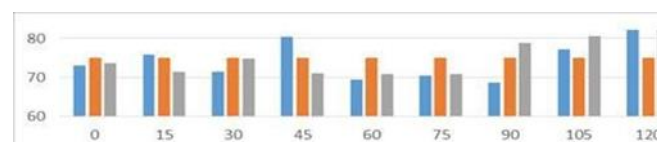
The average noise pollution of the day at NEAR JAY TEX is 76.59 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 1.69 dB which is 2.25% more than standard value.

D. Near MARGEN Impex Ltd. (22°31'38"N 72°54'55"E)



The average noise pollution of the day at NEAR MARGEN IMPEX LIMITED is 67.37 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 7.63 dB which is 10.17% less than standard value.

E. Near Unique Welding Products (22°31'50"N 72°55'5"E)



The average noise pollution of the day at NEAR UNIQUE WELDING PRODUCTS is 74.63 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 0.37 dB which is 0.04% less than standard value.

F. Near Yogi Industries (22°31'47"N 72°55'22"E)



The average noise pollution of the day at NEAR YOGI INDUSTRIES is 69.77 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB,

standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 5.23 dB which is 6.9% less than standard value.

G. Near Unique Forgings (22°31'6"N 72°55'12"E)



The average noise pollution of the day at NEAR UNIQUE FORGINGS is 77.59 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 2.59 dB which is 3.45% more than standard value.

H. Near Anupam Unit III (22°32'11"N 72°55'16"E)



The average noise pollution of the day at NEAR ANUPAM UNIT-III is 75.8 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 0.8 dB which is 1.06% more than standard value.

I. Near Gayatri Timber (22°32'1"N 72°55'20"E)



The average noise pollution of the day at NEAR GAYATRI TIMBER TRADERS is 71.67 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 3.33 dB which is 4.4% less than standard value.

J. Near Water Tank (22°31'56"N 72°55'26"E)



The average noise pollution of the day at NEAR WATER TANK is 77.44 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 2.44 dB which is 3.25% more than standard value.

K. Near P S Welding (22°32'11"N 72°55'30"E)



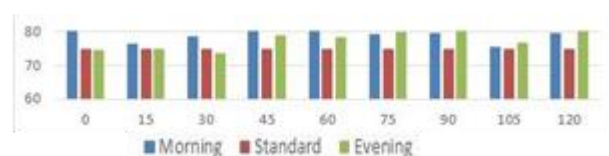
The average noise pollution of the day at NEAR P S WELDING is 69.67 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 5.33 dB which is 7.1% less than standard value.

L. Shakti Industries (22°32'15"N 72°55'31"E)



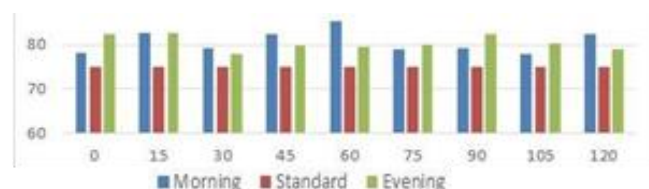
The average noise pollution of the day at NEAR SHAKTI INDUSTRIES is 73.35 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 1.65 dB which is 2.2% less than standard value.

M. Janta Cross Road (22°32'27"N 72°55'50"E)

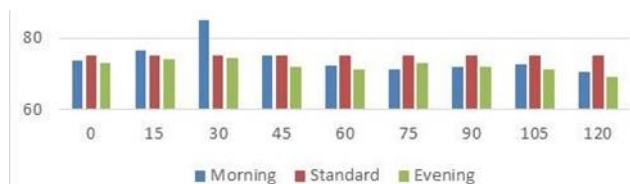


The average noise pollution of the day at JANTA CROSS ROAD is 78.57 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 3.57 dB which is 4.76% more than standard value.

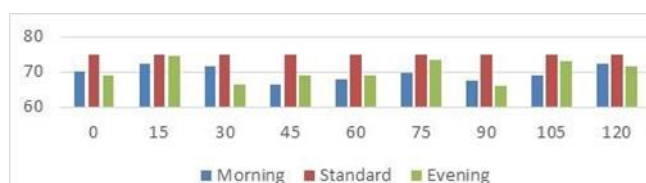
N. Near Charotar Gas (22°32'19"N 72°55'55"E)



The average noise pollution of the day at NEAR CHAROTAR GAS is 80.54 dB which do exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by “Central Board for Pollution Control”. The average of noise pollution at this place is studied as 5.54 dB which is 7.38% more than standard value.

O. Near Samarpan Industries (22°32'17"N 72°55'43"E)

The average noise pollution of the day at NEAR SAMARPAN INDUSTRIES is 72.77 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 2.23 dB which is 2.97% less than standard value.

P. Near ArindamEngg. (22°32'4"N 72°55'45"E)

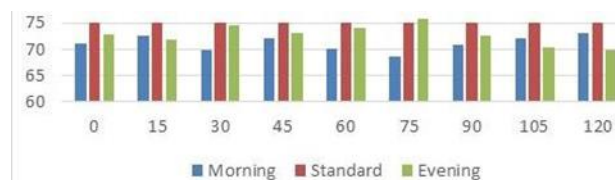
The average noise pollution of the day at NEAR ARINDAM ENGINEERING is 68.25 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 6.75 dB which is 9.0% less than standard value.

Q. Near Pioneer Furnaces (22°32'8"N 72°55'49"E)

The average noise pollution of the day at NEAR PIONEER FURNACES is 72.65 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 2.35 dB which is 3.13% less than standard value.

R. Near IDMC Unit IV (22°31'47"N 72°55'39"E)

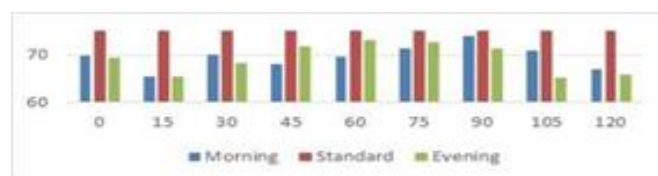
The average noise pollution of the day at NEAR IDMC UNIT IV is 71.11 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 3.89 dB which is 5.18% less than standard value.

S. Near H M Patel School (22°32'7"N 72°55'51"E)

The average noise pollution of the day at NEAR H M PATEL SECONDARY SCHOOL is 72.02 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 2.98 dB which is 3.97% less than standard value.

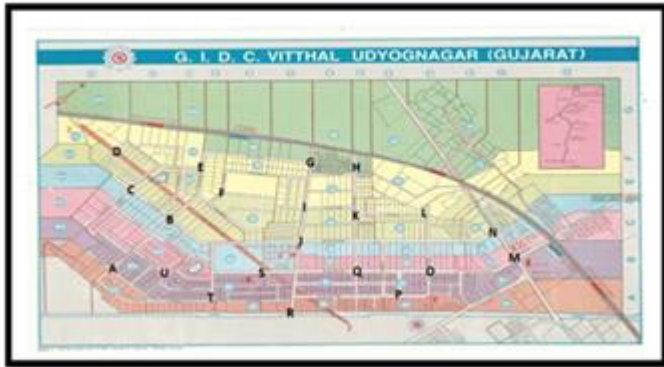
T. Near AEP Industry Pvt. Ltd. (22°31'27"N 72°55'27"E)

The average noise pollution of the day at NEAR AEP INDUSTRIES PVT. is 72.09 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 2.91 dB which is 3.88% less than standard value.

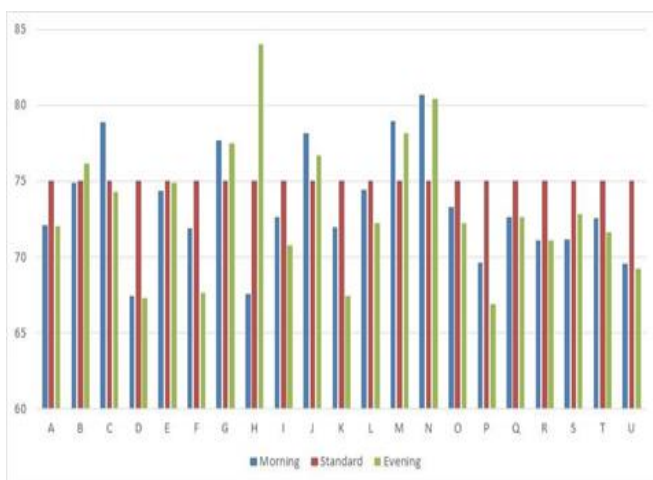
U. Near Jolly Engineers and fabricators (22°31'34"N 72°55'21"E)

The average noise pollution of the day at NEAR JOLLY ENGINEERS AND FABRICATORS is 69.38 dB which do not exceeds the limit of standard industrial noise pollution which is 75 dB, standardized by "Central Board for Pollution Control". The average of noise pollution at this place is studied as 5.62 dB which is 7.49% less than standard value.

The minimum average sound pressure level observed is near MARGEN IMPEX LTD. (D) among selected locations. As per our study, 7 out of 21 locations are having average sound pressure level more than 75 dB. We have observed that humans are less aware of noise pollution compared to other pollution as noise pollution affect human body slowly. The drivers of vehicles are honking their horn even though there is no requirement of it. The sound pressure level increases with increasing in establishment of industry and factories every day.



Morning Evening Comparison



From the above graph, we can study that the average intensity of noise in morning is 73.40 dB and in evening it is 73.90 dB. The above statements prove that the intensity of noise in GIDC is near to standard industrial noise pollution which is 75 dB. Therefore noise pollution should be reduced in GIDC V U Nagar.

Conclusion

The maximum sound pressure level observed is 82.9 dB at UNIQUE WELDING PRODUCT (E) at 11:00a.m. in morning among selected locations.

The maximum sound pressure level observed is 87.2 dB near JAY TEX (C) at 05:00 p.m. in evening among selected locations.

At every place, the sound pressure level is more than 65 dB which causes nervous effects.

According to our study, area near CHAROTAR GAS STATION (N) is highly polluted with noise.

There are no safety tools against noise pollution are provided to workers in G.I.D.C.

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- [2] B. Berglund, T. Lindvall, and D. H. Schwela, "Guidelines of community noise", Geneva, WHO, April 1999.
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