

REPORT ON AMBIENT NOISE LEVEL  
MONITORING OF METRO CITIES ON  
14<sup>th</sup> & 15<sup>th</sup> DECEMBER, 2008

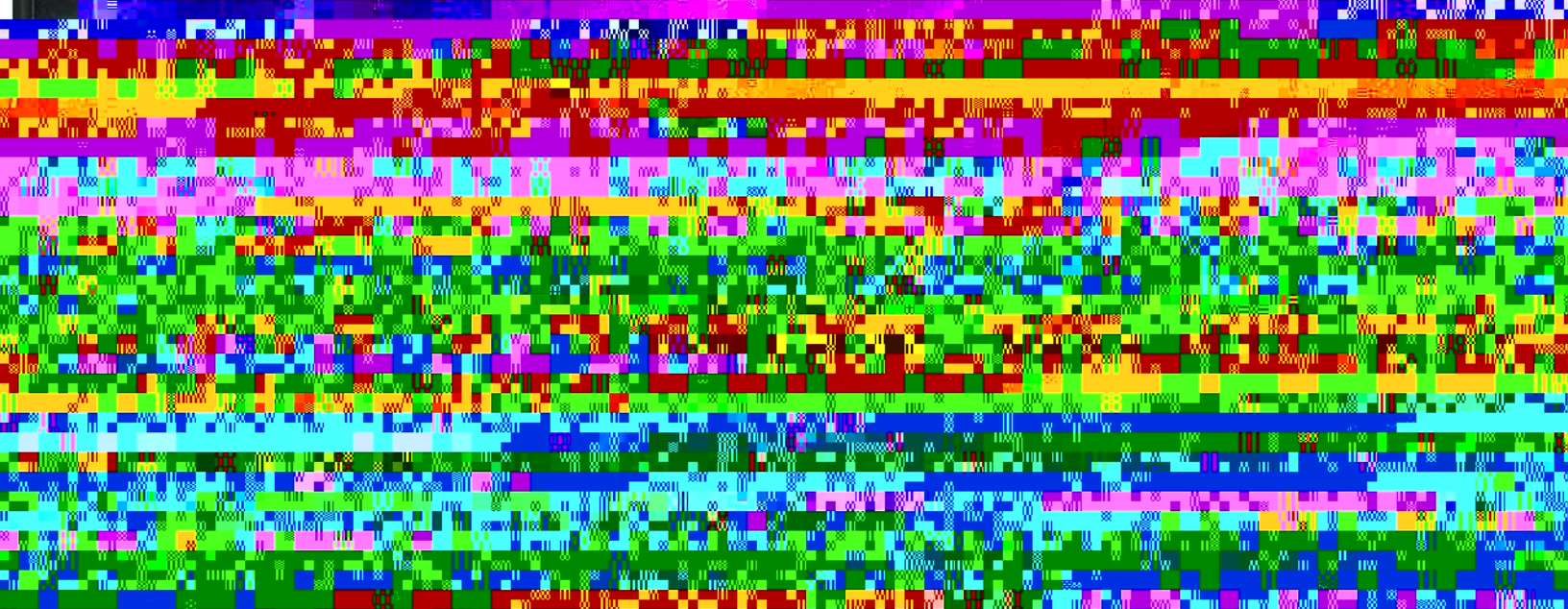


MAHARASHTRA POLLUTION CONTROL BOARD  
"Kalpataru Point", Sion (E)  
Mumbai- 400 022  
<http://mpcb.gov.in>

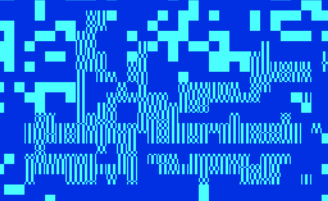
संजय खंदारे भादसे  
सदस्य सचिव  
Sanjay Khandare IAS  
MEMBER SECRETARY



महाराष्ट्र प्रदूषण नियंत्रण मंडळ  
MAHARASHTRA POLLUTION CONTROL BOARD



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**1. Introduction:**

Noise pollution in urban areas is now being recognized as a major environmental issue around the world. With increasing awareness of the adverse impacts of noise on human health, more and more people becoming less tolerant to environmental noise. According to World Health Organization, noise pollution is nowadays the third most hazardous environmental type of pollution, preceded only by air (gas emission) and water pollution.

Noise Pollution in larger cities is an ever-growing problem due to the fact that the urban environment is becoming increasingly crowded, busy and noisy. The people living in the metropolis have leading sources of noise as Road Traffic Noise, Air Craft Noise, Noise from railroads, Resident & Community Noise and Construction Noise etc. Therefore, in order to assess the impact of noise on the citizen in six major Metropolitan cities for 24 hours across the state, Maharashtra Pollution Control Board has carried out the survey for two days on 14<sup>th</sup> & 15<sup>th</sup> December 2008.

**2. Objective:**

The objective of this exercise is to assess the impact of various noise sources on general citizen in two different scenarios (holiday and a working day) i.e. 14<sup>th</sup> (holiday) and 15<sup>th</sup> (working day) of December 2008 and to compare the noise levels with Ambient Noise Standards for the area. Further, to create the awareness and educate the public.

**3. Noise Pollution and its effects on environment:**

Noise is defined as unwanted sound. Noise is a disturbance to the human environment that is increasing at such a high rate that it will become a major threat to the quality of human lives. There are numerous effects on the human environment due to the increase in noise pollution. Many people are exposed to dangerous levels of noise without realizing it whether it is from loud music, a motorcycle, airplane or a running train.

Scientists have recently found that the continuous exposure to noise with a volume more than 70 decibels can lead to permanent hearing damage. Excessive noise levels can also lead to increase of heart beat, blood pressure and blood cholesterol. It also has the potential to harm the respiratory and digestive systems. Constant noise can lead to stress disorders, which could further develop into ulcers or high blood

pressure. A large amount of noise every day not only causes stress for people but also contribute to mental illness, loss of productivity. Sleep deprivation usually occurs for people at a decibel of 45 or higher at 85 decibels hearing damage occurs. People of all ages who already experience health problems are at very high risk.

Noise pollution also effects the vegetation causing poor quality of crops. It also damages the nervous system of animals. Loud noise also weakens the buildings, bridges and monuments.

#### 4. Noise Level Measurement and Noise Pollution Standards:

A decibel is the standard for the measurement of noise. The zero on a decibel scale is at the threshold of hearing, the lowest sound pressure that can be heard. According to D.B. Smith, 20 dB is whisper, 40 dB is quiet office, 60 dB is normal conversation and 80 dB is the level at which sound become physically painful.

Noise is measured in decibel (dB). With reference to the frequency of Noise, 'A' weighting was selected for this entire monitoring. The 'A' frequency weighting is the method of frequency weighting the electrical signal within a noise measuring instrument is to reproduce the way the human ear responds to a range of acoustic frequencies. 'A' weighting filters out lower frequencies very severely. The 'FAST' response was selected to measure the noise levels. It is used for the measurement of time-varying sounds with a response time of 0.125 seconds which is similar to human ear response.

Here are some important functions and their definitions, used while measuring and reporting.

**L<sub>eq</sub>**: The equivalent continuous Sound Pressure Level (SPL) for a particular duration.

**L<sub>max</sub>**: The maximum Sound Pressure Level (SPL) value measured during the duration of monitoring.

**L<sub>min</sub>**: The minimum Sound Pressure Level (SPL) value measured during the duration of monitoring.

**L<sub>10</sub>**: The level that were exceeded during 10% of the measuring time in dB(A).

**L<sub>50</sub>**: The level that were exceeded during 50% of the measuring time in dB(A).

**L<sub>90</sub>**: The level that were exceeded during 90% of the measuring time in dB(A).

**Ldn:** The Day-Night equivalent Sound Level refers to average sound exposure over a 24- hour period. Ldn values are calculated from hourly Leq values, with the Leq values for the night time (10.00 P.M to 06.00 A.M) increased by 10 dB to reflect the greater disturbance potential from night time noises.

The Noise has been recognized as ambient air pollutant. Standards in this regard are laid down under The Environment (Protection) Act, 1986 (and rules made there under) and under the Model Rules of the Factories Act, 1948 for occupational health and safety purposes.

The Central Pollution Control Board constituted a National Committee of Experts on Noise Pollution Control. The Committee recommended noise standards for ambient air and for automobiles, domestic appliances and construction equipment, which were later notified under The Environment (Protection) Act, 1986 as given below:

Area Code	Category of Area	Limits in dB(A) Leq	
		Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

**Note:**

1. Day time is reckoned from 6 A.M to 10 P.M.
2. Night time is reckoned from 10 P.M to 6 A.M.
3. Silence zone is referred as areas within 100 meters around premises such as hospitals, educational institutions and courts. The Silence zones are to be declared by the Competent Authority.
4. Use of vehicular horns, loudspeakers and bursting of crackers shall be banned in these zones.
5. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.

**5. Methodology of Survey:**

The Noise Level Monitoring in six Metropolitan cities for 24 hours continuously (16 hrs day time & 8 hrs night time) was carried out on 14<sup>th</sup> (holiday) & 15<sup>th</sup> (working day) December 2008. The monitoring was

carried at the same locations during both days and during the same period. The distance of the monitoring station and the microphone height were also recorded accurately in the report. The monitoring stations selected include residential areas, silence areas, industrial and commercial areas, adjacent to major roads (traffic) areas and also extended to air and rail traffic. The Global Positioning System (GPS) was used to get the exact position i.e. Latitude and Longitude of the monitoring locations. The main purpose of this exercise was to determine the noise levels during both the days (Sunday and a working day) and to compare it with ambient noise standards for the area. Further, it may help in identifying the significant sources of Noise and finding & implement of remedies to reduce the Noise levels.

There were a total of 25 locations covered in six major cities of Maharashtra state. The detailed list of cities and monitoring locations are shown in table:

Sr. No.	City	Location	Area
1	Mumbai	Backside of High Court	Silence
		Mumbadevi temple	Silence
		Borivali National Park	Silence
		Antop Hill	Residential
		Shivaji Park, Dadar	Residential
		Santacruz Airport	Commercial
		Ghatkopar (W)	Commercial
		Vashi Naka, Chembur	Commercial
		Goregaon (E)	Industrial
		Charkop, Kandivali	Industrial
2	Pune	Pune University	Silence
		Nucleus Mall	Commercial
		Kakade Angan	Residential
3	Nashik	Dwarka Circle	Commercial
		Pandit Colony Near NMC	Residential
		Pavan Nagar CIDCO	Residential
4	Aurangabad	Ghati Hospital	Silence
		Nirala bazaar	Commercial
		CIDCO N-4	Residential
5	Nagpur	Govt. Medical College	Silence
		Sitabardi Police Station	Commercial
		Shivaji Nagar	Residential
6	Kolhapur	Collector Office	Residential
		Dasara Chowk	Silence
		Shahupuri	Commercial

6. Details of Noise Monitoring Stations:

The Global Positioning System (GPS) was used to determine the exact position of the locations of Metropolitan Cities. Also, the selected monitoring station's Latitude and Longitude along with the distance & height of sensor of the sound level meter for all the locations are summarized in the table:

Location	Position	Distance of Monitoring Station in meters	Monitoring Height in meters
<b>MUMBAI</b>			
Hight Court	N 18° 55' 52.3" E 72° 49' 50.2"	2.43	1.29
Mumbadevi temple	N 18° 57' 03.1" E 72° 49' 53.4"	3.16	1.24
Antop hill	N 19° 01' 51.2" E 72° 51' 53.6"	2.70	1.36
Shivaji Park, Dadar	N 19° 01' 31.2" E 72° 50' 14.7"	1.87	1.26
Santacruz Airport	N 19° 05' 36.9" E 72° 51' 17.0"	1.66	1.33
Goregaon (E)	N 19° 10' 17.6" E 72° 51' 16.4"	2.30	1.40
Ghatkopar (W)	N 19° 05' 17.1" E 72° 54' 27.8"	1.80	1.31
Charkop, Kandivali (W)	N 19° 12' 34.4" E 72° 49' 40.9"	1.93	1.27
Vashi Naka, Chembur	N 19° 01' 56.0" E 72° 53' 48.7"	2.29	1.33
Borivali National Park	N 19° 13' 51.1" E 72° 51' 53.3"	2.52	1.36



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<b>PUNE</b>			
Pune University	N 18° 32' 28.6" E 73° 49' 38.4"	3.60	1.24
Nucleus Mall	N 18° 31' 06.0" E 73° 52' 30.8"	2.89	1.30
Kakade Angan	N 18° 37' 27.9" E 73° 47' 6.1"	3.10	1.28
<b>NASHIK</b>			
Dwarka Circle	N 19° 59' 34.9" E 73° 47' 53.5"	3.61	1.29
Pandit Colony Near NMC	N 20° 00' 08.3" E 73° 46' 34.6"	3.42	1.31
Pavan Nagar CIDCO	N 19° 58' 27.1" E 73° 45' 23.5"	2.56	1.22
<b>AURANGABAD</b>			
Ghati Hospital	N 19° 53' 19.08" E 75° 19' 07.4"	2.88	1.32
Nirala bazaar	N 19° 52' 44.5" E 75° 19' 28.5"	3.37	1.39
CIDCO N-4	N 19° 52' 10.0" E 75° 21' 44.7"	2.90	1.30
<b>NAGPUR</b>			
Government Medical College	N 21° 08' 10.3" E 79° 03' 38.9"	3.58	1.23
Sitabardi Police Station	N 21° 08' 34.6" E 79° 04' 54.8"	3.89	1.40
Shivaji Nagar	N 21° 07' 44.5" E 79° 05' 54.5"	4.50	1.32
<b>KOLHAPUR</b>			
Collector Office	N 16° 42' 29.9" E 74° 14' 08.6"	3.45	1.37

Dasara Chowk	N 16° 42' 04.7" E 74° 13' 36.1"	2.69	1.45
Shahupuri	N 16° 41' 59.5" E 74° 14' 25.6"	2.87	1.42

**7. Noise Levels at Various Locations in the City:**

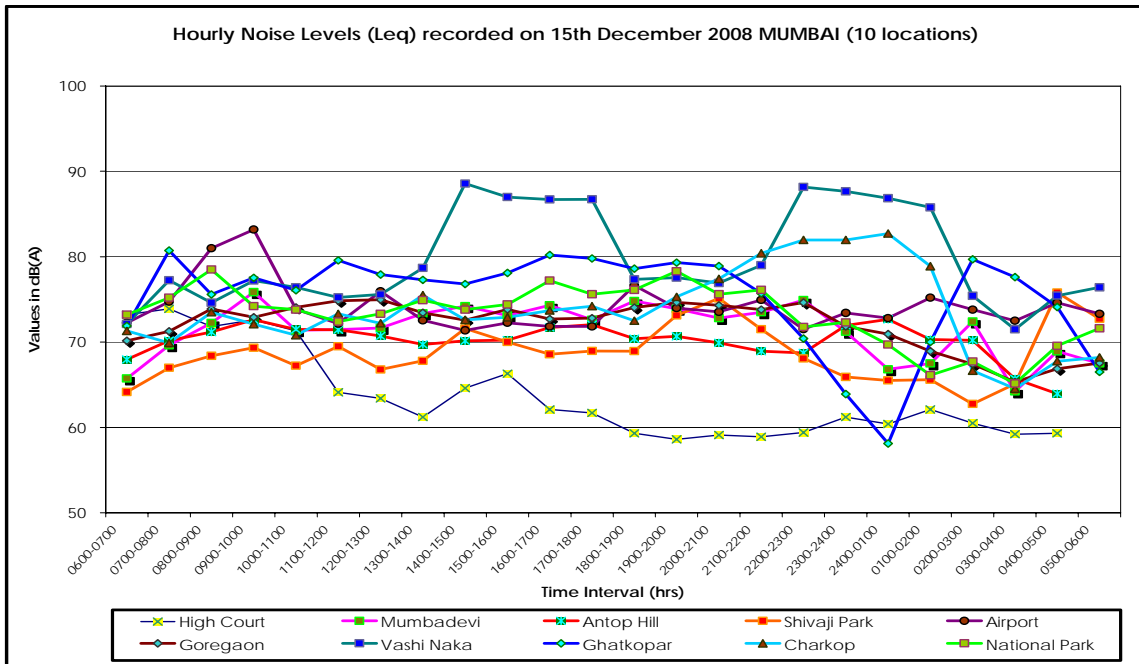
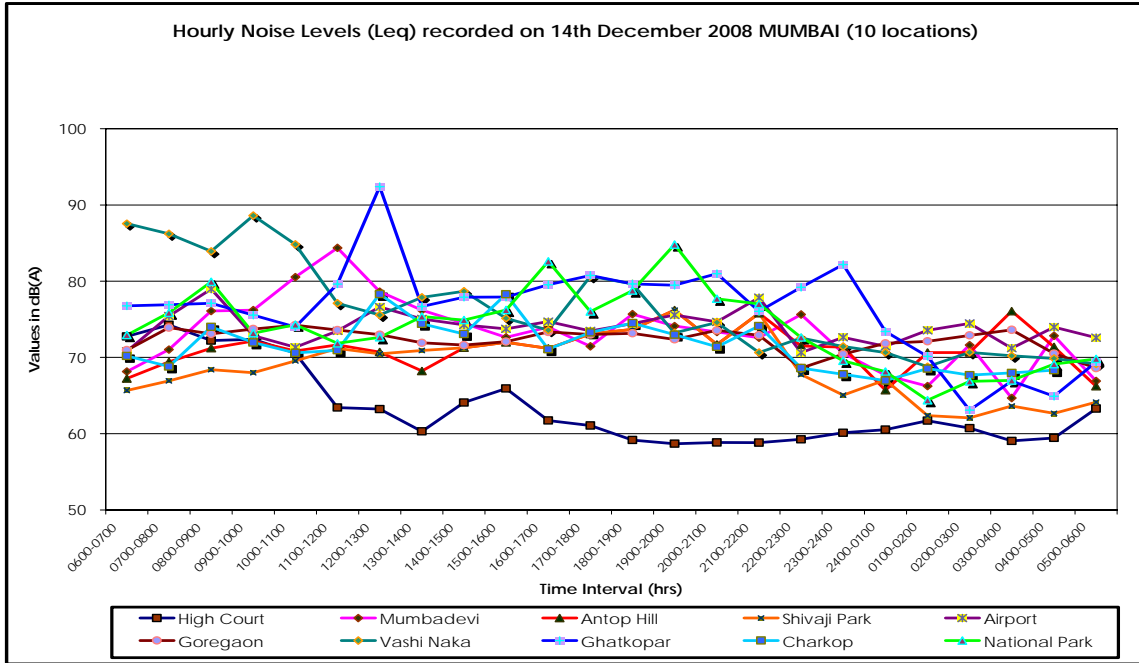
The noise levels at all locations were continuously monitored for a period of 24 hours during holiday and normal working day. The hourly equivalent noise recorded at each of the locations is shown in table:

**1(a) Ambient Noise levels in Mumbai as on 14<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	High Court	14.12.08	64.8	72.6	63.3	58.8	14.12.08 to 15.12.08	60.5	62.2	60.3	59.2
2	Mumbadevi	14.12.08	75.0	79.6	74.3	71.2	14.12.08 to 15.12.08	69.5	73.7	69.1	65.8
3	Antop Hill	14.12.08	71.6	74.7	71.5	68.8	14.12.08 to 15.12.08	70.4	72.9	71.0	66.1
4	Shivaji Park	14.12.08	71.0	74.7	71.2	67.5	14.12.08 to 15.12.08	64.3	67.3	63.9	62.3
5	Airport	14.12.08	74.6	77.2	74.6	72.1	14.12.08 to 15.12.08	72.6	74.1	72.6	71.0
6	Goregaon	14.12.08	72.9	73.8	73.0	71.8	14.12.08 to 15.12.08	71.1	73.1	71.2	68.6
7	Vashi Naka	14.12.08	79.2	86.9	78.3	73.4	14.12.08 to 15.12.08	70.4	71.8	70.4	69.0
8	Ghatkopar	14.12.08	78.8	80.9	77.9	75.8	14.12.08 to 15.12.08	71.2	80.1	69.8	64.4
9	Charkop	14.12.08	73.0	76.4	73.0	70.4	14.12.08 to 15.12.08	67.9	68.6	67.9	67.2
10	National Park	14.12.08	76.5	81.3	75.9	72.8	14.12.08 to 15.12.08	68.4	70.7	68.6	66.1

1(b) Ambient Noise level in Mumbai as on 15<sup>th</sup> December 2008:

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	High Court	15.12.08	65.1	72.9	63.8	59.0	15.12.08 to 16.12.08	60.7	62.5	60.5	59.3
2	Mumbadevi	15.12.08	72.5	74.6	73.0	70.5	15.12.08 to 16.12.08	69.2	73.2	68.2	66.0
3	Antop Hill	15.12.08	70.6	71.9	70.5	69.3	15.12.08 to 16.12.08	68.8	72.2	69.5	65.2
4	Shivaji Park	15.12.08	69.2	72.4	68.9	66.9	15.12.08 to 16.12.08	67.7	73.7	65.8	64.4
5	Airport	15.12.08	74.5	78.8	73.7	71.8	15.12.08 to 16.12.08	73.4	74.8	73.4	72.2
6	Goregaon	15.12.08	73.4	74.7	73.8	71.9	15.12.08 to 16.12.08	69.2	72.7	68.2	66.4
7	Vashi Naka	15.12.08	79.2	86.9	77.3	74.9	15.12.08 to 16.12.08	80.9	87.8	81.1	74.2
8	Ghatkopar	15.12.08	77.7	80.0	78.0	75.6	15.12.08 to 16.12.08	70.0	78.2	70.2	62.2
9	Charkop	15.12.08	73.6	76.5	73.1	71.1	15.12.08 to 16.12.08	74.1	86.3	80.4	66.0
10	National Park	15.12.08	75.2	77.8	75.1	73.3	15.12.08 to 16.12.08	69.2	71.9	69.6	65.8



In **Mumbai**, a total of 10 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the silence areas the minimum sound level was 58.6 dB(A) and the maximum sound level was 84.8 dB(A). At the industrial areas the minimum sound level was 64.5 dB(A) and maximum sound level was 78.3 dB(A). Similarly, at the commercial areas the minimum sound level was 58.1 dB(A) and maximum sound level was 92.4 dB(A)

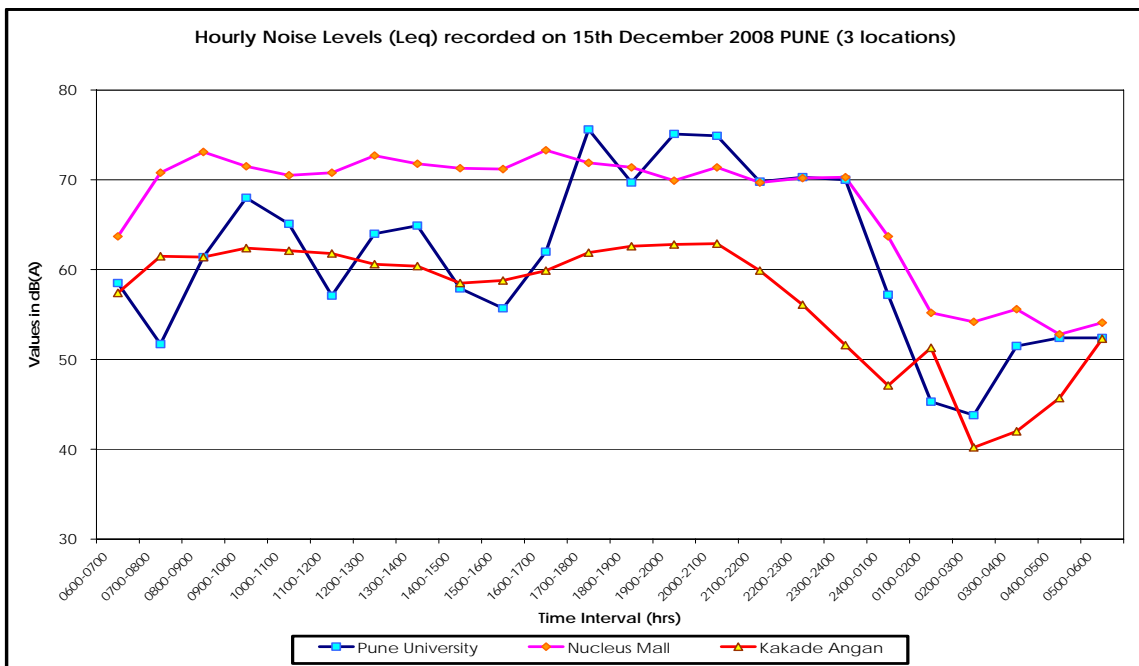
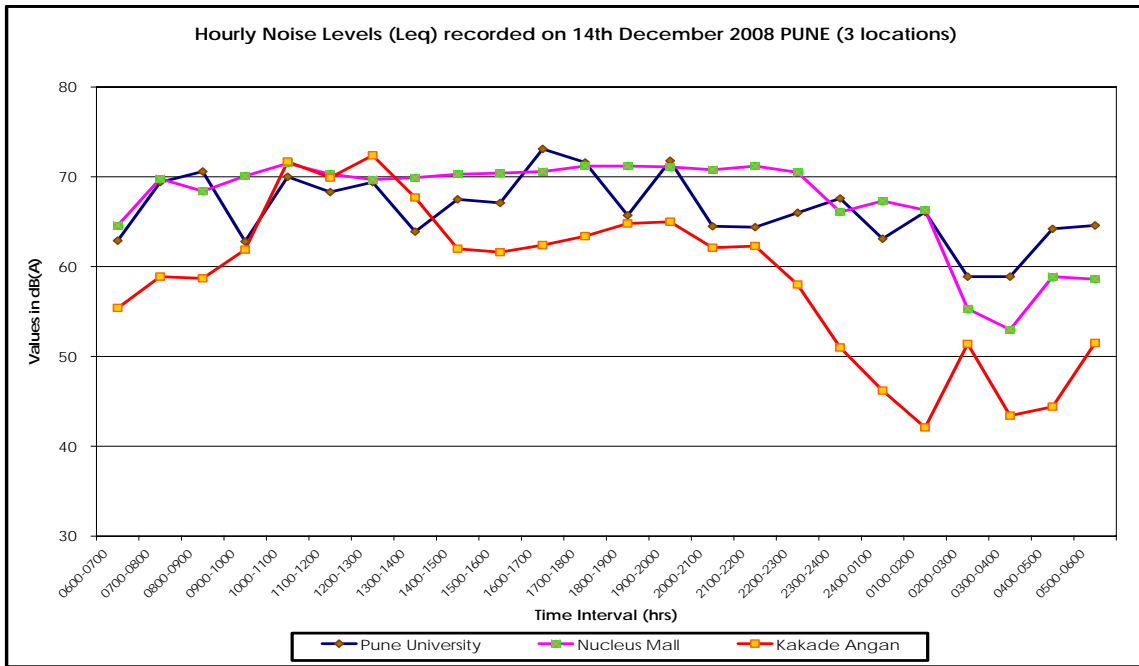
and at the residential areas the minimum sound level was 62.1 dB(A) and maximum sound level was 76.2 dB(A).

**2 (b) Ambient Noise Levels in Pune as on 14<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Pune University	14.12.08	67.7	71.7	67.9	63.4	14.12.08 to 15.12.08	63.7	66.6	64.4	58.9
2	Nucleus Mall	14.12.08	70.1	71.2	70.4	69.1	14.12.08 to 15.12.08	62.0	68.3	62.5	54.6
3	Kakade Angan	14.12.08	63.8	70.8	62.4	58.8	14.12.08 to 15.12.08	48.5	53.5	48.6	43.0

**2(b) Ambient Noise Level in Pune 15<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Pune University	15.12.08	64.5	75.0	64.5	56.4	15.12.08 to 16.12.08	55.4	70.1	52.4	44.9
2	Nucleus Mall	15.12.08	70.9	72.9	71.4	69.8	15.12.08 to 16.12.08	59.5	70.2	55.4	53.7
3	Kakade Angan	15.12.08	60.9	62.7	61.5	58.7	15.12.08 to 16.12.08	48.3	53.4	49.2	41.5



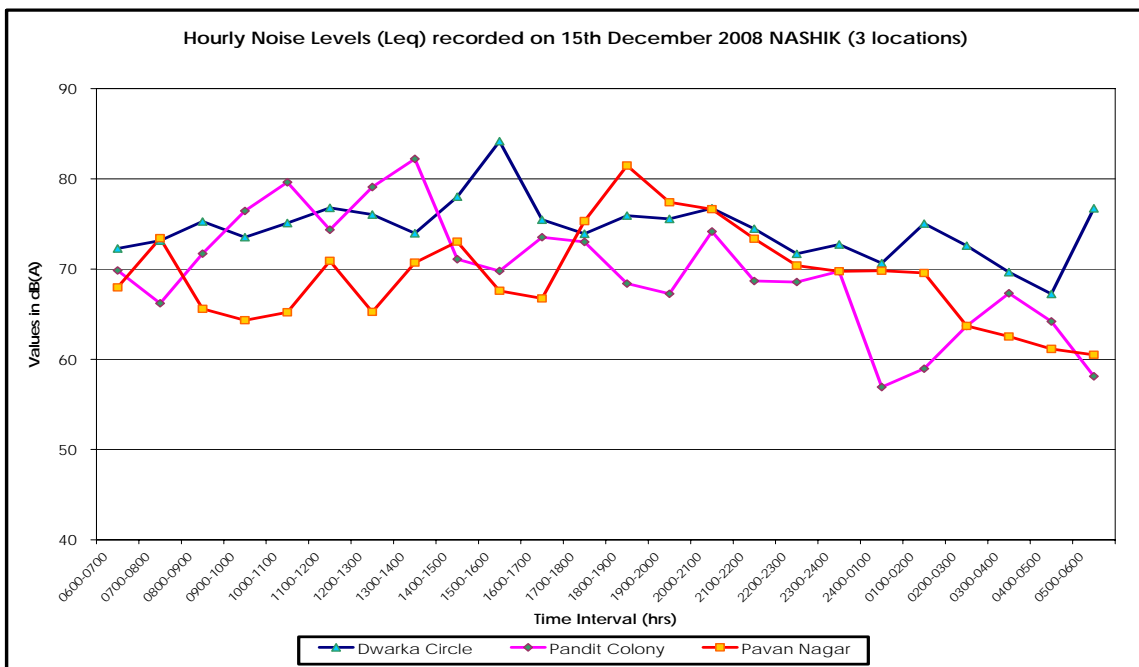
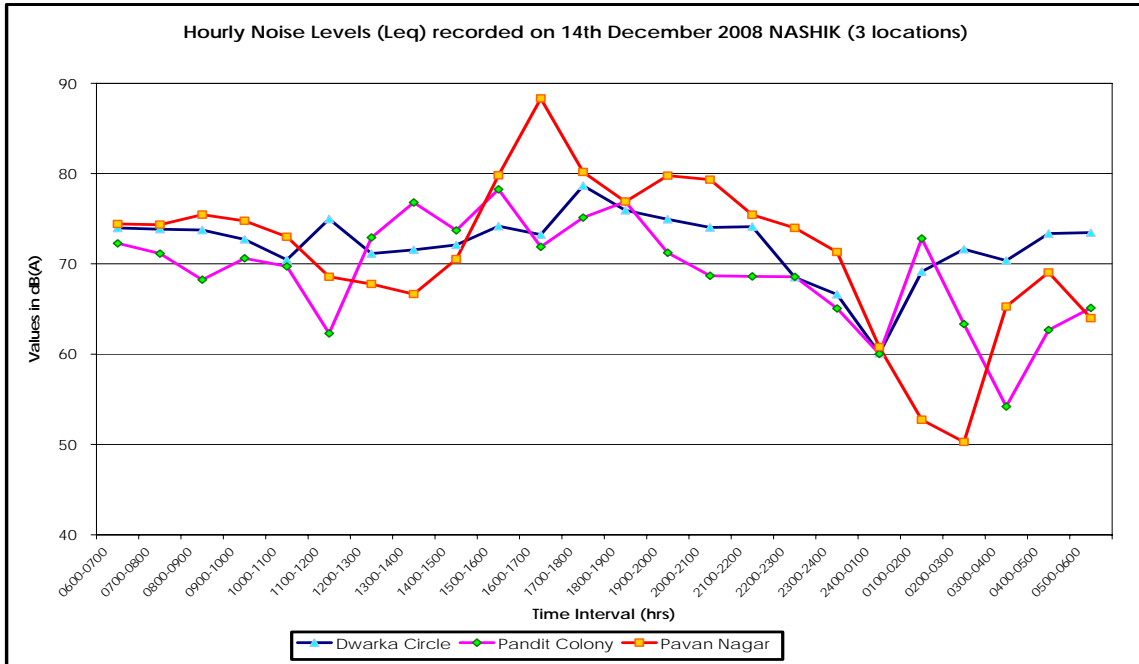
In Pune, a total of 3 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the silence area the minimum sound level was 43.8 dB(A) and maximum sound level was 73.1 dB(A). At commercial area the minimum sound level was 52.8 dB(A) and maximum sound level was 73.3 dB(A) and at the residential area the minimum sound level was 40.2 dB(A) and the maximum sound level was 72.4 dB(A).

**3(a) Ambient Noise Levels in Nashik as on 14<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Dwarka Circle	14.12.08	73.7	75.4	73.9	71.4	14.12.08 to 15.12.08	69.1	73.4	69.8	64.7
2	Pandit Colony	14.12.08	71.8	76.8	71.6	68.4	14.12.08 to 15.12.08	64.0	69.8	64.2	58.3
3	Pavan Nagar	14.12.08	75.3	80.0	75.1	68.2	14.12.08 to 15.12.08	63.4	72.1	64.6	52.0

**3(b) Ambient Noise Level in Nashik 15<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Dwarka Circle	15.12.08	75.7	77.4	75.4	73.3	15.12.08 to 16.12.08	72.0	75.6	72.1	68.9
2	Pandit Colony	15.12.08	72.8	79.4	72.4	67.8	15.12.08 to 16.12.08	63.4	68.9	63.9	57.8
3	Pavan Nagar	15.12.08	70.9	77.0	70.8	65.2	15.12.08 to 16.12.08	65.9	70.0	66.6	61.0



In **Nashik**, a total of 3 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the commercial area the minimum sound level was 60.1dB(A) and maximum sound level was 84.2 dB(A). At the residential areas the minimum sound level was 50.3 dB(A) and the maximum sound level was 88.3 dB(A).

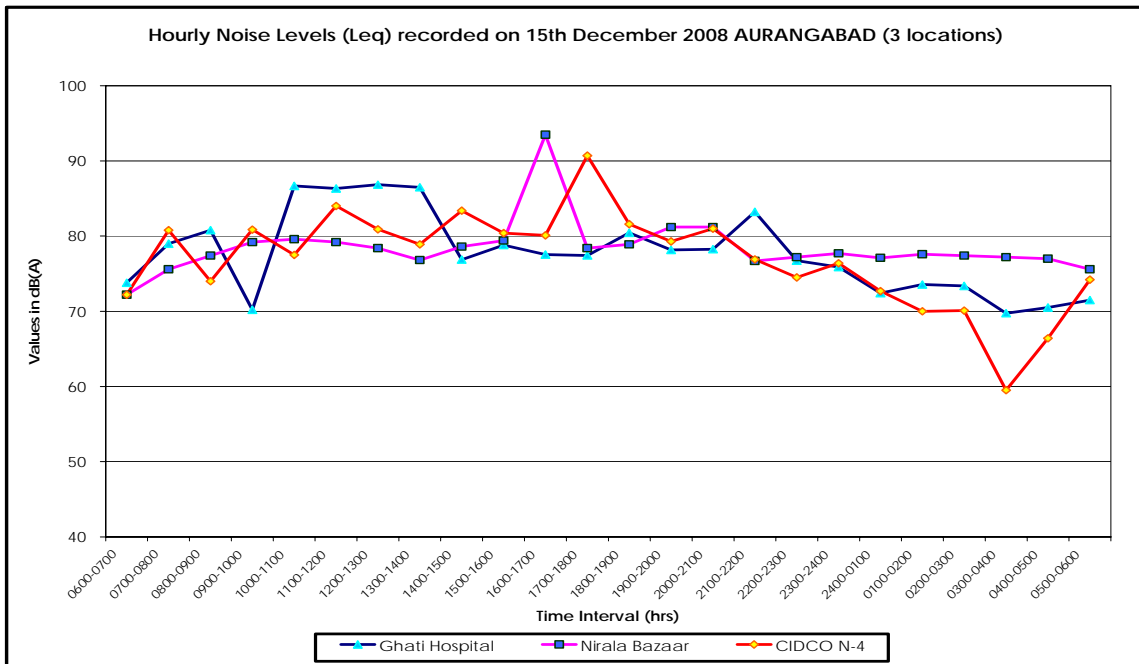
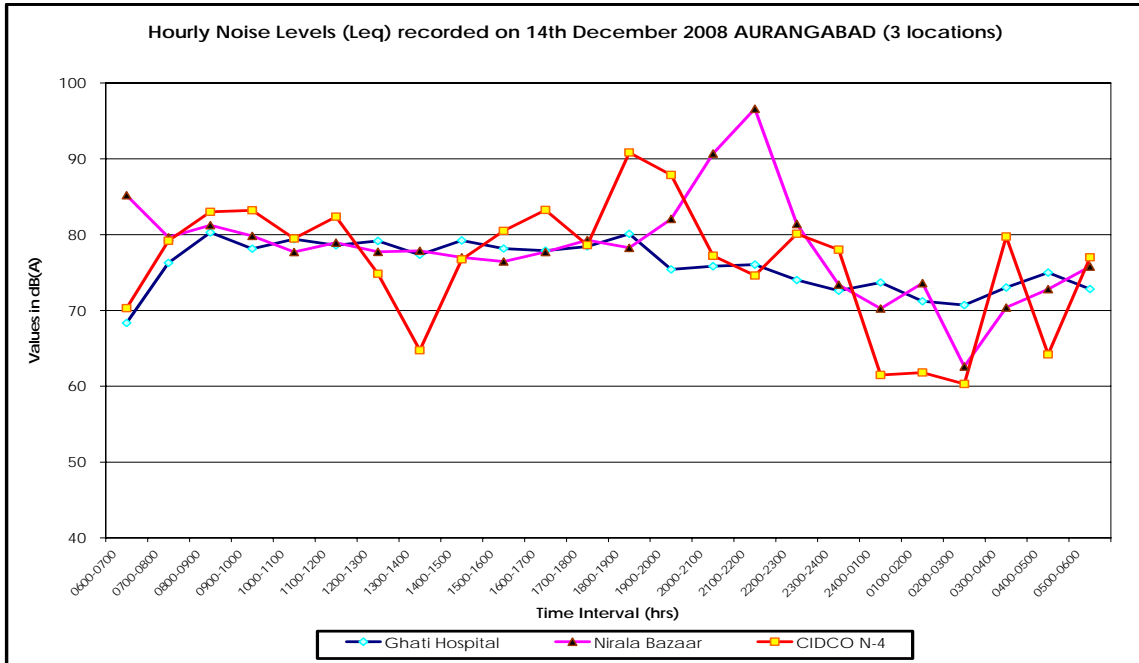


**4(a) Ambient Noise Levels in Aurangabad as on 14<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Ghati Hospital	14.12.08	77.4	79.8	78.2	75.6	14.12.08 to 15.12.08	72.9	74.3	72.9	71.1
2	Nirala Bazaar, Samarth Nagar	14.12.08	81.0	88.0	79.1	77.4	14.12.08 to 15.12.08	72.5	77.5	73.1	68.0
3	CIDCO N-4	14.12.08	79.2	85.6	79.4	72.5	14.12.08 to 15.12.08	70.3	79.8	70.6	61.1

**4(b) Ambient Noise Levels in Aurangabad as on 15<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Ghati Hospital	15.12.08	80.1	86.6	78.9	75.3	15.12.08 to 16.12.08	73.0	76.2	72.9	70.3
2	Nirala Bazaar, Samarth Nagar	15.12.08	79.1	81.2	78.8	76.2	15.12.08 to 16.12.08	77.1	77.6	77.2	76.6
3	CIDCO N-4	15.12.08	80.2	83.7	80.6	75.5	15.12.08 to 16.12.08	70.5	75.1	71.4	64.3



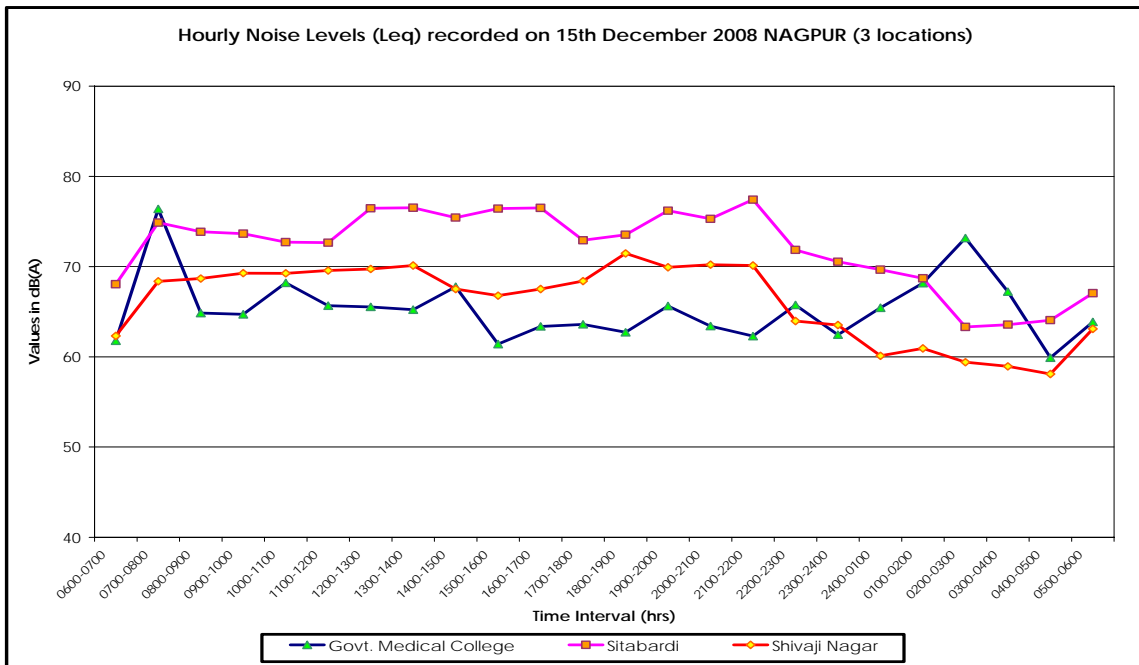
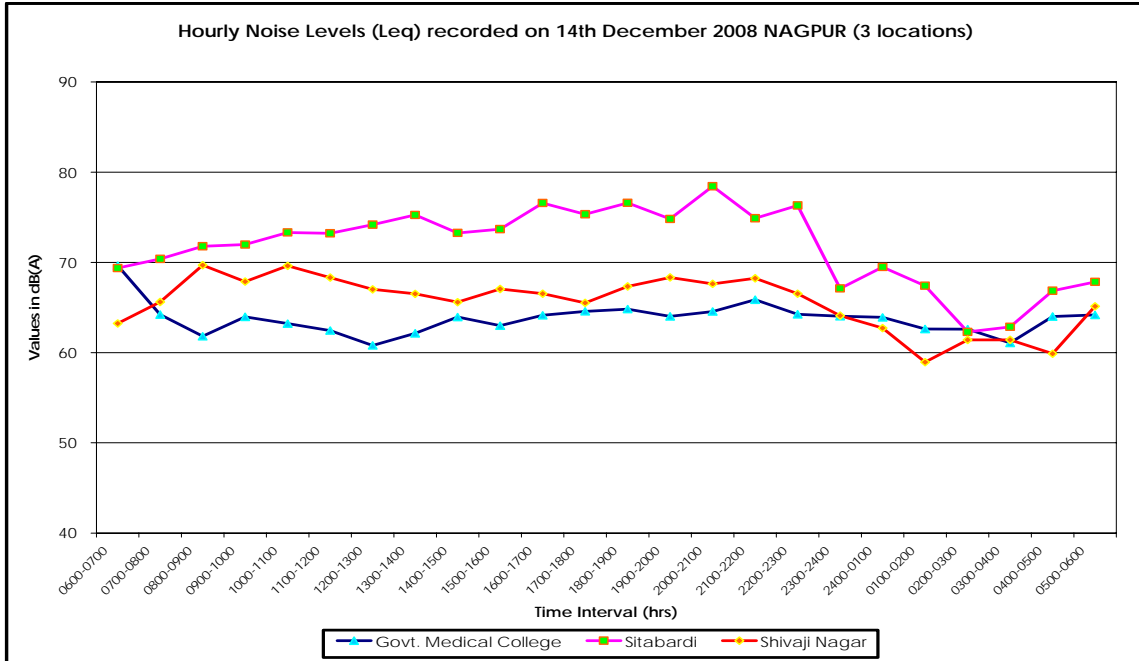
In **Aurangabad**, a total of 3 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the silence area the minimum sound level was 68.4 dB(A) and maximum sound level was 86.8 dB(A). At commercial area the minimum sound level was 62.6 dB(A) and maximum sound level was 96.6 dB(A) and at the residential area the minimum sound level was 59.5 dB(A) and the maximum sound level was 90.8 dB(A).

5(a) Ambient Noise Levels in Nagpur as on 14<sup>th</sup> December 2008:

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Govt. Medical College	14.12.08	63.9	65.3	64.0	62.0	14.12.08 to 15.12.08	63.3	64.2	64.0	62.1
2	Sitabardi Police Station	14.12.08	73.9	76.6	73.9	71.1	14.12.08 to 15.12.08	67.5	71.5	67.3	62.7
3	Shivaji Nagar	14.12.08	67.1	69.0	67.2	65.6	14.12.08 to 15.12.08	62.5	65.6	62.1	59.6

5(b) Ambient Noise Level in Nagpur as on 15<sup>th</sup> December 2008:

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Govt. Medical College	15.12.08	65.2	68.0	64.8	62.0	15.12.08 to 16.12.08	65.7	69.7	65.6	61.7
2	Sitabardi Police Station	15.12.08	74.5	76.5	75.1	72.7	15.12.08 to 16.12.08	67.3	70.9	67.9	63.5
3	Shivaji Nagar	15.12.08	68.7	70.2	69.3	67.2	15.12.08 to 16.12.08	61.0	63.7	60.5	58.7



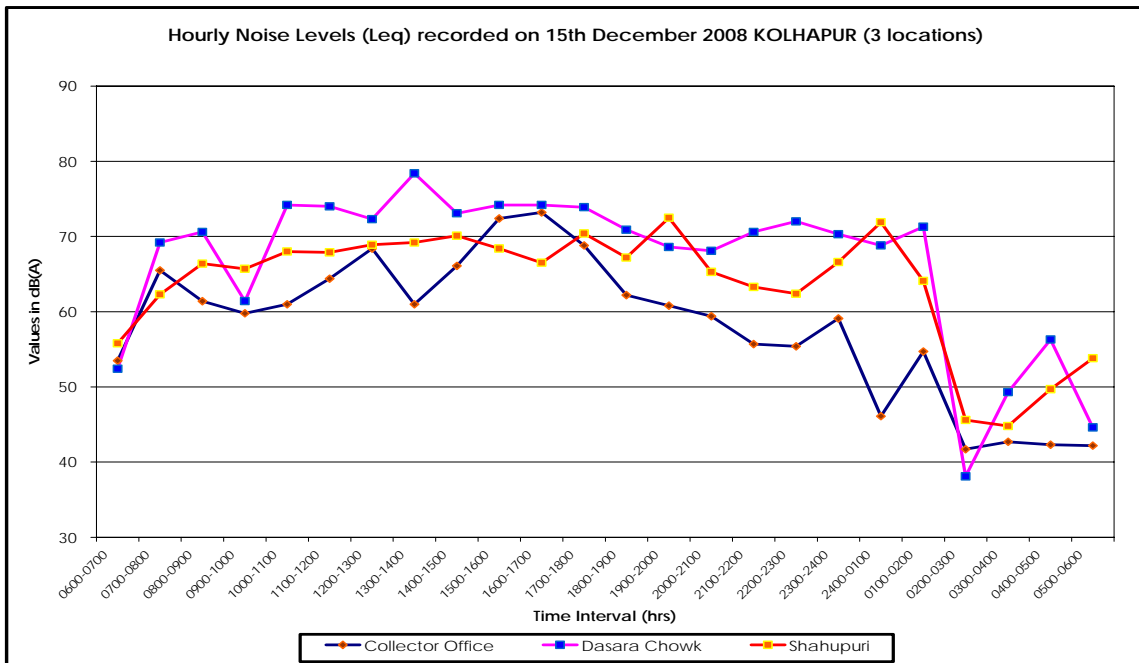
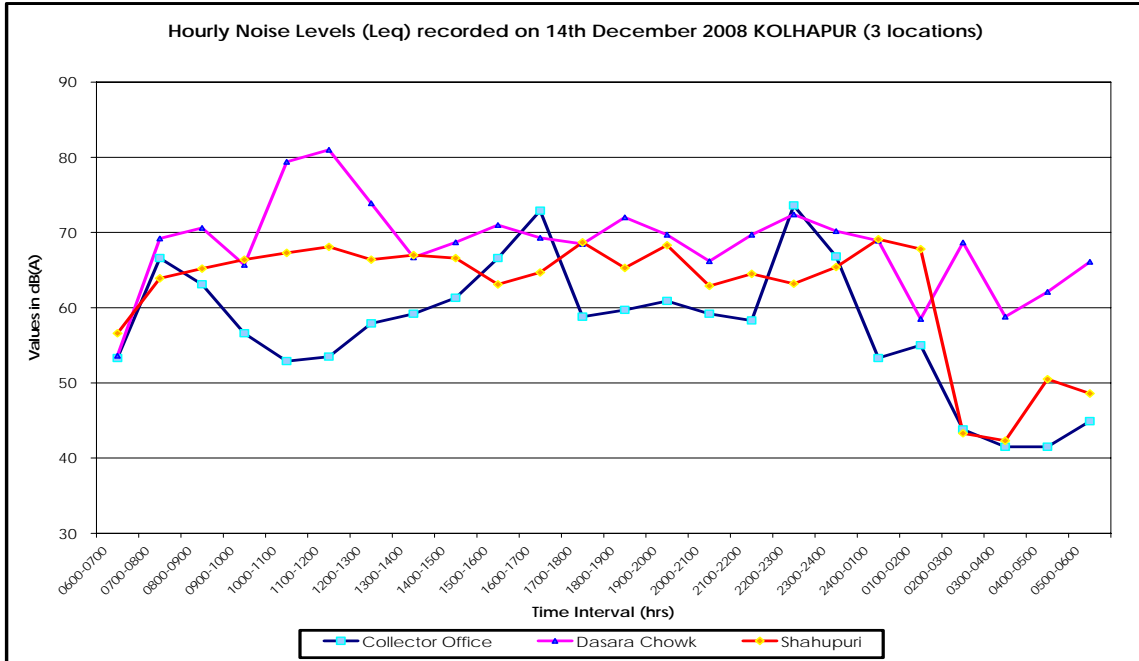
In **Nagpur**, a total of 3 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the silence area the minimum sound level was 59.9 dB(A) and maximum sound level was 76.4 dB(A). At commercial area the minimum sound level was 62.3 dB(A) and maximum sound level was 78.4 dB(A) and at the residential area the minimum sound level was 58.1dB(A) and the maximum sound level was 71.5 dB(A).

**6(a) Ambient Noise Levels in Kolhapur on 14<sup>th</sup> December 2008:**

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Collector Office	14.12.08	60.1	66.6	59.2	53.4	14.12.08 to 15.12.08	52.6	68.8	49.1	41.5
2	Dasara Chowk	14.12.08	69.7	76.7	69.5	66.0	14.12.08 to 15.12.08	65.7	70.9	67.4	58.7
3	Shahupuri	14.12.08	65.3	68.2	65.9	63.0	14.12.08 to 15.12.08	56.3	68.2	56.9	43.0

**6(b) Ambient Noise Level in Kolhapur 15<sup>th</sup> December 2008:**

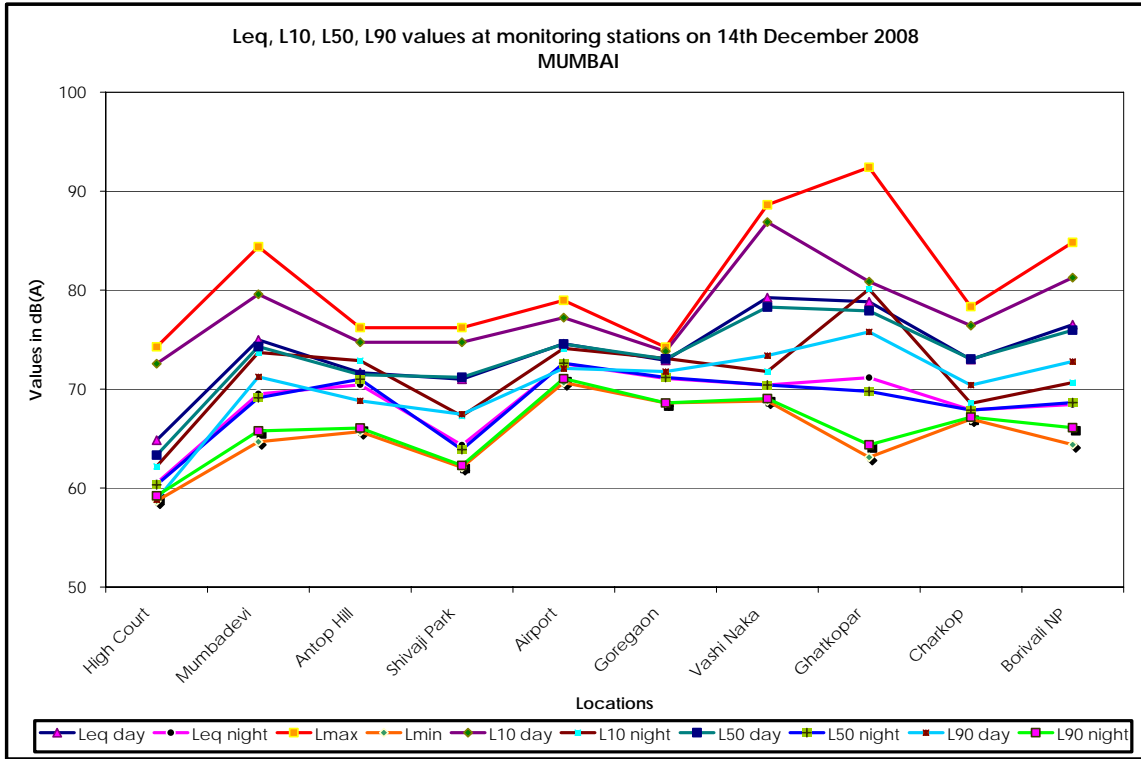
Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			Leq	L10	L50	L90		Leq	L10	L50	L90
1	Collector Office	15.12.08	63.4	70.6	61.8	57.6	15.12.08 to 16.12.08	48.0	56.5	44.4	42.1
2	Dasara Chowk	15.12.08	70.4	74.2	71.6	64.8	15.12.08 to 16.12.08	58.8	71.5	62.6	42.7
3	Shahupuri	15.12.08	66.7	70.3	67.6	62.8	15.12.08 to 16.12.08	57.4	68.2	58.1	45.4



In **Kolhapur**, a total of 3 locations were monitored continuously for two days from 14<sup>th</sup> December to 15<sup>th</sup> December for 24 hours. It was observed that, at the silence area the minimum sound level was 38.1 dB(A) and maximum sound level was 81.0 dB(A). At commercial area the minimum sound level was 42.3 dB(A) and maximum sound level was 69.1 dB(A) and at the residential area the minimum sound level was 41.5 dB(A) and the maximum sound level was 73.6 dB(A).

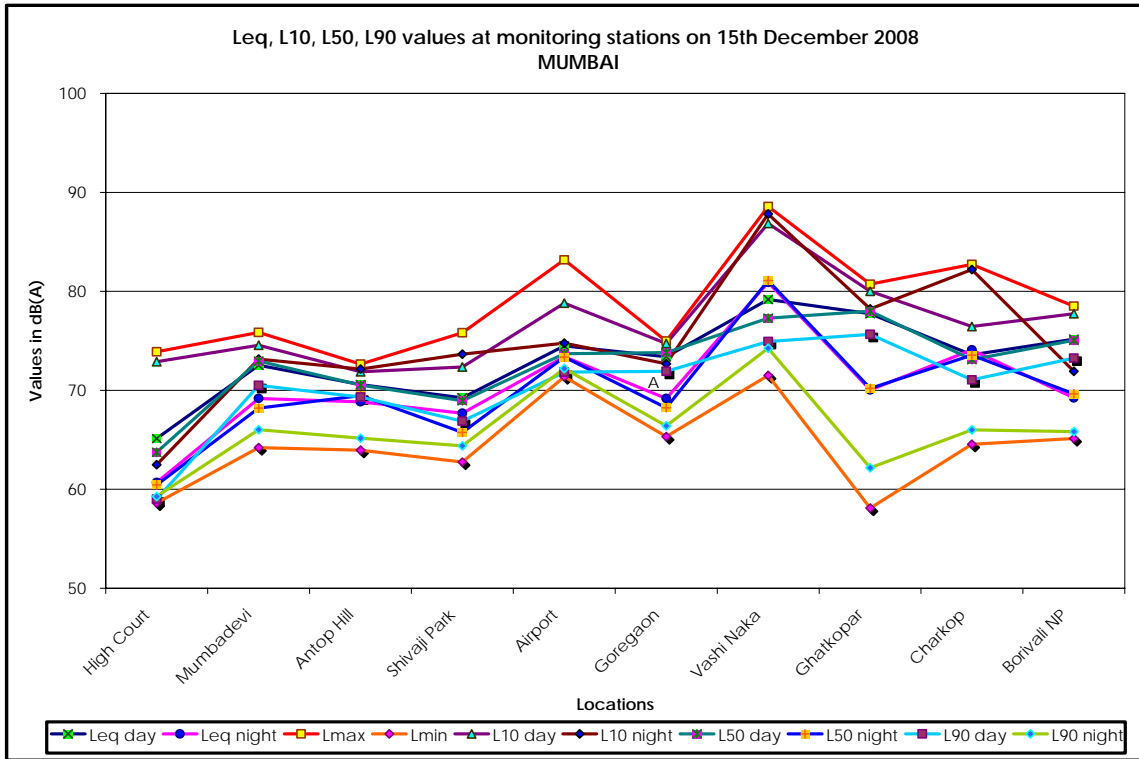
8. **Graphical representation of  $L_{eq}$ ,  $L_{10}$ ,  $L_{50}$ ,  $L_{90}$ :** The following are the graphs of each metropolitan city which shows the noise levels at day time and night time.

**1(a) Noise Levels at Mumbai as on 14<sup>th</sup> December 2008**



From the above figure 1(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 64.8 dB(A) at High Court to 79.2 dB(A) at Vashi Naka and during night time the noise levels ( $L_{eq}$ ) ranged between 60.5 dB(A) at High Court to 72.6 dB(A) at Airport . The maximum noise level observed was 92.4 dB(A) at Ghatkopar and the minimum noise level observed was 58.7 dB(A) at High Court.

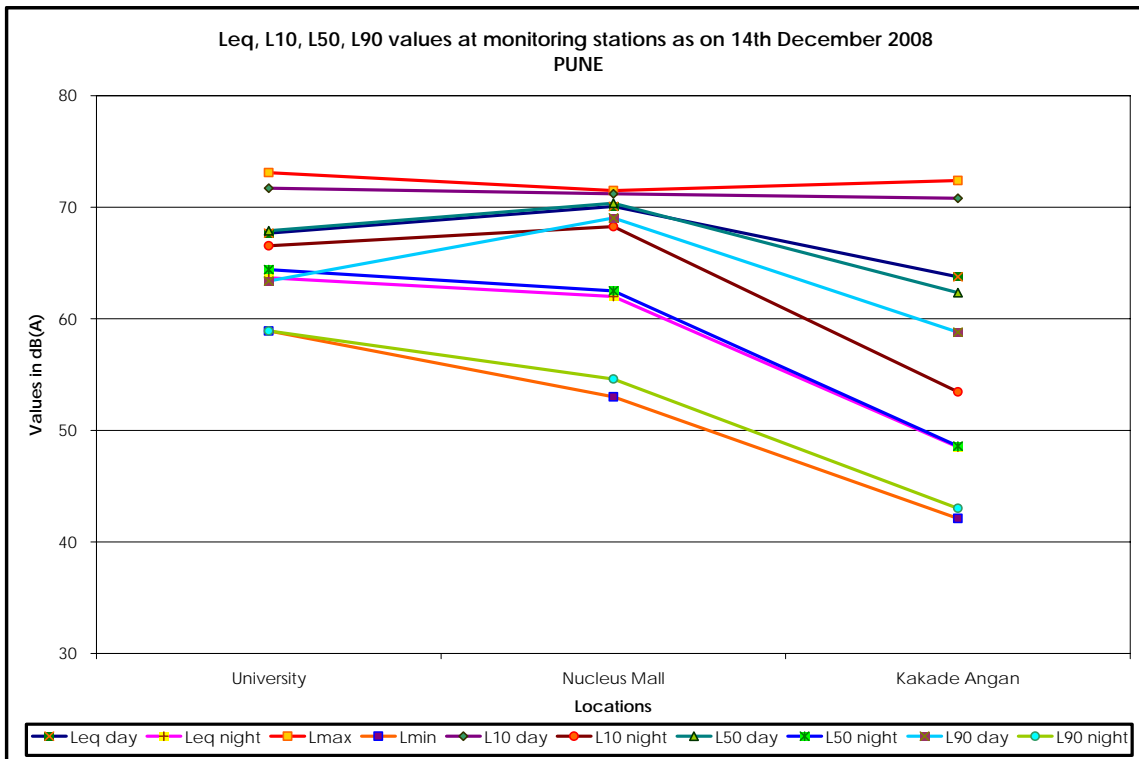
1(b) Noise Levels at Mumbai as on 15<sup>th</sup> December 2008



From the above figure 1(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 65.1dB(A) at High Court to 79.2 dB(A) at Vashi Naka and during night time the noise levels ( $L_{eq}$ ) ranged between 60.7 dB(A) at High Court to 80.9 dB(A) at Vashi Naka. The maximum noise level observed was 88.6 dB(A) at Vashi Naka and the minimum noise level observed was 58.6 dB(A) at High Court.

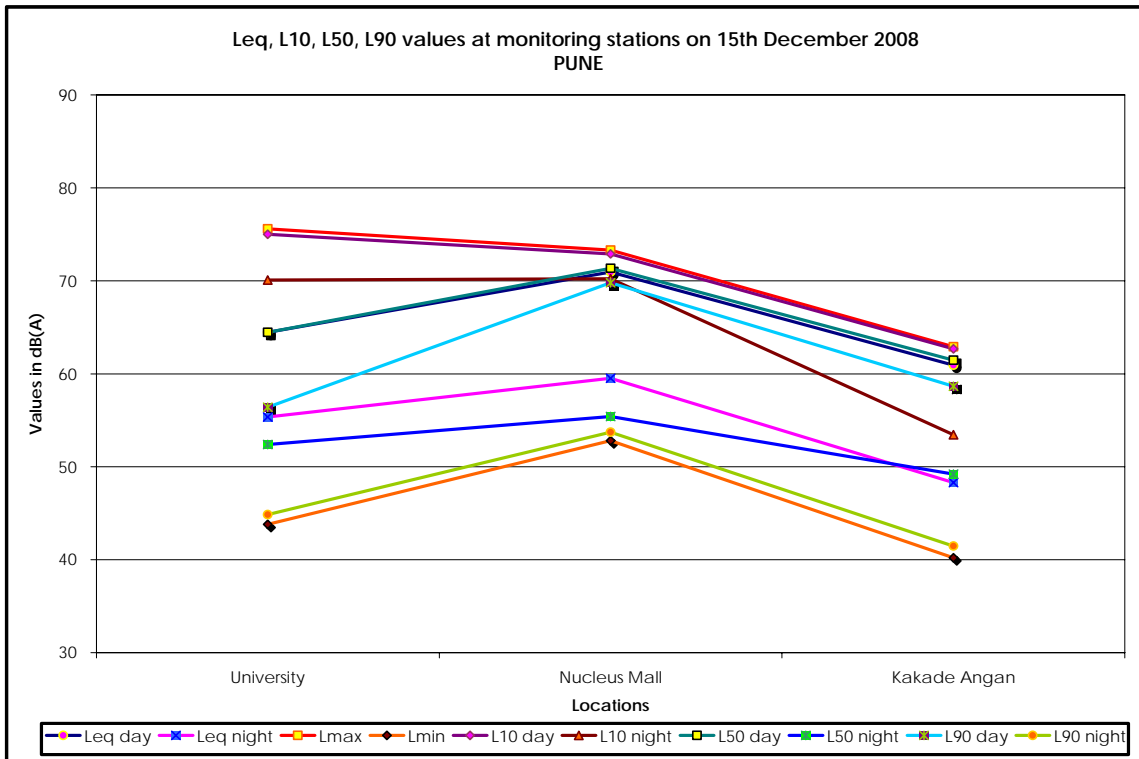


2(a) Noise Level at Pune as on 14<sup>th</sup> December 2008



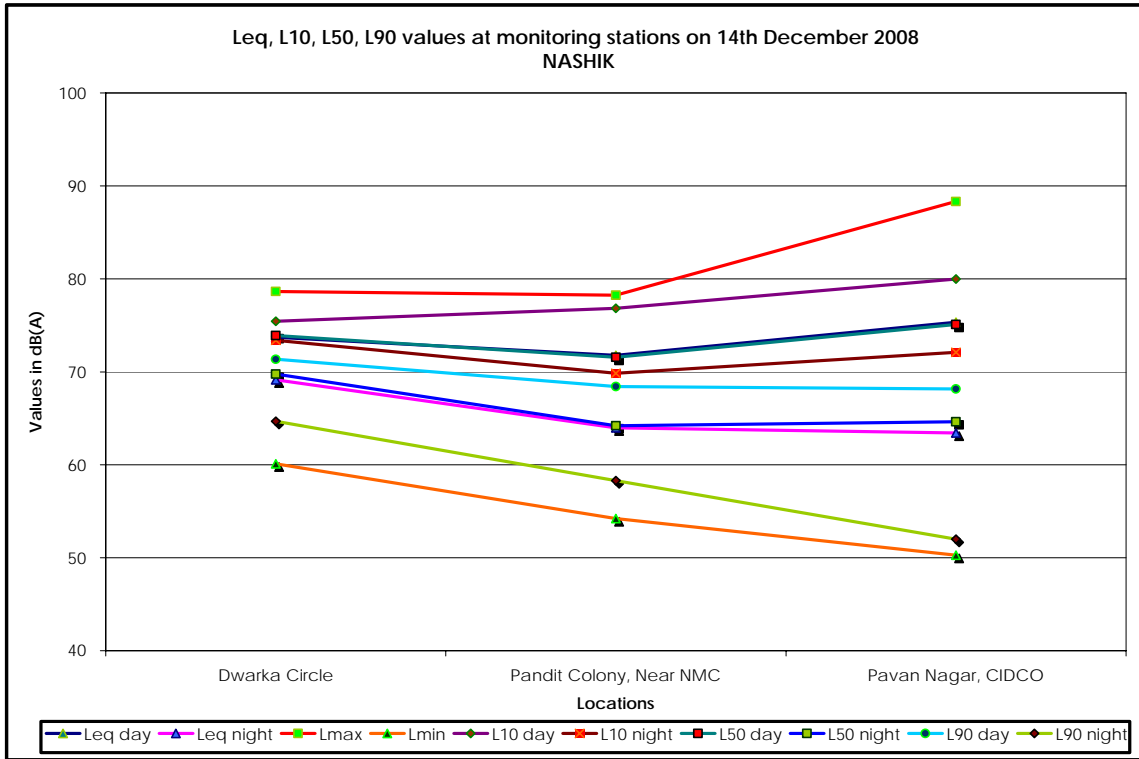
From the above figure 2(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 63.8 dB(A) at Kakade Angan to 70.1 dB(A) at Nucleus Mall and during night time the noise levels ( $L_{eq}$ ) ranged between 48.5 dB(A) at Kakade Angan to 63.7 dB(A) at Pune University. The maximum noise level observed was 73.1 dB(A) at Pune University and the minimum noise level observed was 42.1dB(A) at Kakade Angan .

2(b) Noise Level at Pune as on 15<sup>th</sup> December 2008



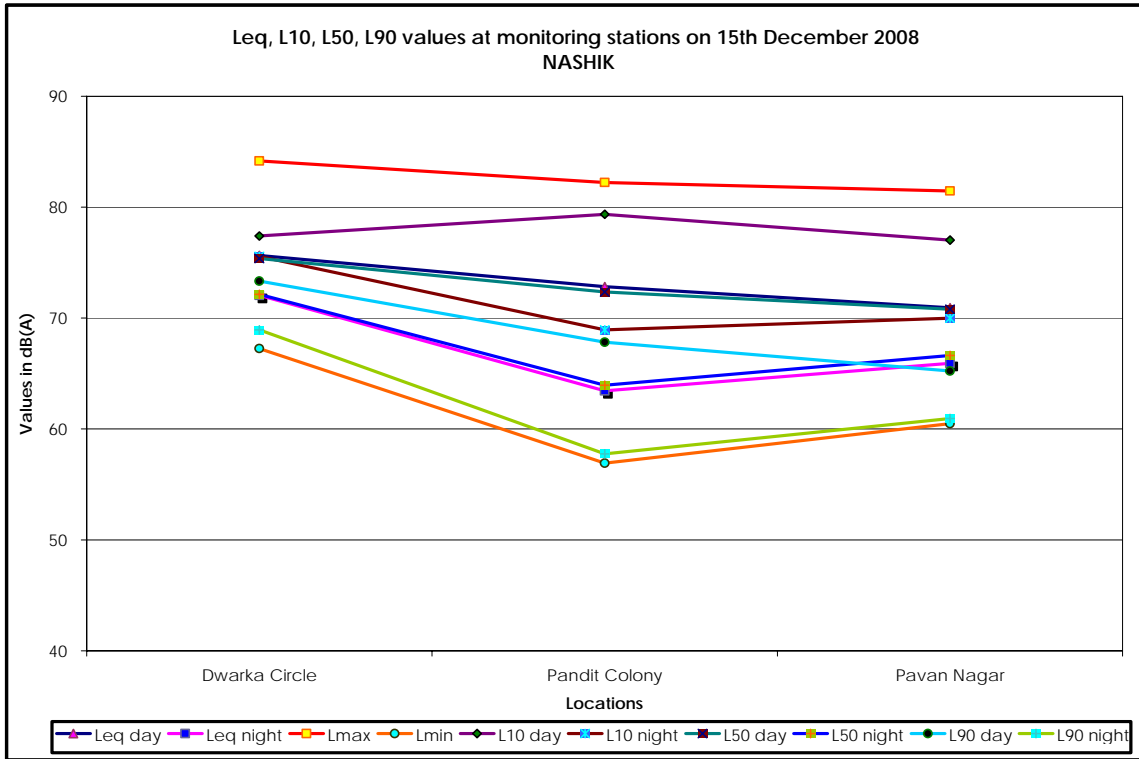
From the above figure 2(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 60.9 dB(A) at Kakade Angan to 70.9 dB(A) at Nucleus Mall and during night time the noise levels ( $L_{eq}$ ) ranged between 48.3 dB (A) at Kakade Angan to 70.2 dB(A) at Nucleus Mall. The maximum noise level observed was 75.6 dB(A) at Pune University and the minimum noise level observed was 40.2 dB(A) at Kakade Angan .

3(a) Noise Levels at Nashik as on 14<sup>th</sup> December 2008



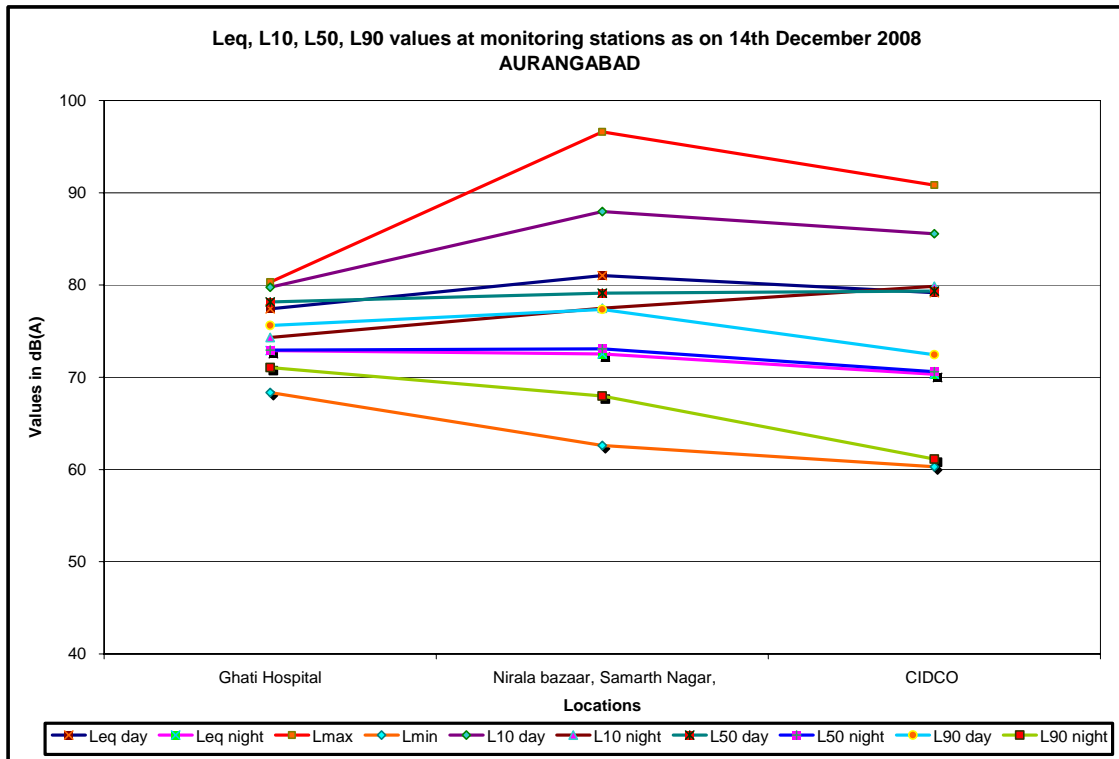
From the above figure 3(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 71.8 dB(A) at Dwarka Circle to 75.3 dB(A) at Pavan Nagar and during night time the noise levels ( $L_{eq}$ ) ranged between 63.4 dB(A) at Pavan Nagar to 69.1dB(A) at Dwarka Circle. The maximum noise level observed was 88.3 dB(A) at Pavan Nagar and the minimum noise level observed was 50.3 dB(A) at Pavan Nagar.

3(b) Noise Levels at Nashik as on 15<sup>th</sup> December 2008



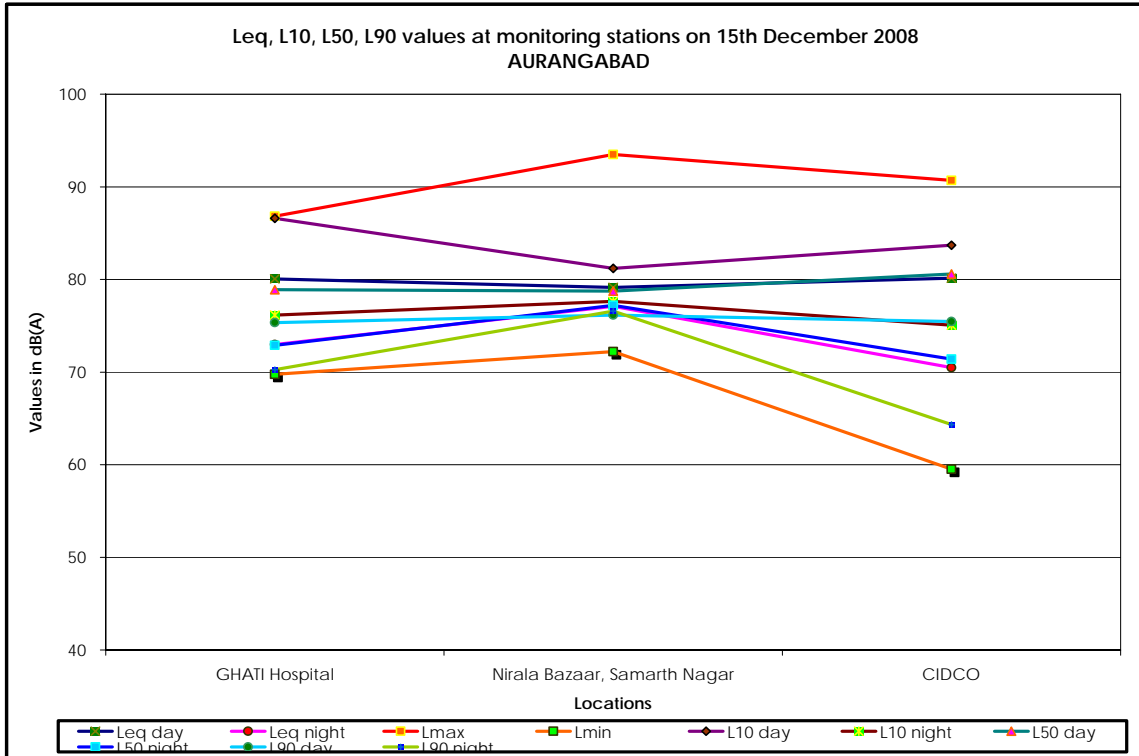
From the above figure 3(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 70.9 dB(A) at Pavan Nagar to 75.7 dB(A) at Dwarka Circle and during night time the noise levels ( $L_{eq}$ ) ranged between 63.4 dB(A) at Pandit Colony to 72.0 dB(A) at Dwarka Circle. The maximum noise level observed was 84.2 dB(A) at Dwarka Circle and the minimum noise level observed was 56.9 dB(A) at Pandit Colony.

4(a) Noise Levels at Aurangabad as on 14<sup>th</sup> December 2008



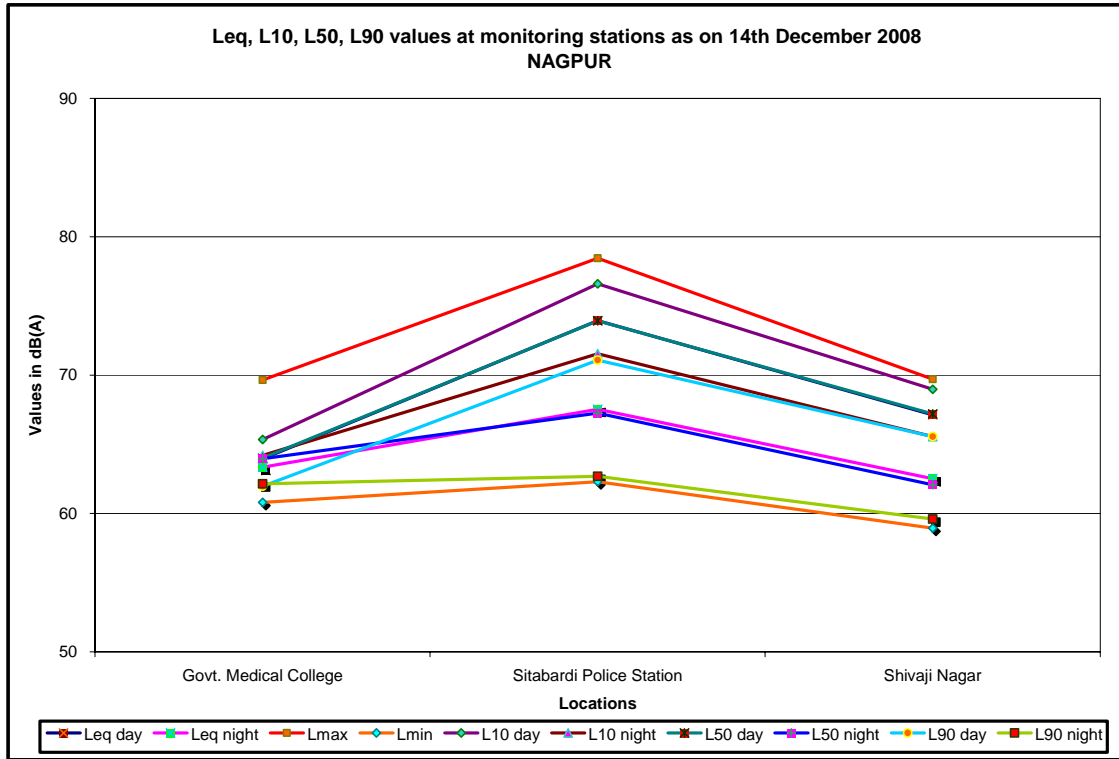
From the above figure 4(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 77.4 dB(A) at Ghati Hospital to 81.0 dB(A) at Nirala Bazaar and during night time the noise levels ( $L_{eq}$ ) ranged between 70.3 dB(A) at CIDCO to 72.9 dB(A) at Ghati Hospital. The maximum noise level observed was 96.6 dB(A) at Nirala Bazaar and the minimum noise level observed was 60.3 dB(A) at CIDCO.

4(b) Noise Levels at Aurangabad as on 15<sup>th</sup> December 2008



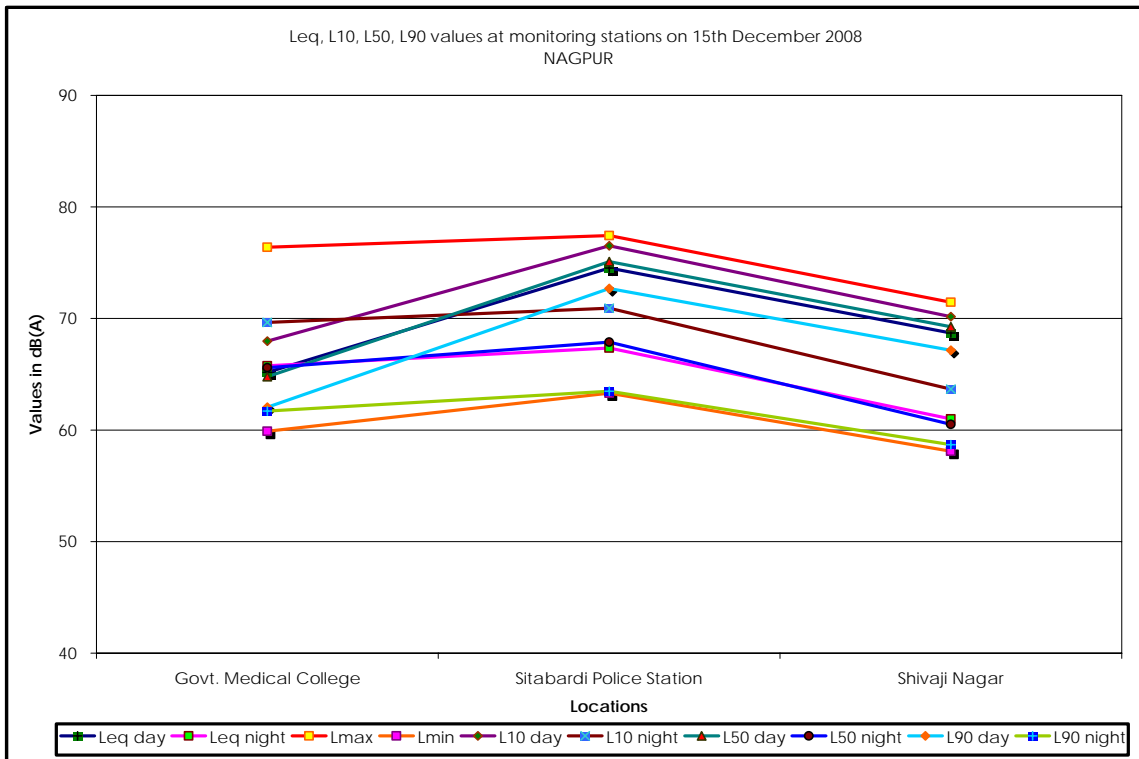
From the above figure 4(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 79.1 dB(A) at Nirala Bazaar to 80.2 dB(A) at CIDCO and during night time the noise levels ( $L_{eq}$ ) ranged between 70.5 dB(A) at CIDCO to 73.0 dB(A) at Ghati Hospital. The maximum noise level observed was 93.5 dB(A) at Nirala Bazaar and the minimum noise level observed was 59.5 dB(A) at CIDCO.

5(a) Noise Levels at Nagpur as on 14<sup>th</sup> December 2008



From the above figure 5(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 63.9 dB(A) at Government Medical College to 73.9 dB(A) at Sitabardi and during night time the noise levels ( $L_{eq}$ ) ranged between 62.5dB(A) at Shivaji Nagar to 67.5 dB(A) at Sitabardi. The maximum noise level observed was 76.4 dB(A) at Sitabardi and the minimum noise level observed was 60.8 dB(A) at Government Medical College.

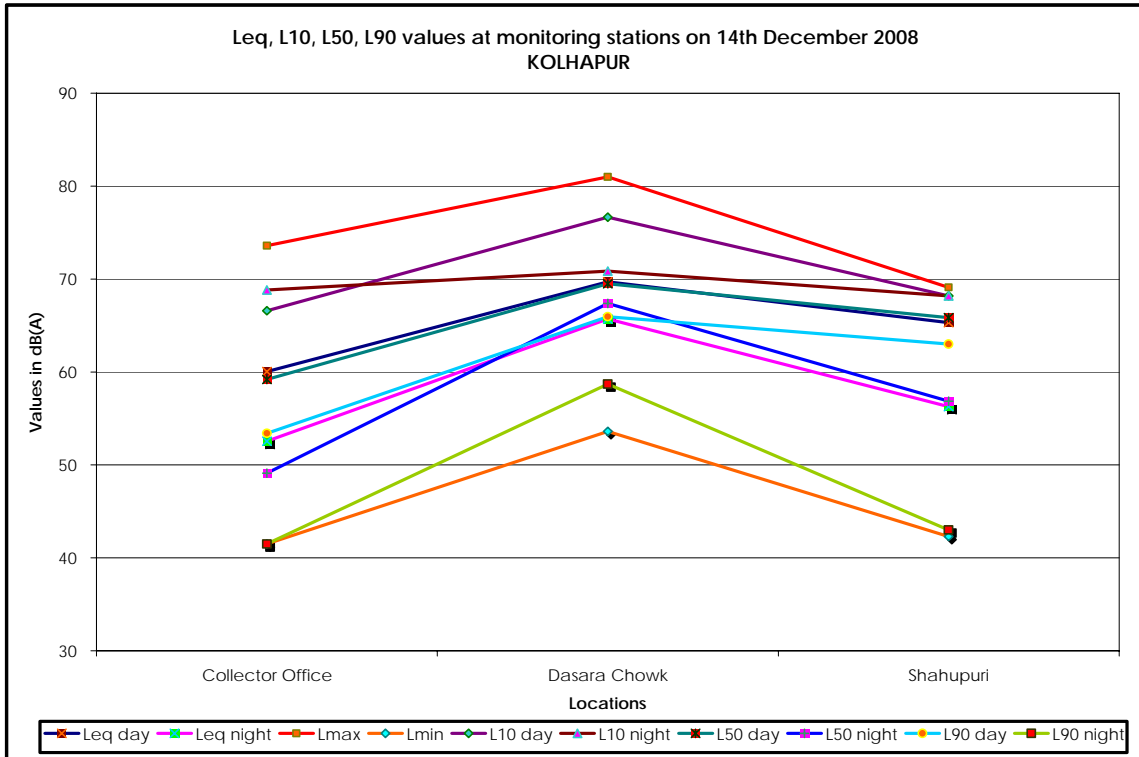
5(b) Noise Levels at Nagpur as on 15<sup>th</sup> December 2008



From the above figure 5(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 65.2 dB(A) at Government Medical College to 74.5 dB(A) at Sitabardi and during night time the noise levels ( $L_{eq}$ ) ranged between 61.0 dB(A) at Shivaji Nagar to 67.3 dB(A) at Sitabardi. The maximum noise level observed was 77.4 dB(A) at Sitabardi and the minimum noise level observed was 58.1 dB(A) at Shivaji Nagar.

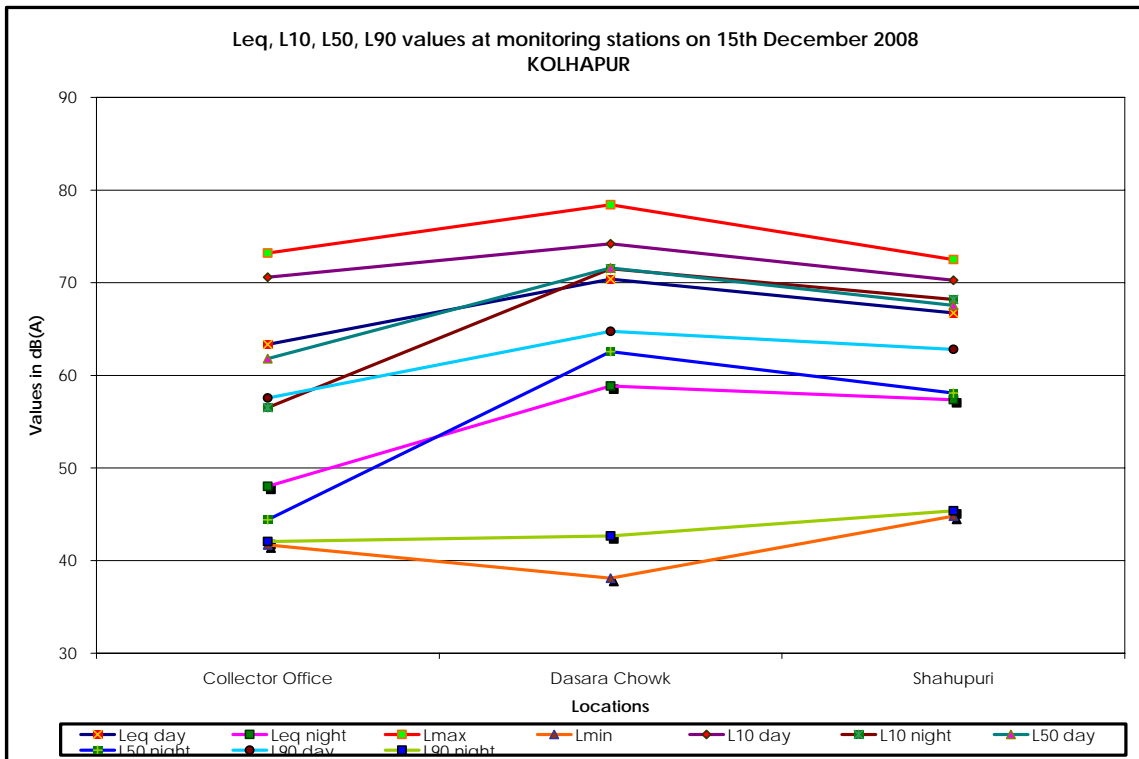


6(a) Noise Levels at Kolhapur as on 14<sup>th</sup> December 2008



From the above figure 6(a) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 60.1dB(A) at Collector Office to 69.7 dB(A) at Dasara Chowk and during night time the noise levels ( $L_{eq}$ ) ranged between 52.6 dB(A) at Collector Office to 65.7 dB(A) at Dasara Chowk. The maximum noise level observed was 81.0 dB(A) at Dasara Chowk and the minimum noise level observed was 41.5 dB(A) at Collector Office.

6(b) Noise Levels at Kolhapur as on 15<sup>th</sup> December 2008



From the above figure 6(b) the ambient noise levels ( $L_{eq}$ ) during day time ranged between 63.4 dB(A) at Collector Office to 70.4 dB(A) at Dasara Chowk and during night time the noise levels ( $L_{eq}$ ) ranged between 48.0 dB(A) at Collector Office to 58.8 dB(A) at Dasara Chowk. The maximum noise level observed was 78.4 dB(A) at Dasara Chowk and the minimum noise level observed was 38.1 dB(A) at Dasara Chowk.

9. **Day-Night Noise Levels according to area:** The day night equivalent (Ldn) noise levels were calculated and are compared with Lmax, Lmin and the maximum permissible limit of the area as follows,

**1(a) Noise Levels as on 14<sup>th</sup> December 2008:**

Area	Location	Ldn dB(A)	Lmax dB(A)	Lmin dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>					
Silence	High Court	67.8	74.3	58.7	50
	Mumbadevi	77.0	84.4	64.7	50
	National Park	77.2	84.8	64.4	50
Residential	Antop Hill	76.6	76.2	65.7	55
	Shivaji Park	72.4	76.2	62.1	55
Commercial	Airport	79.0	79.0	70.7	65
	Vashi Naka	79.6	88.6	68.8	65
	Ghatkopar	79.7	92.4	63.1	65
Industrial	Goregaon	77.4	74.2	68.6	75
	Charkop	75.3	78.3	67.0	75
<b>PUNE</b>					
Silence	University	76.7	73.1	58.9	50
Residential	Kakade Angan	62.6	72.4	42.1	55
Commercial	Nucleus Mall	70.8	71.5	53.0	65
<b>NASHIK</b>					
Residential	Pandit Colony	72.6	78.2	54.2	55
Residential	Pavan Nagar	74.7	88.3	50.3	55
Commercial	Dwarka Circle	76.3	78.7	60.1	65
<b>AURANGABAD</b>					
Silence	Ghati Hospital.	80.0	80.3	68.4	50
Residential	CIDCO N-4	79.6	90.8	60.3	55
Commercial	Nirala Bazaar	81.5	96.6	62.6	65
<b>NAGPUR</b>					
Silence	Medical College	69.4	69.6	60.8	50
Residential	Shivaji Nagar	69.7	69.7	58.9	55
Commercial	Sitabardi	75.4	78.4	62.3	65
<b>KOLHAPUR</b>					
Silence	Dasara Chowk	72.7	81.0	53.6	50
Residential	Collector Office	61.1	73.6	41.5	55
Commercial	Shahupuri	65.6	69.1	42.3	65

1(b) Noise Levels as on 15<sup>th</sup> December 2008:

Area	Location	Ldn dB(A)	Lmax dB(A)	Lmin dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>					
Silence	High Court	67.8	73.9	58.6	50
	Mumbadevi	75.9	75.9	64.2	50
	National Park	76.9	78.5	65.1	50
Residential	Antop Hill	75.1	72.7	63.9	55
	Shivaji Park	74.0	75.8	62.7	55
Commercial	Airport	79.6	83.2	71.4	65
	Vashi Naka	86.6	88.6	71.5	65
	Ghatkopar	78.6	80.7	58.1	65
Industrial	Goregaon	76.2	75.0	65.3	75
	Charkop	80.0	82.7	64.5	75
<b>PUNE</b>					
Silence	University	64.8	75.6	43.8	50
Residential	Kakade Angan	60.1	62.9	40.2	55
Commercial	Nucleus Mall	70.4	73.3	52.8	65
<b>NASHIK</b>					
Residential	Pandit Colony	72.9	82.2	56.9	55
Residential	Pavan Nagar	73.2	81.5	60.5	55
Commercial	Dwarka Circle	78.9	84.2	67.3	65
<b>AURANGABAD</b>					
Silence	Ghati Hospital.	81.3	86.8	69.8	50
Residential	CIDCO N-4	80.3	90.7	59.5	55
Commercial	Nirala Bazaar	83.5	93.5	72.2	65
<b>NAGPUR</b>					
Silence	Medical College	71.6	76.4	59.9	50
Residential	Shivaji Nagar	69.6	71.5	58.1	55
Commercial	Sitabardi	75.6	77.4	63.3	65
<b>KOLHAPUR</b>					
Silence	Dasara Chowk	69.9	78.4	38.1	50
Residential	Collector Office	62.2	73.2	41.7	55
Commercial	Shahupuri	66.9	72.5	44.8	65

10. Conclusion:

It is observed from the results that, the noise levels mostly were exceeding the permissible limit during the both days on 14<sup>th</sup> (holiday) & 15<sup>th</sup> (working day) December 2008 in all the six Metropolitan Cities of Maharashtra except at Goregaon and Charkop in Mumbai, as shown in the table,

**1(a) Noise Levels as on 14<sup>th</sup> December 2008 during DAY TIME**

Area	Location	Leq dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>			
Silence	High Court	64.8	50
	Mumbadevi	75.0	50
	National Park	76.5	50
Residential	Antop Hill	71.6	55
	Shivaji Park	71.0	55
Commercial	Airport	74.6	65
	Vashi Naka	79.2	65
	Ghatkopar	78.8	65
Industrial	Goregaon	72.9	75
	Charkop	73.0	75
<b>PUNE</b>			
Silence	University	67.7	50
Residential	Kakade Angan	63.8	55
Commercial	Nucleus Mall	70.1	65
<b>NASHIK</b>			
Residential	Pandit Colony	71.8	55
Residential	Pavan Nagar	75.3	55
Commercial	Dwarka Circle	73.7	65
<b>AURANGABAD</b>			
Silence	Ghati Hospital.	77.4	50
Residential	CIDCO N-4	79.2	55
Commercial	Nirala Bazaar	81.0	65
<b>NAGPUR</b>			
Silence	Medical College	63.9	50
Residential	Shivaji Nagar	67.1	55
Commercial	Sitabardi	73.9	65
<b>KOLHAPUR</b>			
Silence	Dasara Chowk	69.7	50
Residential	Collector Office	60.1	55
Commercial	Shahupuri	65.3	65

**1(b) Noise Levels as on 14<sup>th</sup> December 2008 during NIGHT TIME**

Area	Location	Leq dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>			
Silence	High Court	60.5	40
	Mumbadevi	69.5	40
	National Park	68.4	40
Residential	Antop Hill	70.4	45
	Shivaji Park	64.3	45
Commercial	Airport	72.6	55
	Vashi Naka	70.4	55
	Ghatkopar	71.2	55
Industrial	Goregaon	71.1	70

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	Charkop	67.9	70
<b>PUNE</b>			
Silence	University	63.7	40
Residential	Kakade Angan	48.5	45
Commercial	Nucleus Mall	62.0	55
<b>NASHIK</b>			
Residential	Pandit Colony	64.0	45
Residential	Pavan Nagar	63.4	45
Commercial	Dwarka Circle	69.1	55
<b>AURANGABAD</b>			
Silence	Ghati Hospital.	72.9	40
Residential	CIDCO N-4	70.3	45
Commercial	Nirala Bazaar	72.5	55
<b>NAGPUR</b>			
Silence	Medical College	63.3	40
Residential	Shivaji Nagar	62.5	45
Commercial	Sitabardi	67.5	55
<b>KOLHAPUR</b>			
Silence	Dasara Chowk	65.7	40
Residential	Collector Office	52.6	45
Commercial	Shahupuri	56.3	55

**2(a) Noise Levels as on 15<sup>th</sup> December 2008 during DAY TIME**

Area	Location	Leq dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>			
Silence	High Court	65.1	50
	Mumbadevi	72.5	50
	National Park	75.2	50
Residential	Antop Hill	70.6	55
	Shivaji Park	69.2	55
Commercial	Airport	74.5	65
	Vashi Naka	79.2	65
	Ghatkopar	77.7	65
Industrial	Goregaon	73.4	75
	Charkop	73.6	75
<b>PUNE</b>			
Silence	University	64.5	50
Residential	Kakade Angan	60.9	55
Commercial	Nucleus Mall	70.9	65
<b>NASHIK</b>			
Residential	Pandit Colony	72.8	55
Residential	Pavan Nagar	70.9	55
Commercial	Dwarka Circle	75.7	65
<b>AURANGABAD</b>			
Silence	Ghati Hospital.	80.1	50
Residential	CIDCO N-4	80.2	55
Commercial	Nirala Bazaar	79.1	65

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<b>NAGPUR</b>			
Silence	Medical College	65.2	50
Residential	Shivaji Nagar	68.7	55
Commercial	Sitabardi	74.5	65
<b>KOLHAPUR</b>			
Silence	Dasara Chowk	70.4	50
Residential	Collector Office	63.4	55
Commercial	Shahupuri	66.7	65

**2(b) Noise Levels as on 15<sup>th</sup> December 2008 during NIGHT TIME**

Area	Location	Leq dB(A)	Maximum Permissible Limit in dB(A)
<b>MUMBAI</b>			
Silence	High Court	60.7	40
	Mumbadevi	69.2	40
	National Park	69.2	40
Residential	Antop Hill	68.8	45
	Shivaji Park	67.7	45
Commercial	Airport	73.4	55
	Vashi Naka	80.9	55
	Ghatkopar	70.0	55
Industrial	Goregaon	69.2	70
	Charkop	74.1	70
<b>PUNE</b>			
Silence	University	55.4	40
Residential	Kakade Angan	48.3	45
Commercial	Nucleus Mall	59.5	55
<b>NASHIK</b>			
Residential	Pandit Colony	63.4	45
Residential	Pavan Nagar	65.9	45
Commercial	Dwarka Circle	72.0	55
<b>AURANGABAD</b>			
Silence	Ghati Hospital.	73.0	40
Residential	CIDCO N-4	70.5	45
Commercial	Nirala Bazaar	77.1	55
<b>NAGPUR</b>			
Silence	Medical College	65.7	40
Residential	Shivaji Nagar	61.0	45
Commercial	Sitabardi	67.3	55
<b>KOLHAPUR</b>			
Silence	Dasara Chowk	58.8	40
Residential	Collector Office	48.0	45
Commercial	Shahupuri	57.4	55

From the above tables it is clear that, In **MUMBAI**, the noise levels in all locations were exceeding the standards except at the industrial areas i.e. Goregaon & Charkop

locations during both day time and night time. On comparing the noise levels during day time & night time, it shows that during day time the noise levels were higher on 14<sup>th</sup> December (holiday) and during night time the noise levels were higher on 15<sup>th</sup> December (working day). The noisiest place was VashiNaka having average value of 79.2 dB(A) during day time and 75.7 dB(A) during night time and least noisy place was High Court having average value of 65.0 dB(A) during day time and 60.6 dB(A) during night time for two days.

In **PUNE**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time and night time, it shows that the noise levels were higher during both the day time & night time on 14<sup>th</sup> December (holiday). The noisiest place was Nucleus Mall having average value of 70.5 dB(A) during day time and 60.8 dB(A) during night time and least noisy place was Kakade Angan having average value of 62.4 dB(A) during day time and 48.4 dB(A) during night time for two days.

In **NASHIK**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time and night time, it shows that during day time the noise levels were higher on 14<sup>th</sup> December (holiday) and during night time the noise levels were higher on 15<sup>th</sup> December (working day). The noisiest place was Dwarka Circle having average value of 74.7 dB(A) during day time and 70.6 dB(A) during night time and least noisy place was Pandit Colony having average value of 72.3 dB(A) during day time and 63.7 dB(A) during night time for two days.

In **AURANGABAD**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time and night time, it shows that the noise levels were higher during both day time & night time on 15<sup>th</sup> December (working day). The noisiest place was Nirala Bazaar having average value of 80.1 dB(A) during day time and 74.8 dB(A) during night time and the least noisy place during day time was Ghati Hospital having average value of 78.8 dB(A) and during night time was CIDCO N-4 having average value of 70.4 dB(A) for two days.

In **NAGPUR**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time and night time, it shows that during day time the noise levels were higher on 15<sup>th</sup> December (working day) and during night time the noise levels were nearly equal during both the days i.e. 14<sup>th</sup> December (holiday) & 15<sup>th</sup> December (working day). The noisiest place was Sitabardi having



average value of 74.2 dB(A) during day time and 67.4 dB(A) during night time. And the least noisy place during day time was Government Medical College having average value of 64.6 dB(A) and during night time was Shivaji Nagar having average value of 61.8 dB(A) for two days.

In **KOLHAPUR**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time and night time, it shows that during day time the noise levels were higher on 15<sup>th</sup> December (working day) and during night time the noise levels were higher on 14<sup>th</sup> December (holiday). The noisiest place was Dasara Chowk having average value of 70.1dB(A) during day time and 62.3 dB(A) during night time and least noisy place was Collector Office having average value of 61.8 dB(A) during day time and 50.3 dB(A) during night time for two days.

11. Glimpse of the event:



Ms. Anna Adelinde & Ms. Smita Jadhav at Antop Hill, Mumbai.



Ms. Pooja Parmar & Ms. Aparna Sarang at Pravasi Indl. Estate, Goregaon, Mumbai.



Mr. Sanjay Bhandari & Mr. Praveen Bhise at Vashi Naka, Mumbai.



Mr. Avinash Vishwakarma & Mr. Arvind Pal at Charkop, Mumbai.



Mr. Sakeeb Jaffer & Mr. Akshob Shroff at Santacruz Airport, Mumbai.



Ms. Shraddha Vora & Ms. Khushbu Jain at Borivali National Park, Mumbai.



Mr. Amir Mulla at Kakade Angan, Pune.



Mr. Sambhaji More at Nucleus Mall, Pune.



Mr. Hemant at Pune University, Pune.



Mr. Ganesh Mahalunkar at Dasara Chowk, Kolhapur.



Mr. Rohit Jadhav at Shahupuri, Kolhapur.



Mr. Vikas Jadhav at Collector Office, Kolhapur.



Dr. Dhapate at CIDCO N-4, Aurangabad.



Mr. Pravin Nalavade at Ghati Hospital, Aurangabad.



Mr. Borekar & Mr. Meshram at Shivaji Nagar, Nagpur.



Mr. Dudke at Dwarka Circle, Nashik.



Mr. S.N. Ahire at Pandit Colony, Nashik.



Mr. Borekar, Mr. Sunil & Mr. Mangesh at Government Medical College, Nagpur.