

AMBIENT NOISE LEVEL MONITORING OF METROPOLITAN CITIES 13th & 14th December 2009



MAHARASHTRA POLLUTION CONTROL BOARD
Kalpataru Point, Sion (East), Mumbai-400022.
Website: <http://mpcb.gov.in>


December, 2009

FOREWORD

Noise pollution in urban areas is now being recognized as a major environmental issue around the world. People living in the metropolitan cities have leading sources of noise pollution as road traffic noise, air craft noise, noise from rail roads, construction noise etc. In order to assess the impact of traffic noise exposure on residents living adjacent to major roads, Maharashtra Pollution Control Board has conducted this noise monitoring study at 25 locations covering six major cities in Maharashtra, as per CPCB protocol. It is also aimed at generating long term ambient noise level data and trend, at the identified locations, by repeating the monitoring survey every year. Noise monitoring was carried out at 25 locations covering six major cities in Maharashtra, for 24 hours continuously (16 hrs. day time & 8 hrs. night time), for two days, i.e. on 13th & 14th December, 2009 (Sunday & working day).

This report contains the methodology and observations made during the study. Results are reported as Leq day time, Leq night time, L₁₀, L₅₀, L₉₀, L_{max}, L_{min} in dB(A) and are compared with ambient noise standards for the area as well as with previous year's results.

Field monitoring of this study was conducted by M/s Ashwamedh Engineers & Consultants C.S.Ltd, Nashik and was supported by all Regional Offices of the Board, in the field. The entire study work including planning, co-ordination and report preparation was done at PAMS division of the Board. The contributions of Dr.Ajay A.Deshpande, Smt. S.K.Pillai, Shri. S.C.Kollur & Shri. S.D Save are appreciated.


(Mahesh Pathak, IAS)
Member Secretary

December, 2009

CONTENTS

Sr. No	Title	Page No
1	Introduction	4
2	Objective	4
3	Noise Pollution and its effects on Environment	4
4	Noise Level Measurement and Noise Level Standards	5
5	Methodology of the survey	6
6	Details of Noise Monitoring Stations	7
7	Noise Levels at Various Locations in the City	10
8	Graphical representation of L_{eq} , L_{10} , L_{50} , & L_{90}	23
9	Day-Night Noise levels according to area	35
10	Conclusion	37
11	Glimpse of the event	43

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 13th & 14th December 2009.

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. 13th (holiday) and 14th (working day) of December 2009 and to compare the noise levels with Ambient Noise Standards for the area and also with the previous year observation. 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_{eq}: The equivalent continuous Sound Pressure Level (SPL) for a particular duration.

L_{max}: The maximum Sound Pressure Level (SPL) value measured during the duration of monitoring.

L_{min}: The minimum Sound Pressure Level (SPL) value measured during the duration of monitoring.

L₁₀: The level that were exceeded during 10% of the measuring time in dB(A).

L₅₀: The level that were exceeded during 50% of the measuring time in dB(A).

L₉₀: The level that were exceeded during 90% of the measuring time in dB(A).

L_{dn}: The Day-Night equivalent Sound Level refers to average sound exposure over a 24- hour period. L_{dn} values are calculated from hourly L_{eq} values, with the L_{eq} 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 13th (holiday) & 14th (working day) December 2009. The monitoring was carried out 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

Maharashtra Pollution Control Board

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	
		Borivali National Park	
		Antop Hill	Residential
		Shivaji Park, Dadar	
		Santacruz Airport	Commercial
		Ghatkopar (W)	
		Vashi Naka, Chembur	
		Goregaon (E)	Industrial
		Charkop, Kandivali	
2	Pune	Pune University	Silence
		Nucleus Mall	Commercial
		Kakade Angan	Residential
3	Nashik	Dwarka Circle	Commercial
		Pandit Colony Near NMC	Residential
		Pavan Nagar CIDCO	
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 &

Maharashtra Pollution Control Board

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
MUMBAI			
High 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

Maharashtra Pollution Control Board

PUNE			
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
NASHIK			
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
AURANGABAD			
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
NAGPUR			
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
KOLHAPUR			
Collector Office	N 16° 42' 29.9" E 74° 14' 08.6"	3.45	1.37
Dasara Chowk	N 16° 42' 04.7"	2.69	1.45

	E 74° 13' 36.1"		
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:

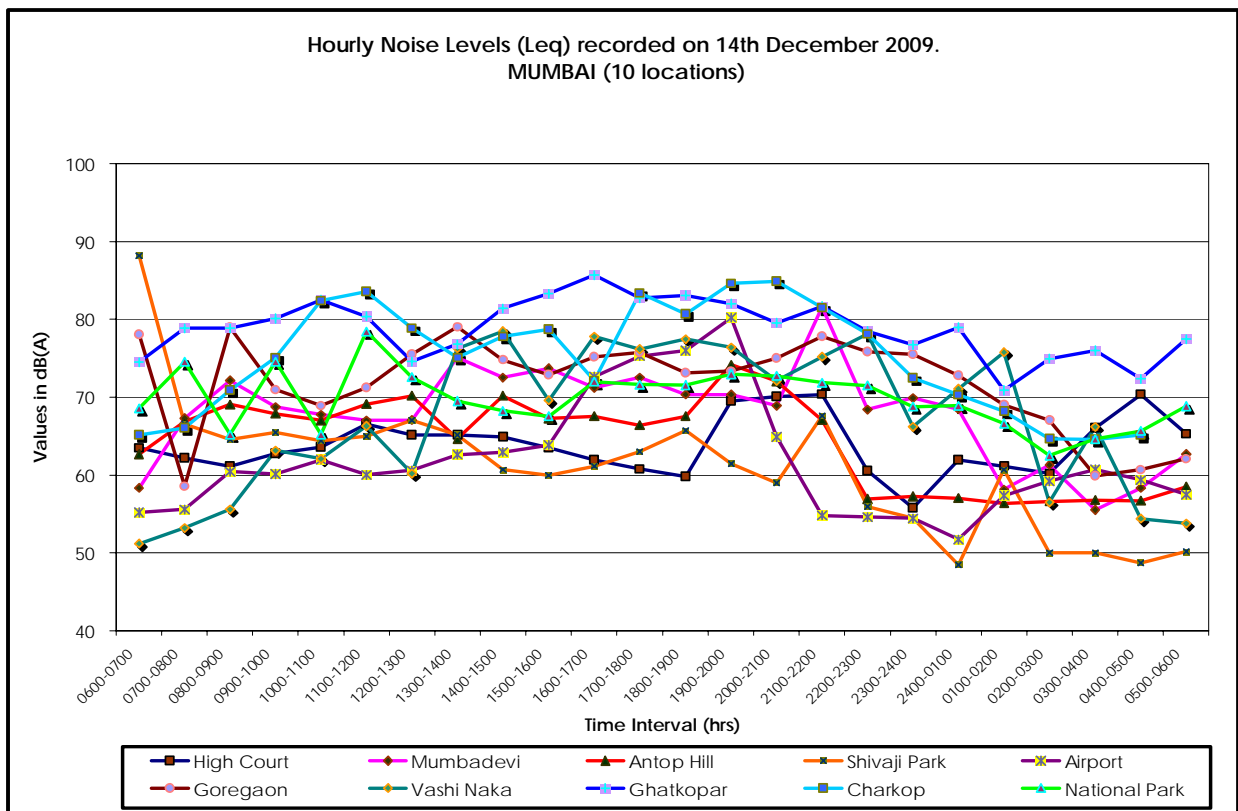
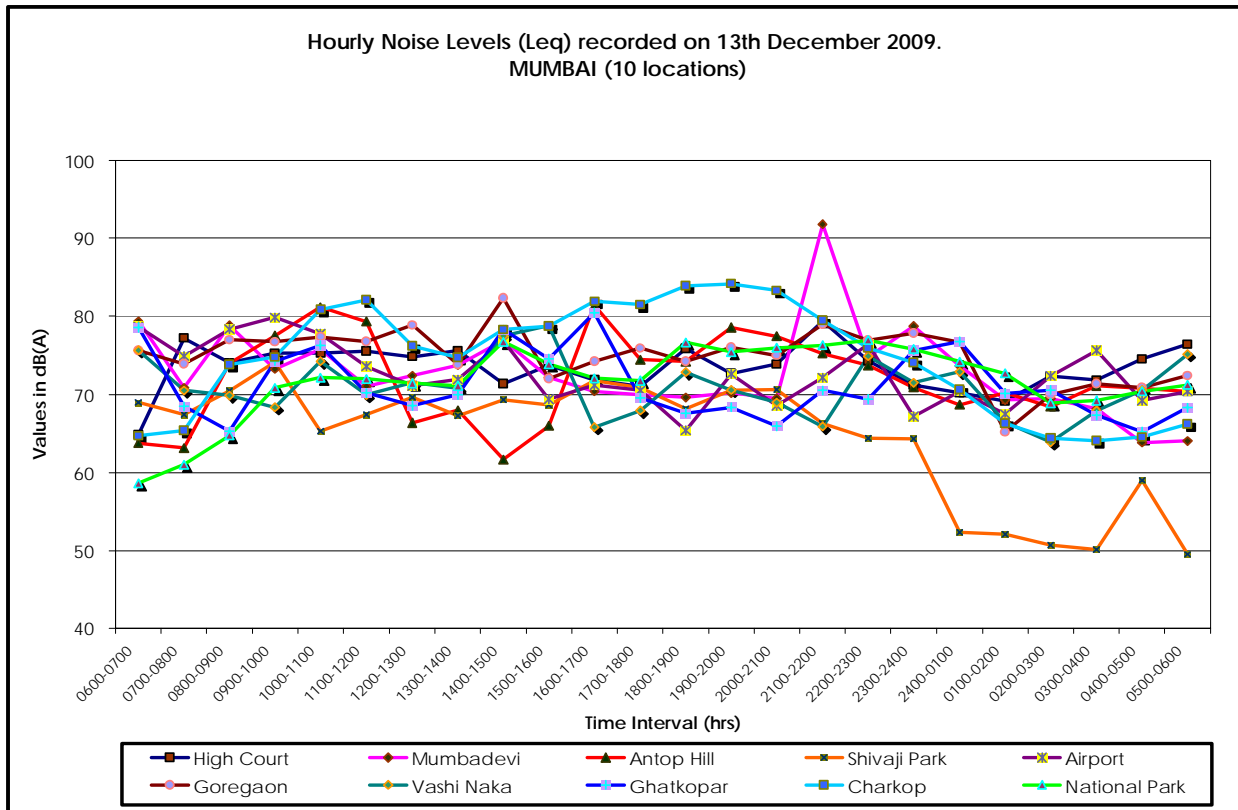
1) Mumbai:

1(a) Ambient Noise levels in Mumbai as on 13th December 2009:

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			L _{eq}	L ₁₀	L ₅₀	L ₉₀		L _{eq}	L ₁₀	L ₅₀	L ₉₀
1	High Court	13.12.09	73.9	76.5	74.4	71.2	13.12.09 to 14.12.09	72.5	75.1	72.1	69.9
2	Mumbadevi	13.12.09	74.1	79.1	72.3	69.8	13.12.09 to 14.12.09	70.2	76.0	69.3	63.9
3	Antop Hill	13.12.09	72.6	80.2	74.3	63.4	13.12.09 to 14.12.09	70.5	71.9	70.6	68.6
4	Shivaji Park	13.12.09	69.2	71.3	69.1	66.8	13.12.09 to 14.12.09	55.3	64.3	52.2	49.9
5	Airport	13.12.09	73.3	78.5	72.4	69.0	13.12.09 to 14.12.09	71.1	75.9	70.4	67.4
6	Goregaon	13.12.09	76.2	78.9	76.0	73.9	13.12.09 to 14.12.09	72.7	77.2	71.9	68.5
7	Vashi Naka	13.12.09	71.2	76.6	70.6	66.9	13.12.09 to 14.12.09	70.4	75.0	71.0	65.7
8	Ghatkopar	13.12.09	71.7	78.4	70.0	66.7	13.12.09 to 14.12.09	70.4	76.0	69.8	66.7
9	Charkop	13.12.09	77.7	83.6	79.1	69.6	13.12.09 to 14.12.09	68.3	74.6	66.3	64.3
10	National Park	13.12.09	71.3	76.5	72.0	62.9	13.12.09 to 14.12.09	72.4	76.1	72.0	69.1

1(b) Ambient Noise levels in Mumbai as on 14th December 2009:

Sr. No.	Monitoring Site	Date	Day Time (6AM-10PM) Values in dB(A)				Date	Night Time (10PM-6AM) Values in dB(A)			
			L _{eq}	L ₁₀	L ₅₀	L ₉₀		L _{eq}	L ₁₀	L ₅₀	L ₉₀
1	High Court	14.12.09	64.5	69.8	63.6	61.0	14.12.09 to 15.12.09	62.7	67.4	61.6	58.9
2	Mumbadevi	14.12.09	70.3	74.4	70.4	67.1	14.12.09 to 15.12.09	62.9	68.9	62.0	57.4
3	Antop Hill	14.12.09	68.1	71.2	67.5	65.5	14.12.09 to 15.12.09	57.0	57.6	56.8	56.6
4	Shivaji Park	14.12.09	65.3	67.3	64.8	60.4	14.12.09 to 15.12.09	52.3	57.4	50.1	48.6
5	Airport	14.12.09	64.2	75.6	62.3	55.4	14.12.09 to 15.12.09	56.9	59.8	57.4	53.7
6	Goregaon	14.12.09	73.7	78.5	74.9	69.9	14.12.09 to 15.12.09	67.9	75.6	68.0	60.4
7	Vashi Naka	14.12.09	68.2	77.7	70.9	54.4	14.12.09 to 15.12.09	65.3	76.5	66.2	54.2
8	Ghatkopar	14.12.09	80.4	83.2	80.9	75.7	14.12.09 to 15.12.09	75.8	78.7	76.4	72.0
9	Charkop	14.12.09	77.6	84.1	78.8	68.5	14.12.09 to 15.12.09	68.7	74.2	67.1	64.7
10	National Park	14.12.09	71.1	74.6	71.8	66.4	14.12.09 to 15.12.09	67.2	69.7	67.7	64.0



Maharashtra Pollution Control Board

In **Mumbai**, a total of 10 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the silence areas the minimum sound level was 55.5dB(A) and the maximum sound level was 91.8 dB(A). At the industrial areas the minimum sound level was 58.6 dB(A) and maximum sound level was 84.9dB(A). At the commercial areas the minimum sound level was 51.2 dB(A) and maximum sound level was 85.7 dB(A) and at the residential areas the minimum sound level was 48.5 dB(A) and maximum sound level was 88.2 dB(A).

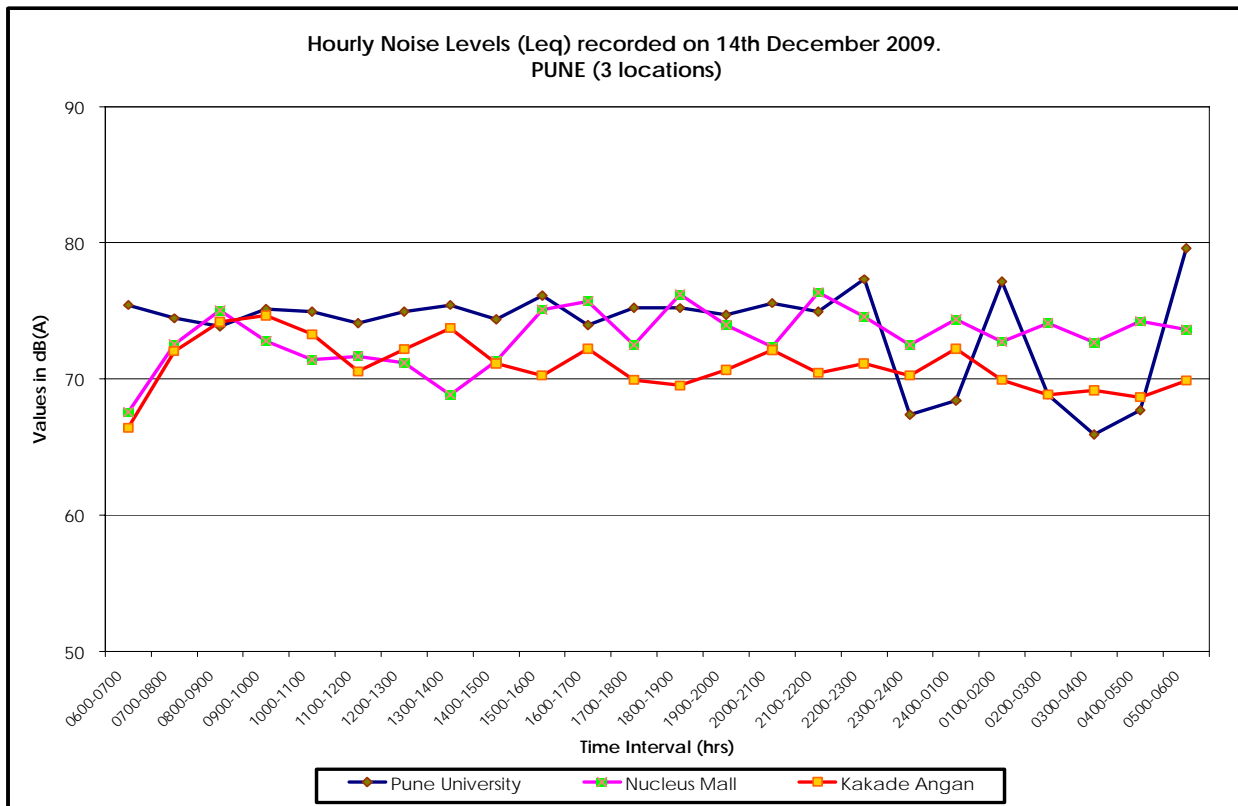
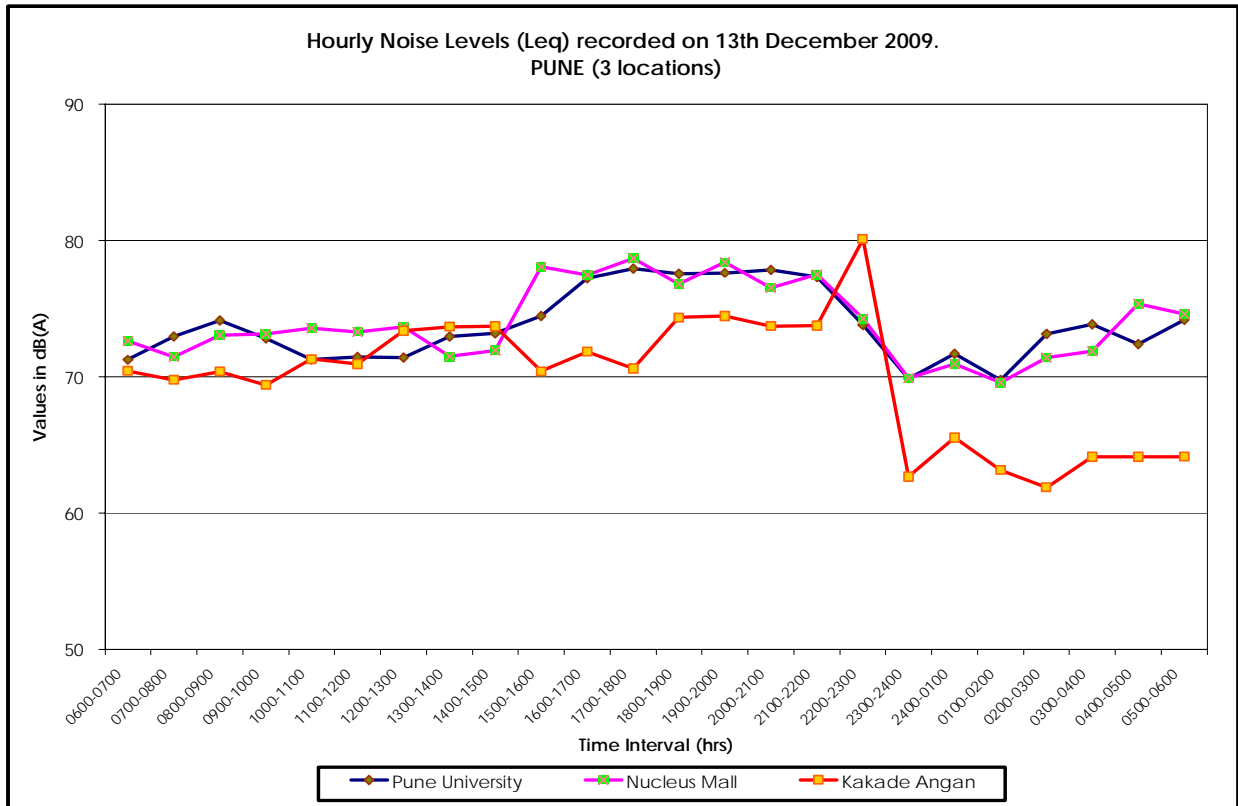
2) Pune:

2 (a) Ambient Noise Levels in Pune as on 13th December 2009:

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	13.12.09	74.5	77.7	73.7	71.3	13.12.09 to 14.12.09	72.3	74.0	72.8	69.8
2	Nucleus Mall	13.12.09	74.9	78.2	73.6	71.7	13.12.09 to 14.12.09	72.2	74.8	71.7	69.8
3	Kakade Angan	13.12.09	72.0	74.0	71.6	70.1	13.12.09 to 14.12.09	65.7	69.9	64.1	62.4

2(b) Ambient Noise Level in Pune as on 14th December 2009:

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	14.12.09	74.9	75.5	74.9	74.0	14.12.09 to 15.12.09	71.5	78.0	68.6	66.9
2	Nucleus Mall	14.12.09	72.8	76.0	72.5	70.0	14.12.09 to 15.12.09	73.6	74.4	73.8	72.6
3	Kakade Angan	14.12.09	71.5	74.0	71.6	69.7	14.12.09 to 15.12.09	70.0	71.4	69.9	68.8



In **Pune**, a total of 3 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the silence area the minimum sound level was 65.9 dB(A) and maximum sound level was 79.6 dB(A). At commercial area the minimum sound level was 67.6 dB(A) and maximum sound level was 78.7 dB(A) and at the residential area the minimum sound level was 61.9 dB(A) and the maximum sound level was 81.1 dB(A).

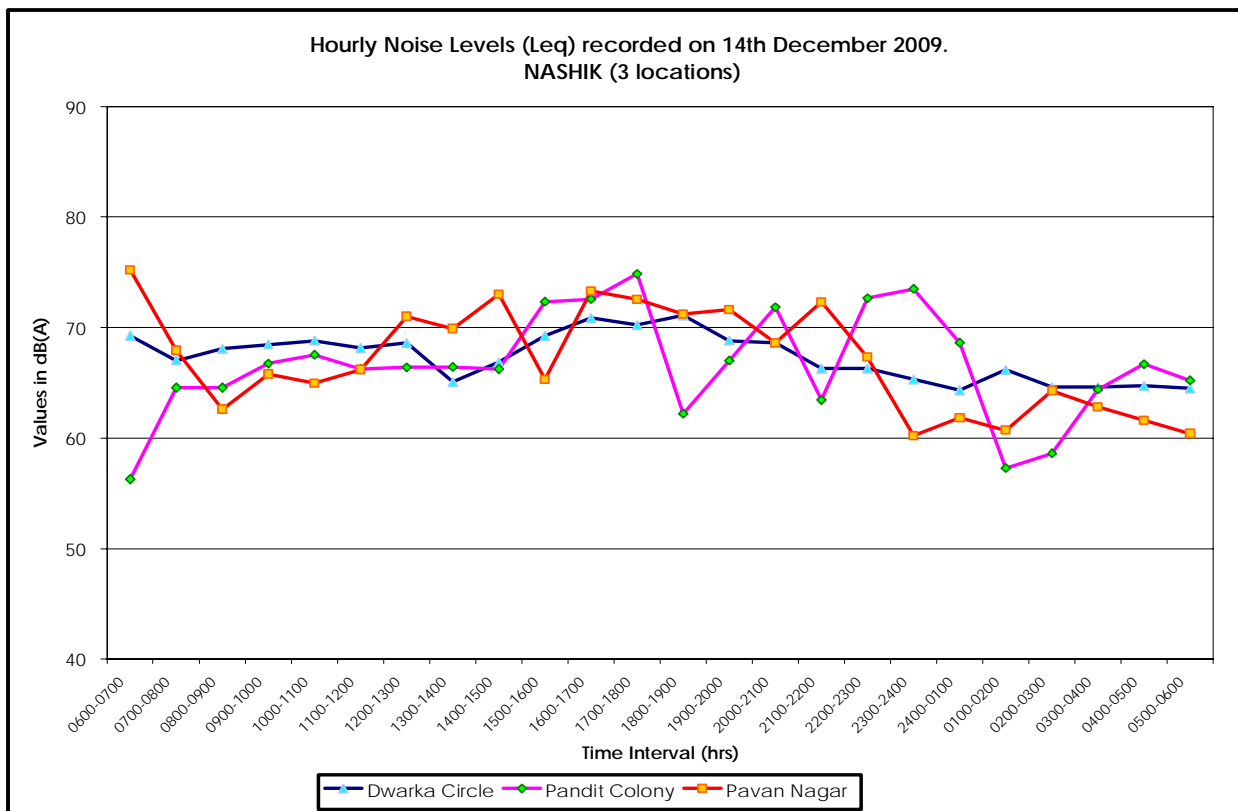
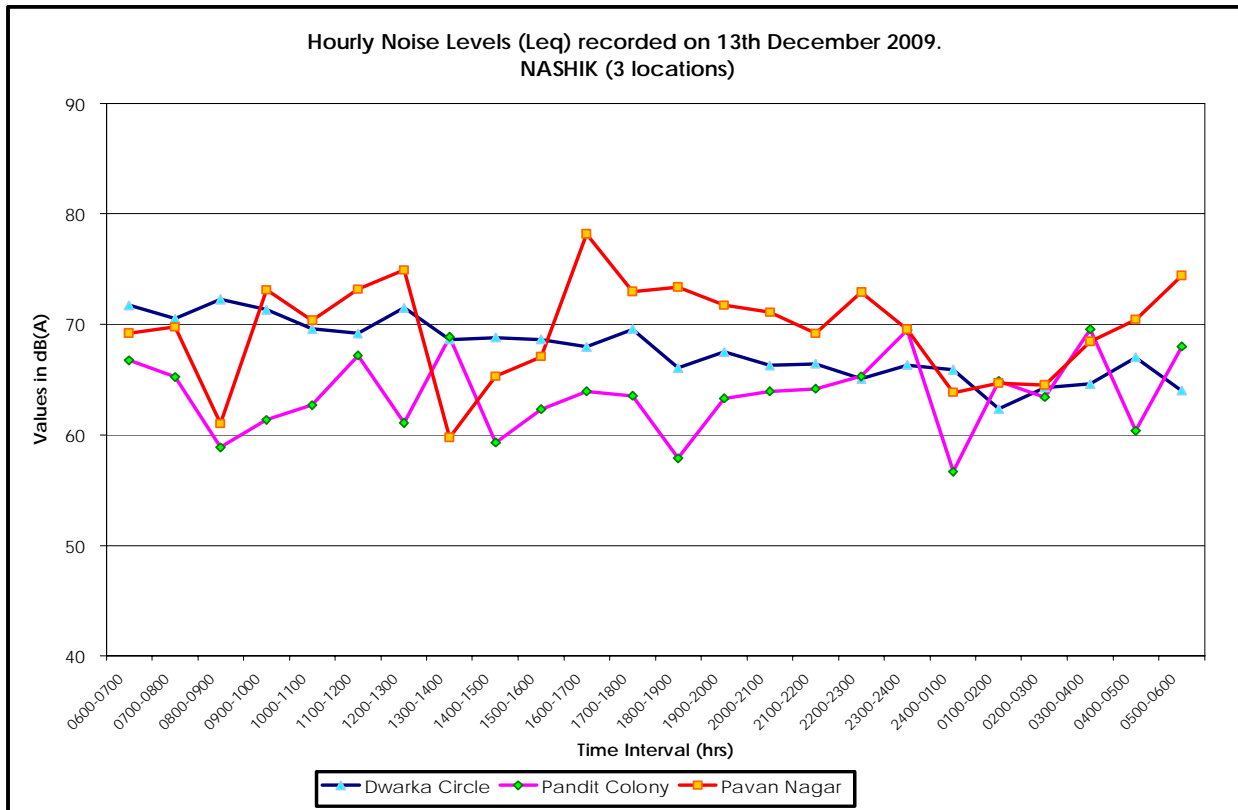
3) Nashik:

3(a) Ambient Noise Levels in Nashik as on 13th December 2009:

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	13.12.09	69.1	71.6	69.0	66.3	13.12.09 to 14.12.09	64.9	66.5	64.8	63.5
2	Pandit Colony	13.12.09	63.2	67.0	63.4	59.1	13.12.09 to 14.12.09	64.7	69.5	65.1	59.2
3	Pavan Nagar	13.12.09	70.0	74.1	70.7	63.2	13.12.09 to 14.12.09	68.6	73.4	69.0	64.3

3(b) Ambient Noise Level in Nashik as on 14th December 2009:

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	14.12.09	68.5	70.5	68.6	66.6	14.12.09 to 15.12.09	65.1	66.2	64.7	64.5
2	Pandit Colony	14.12.09	66.8	72.5	66.4	62.8	14.12.09 to 15.12.09	65.9	72.9	66.0	58.2
3	Pavan Nagar	14.12.09	69.5	73.2	70.5	65.1	14.12.09 to 15.12.09	62.4	65.2	61.7	60.3



Maharashtra Pollution Control Board

In **Nashik**, a total of 3 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the commercial area the minimum sound level was 62.4 dB(A) and maximum sound level was 72.3 dB(A). At the residential areas the minimum sound level was 56.3 dB(A) and the maximum sound level was 78.2 dB(A).

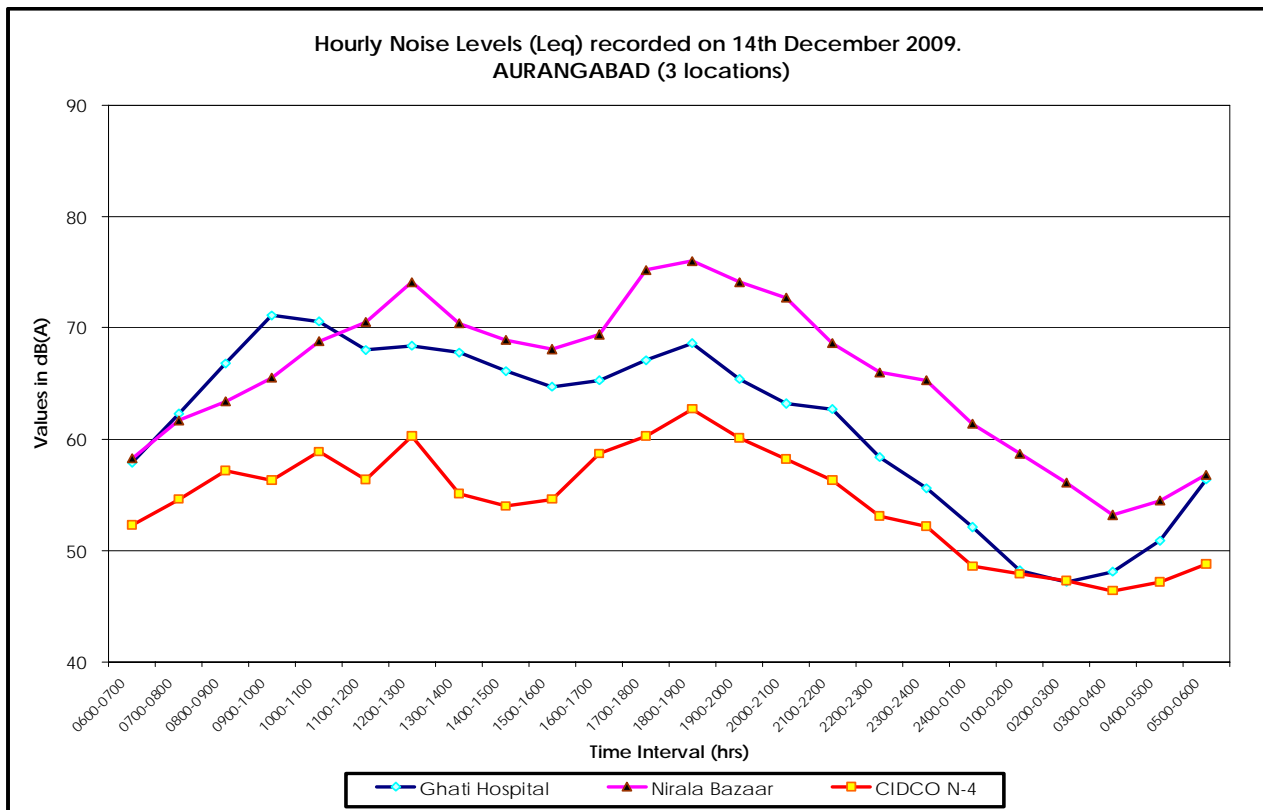
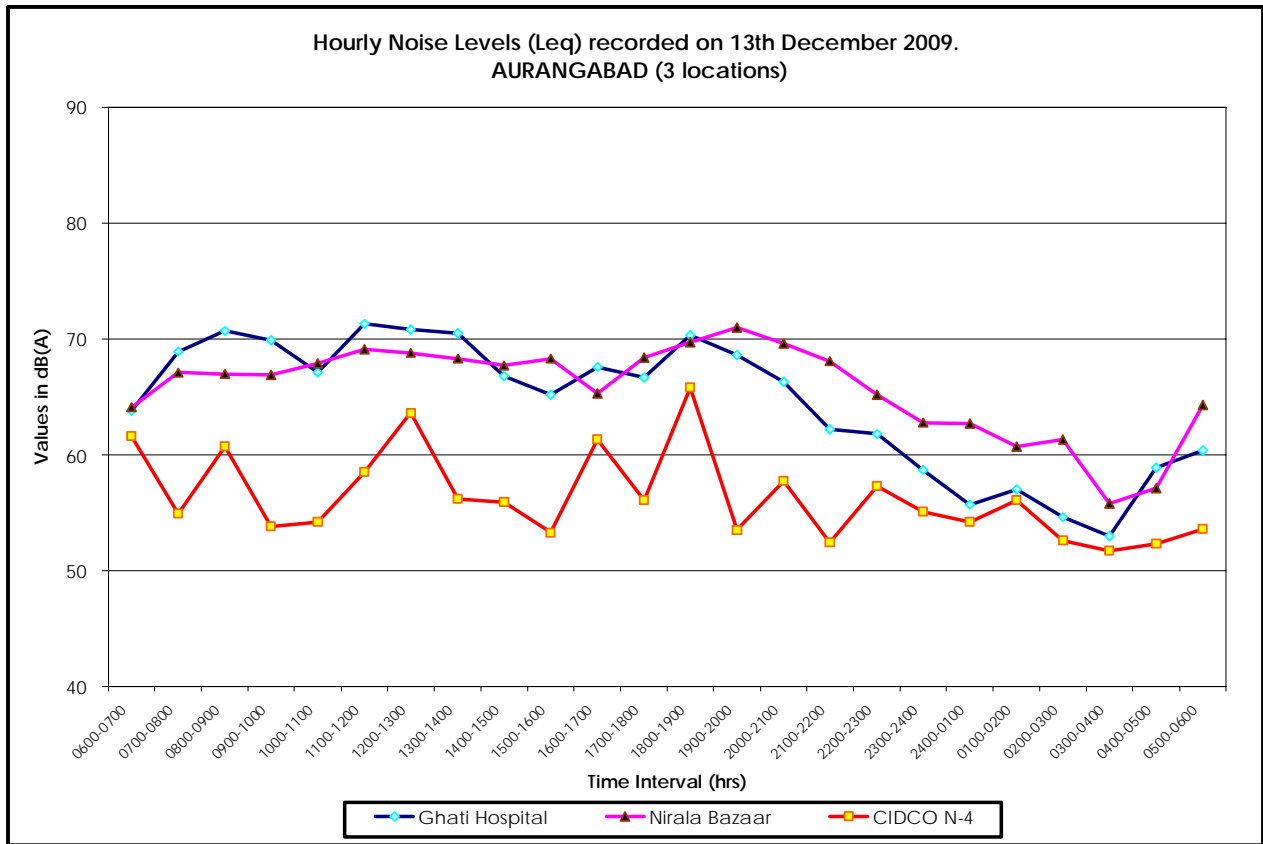
4) Aurangabad:

4(a) Ambient Noise Levels in Aurangabad as on 13th December 2009:

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	13.12.09	67.9	70.8	68.1	64.5	13.12.09 to 14.12.09	57.5	60.8	57.9	54.1
2	Nirala Bazaar, Samarth Nagar	13.12.09	68.0	69.7	68.2	66.1	13.12.09 to 14.12.09	61.2	64.6	62.0	56.7
3	CIDCO N-4	13.12.09	57.5	62.6	56.2	53.4	13.12.09 to 14.12.09	54.1	56.5	53.9	52.1

4(b) Ambient Noise Levels in Aurangabad as on 14th December 2009:

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	14.12.09	66.0	69.6	66.5	62.5	14.12.09 to 15.12.09	52.1	57.0	51.5	47.8
2	Nirala Bazaar, Samarth Nagar	14.12.09	69.1	74.7	69.2	62.6	14.12.09 to 15.12.09	59.0	65.5	57.8	54.1
3	CIDCO N-4	14.12.09	57.3	60.3	56.8	54.3	14.12.09 to 15.12.09	48.9	52.5	48.3	47.0



Maharashtra Pollution Control Board

In **Aurangabad**, a total of 3 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the silence area the minimum sound level was 47.2 dB(A) and maximum sound level was 71.3 dB(A). At commercial area the minimum sound level was 53.2 dB(A) and maximum sound level was 76.0 dB(A) and at the residential area the minimum sound level was 46.4 dB(A) and the maximum sound level was 65.8 dB(A).

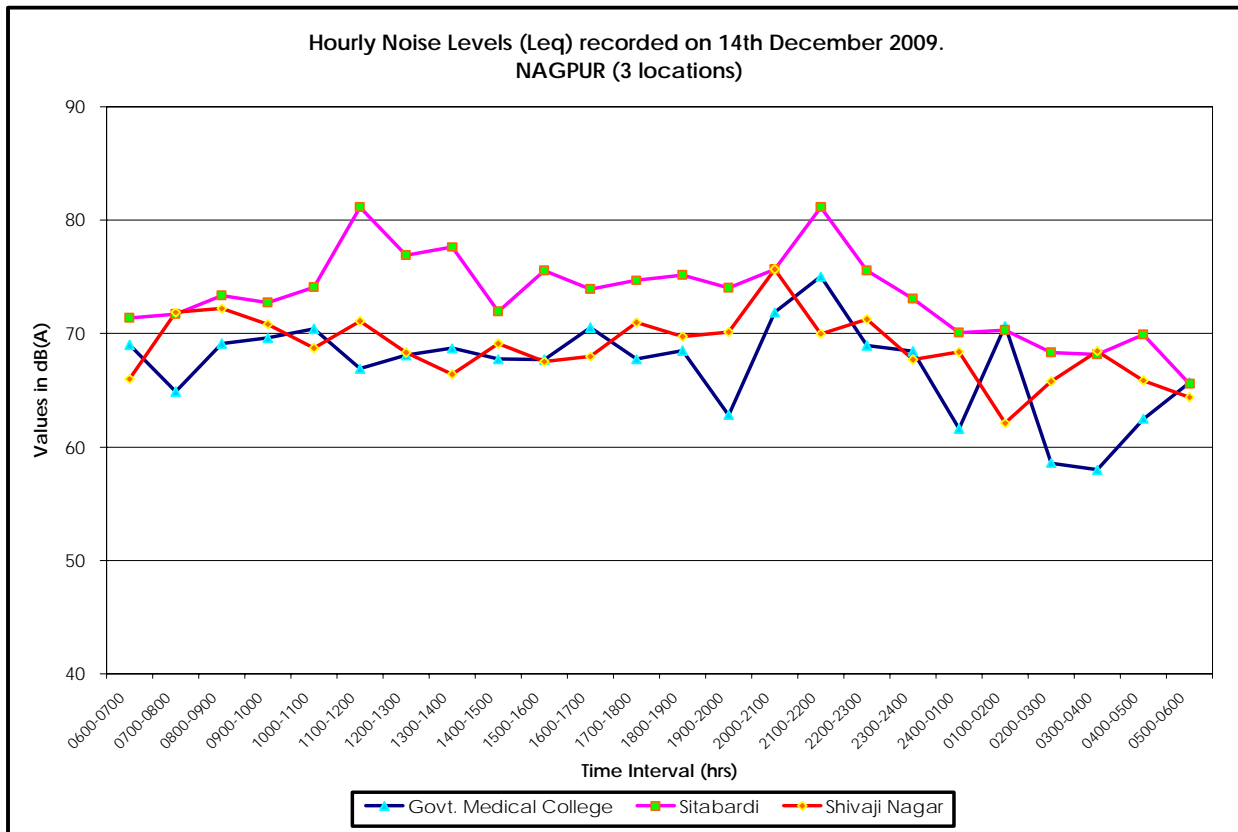
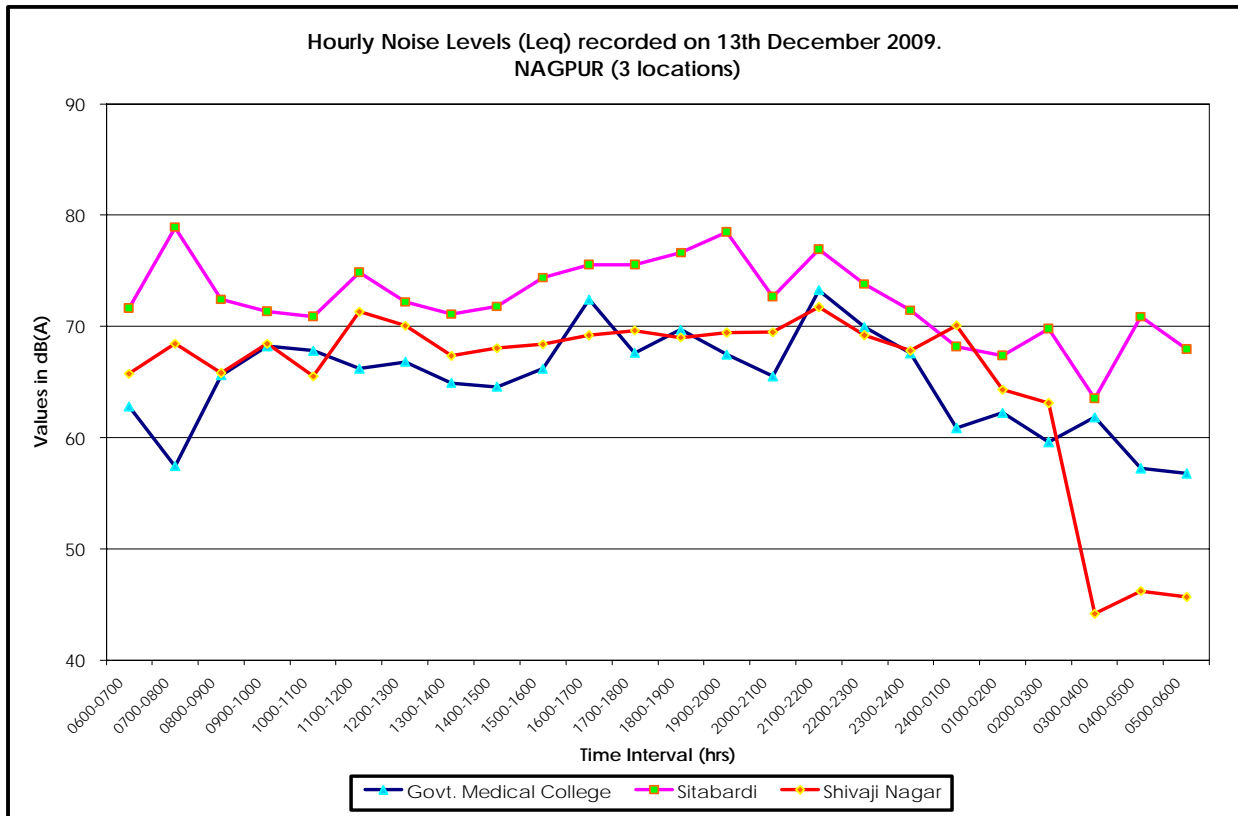
5) Nagpur:

5(a) Ambient Noise Levels in Nagpur as on 13th December 2009:

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	13.12.09	66.7	71.1	66.5	63.7	13.12.09 to 14.12.09	62.0	68.3	61.3	57.1
2	Sitabardi Police Station	13.12.09	74.1	77.7	73.5	71.2	13.12.09 to 14.12.09	69.1	72.1	69.0	66.2
3	Shivaji Nagar	13.12.09	68.6	70.7	68.7	65.8	13.12.09 to 14.12.09	58.8	69.5	63.7	45.2

5(b) Ambient Noise Level in Nagpur as on 14th December 2009:

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	14.12.09	68.7	71.2	68.6	65.9	14.12.09 to 15.12.09	64.3	69.5	64.1	58.4
2	Sitabardi Police Station	14.12.09	75.1	79.3	74.4	71.8	14.12.09 to 15.12.09	70.1	73.8	70.0	67.4
3	Shivaji Nagar	14.12.09	69.8	72.0	69.9	66.9	14.12.09 to 15.12.09	66.7	69.3	66.8	63.7



Maharashtra Pollution Control Board

In **Nagpur**, a total of 3 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the silence area the minimum sound level was 56.8 dB(A) and maximum sound level was 75.0 dB(A). At commercial area the minimum sound level was 63.5 dB(A) and maximum sound level was 81.1 dB(A) and at the residential area the minimum sound level was 44.2 dB(A) and the maximum sound level was 75.7 dB(A).s

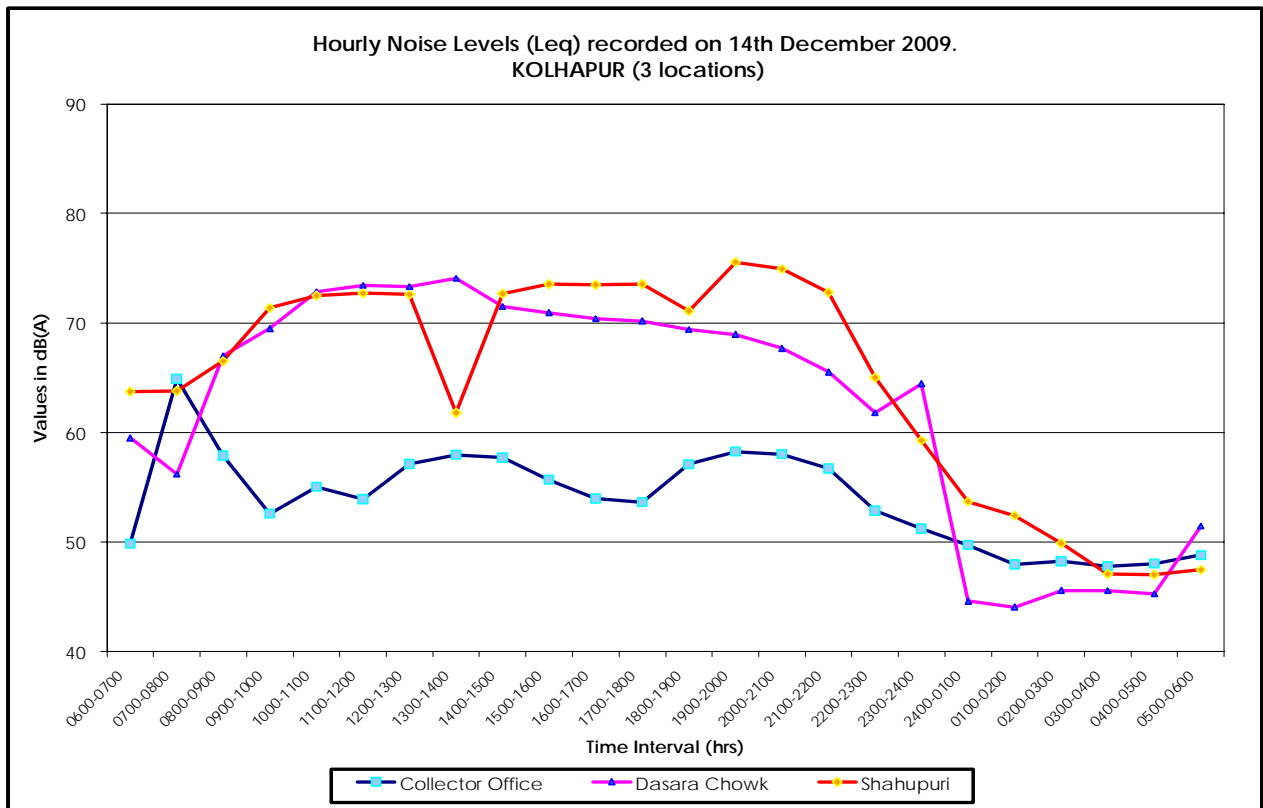
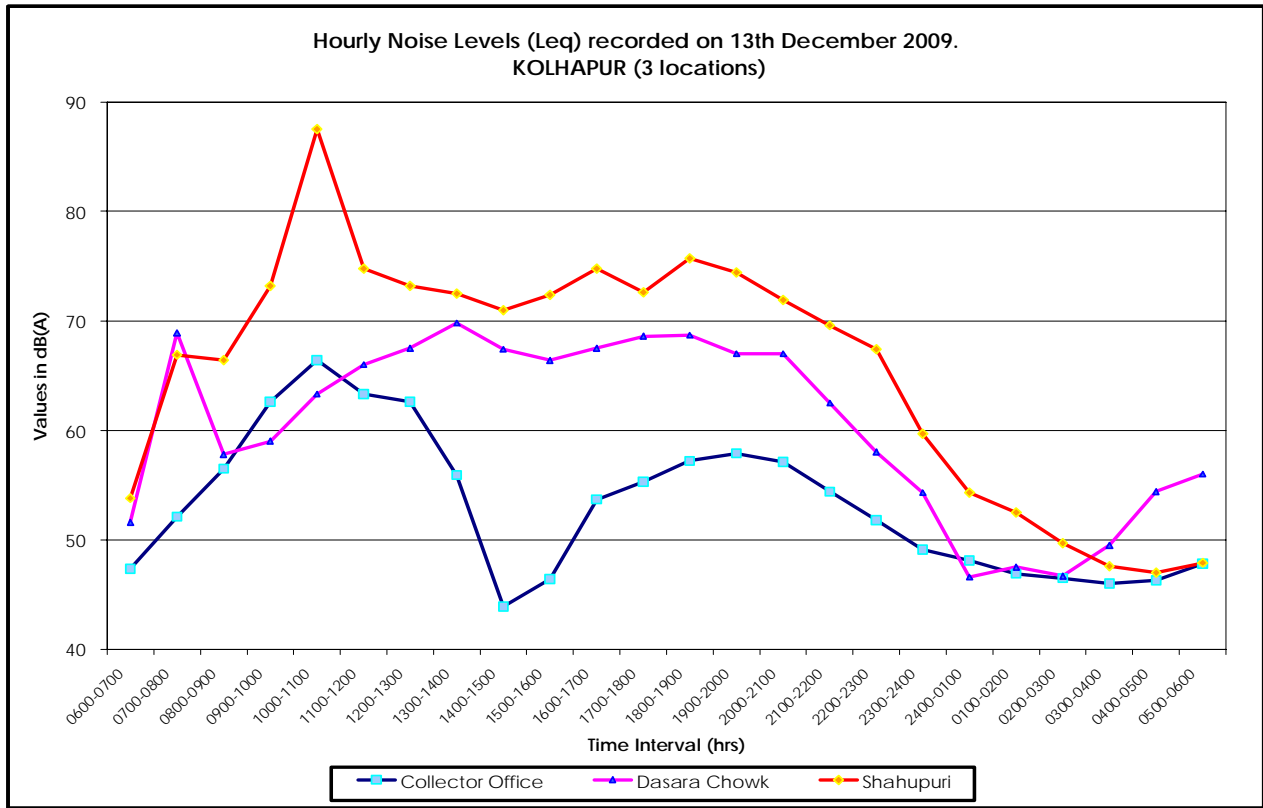
6) kolhapur:

6(a) Ambient Noise Level in Kolhapur as on 13th December 2009:

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	13.12.09	55.8	63.0	56.2	46.9	13.12.09 to 14.12.09	47.8	49.9	47.4	46.2
2	Dasara Chowk	13.12.09	64.9	68.8	67.0	58.4	13.12.09 to 14.12.09	51.6	56.6	51.9	46.7
3	Shahupuri	13.12.09	71.9	75.3	72.6	66.7	13.12.09 to 14.12.09	53.3	62.0	51.1	47.4

6(b) Ambient Noise Level in Kolhapur as on 14th December 2009:

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	56.3	58.1	56.9	53.1	14.12.09 to 15.12.09	49.3	51.7	48.5	47.9
2	Dasara Chowk	14.12.08	68.8	73.4	69.8	62.5	14.12.09 to 15.12.09	50.3	62.6	45.6	44.4
3	Shahupuri	14.12.08	70.8	74.2	72.6	63.8	14.12.09 to 15.12.09	52.7	61.0	51.1	47.1

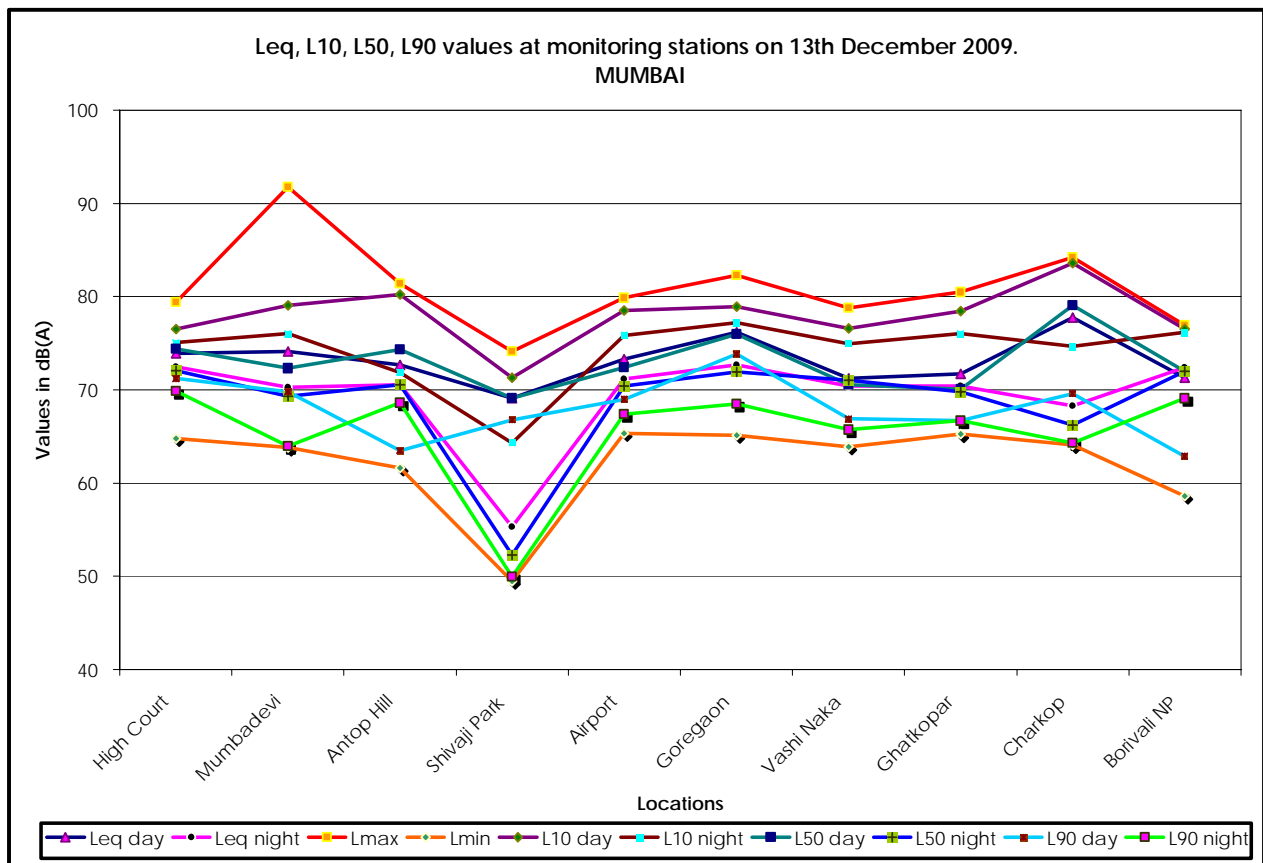


In **Kolhapur**, a total of 3 locations were monitored continuously for two days from 13th to 14th December 2009 for 24 hours. It was observed that, at the silence area the minimum sound level was 44.1 dB(A) and maximum sound level was 74.1 dB(A). At commercial area the minimum sound level was 47.0 dB(A) and maximum sound level was 87.5 dB(A) and at the residential area the minimum sound level was 43.9 dB(A) and the maximum sound level was 66.4 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) Mumbai:

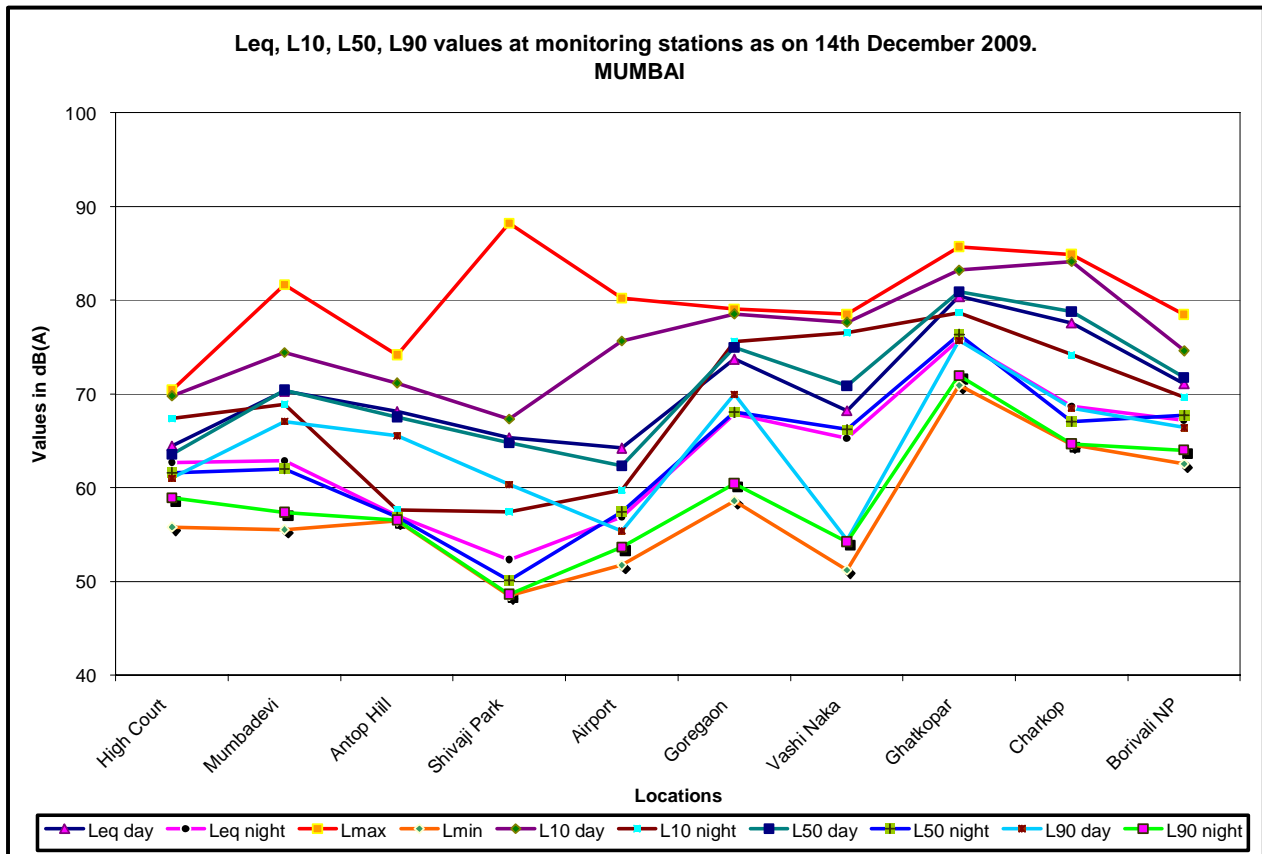
1(a) Noise Levels at Mumbai as on 13th December 2009



From the above figure 1(a) the ambient noise levels (L_{eq}) during day time ranged between 69.2 dB(A) at Shivaji Park to 77.7 dB(A) at Charkop (Kandivli) and during night time the noise levels (L_{eq}) ranged between 55.3 dB(A) at Shivaji Park to 72.7 dB(A) at Goregaon . The maximum noise

level observed was 91.8 dB(A) at Mumbadevi and the minimum noise level observed was 49.5 dB(A) at Shivaji Park.

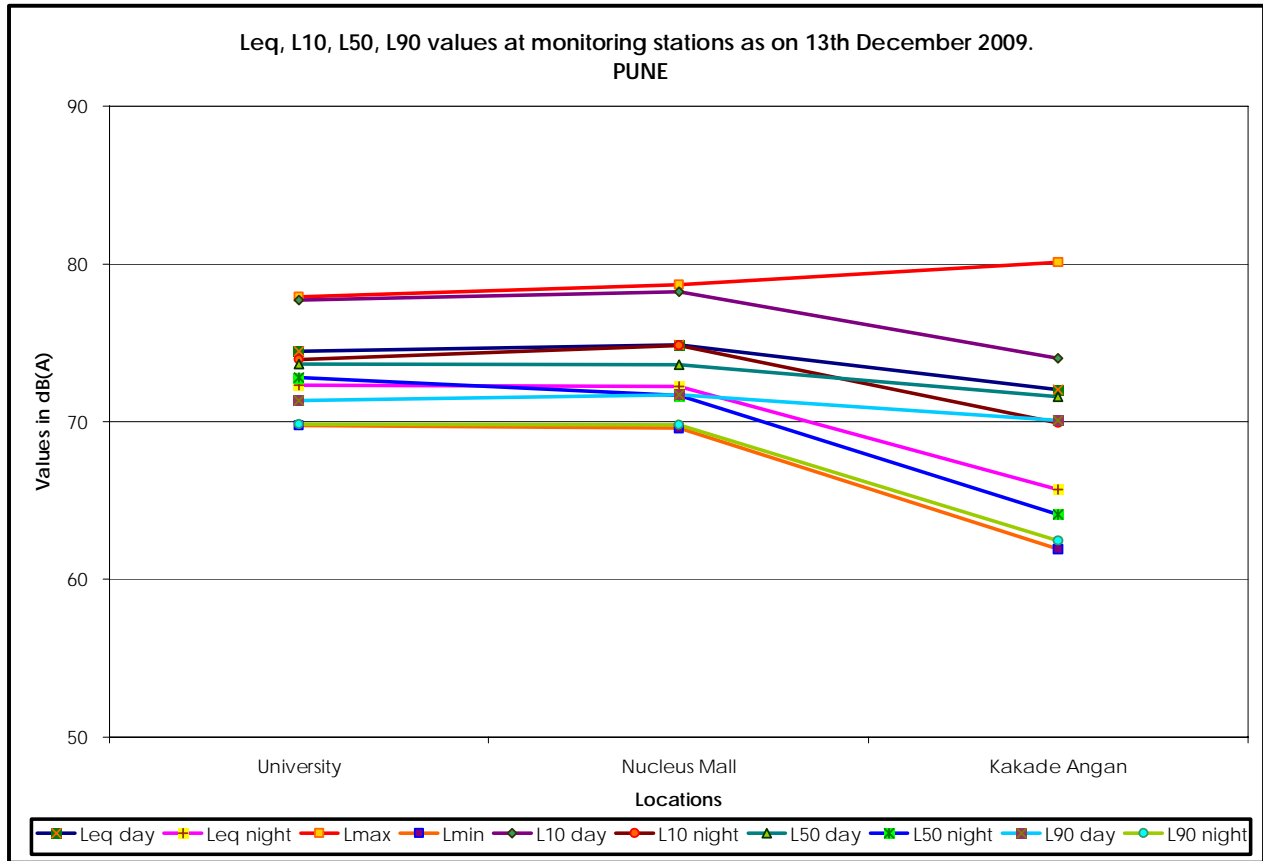
1(b) Noise Levels at Mumbai as on 14th December 2009



From the above figure 1(b) the ambient noise levels (L_{eq}) during day time ranged between 64.2 dB(A) at Airport to 80.4 dB(A) at Ghatkopar and during night time the noise levels (L_{eq}) ranged between 52.3 dB(A) at Shivaji Park to 75.8 dB(A) at Ghatkopar. The maximum noise level observed was 88.2 dB(A) at Shivaji Park and the minimum noise level observed was 48.5 dB(A) at Shivaji Park.

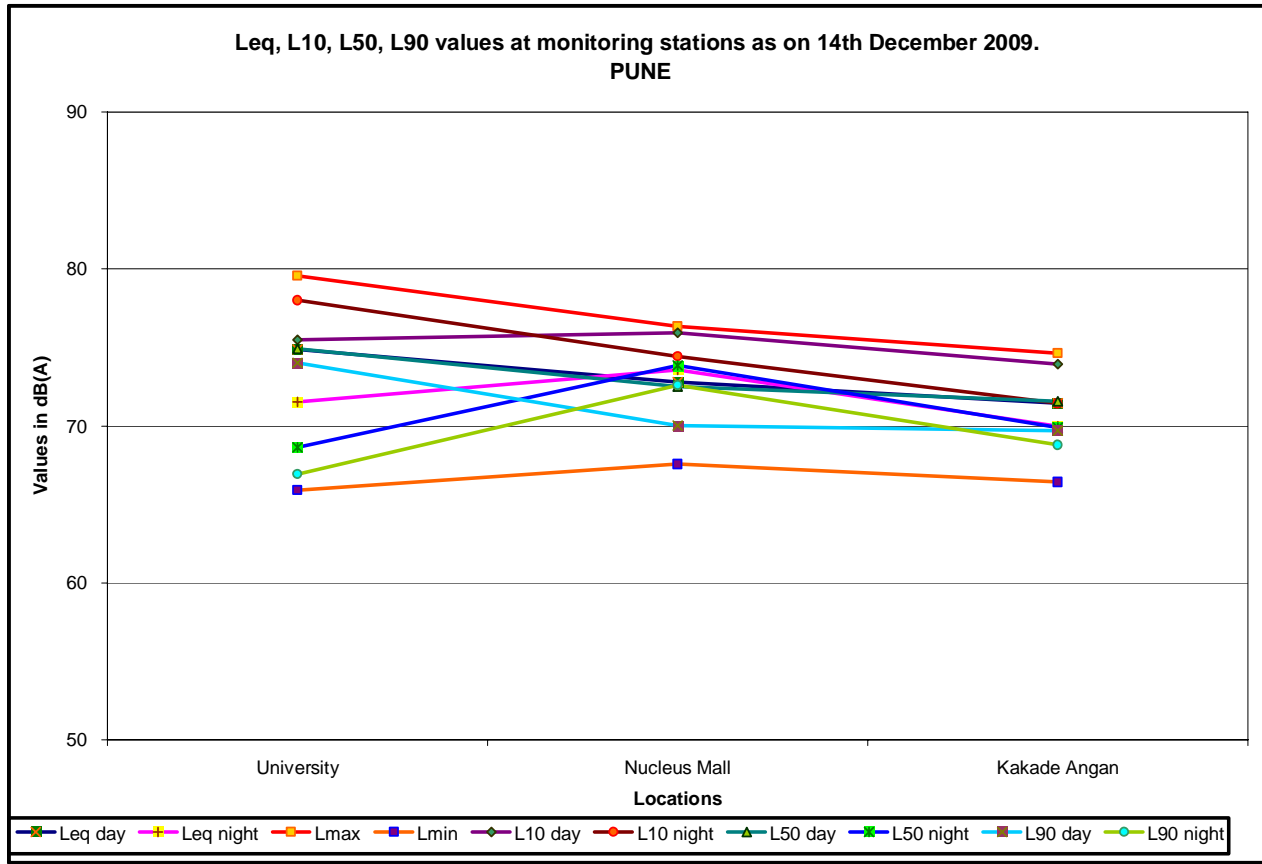
2) Pune:

2(a) Noise Level at Pune as on 13th December 2009



From the above figure 2(a) the ambient noise levels (L_{eq}) during day time ranged between 72.0 dB(A) at Kakade Angan to 74.9 dB(A) at Nucleus and during night time the noise levels (L_{eq}) ranged between 65.7 dB(A) at Kakade Angan to 72.3 dB(A) at Pune University. The maximum noise level observed was 80.1 dB(A) at kakade Angan and the minimum noise level observed was 61.9 dB(A) at kakade Angan.

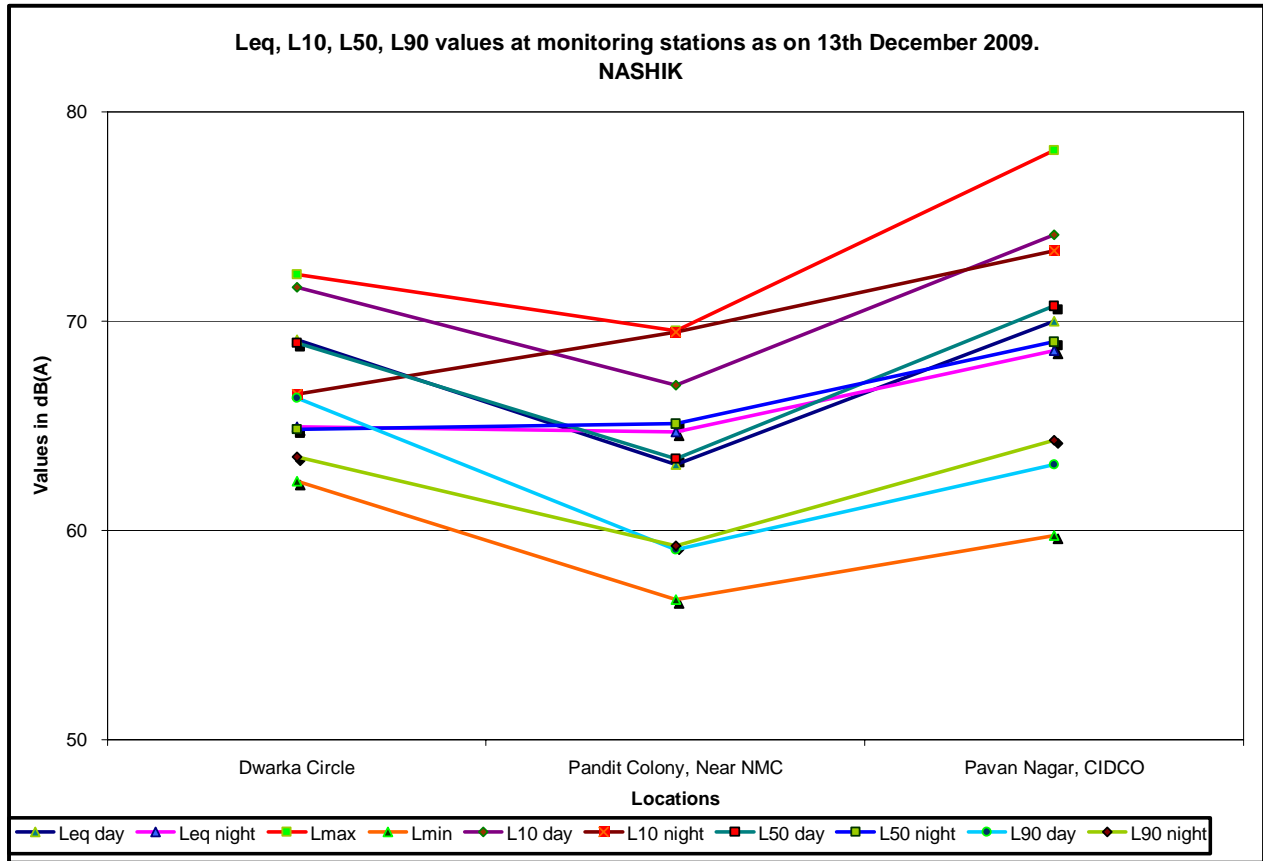
2(b) Noise Level at Pune as on 14th December 2009



From the above figure 2(a) the ambient noise levels (L_{eq}) during day time ranged between 71.5 dB(A) at Kakade Angan to 74.9 dB(A) at Pune University and during night time the noise levels (L_{eq}) ranged between 70.0 dB(A) at Kakade Angan to 73.6 dB(A) at Nucleus Mall. The maximum noise level observed was 79.6 dB(A) at Pune University and the minimum noise level observed was 65.9 dB(A) at Pune University.

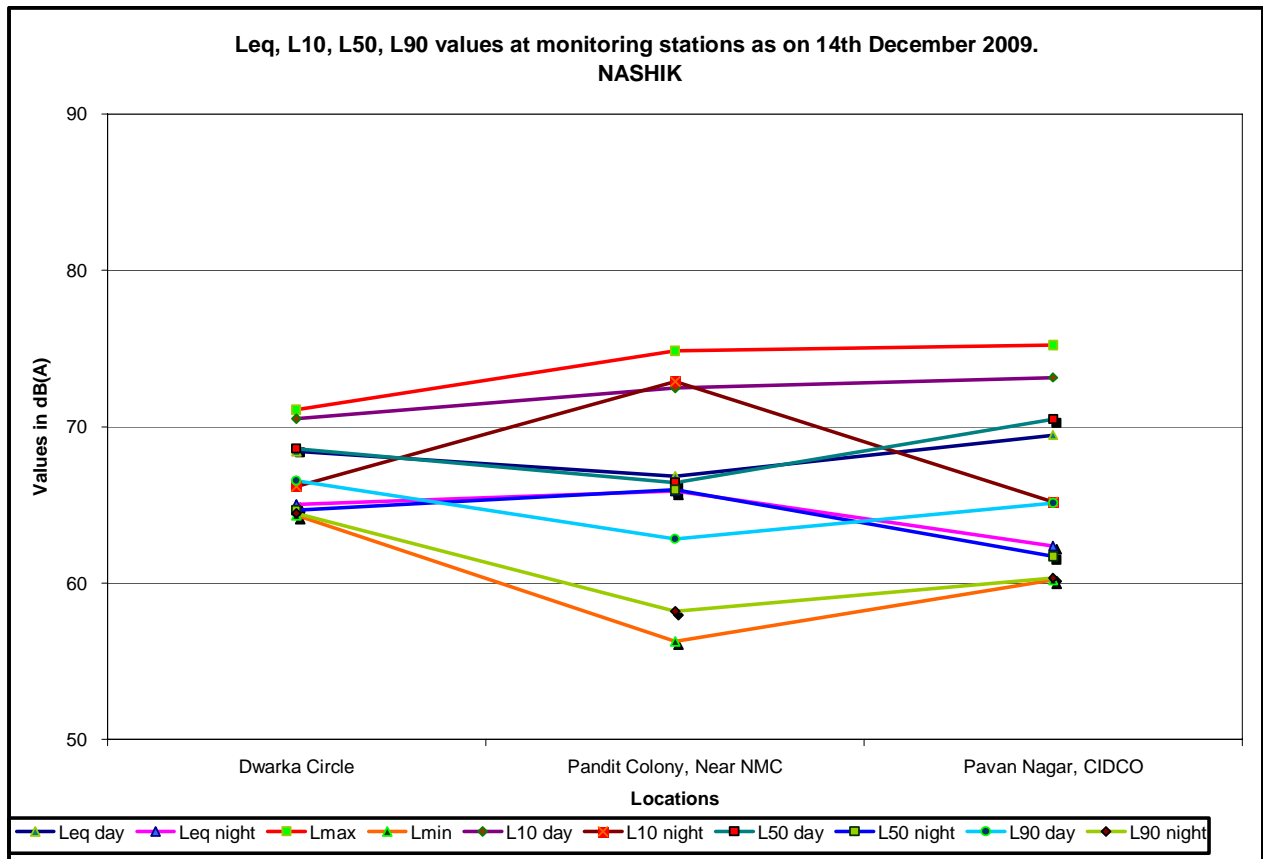
3) Nashik:

3(a) Noise Levels at Nashik as on 13th December 2009



From the above figure 3(a) the ambient noise levels (L_{eq}) during day time ranged between 63.2 dB(A) at Pandit Colony to 70.0 dB(A) at Pavan Nagar and during night time the noise levels (L_{eq}) ranged between 64.7 dB(A) at Pandit colony to 68.6 dB(A) at Pavan Nagar. The maximum noise level observed was 78.2 dB(A) at Pavan Nagar and the minimum noise level observed was 56.7 dB(A) at Pandit Colony.

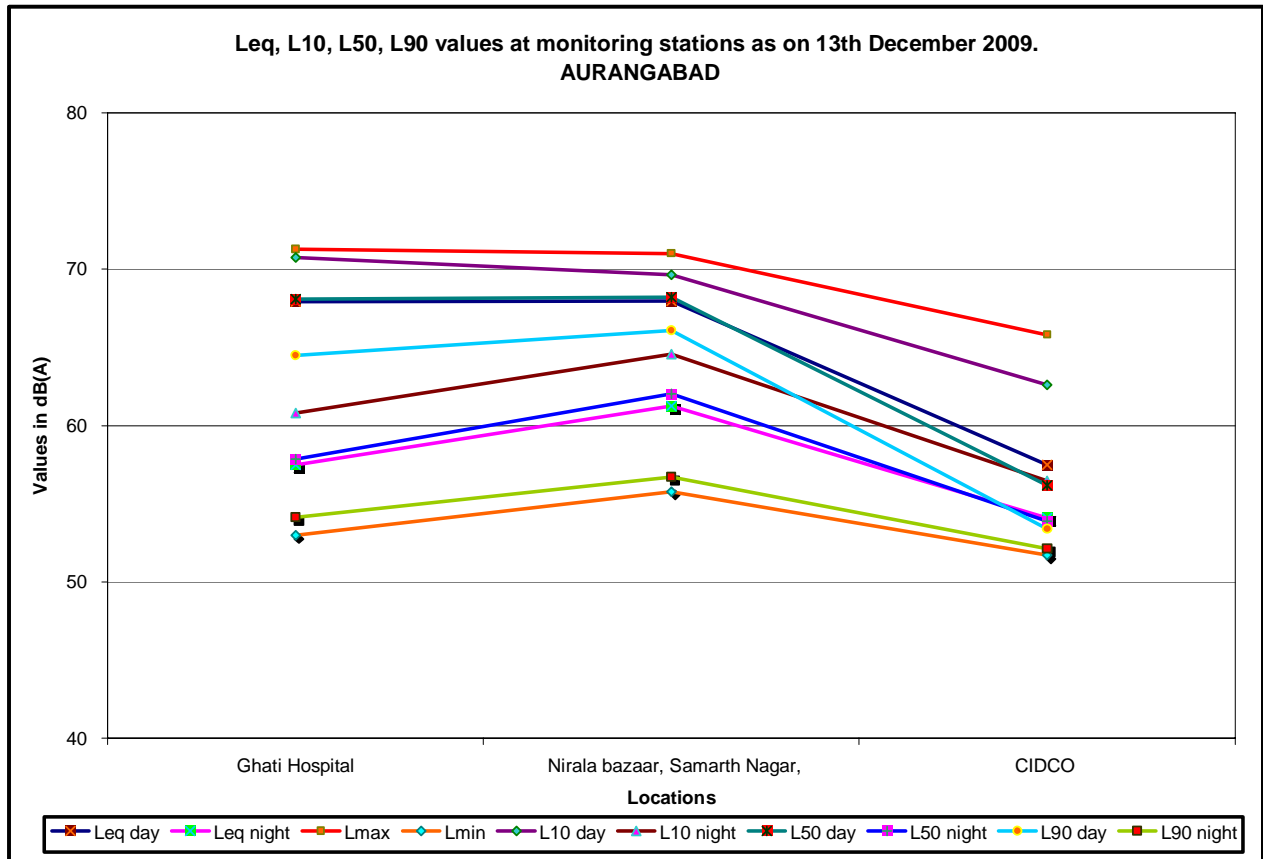
3(b) Noise Levels at Nashik as on 14th December 2009



From the above figure 3(b) the ambient noise levels (L_{eq}) during day time ranged between 66.8 dB(A) at Pandit Colony to 69.5 dB(A) at Pavan Nagar and during night time the noise levels (L_{eq}) ranged between 62.4 dB(A) at Pavan Nagar to 65.9 dB(A) at Pandit Colony. The maximum noise level observed was 75.2 dB(A) at Pavan Nagar and the minimum noise level observed was 56.3 dB(A) at Pandit Colony.

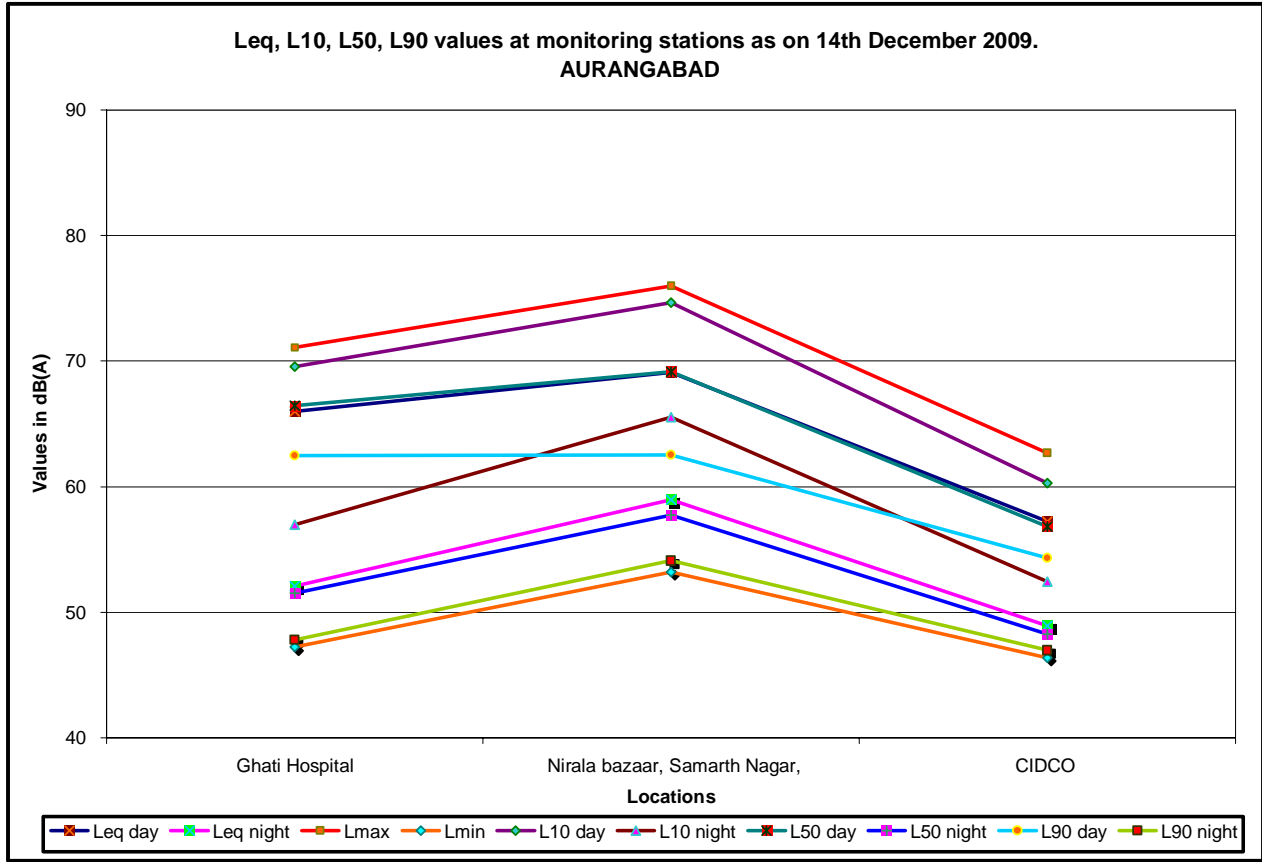
4) Aurangabad:

4(a) Noise Levels at Aurangabad as on 13th December 2009



From the above figure 4(a) the ambient noise levels (L_{eq}) during day time ranged between 57.5 dB(A) at CIDCO to 68.0 dB(A) at Nirala Bazaar and during night time the noise levels (L_{eq}) ranged between 54.1 dB(A) at CIDCO to 61.2 dB(A) at Nirala Bazar. The maximum noise level observed was 71.3 dB(A) at Ghati Hospital and the minimum noise level observed was 51.7 dB(A) at CIDCO.

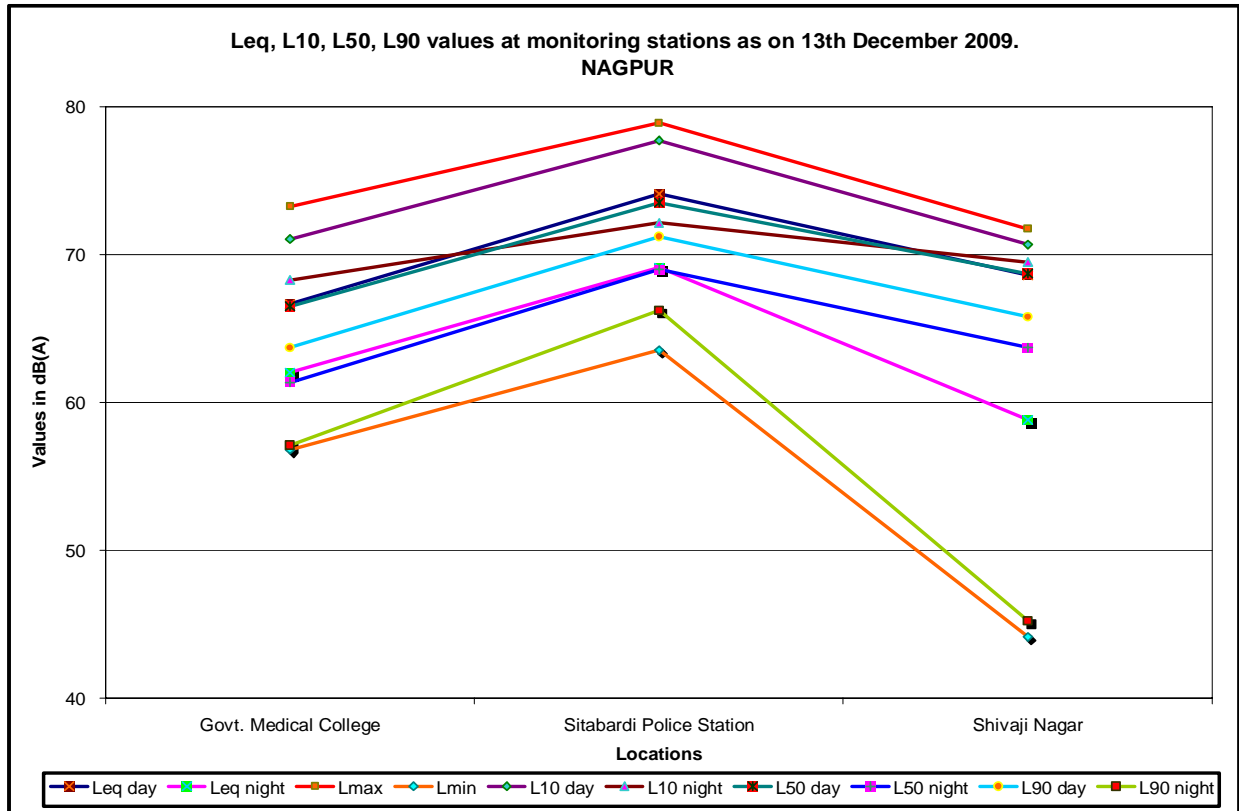
4(b) Noise Levels at Aurangabad as on 14th December 2009



From the above figure 4(b) the ambient noise levels (L_{eq}) during day time ranged between 57.3 dB(A) at CIDCO to 69.1 dB(A) at Nirala Bazar and during night time the noise levels (L_{eq}) ranged between 48.9 dB(A) at CIDCO to 59.0 dB(A) at Nirala Bazar. The maximum noise level observed was 76.0 dB(A) at Nirala Bazaar and the minimum noise level observed was 46.4 dB(A) at CIDCO.

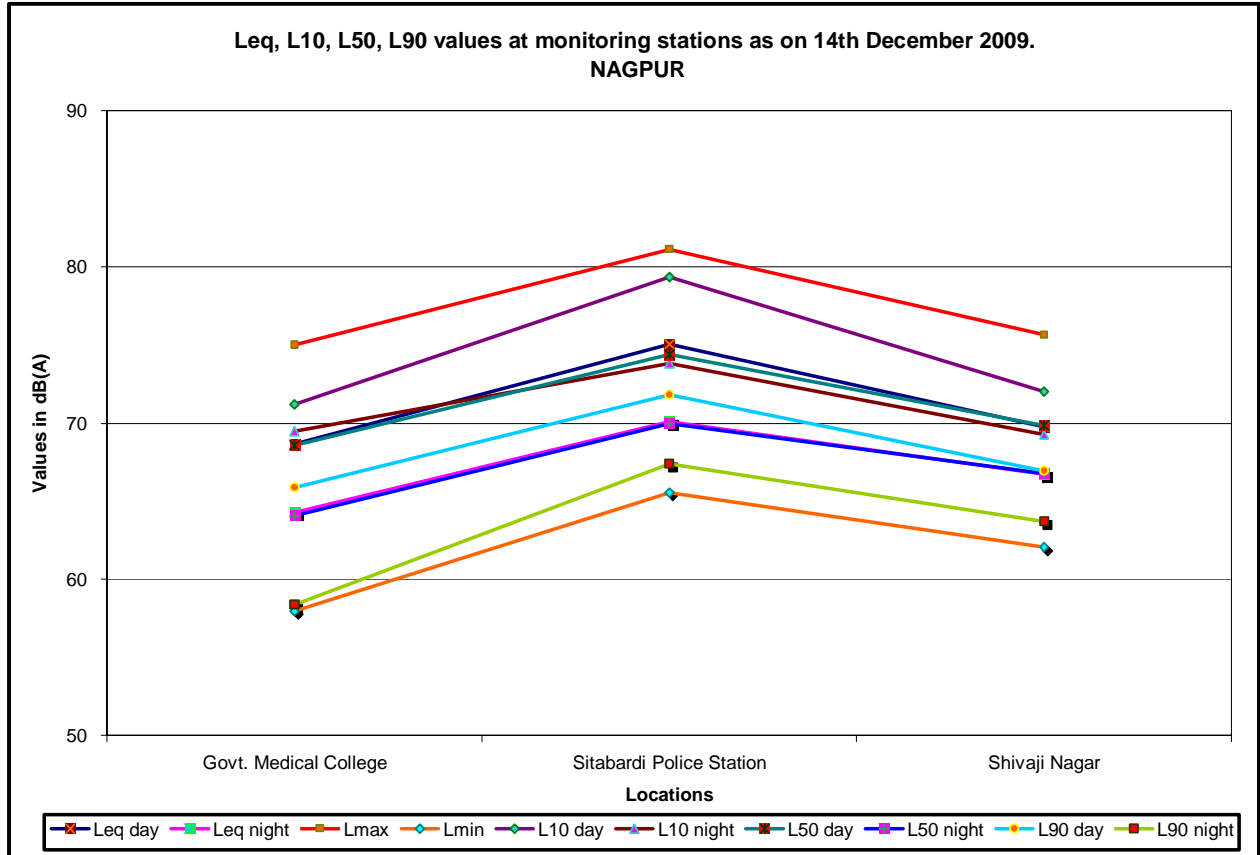
5) Nagpur:

5(a) Noise Levels at Nagpur as on 13th December 2009



From the above figure 5(a) the ambient noise levels (L_{eq}) during day time ranged between 66.7 dB(A) at Government Medical College to 74.1 dB(A) at Sitabardi and during night time the noise levels (L_{eq}) ranged between 58.8dB(A) at Shivaji Nagar to 69.1 dB(A) at Sitabardi. The maximum noise level observed was 78.9 dB(A) at Sitabardi and the minimum noise level observed was 44.2 dB(A) at Shivaji Nagar.

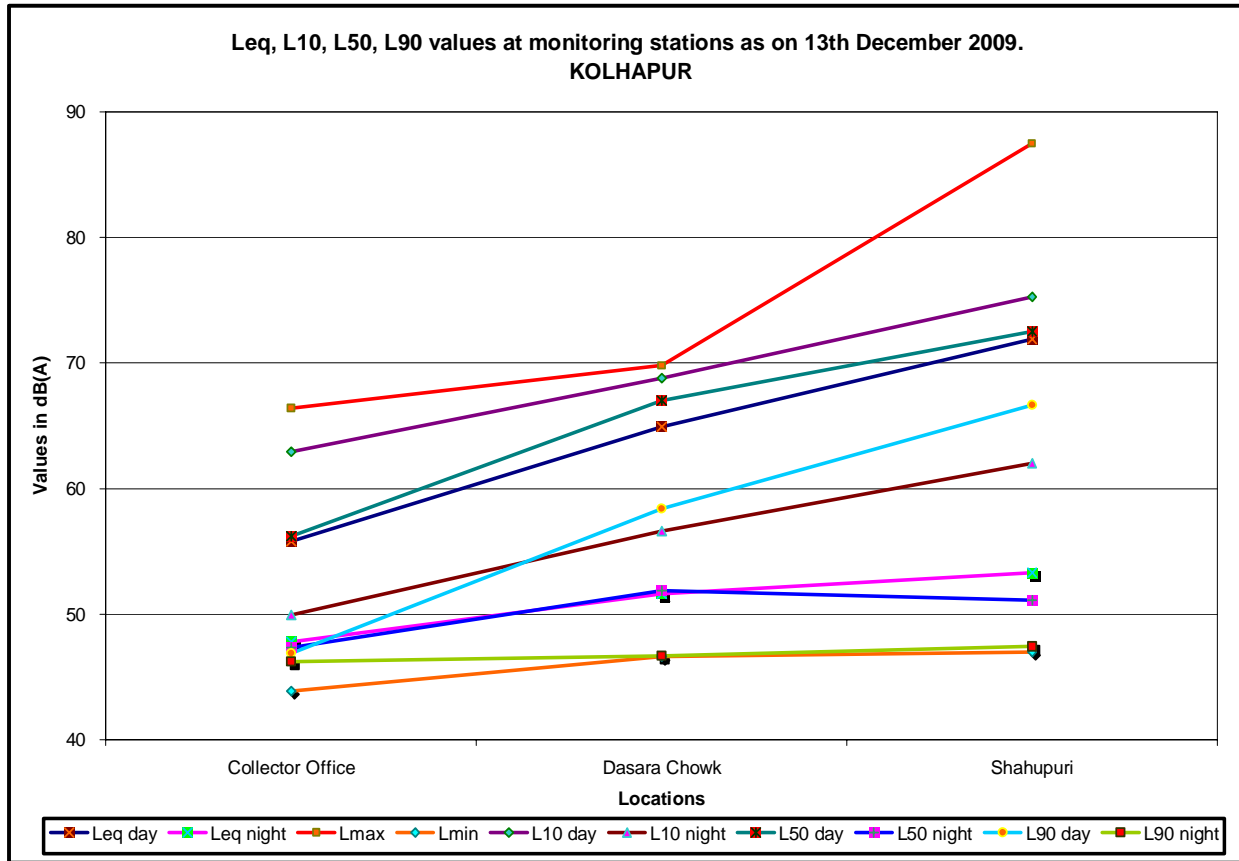
Maharashtra Pollution Control Board
5(b) Noise Levels at Nagpur as on 14th December 2009



From the above figure 5(b) the ambient noise levels (L_{eq}) during day time ranged between 68.7 dB(A) at Government Medical College to 75.1 dB(A) at Sitabardi and during night time the noise levels (L_{eq}) ranged between 64.3 dB(A) at Government Medical College to 70.1 dB(A) at Sitabardi. The maximum noise level observed was 81.1 dB(A) at Sitabardi and the minimum noise level observed was 58.0 dB(A) at Government Medical College.

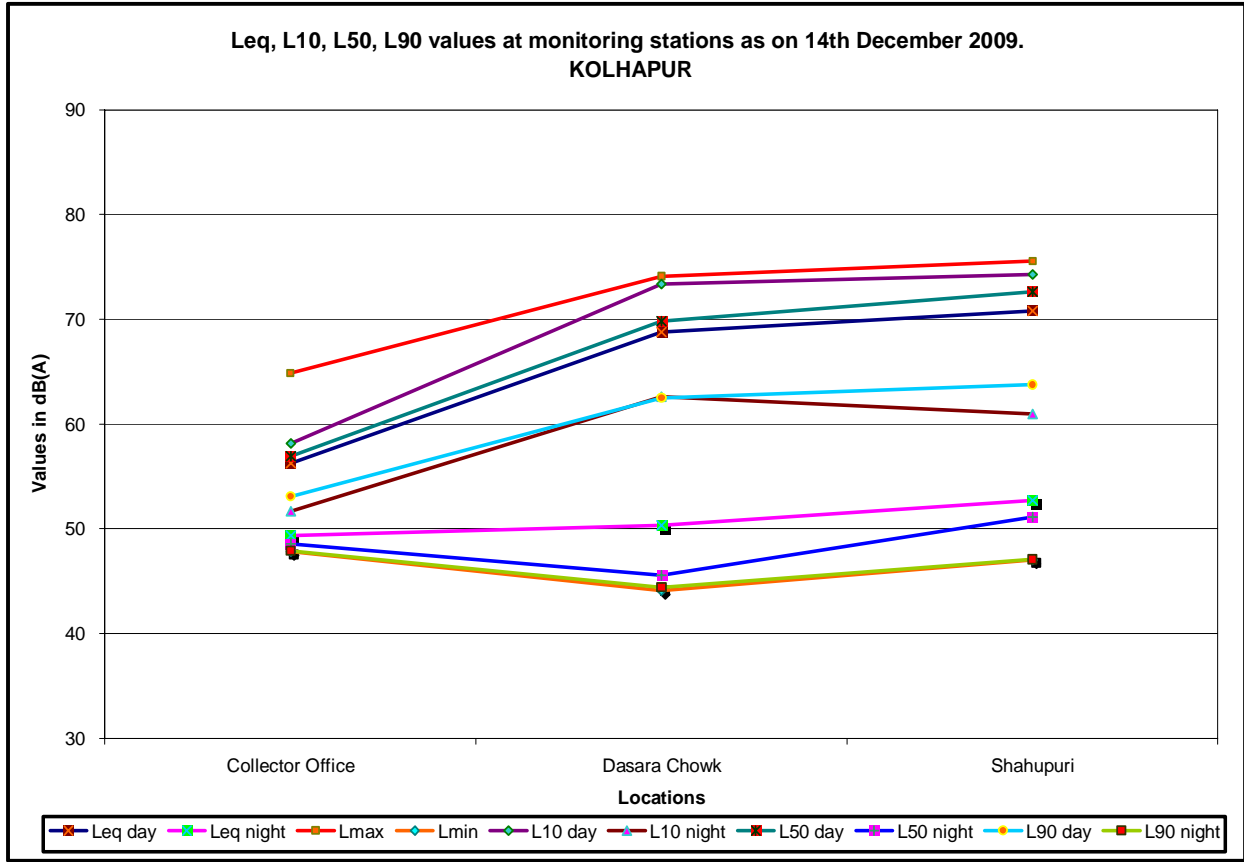
6) kolhapur:

6(a) Noise Levels at Kolhapur as on 13th December 2009



From the above figure 6(a) the ambient noise levels (L_{eq}) during day time ranged between 55.8 dB(A) at Collector Office to 71.9 dB(A) at Shahupuri and during night time the noise levels (L_{eq}) ranged between 47.8 dB(A) at Collector Office to 53.3 dB(A) at Shahupuri. The maximum noise level observed was 87.5 dB(A) at Shahupuri and the minimum noise level observed was 43.9 dB(A) at Collector Office.

Maharashtra Pollution Control Board
6(b) Noise Levels at Kolhapur as on 14th December 2009



From the above figure 6(b) the ambient noise levels (L_{eq}) during day time ranged between 56.3 dB(A) at Collector Office to 70.8 dB(A) at Shahupuri and during night time the noise levels (L_{eq}) ranged between 49.3 dB(A) at Collector Office to 52.7 dB(A) at Shahupuri. The maximum noise level observed was 75.6 dB(A) at Shahupuri and the minimum noise level observed was 44.1 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 13th December 2009:

Area	Location	Ldn dB(A)	Lmax dB(A)	Lmin dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI					
Silence	High Court	79.1	79.4	64.8	50
	Mumbadevi	77.5	91.8	63.8	50
	National Park	78.7	76.9	58.6	50
Residential	Antop Hill	77.3	81.4	61.7	55
	Shivaji Park	68.1	74.1	49.5	55
Commercial	Airport	77.9	79.9	65.4	65
	Vashi Naka	76.9	78.8	63.9	65
	Ghatkopar	77.0	80.5	65.2	65
Industrial	Goregaon	79.8	82.3	65.1	75
	Charkop	77.9	84.2	64.1	75
PUNE					
Silence	University	79.1	77	69.9	50
Residential	Kakade Angan	73.8	80.1	61.9	55
Commercial	Nucleus Mall	79.1	78.7	69.6	65
NASHIK					
Residential	Pandit Colony	70.9	69.5	56.7	55
Residential	Pavan Nagar	75.2	78.2	59.8	55
Commercial	Dwarka Circle	72.3	72.3	62.4	65
AURANGABAD					
Silence	Ghati Hospital.	67.8	71.3	53.0	50
Residential	CIDCO N-4	61.2	65.8	51.7	55
Commercial	Nirala Bazaar	69.5	71.0	55.8	65
NAGPUR					
Silence	Medical College	69.5	73.3	56.8	50
Residential	Shivaji Nagar	68.7	71.7	44.2	55
Commercial	Sitabardi	76.7	78.9	63.5	65
KOLHAPUR					
Silence	Dasara Chowk	64.0	69.8	46.6	50
Residential	Collector Office	56.7	66.4	43.9	55
Commercial	Shahupuri	70.2	87.5	47.0	65

Maharashtra Pollution Control Board
1(b) Noise Levels as on 14th December 2009:

Area	Location	Ldn dB(A)	Lmax dB(A)	Lmin dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI					
Silence	High Court	69.4	70.4	55.8	50
	Mumbadevi	71.4	81.7	55.5	50
	National Park	74.4	78.5	62.5	50
Residential	Antop Hill	67.7	74.2	56.4	55
	Shivaji Park	64.4	88.2	48.5	55
Commercial	Airport	65.4	80.2	51.7	65
	Vashi Naka	72.2	78.5	51.2	65
	Ghatkopar	83.2	85.7	70.9	65
Industrial	Goregaon	75.8	79.1	58.6	75
	Charkop	78.0	84.9	64.6	75
PUNE					
Silence	University	78.6	79.6	65.9	50
Residential	Kakade Angan	76.6	74.6	66.4	55
Commercial	Nucleus Mall	79.9	76.4	67.6	65
NASHIK					
Residential	Pandit Colony	72.4	74.9	56.3	55
Residential	Pavan Nagar	70.8	75.2	60.2	55
Commercial	Dwarka Circle	72.1	71.1	64.3	65
AURANGABAD					
Silence	Ghati Hospital.	64.9	71.1	47.2	50
Residential	CIDCO N-4	58.0	62.7	46.4	55
Commercial	Nirala Bazaar	69.1	76.0	53.2	65
NAGPUR					
Silence	Medical College	71.7	75.0	58.0	50
Residential	Shivaji Nagar	73.7	75.1	62.1	55
Commercial	Sitabardi	77.7	81.1	65.6	65
KOLHAPUR					
Silence	Dasara Chowk	67.1	74.1	44.1	50
Residential	Collector Office	57.7	64.9	47.8	55
Commercial	Shahupuri	69.1	75.6	47.0	65

10. Conclusion:

It is observed from the results that, the noise levels mostly were exceeding the permissible limit during the both days on 13th (holiday) & 14th (working day) December 2009 in all the six Metropolitan Cities of Maharashtra as shown in the table,

The detailed comparison of Noise level results during last year result are as follows

1(a) Noise Levels as on 14th December 2008 & 13th December 2009, during DAY TIME

Area	Location	Sunday, 14 December, 2008 (Holiday) Leq dB(A)	Sunday, 13 December, 2009 (Holiday) Leq dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI				
Silence	High Court	64.8	73.9	50
	Mumbadevi	75.0	74.1	50
	National Park	76.5	71.3	50
Residential	Antop Hill	71.6	72.6	55
	Shivaji Park	71.0	69.2	55
Commercial	Airport	74.6	73.3	65
	Vashi Naka	79.2	71.2	65
	Ghatkopar	78.8	71.7	65
Industrial	Goregaon	72.9	76.2	75
	Charkop	73.0	77.7	75
PUNE				
Silence	University	67.7	74.5	50
Residential	Kakade Angan	63.8	72.0	55
Commercial	Nucleus Mall	70.1	74.9	65
NASHIK				
Residential	Pandit Colony	71.8	63.2	55
Residential	Pavan Nagar	75.3	70.0	55
Commercial	Dwarka Circle	73.7	69.1	65
AURANGABAD				
Silence	Ghati Hospital.	77.4	67.9	50
Residential	CIDCO N-4	79.2	57.5	55
Commercial	Nirala Bazaar	81.0	68.0	65
NAGPUR				
Silence	Medical College	63.9	66.7	50
Residential	Shivaji Nagar	67.1	68.6	55
Commercial	Sitabardi	73.9	74.1	65
KOLHAPUR				
Silence	Dasara Chowk	69.7	64.9	50
Residential	Collector Office	60.1	55.8	55
Commercial	Shahupuri	65.3	71.9	65

Maharashtra Pollution Control Board
1(b) Noise Levels as on 14th December 2008 & 13th December 2009, during

NIGHT TIME

Area	Location	Sunday, 14 December, 2008 (Holiday) Leq dB(A)	Sunday, 13 December, 2009 (Holiday) Leq dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI				
Silence	High Court	60.5	72.5	40
	Mumbadevi	69.5	70.2	40
	National Park	68.4	72.4	40
Residential	Antop Hill	70.4	70.5	45
	Shivaji Park	64.3	55.3	45
Commercial	Airport	72.6	71.1	55
	Vashi Naka	70.4	70.4	55
	Ghatkopar	71.2	70.4	55
Industrial	Goregaon	71.1	72.7	70
	Charkop	67.9	68.3	70
PUNE				
Silence	University	63.7	72.3	40
Residential	Kakade Angan	48.5	65.7	45
Commercial	Nucleus Mall	62.0	72.2	55
NASHIK				
Residential	Pandit Colony	64.0	64.7	45
Residential	Pavan Nagar	63.4	68.6	45
Commercial	Dwarka Circle	69.1	64.9	55
AURANGABAD				
Silence	Ghati Hospital.	72.9	57.5	40
Residential	CIDCO N-4	70.3	54.1	45
Commercial	Nirala Bazaar	72.5	61.2	55
NAGPUR				
Silence	Medical College	63.3	62.0	40
Residential	Shivaji Nagar	62.5	58.8	45
Commercial	Sitabardi	67.5	69.1	55
KOLHAPUR				
Silence	Dasara Chowk	65.7	51.6	40
Residential	Collector Office	52.6	47.8	45
Commercial	Shahupuri	56.3	53.3	55

1(a) Noise Levels as on 15th December 2008 & 14th December 2009, during

DAY TIME

Area	Location	Monday, 15 December, 2008 (Working Day) Leq dB(A)	Monday, 14 December, 2009 (Working Day) Leq dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI				
Silence	High Court	65.1	64.5	50
	Mumbadevi	72.5	70.3	50
	National Park	75.2	71.1	50
Residential	Antop Hill	70.6	68.1	55
	Shivaji Park	69.2	65.3	55
Commercial	Airport	74.5	64.2	65
	Vashi Naka	79.2	68.2	65
	Ghatkopar	77.7	80.4	65
Industrial	Goregaon	73.4	73.7	75
	Charkop	73.6	77.6	75
PUNE				
Silence	University	64.5	74.9	50
Residential	Kakade Angan	60.9	71.5	55
Commercial	Nucleus Mall	70.9	72.8	65
NASHIK				
Residential	Pandit Colony	72.8	66.8	55
Residential	Pavan Nagar	70.9	69.5	55
Commercial	Dwarka Circle	75.7	68.5	65
AURANGABAD				
Silence	Ghati Hospital.	80.1	66.0	50
Residential	CIDCO N-4	80.2	57.3	55
Commercial	Nirala Bazaar	79.1	69.1	65
NAGPUR				
Silence	Medical College	65.2	68.7	50
Residential	Shivaji Nagar	68.7	69.8	55
Commercial	Sitabardi	74.5	75.1	65
KOLHAPUR				
Silence	Dasara Chowk	70.4	68.8	50
Residential	Collector Office	63.4	56.3	55
Commercial	Shahupuri	66.7	70.8	65

Maharashtra Pollution Control Board
1(b) Noise Levels as on 15th December 2008 & 14th December 2009, during

NIGHT TIME

Area	Location	Monday, 15 December, 2008 (Working Day) Leq dB(A)	Monday, 14 December, 2009 (Working Day) Leq dB(A)	Maximum Permissible Limit in dB(A)
MUMBAI				
Silence	High Court	60.7	62.7	40
	Mumbadevi	69.2	62.9	40
	National Park	69.2	67.2	40
Residential	Antop Hill	68.8	57.0	45
	Shivaji Park	67.7	52.3	45
Commercial	Airport	73.4	56.9	55
	Vashi Naka	80.9	65.3	55
	Ghatkopar	70.0	75.8	55
Industrial	Goregaon	69.2	67.9	70
	Charkop	74.1	68.7	70
PUNE				
Silence	University	55.4	71.5	40
Residential	Kakade Angan	48.3	70.0	45
Commercial	Nucleus Mall	59.5	73.6	55
NASHIK				
Residential	Pandit Colony	63.4	65.9	45
Residential	Pavan Nagar	65.9	62.4	45
Commercial	Dwarka Circle	72.0	65.1	55
AURANGABAD				
Silence	Ghati Hospital.	73.0	52.1	40
Residential	CIDCO N-4	70.5	48.9	45
Commercial	Nirala Bazaar	77.1	59.0	55
NAGPUR				
Silence	Medical College	65.7	64.3	40
Residential	Shivaji Nagar	61.0	70.1	45
Commercial	Sitabardi	67.3	66.7	55
KOLHAPUR				
Silence	Dasara Chowk	58.8	50.3	40
Residential	Collector Office	48.0	49.3	45
Commercial	Shahupuri	57.4	52.7	55

From the above tables it is clear that,

In **MUMBAI**, the noise levels in all locations were exceeding the standards. On comparing the noise levels during day time & night time, it shows that the noise level were higher during both day time and night time on 13th December (holiday). The noisiest place was Ghatkopar having average value of 80.4 dB(A) on 14th December during day time and 75.8 dB(A) during night time and least noisy place was Airport having average value of 64.2 dB(A) during day time and during night time was Shivaji Park having average value of 52.3 dB(A) on 14th December 2009.

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 on 13th December (holiday) and during night time the noise levels were higher on 14th December (Working day). The noisiest place was both the Nucleus Mall and Pune University having average value of 74.9dB(A) during day time on 13th and 14th December 2009 and during night time was Nucleus Mall having average value of 73.6 dB(A) on 14th December 2009 and least noisy place was Kakade Angan having average value of 71.5dB(A) during day time on 14th December 2009 and 65.7 dB(A) during night time on 13th December 2009.

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 14th December (working day) and during night time the noise levels were higher on 13th December (holiday). The noisiest place was Pavan Nagar having average value of 70.0 dB(A) during day time and 68.6 dB(A) during night time on 13th December 2009 and least noisy place was Pandit Colony having average value of 63.2 dB(A) during day time on 13th December 2009 and during night time was Pavan Nagar having average value of 62.4 dB(A) on 14th December 2009.

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 13th December (holiday). The noisiest place was Nirala Bazar having average value of 69.1 dB(A) during day time on 14 December 2009 and 61.2 during night time on 13th December 2009 and the least noisy place during day time was CIDCO N-4 having average value of 57.3 dB(A) and 48.9 dB(A) during night time on 14th December 2009.

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 the noise levels were higher during both day time & night time on 14th

Maharashtra Pollution Control Board

December (working day). The noisiest place was Sitabardi having average value of 75.1 dB(A) during day time and 70.1 dB(A) during night time on 14th December 2009 and the least noisy place during day time was Government Medical College having average value of 66.7 dB(A) on 13th December 2009 and during night time was Shivaji Nagar having average value of 58.8 dB(A) on 13th December 2009.

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 14th December (working day) and during night time the noise levels were higher on 13th December (holiday). The noisiest place was Shahupuri having average value of 71.9 dB(A) during day time and 53.3 dB(A) during night time on 13th December 2009 and least noisy place was Collector Office having average value of 55.8 dB(A) during day time and 47.8 dB(A) during night time on 13th December 2009.

When compared with last year's results at the same locations, increasing trends in noise levels were observed in Pune city, where as, decreasing trends in noise levels were observed in Aurangabad city, through out the survey, irrespective of holiday/working day and day time / night time.

11. Glimpse of the event:



Miss. Tejal Gawade at Goregaon, Mumbai.



Miss. Sheelu Singh at Charkop, Kandivali(E) Mumbai.



Mr. Rohit Talaskar at Borivali National Park, Borivali (W).



Mr. Ashwin Ghag and Ketan Mistri at Bombay High Court, Mumbai.



Miss. Vaishali Varpe at Shivaji Park, Dadar, Mumbai.



Mr. Anthony D'souza at Vashi Naka, Chembur, Mumbai.



Mr. Shital Kumar Nale at Pune University, Pune.



Mr. Subhash P. Nair at Nucleus Mall, Pune.



Mr. Rakesh D Kamble at Kakade Angan, Pune.



Mr. Rohit Mahendra Wadhwekar at Dasera Chowk, Kolhapur.



Mr. Vasudev Patil at Pavan Nagar, Nashik.



Mr. Subhash Ahire at Pandit Colony, Nashik.



Miss. Deepa jaiswal at CIDCO N-4, Aurangabad.



Mr. Santosh Shinde at Ghati Hospital, Aurangabad.



Mr. Prashant Sulunke at Nirala Bazar, Aurangabad.



Mr. Mangesh Atkare and Mr. R.M. Vankhede at Government medical College, Nagpur.



Mr. Kamlakar Borikar, Mr. S.G. Karankar, Mr. Y.D. Patil at Shivaji Nagar, Nagpur.



Mr. S. R. Mishra and Miss. P. D. Deshmukh at Sitabardi, Nagpur.