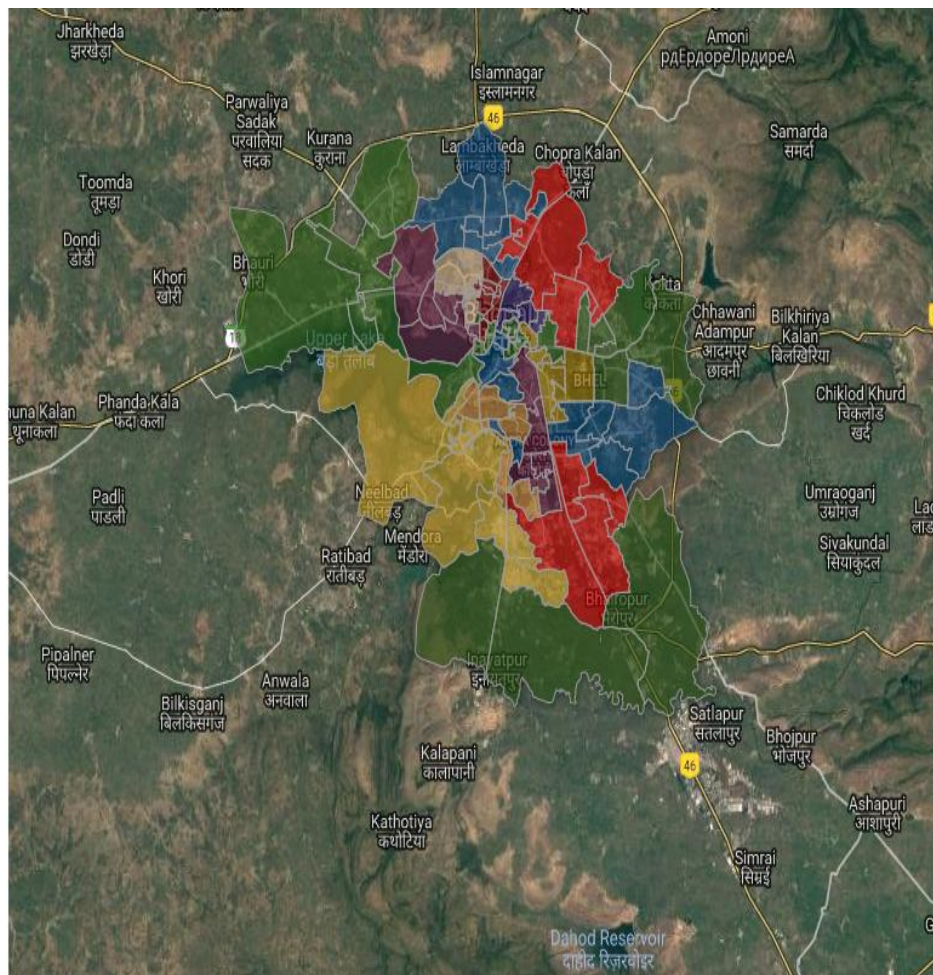


# **ACTION PLAN FOR CONTROL OF AIR POLLUTION IN NON-ATTAINMENT CITY OF MADHYA PRADESH (BHOPAL)**

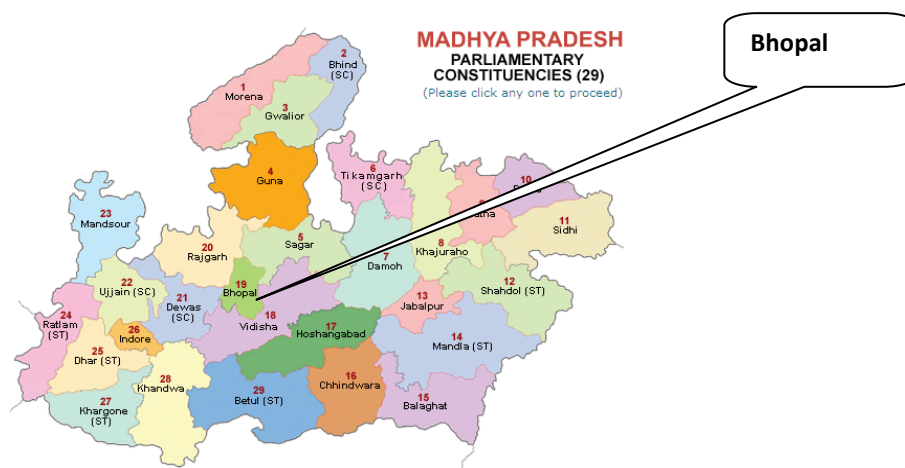


**M.P. POLLUTION CONTROL BOARD**

**REGIONAL OFFICE, E-5 PARYAVARAN PARISAR ARERA COLONY BHOPAL - 16**

## Bhopal City

**Geography** – Bhopal is the capital of Madhya Pradesh. Geographically the city is located in the west-south of the state at 23° 15' 0" N, 77° 25' 0" E. Bhopal has an average elevation of 500 metres (1401 ft). It is located on the Malwa plateau, it is higher than the north Indian plains and the land rises towards the Vindhya Range to the south. The city has uneven elevation and has small hills within its boundaries. The prominent hills in Bhopal are Idgah hills and Shyamala hills in the northern region, Katara hills in southern region. City's geography has in it two lakes namely upper lake and lower lake. Bhopal city is divided into two parts where one part which is near the VIP road and lake is old Bhopal (north) and the other is where mainly malls are situated New Bhopal (South). The total area of the metropolis capital is 285.88 km<sup>2</sup>.



**Climate** - Bhopal has a humid subtropical climate, with cool, dry winters, a hot summer and a humid monsoon season. Summers start in late March and go on till mid-June, the average temperature being around 30 °C (86 °F), with the peak of summer in May, when the highs regularly exceed 40 °C (104 °F). The monsoon starts in late June and ends in late September. These months see about 40 inches (1020 mm) of precipitation, frequent thunderstorms and flooding. The average temperature is around 25 °C (77 °F) and the humidity is quite high. Temperatures rise again up to late October when winter starts, which lasts up to early March. Winters in Bhopal are cool, and not very much comfortable like summers, with average daily temperatures around 16 °C (61 °F) . The winter peaks in January when temperatures may drop close to freezing on some nights. Lowest temperature ever recorded was 0.3C. Total annual rainfall is about 1146 mm (46 inches).

## **Environmental Quality**

**Water** – Water regime in the city is not exposed to chemical pollution as there is no major (chemical) industrial cluster in the city limits, however the water bodies are exposed to the domestic pollution load. The surface water quality of the lakes in the city falls under B or C category when compared with the standards laid in the IS 2296 (1982) as these water bodies are located in the dense urban areas and are dependent on rains. Nevertheless water supply in part of the city is being sufficed from the upper lake after conventional treatment. Ground water quality in the city is moderate.

**Air:** No major industrial or agriculture activities are being carried out in the city limits. The nearest major Industrial area Mandideep (District Raisen) is located at about 15 Km from the city boundary.

The only Industrial Activities being carried out within the city limits are:

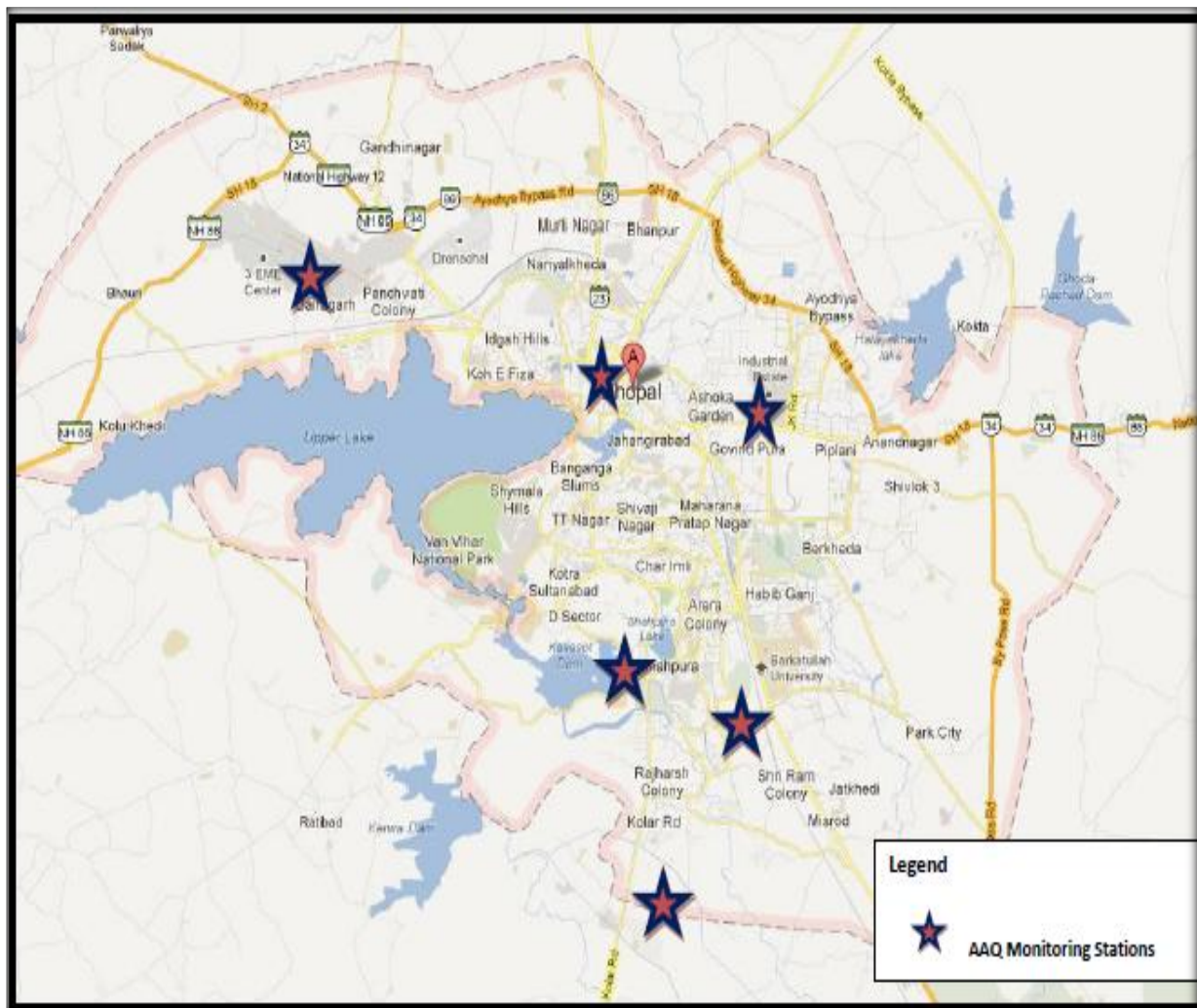
- a) Govindpura Industrial Area (most of the units are fabricating units)
- b) Unit of BHEL (no major source of air pollution)
- c) Unit of Sanchi Dugdha Sangh – (the unit has switch over fuel from furnace oil to LPG in the boiler)

The hot-spots identified with respect to the congested traffic zones include:

- a) Hamidia Road
- b) Bairagarh
- c) Kolar Road
- d) Hoshangabad Road
- e) M.P. Nagar

The ambient air quality of the city is being monitored by the Regional Office M.P. Pollution Control Board Bhopal at following 06 points:

- 1. Hamidia Road
- 2. Arera Colony
- 3. Kolar Road
- 4. Bairagarh
- 5. Barkaullaha University Hoshangabad Road
- 6. Govindpura Industrial Area



**Ambient Air Quality Monitoring Stations**

The monitoring results and the trends from 2014 – 2018 are presented in TABLE 1-2.

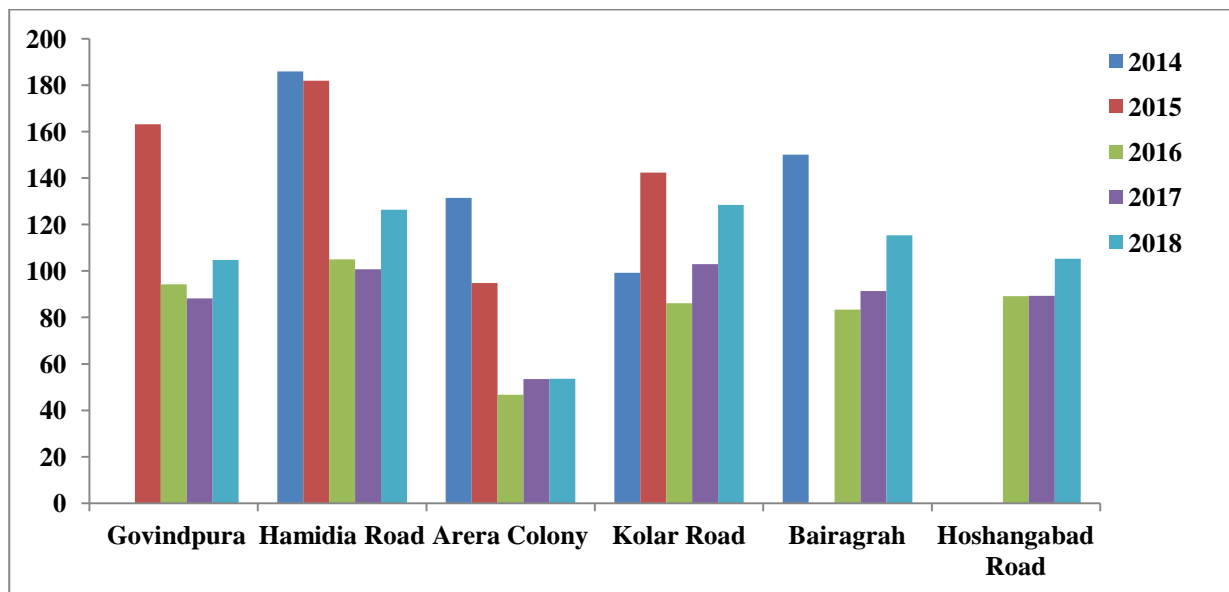
**TABLE – 1**  
**Annual Average value of PM<sub>10</sub> (Microgram / m<sup>3</sup>)**

Station	Year				
	2014	2015	2016	2017	2018
	PM10	PM10	PM10	PM10	PM10
<b>CETP Govindpura, Bhopal</b>	150	163.1	94.2	88.2	104.7
<b>Mrignayani,Hamidia Road Bhopal</b>	185.9	181.9	105	100.8	126.3
<b>Paryavaran Parisar, Bhopal</b>	131.5	94.8	46.7	53.5	53.6
<b>Kolar Thana,Kolar Road, Bhopal</b>	99.2	142.4	86.1	103	128.4
<b>Main Road Hemu Kalani,Bairagrah, Bhopal.</b>	-	-	83.4	91.3	115.4
<b>Near B.U. Hoshangabad Road,Bhopal.</b>	-	-	89.1	89.3	105.3

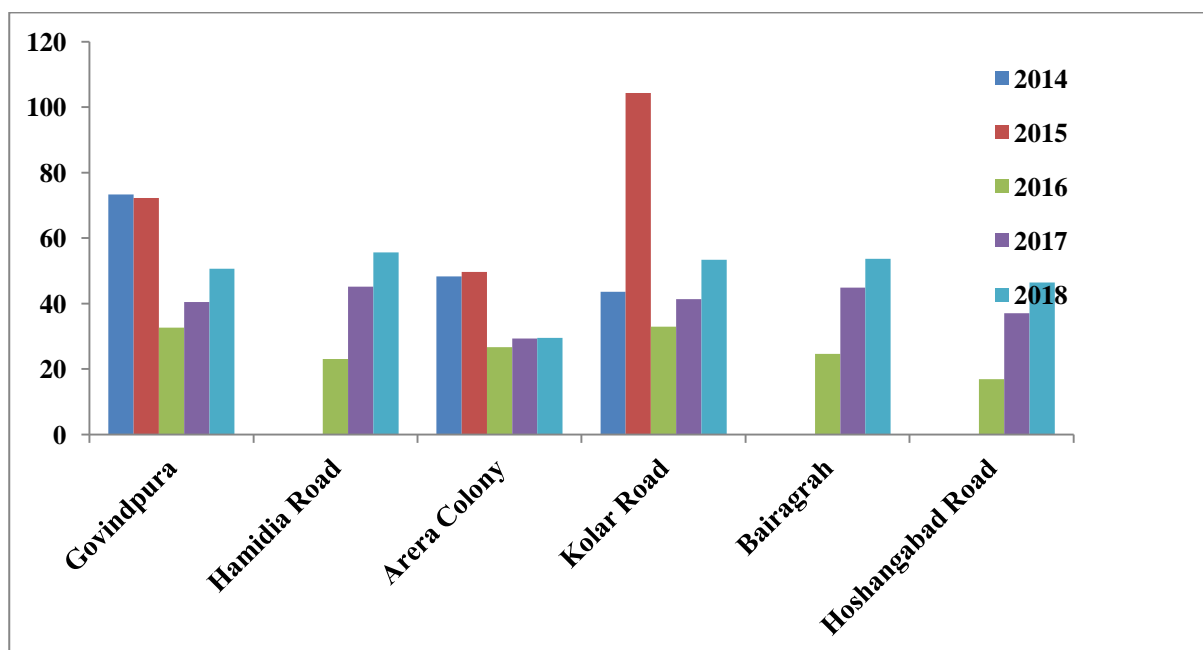
**TABLE – 2**  
**Annual Average value of PM<sub>2.5</sub> (Microgram / m<sup>3</sup>)**

Station	Year				
	2014	2015	2016	2017	2018
	PM2.5	PM2.5	PM2.5	PM2.5	PM2.5
<b>CETP Govindpura, Bhopal</b>	73.3	72.2	32.6	40.5	50.6
<b>Mrignayani,Hamidia Road Bhopal</b>	-	-	23.1	45.2	55.6
<b>Paryavaran Parisar, Bhopal</b>	48.3	49.7	26.7	29.3	29.5
<b>Kolar Thana,Kolar Road, Bhopal</b>	43.6	104.3	32.9	41.3	53.4
<b>Main Road Hemu Kalani,Bairagrah, Bhopal.</b>	-	-	24.6	44.9	53.7
<b>Near B.U. Hoshangabad Road,Bhopal.</b>	-	-	16.9	37	46.4

### PM<sub>10</sub>: Trends from 2014 -2018



### PM<sub>2.5</sub>: Trends from 2014 -2018



The results reveal that the concentration of gaseous pollutants viz. SO<sub>2</sub> and NO<sub>x</sub> has always remained within the limits as prescribed in the standards. The concentration of particulate matter has shown higher values at some instances. The apparent cause for higher particulate matter in the air is traffic of the city and

to some extent the infrastructure development activities going on in the city. It is also noteworthy to state that several long-term as well as short-term infrastructure development activities under the smart city project are also in progress in the centre part of the city occasionally resulting in the increase in particulate matter in ambient air. A gradual improvement in the air quality is observed from 2014 onwards with implementation of various plans such as:

- Execution of the plans for traffic management of the city, these plans include – widening of identified roads, removal / reduction of rotaries, construction of fly-over bridges / cable bridges, regular PUC check-up camps, synchronization of signal lights etc.
- Execution of the plans under the ‘Ujwalla Yojna’ - replacement of fossil fuel with the LPG gas in the domestic sector thus controlling the fugitive emissions from domestic sources.
- Total control on the burning of agriculture residues in the farms located on the outskirts of the city.
- Total control on the burning of MSW at the dumping site located at Bhanpura Khanty.
- All air polluting industries from the industrial area operating in the city have been shifted / closed. The unit of Sanchi Dugdha Sangh located in the centre of the city has switched over the fuel from FO to LPG.

Here it is noteworthy to state that the ambient air quality of the city is continuously observed to be improving for last 02 years and the same is expected to improve further with execution of various plans as proposed in this report.



## **1. BACKGROUND**

- 1.1** Central Pollution Control Board vide its letter dated 01.07.2016, identified Bhopal as “Non Attainment City” and issued directions u/s 18(1)(b) of the Air (Prevention & Control of Pollution) Act, 1981 to ensure the time bound action on various “Action Points”, in order to improve the Air quality of Bhopal so as to confirm the prescribed standards.
- 1.2** In compliance to the above directions issued by CPCB, the department of environment Govt. of M.P. organized a meeting on dated 16-09-2016 under the Chairmanship of Chief Secretary of Govt. of M.P. Secretaries from various stake holder departments were present in the meeting.
- 1.3** A Committee was formed by the Chief Secretary Govt. of M.P. under the chair of Bhopal Divisional Commissioner comprising members from various stake holder departments. To streamline & identify the exact actions required meetings were called by the Divisional Commissioner Bhopal. Later administrative order was issued by the Divisional Commissioner constituting the district level committee to review the executions and finalize the action plan pertaining to left out works with different departments. Since, November 2016 four collective meetings have been conducted, in addition to the same continuous inter-action with the concerned officers of respective departments is being observed to update the compliance status.

## **2.0 NGT Case No. 681/2018**

- 2.1** Hon’ble National Green Tribunal, Central Zonal Bench, New Delhi, in the matter of original application no. 681/2018 (*News Item Published in the “Times of India” authored by Shri Vishwamohan Titled “NCAP with multiple timelines to clear Air in 102 cities to be released around August-15”*) passed an order on 08/10/2018. The para 14 & 15 of this order are relevant to comply. In para 10 of the above order, it is stated that CPCB



has identified Bhopal city as non attainment city for pollutant PM<sub>10</sub> parameter exceeding the prescribed norms.

**2.2** That in para 08 of the above order, it is mentioned that CPCB gave presentation before Hon'ble Green Tribunal on 05.09.2018 and the data of air quality from 2011-2015 were considered in the above presentation and thus on the basis of air quality data for year 2011-15, Bhopal city has been considered as non attainment city by CPCB.

**2.3** In para 15 (i, ii, iii, iv & v), Hon'ble National Green Tribunal has issued following directions:-

- i. *All the states & Union Territories with Non Attainment Cities must prepare appropriate action plans within 02 months aimed at bringing the standards of air quality within the prescribed norms within 06 months from date of finalization of the action plan.*
- ii. *The Action Plans may be prepared by six-member committee comprising of Directors of Environment, Transport, Industries, Urban Development, Agriculture and Member Secretary, State Pollution Control Board or Committee of the concerned State. The Committee may be called Air Quality Monitoring Committee (AQMC). The AQMC will function under the overall supervision and coordination of Principal Secretary, Environment of the concerned State/Union Territory. This may be further supervised by the Chief Secretaries concerned or their counterparts in Union Territories by ensuring intra-sect oral co-ordination.*
- iii. *The Action Plans may take into account the GRAP, the CAP and the action plan prepared by CPCB as well as all other relevant factors. The Action Plans may be placed before the Committee as directed in direction no. vi. The Action Plan will include components like identification of source and its apportionment considering sectors*

*like vehicular pollution, industrial pollution, dust pollution, construction activities, garbage burning, agricultural pollution including pollution caused by burning of crop residue, residential and indoor pollution etc. The action plan shall also consider measures for strengthening of Ambient Air Quality (AAQ) monitoring and steps for public awareness including issuing of advisory to public for prevention and control of air pollution and involvement of schools, colleges and other academic institutions and awareness programmes.*

- iv. The Action Plan will indicate steps to be taken to check different sources of pollution having speedy, definite and specific timelines for execution.*
- v. The Action Plan should be consistent with the carrying capacity assessment of the non-attainment cities in terms of vehicular pollution, industrial emissions and population density, extent of construction and construction activities etc. The carrying capacity assessment shall also lay emphasis on agricultural and indoor pollution in rural areas. Depending upon assessed carrying capacity and source apportionment the authorities may consider the need for regulating number of vehicles and their parking and plying, population density, extent of construction and construction activities etc. Guidelines may accordingly be framed to regulate vehicles and industries in non-attainment cities in terms of carrying capacity assessment and source apportionment.*

After several meetings with stake holder departments and based on the information furnished on the completed/ on-going/ proposed activities an action plan with compliance status has been prepared and finalized so as to attain the air quality of Bhopal City as per the prescribed standards. The same is submitted with this report.

**Action Plan for Non-Attainment City, Bhopal, as per Hon'ble NGT Principal Bench, New Delhi**  
**Case No. OA 681/2018 Order dated 08.10.2018**

Source group	Action	Implementation period (short/mid/long-term)	Responsible agency(ies)	Works to be done	Time target for implementation	Work already completed/Remark
Vehicles	1. Restriction on plying & phasing out of 15 years old commercial diesel driven vehicles.	Mid	Transport Department	The order to restrict about plying and phasing out of 15 years old commercial diesel driven vehicles is required to be issued.	12 months (policy matter-decision at govt. level)	1. Transport Department, Govt. of MP has issued notification dated: 24/11/2010 and has phased out the public service vehicles (Buses), which are older than 15 years. 2. Transport Department, Govt. of MP has issued draft notification dated: 01/03/2018 and has disallowed permission for to the School / Education Institution vehicles older than 15 years from

						<p>the year of manufacture.</p> <p>3. As per Central Motor Vehicle Act, 1988, Sec.59 <b>“Power to fix the age limit of motor vehicle”</b> under this section Central Government is empowered to fix the age limit of motor vehicle. Hence to phase out 15 year old all other categories of diesel driven vehicles is a policy matter and the decision is required to be taken at Central government level.</p>
	2. Introduction of cleaner fuels (CNG/ LPG) for Vehicles.	Mid	Transport Department & Oil Companies	Introduction of cleaner fuels (CNG/ LPG) for Vehicles.	December 2019	Till date no CNG / LPG filling stations have been established in the city.
	3. Regular Checking of Vehicular emission and issue of PUC.	Short Regular activity	Transport Department & Traffic Police	--	--	As per the information from RTO already <b>38</b> vehicle emission monitoring centres have been registered in the city for periodic check-up and certification of PUC. PCB in coordination with traffic

						police is conducting regular PUC camps at various locations in the city. During the period from April 2017 to October 2018 total 2243 vehicles have been checked.
	4. Good traffic management re-direction of traffic movement to avoid congestion.	Mid	Traffic Police / Smart City Project	<ul style="list-style-type: none"> <li>• 327 buses and 20 bus routes are being placed in the city.</li> <li>• Inter-city bus services on 208 routes with 110 buses are under planning in the city by the BCLL.</li> <li>• 05 Km long cycle track is under</li> </ul>	01 month  --  --	1. Integrated Traffic Management System comprising cameras and control systems has been set up at 21 sites/junctions by the Smart City Project Bhopal. 2. BCLL has been constituted to provide public transport to the city population. 587 buses on 16 routes have been deployed by the BCLL. About 150000 passengers are benefitted with the service every day. Thus reducing the use of personal vehicles and improving the air quality of the city. CSE study also supports these facts. 3. 12 Km Cycle track has been constructed. Under public bike sharing 300 cycles have been

				construction under smart city project.		placed at 80 cycle-stands in the city 450 cycles shall be placed on these stands. 4. Rotaries on squares are under re-construction with advice of the safety experts. 5. In light of the above executions CSE in its study has declared Bhopal as the least air polluted city.
	6. Ban on registration of Diesel driven auto rickshaw / tempo.	Short	Transport Department	--	--	Diesel operated tempo and auto rickshaw are not issued permit in the municipal limit of the city.
	7. Promotion and operationalization of E-rickshaw.	Mid	Transport Department	200 no. of E-rickshaws more to be deployed.	April 2019	300 No. E-rickshaw has already been placed on the road.
	8. Development of Multi-layer parking.	Long	Municipal Corporation, UD & HD & District	Work pertaining to 02 more multi-layer parking is in	--	Multi-level parking at 02 most congested area has already been constructed & operational.

			Administration	progress.		
	9. Retrofitting of particulate filters in diesel driven vehicles,	Mid	Transport Department	After finalization of the policy the department shall implement on ground	December 2019	Matter shall be taken up with the transport department.
	10. Checking of fuel adulteration,	Short Regular activity	District Adm. & Oil Companies.	--	--	Regular checking of fuel adulteration & random monitoring of fuel quality are done by the Food & Civil Supplies department.
	11. Monitoring on vehicle fitness	Short Regular activity	Transport Department & Traffic Police	--	--	Is being done by the RTO on regular basis. RTO has appropriate facilities for the same.
	12. Periodic calibration test of vehicular emission monitoring instrument.	Short Regular activity	MPPCB & Transport Department	--	--	PCB get the calibration of all the vehicular monitoring instruments periodically. PCB carry out sudden inspection of the PUC centres established by the RTO.



<b>Road dust</b>	1. Regular cleaning of road dust.	Short Regular Activity	Bhopal Municipal Corporation	02 more such sweeping machines are under procurement under the smart city project.	March 2019	<ul style="list-style-type: none"> <li>• Entire city is being cleaned up through manual sweeping on regular basis. Special squad of employees has been deployed for the same. Provision of 03 times cleaning has been made in the commercial areas of the city, whereby road dust is cleaned along with the other municipal solid wastes.</li> <li>• Municipal Corporation &amp; smart city project are operating two road sweepers to clean the road dust on major roads of the city.</li> <li>• In view of the need 02 more road sweepers are under procurement by the Smart City Project.</li> </ul>
	2. Water spraying on road through tankers.	Mid Regular Activity	Bhopal Municipal Corporation	--	--	<ul style="list-style-type: none"> <li>• Foot-path &amp; other public places are being washed using raw water as per the requirement.</li> <li>• Wet cleaning is covered in the mechanical sweeping being</li> </ul>

						procured by the Smart City Project.
	3. Construction of road shoulders & pavements	Long Regular Activity	Municipal Corporation & Road Construction Department.	--	--	<ul style="list-style-type: none"> <li>The work pertaining to construction and repair of the shoulders / pavements is progress.</li> </ul>
	4. Tree plantation along the roads.	Long Regular activity	Bhopal Municipal Corporation	--	--	<ul style="list-style-type: none"> <li>No of trees planted in the current year 36000.</li> </ul>
	5. Development of green belt in open areas, gardens, park / community places, Schools & Housing societies.	Long Regular activity	Municipal Corporation	--	--	<ul style="list-style-type: none"> <li>In city 86 parks / gardens have already been developed and maintained by Municipal Corporation.</li> <li>Housing Societies &amp; Schools are encouraged to develop green areas.</li> <li>Smart City Project is developing Green Master Plan for the city.</li> </ul>
	6. Introduction of	Long	Bhopal	--	--	<ul style="list-style-type: none"> <li>Fountains have already been</li> </ul>

	water fountains at major traffic intersection / golumber circle		Municipal Corporation			placed on the busy squares (Mata Mandir, Polytechnic Square & 07 No. bus stop) of the city. Construction of fountains on some other squares is under progress. • Vertical Gardens have been developed on the main roads of the city.
<b>Construction Activities</b>	1. Covering of Construction site	Short Regular activity	Bhopal Municipal Corporation & Building Construction Deptt.	--	--	Is being complied. Bhopal Municipal Corporation has issued administrative orders in this regard. Building permission section has inserted a condition in this regard and the same is being monitored by them.
	2. Transportation of construction material like sand, soil, stone chips etc. in covered system.	Short Regular activity	Transport Department, Distt. Adm. & Traffic Police	--	--	Is being complied. Bhopal Municipal Corporation has issued permanent administrative orders in this regard. Provision of penalty has been laid for violation of the orders.
	3. Restriction on	Short	Bhopal	--	--	Is being complied. Bhopal Municipal

	storage of construction material along the road.	regular Activity.	Municipal Corporation			Corporation has issued permanent administrative orders in this regard. Provision of penalty has been laid for violation of the orders.
<b>Biomass and garbage burning</b>	1. Restriction on open burning of Municipal Solid Waste, Bio-mass, Plastic, horticulture waste etc.	Short regular activity.	Bhopal Municipal Corporation	Waste to Energy Plant (23 MW) using MSW is under installation at Adampur Chchawani Bhopal by the BMC	December 2019	<ul style="list-style-type: none"> <li>• Bhopal Municipal Corporation has issued administrative orders banning the burning of polythene and other waste in open. There is provision of penalty in case of any violation.</li> <li>• Waste to Energy Plant (23 MW) is under installation for disposal of MSW of the city.</li> <li>• A bio-methanization plant to get bio-gas and compost from vegetable waste (capacity: 5 T) has been installed at Bittan Market.</li> <li>• 03 bio-methanization plants to get bio-gas and compost have been installed at temporary transfer stations.</li> <li>• Compost plant along with the</li> </ul>

						<p>remediation &amp; capping work is in progress at the old MSW dumping site located at Bhanpura.</p> <ul style="list-style-type: none"> <li>• MSW is being collected from door-to-door. Covered vehicles have been deployed for transport of the MSW.</li> <li>• For disposal of garden waste construction of compost pits in societies is in progress.</li> </ul>
	2. Immediate lifting of solid waste generated from de-silting and cleaning of municipal drains for its disposal	Short Regular activity	Bhopal Municipal Corporation	--	--	Vehicles have been deployed for lifting of silt and solid waste being generated from the open drains.
	3. Transportation of municipal solid waste, construction	Short Regular activity	Bhopal Municipal Corporation	--	--	Permanent orders have been issued by the BMC for disposal of C & D waste as per the provisions of the rules with provisions of fee/ penalty.

	material and debris in covered system					
	4. Ensuring promotion and use of cleaner fuel for commercial purposes like local dhaba / eateries and domestic use	Long	District Adm. & Oil companies			Only LPG is being promoted for use in the eateries, restaurants & domestic purposes of the city. Under PMUY 74925 LPG Gas Connections have been provided to weaker sections in the city by OICL and BPCL.
<b>Industries</b>	1. Installation and operation of air pollution control devices in industries.	Short Regular activity	MPPCB	--	--	➤ Total emission generating industries in the Govindpura Industrial Area and other parts of the city – 27 Nos. ➤ These industries have adequate APCD.
	2. Ensuring emission standards in industries.	Short Regular activity	MPPCB	--	--	Is being complied.

	3. Adoption of cleaner technology in brick kilns.	Mid	MPPCB	--	--	No brick kilns are working in the city limits.
	4. Shifting of polluting Industries	Long	MPPCB & Industry Department	--	--	Presently not required.
	5. Ban on Polluting Industries	Short	MPPCB & Ind. Deptt.	--	--	Presently not required.
Strengthening of AAQ Monitoring	1. Installation of four CAAQMS at Bhopal.	Mid	MPPCB	A. 02 CAAQMS station under CSR funds of CPSU through CPCB. B. 02 CAAQM stations under State Govt. financial assistance.	March 2019	➤ Presently Ambient Air Quality is being monitored at 06 locations in the city limit through air samplers. The daily monitoring results is being displayed on public domain of PCB and on the LED screens at TT Nagar Stadium, Smart Poles and Traffic Police poles. The results are also broadcasted through WhatsApp messaging.



	2. Source apportionment studies	Long	MPPCB		December 2019	Proposal for study under process.
<b>Public Awareness</b>	1. Issue of advisory to public for prevention and control of air pollution	Short Regular Activity	MPPCB & District Administration.	--	--	MPPCB issues advisory on various occasions as may be required.
	2. Involvement of School and other academic institution in awareness program	Mid Regular Activity	MPPCB	--	--	MPPCB has organized 131 awareness programs in the city as well as in adjoining districts during last three years.
<b>Others</b>	1. Compliance of guidelines on DG set and action against violation	Short Regular Activity	MPPCB and Bhopal Municipal Corporation	--	--	<ul style="list-style-type: none"> <li>• With 24 hours power supply in the city the use of DG set has reduced to great extent.</li> <li>• Only DG Sets conforming Environmental Norms &amp; guidelines are permitted for use.</li> </ul>

						<ul style="list-style-type: none"> <li>In last 02 years action against 04 DG sets have been taken (03 removed &amp; 01 up-graded as per norms)</li> </ul>
	2. Help line to oversee non-compliances on afore said issues	Short Regualr Activity	MPPCB & Bhopal Municipal Corporation	--	--	Bhopal Municipal Corporation helpline is provided as: 18002330014 MPPCB RO Bhopal- 0755-2466392 and E-mail: <a href="mailto:romppcb_bpl@rediffmail.com">romppcb_bpl@rediffmail.com</a> (displayed in the web-site)

## Fly Overs / Still-Cable Bridge (Completed)



### FLY Over / Cable Bridge

- 04 completed & operational
- 03 under construction



## Fly Overs (Under Completion)



**Air Port Road**



**Hoshangabad Road –  
Bawadia Kala**



**Subhash Nagar**

## By-Pass of Bhopal City



**By-pass road for Bhopal City – avoids heavy traffic through the city**

**Other city by-passes already completed are:**

- Ayodhya By-pass
- By-pass connecting Hoshangabad to Vidisha, Raisen and Bina.

## Multi Level Parking



New Market



Ibrahimipura

## Rotary Optimization and road widening



Retghat Square



Krond Square



## Segregation of traffic through development of separate Inter-city Bus Stands



**Western City- Halalpur Bus Stand**

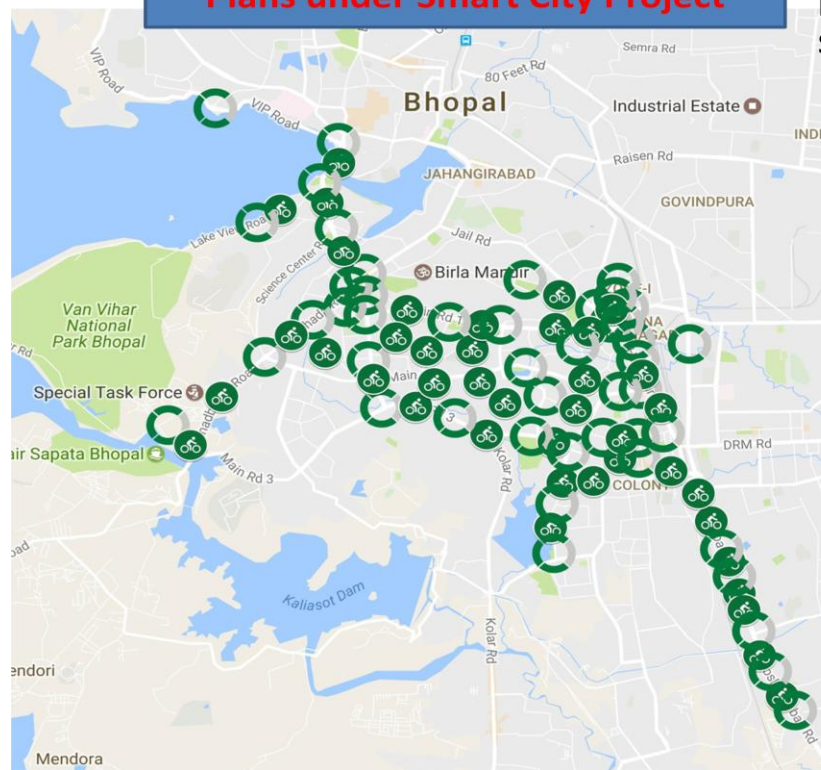


**Old Centrally Located - Nadra Bus Stand**



**Eastern Part – Kushbhau Thakre ISBT**

## Plans under Smart City Project

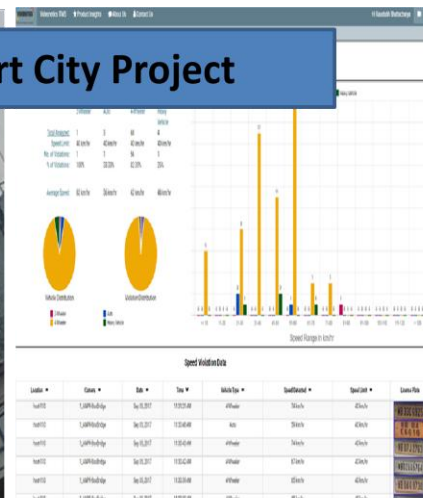


## PUBLIC BIKE SHARING STATION PLACEMENT

## NETWORK CONNECTIVITY



## Plans under Smart City Project



## INTEGRATED TRAFFIC MANAGEMENT SYSTEM IMPLEMENTATION





## Survey Results



Out of 500 cities, 434 cities participated in Swachh Survekshan 2017. Based on the scores obtained by the cities across all the three parts of the survey, the ranking of the cities, in descending order, is shown in the table below:

**TABLE 1** 2017 RANKING FOR ALL 434 CITIES ON THE BASIS OF TOTAL SCORE

RANKING	CITY (ULB)	MUNICIPAL DOCUMENTATION (900)	INDEPENDENT OBSERVATION (500)	CITIZEN FEEDBACK & SWACHHTA APP (600)	TOTAL SCORE (2000)
1	Indore	875.00	435.78	496.94	1807.72
2	Bhopal	829.58	483.00	487.85	1800.43
3	Visakhapatnam (Vizag)	869.00	458.51	469.02	1796.53
4	Surat	848.58	424.66	489.25	1762.49
5	Mysuru (Mysore)	833.37	460.25	449.74	1743.36
6	Tiruchirappalli (Trichy)	854.37	436.41	425.06	1715.84
7	New Delhi Municipal Council (NDMC)	819.95	426.88	461.13	1707.96
8	Navi Mumbai	856.13	392.24	456.77	1705.14
9	Tirupati	809.13	465.76	428.97	1703.86
10	Vadodara	837.25	406.24	459.58	1703.07

सेक्टर ऑफ साइंस एंड प्रौद्योगिकी में जारी किए 14 शहरों पर किए गए सर्वे के नतीजे

संस्था ने कक्षा-साइकिल को बहाल देने की गारंटी

हजेती • कोलकाता

सहजता के मामले में कक्षा की शिक्षा हमेशा	छात्रों के अंदर दृढ़ता है। दूसरे भाषा
भाषा को प्रोत्साहित करता है। इससे	विषयवस्तु और विचारों में समझ बढ़ती है।
मैंने इसे न केवल सहजता के मामले में	भाषा बढ़ाई है। भाषा को वाक्य
भाषा के समझ में। इस विषय में दूसरे में	प्रतिभा और भाषा के विचारों में बढ़ाई है।
दूसरे छात्रों को असाधारण रूप से	विचारों में प्रतिभा के विचारों में बढ़ाई है।
असाधारण है।	कक्षा के विचारों को विचारों में बढ़ाई है।

यह बलवान युवा को जो हार  
मोटा प्राँ सदन हूँ एनबलनेट  
(सिंह) के लिये मैंने अर्ध (बलवान)  
जला है। बलवान साह सदन के लिये  
बलवान टूटने के साथ बलवान  
पिता बलवान के बलवान देने चाहिए।

हिंदवाडा में सेहत के लिए सबसे अच्छी हवा- पेज 4

परिवहन में समग्र  
कार्बन उत्सर्जन के  
आधार पर किया सवे

पत्रिका न्यूज नेटवर्क  
patrika.com

भीषणरु शरीर धीरेकुन में कम  
 कर्बन उत्सर्जन और ऊष्मा खापक के  
 मन्त्रने में प्रीपतन ने पल्ला स्तन  
 श्राव किया हैं। सोपस्ट (सेटा) कोर  
 सडस (एड एक्वायरेमेट) को ओर से  
 देते के 14 शलते में पीकन के  
 रीपन समक कर्बन उत्सर्जन पर  
 शोच किया गया, जिस्की रिशेंट  
 भीष्णरु को कोलकता में जारी की  
 गई। इसमें न्यूनतम ऊष्मा खाप और  
 कर्बन कम कर्बन उत्सर्जन के चरते  
 भीषणरु को यह रीति मिली की प्रति  
 कोर कर्बन उत्सर्जन की श्रेणी में  
 कोलकता न्यूनतम उत्सर्जन के साथ  
 श्लेष्क म्याप पर रहा हैं।

सौर-एनर्जी की ओर से परिवहन के साधनों के उपयोग और परिवहन में उपयोग होने वाली ऊर्जा और साधनों में उत्पन्न होने वाले कार्बन पर ध्यान दिया गया। मेगा मिस्ट्रीज में

खतरे की घंटी बजाता शहरी परिवहन

रिपोर्ट में परिखन के साधनों के चलते होने वाले प्रत्यक्ष को बंद विनाशकारी बताया है। रिपोर्ट के अनुसार देश में कुल रजिस्टर्ड वाहनों की संख्या को 10 करोड़ 50 लाख तक पहुंचने में 1952 से 2008 तक छह दशक लगे लेकिन 2008 से 2016 के छह वर्षों में इतने ही वाहन रजिस्टर्ड हो गए।

कॉम्पेक्ट शहर,  
छोटे वाहन

सौराष्ट्र ने अपनी रिपोर्ट में बताया कि विल्ली में भेटे और ला प्लोर बागों जैसे सार्वजनिक जैववन के सधनों की अधिकता के बावजूद यह शहर इसलिए पिछड़ा था क्योंकि इसके बावजूद भी ग्राहक परिवहन के निजी सधनों का उपयोग बहुत ज्यादा है, नागरिक लम्बी दूरी के यात्राओं के लिए कारों आदि का उपयोग करते हैं। वहीं कालकाता और मुम्बई के लोग मेट्रो, टॉम और बसें के ज्यादा के साथ पैदल चलने तक की अधिक आदतों से तुलनात्मक कार्बन उत्सर्जन सूचकांक में नीचे हैं।

कारें कम, इसलिए  
अव्वल रहे हम

मोपलत में रहती ट्रेडिंग का स्थल  
अभी भी अस्थावर कम है। सड़कों  
पर देखने वाले वाहनों में दुकानों  
वाहनों को लोडिंग कम है जिससे प्रति  
प्रति व्यक्ति कम कार्बन  
उत्सर्जन होता है। जो कारों सड़कों  
पर हैं वे भी धीरे लेकल हैं। एसयूवी  
और लार्ज कार का उपयोग का बल  
ज्यादा नहीं होता है के घटते भी कार्बन  
उत्सर्जन कम है। हाहा की सड़कों  
पर जाम की स्थिति कम बनने से  
प्रति प्रति कार्बन उत्सर्जन कम होता  
है। हाहा के अंदर हीवाली अधिक  
होने के कारण भी कार्बन का स्तर  
नहीं बढ़ पाया।

# Bhopal air cleanest among all cities

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## CLEANEST COMMUTE

**New Delhi:** Emission levels are the least in Bhopal which also guzzles the lowest amount of fuel for urban commute while Delhi is the worst on both these parameters among 14 Indian cities assessed and ranked by Delhi-based think-tank Centre for Science and Environment (CSE).

For Bhopal, used to fresh air and green surroundings, the finding comes as a validation rather than surprise. "Bhopal has the lowest particulate matter, nitrogen oxide and CO<sub>2</sub> load. Bhopal has worked

Bhopal tops for lowest overall emissions & energy use from urban commute	
1 Bhopal	6 Jaipur
2 Vijayawada	7 Kolkata
3 Chandigarh	8 Ahmedabad
4 Lucknow	9 Pune
5 Kochi	10 Mumbai

on building its bus and bicycle programmes with an enhanced bus fleet," says the study.

## Air quality: Delhi at bottom

Continued from P 1

Bhopal has taken early action to improve its public transport usage — its city bus system (that already accounts for 23% of modal share for public transport — and its high share of personal vehicle trips has not eroded the advantage of its compactness and low vehicle miles travelled. Thus, Bhopal has the lowest particulate matter, nitrogen oxide and CO2 load. Bhopal has worked on building its bus and bicycle programmes with an enhanced bus fleet, a BRTS, and public bike sharing schemes," says the study.

The thinktank selected the 14 cities for its study as these are among the most populous in different regions and can be used as better indicators in the race for clean and low carbon mobility. The study groups six of them — Delhi, Mumbai, Kolkata, Chennai, Bengaluru

and Hyderabad — as “mega cities” while the remaining eight are clubbed as metropolitan cities.

The overall analysis was done on the basis of the combined score on total emissions of heat-trapping carbon dioxide and toxic pollutants like particulate matter (PM) and nitrogen oxides, as well as energy-guzzling from urban commuting practices. Kolkata figured at the top among the megacities for the lowest level of emissions and energy consumption, banking on its "public transport culture, compact city design, high street density, short travel distances and restricted availability of land for roads and parking".

On the other hand, Delhi, despite having the third-highest share of public transport trips, came at the bottom in overall emissions and fuel use. These are the highest due to the sheer number of personal vehicles

high volume of travel and long trip distances. "This negative per-trip emissions improvement derived from its CN programme and limited public transport strategy," says CSE's report, "The Urban Commute", which was launched in Kolkata on Friday.

Delhi has, in fact, the highest vehicle stock among the cities. As a result, Delhi enforces PM five times more than Mumbai and three times more than Mumbai. Besides, Delhi's poor rank is an effect of its relatively higher population compared to other mega cities.

The thinktank in its study analysed level of motorisation, travel demand base population, share of different modes of transport (public transport, walking, cycle and personal vehicles), average length of daily travel and quality of vehicle technologies and fuels to come up with the findings. **THE**

# Third Party Evaluation - 2018



## Work-shops and Awareness Programs Conducted at Bhopal

















## AWARENESS PROGRAMS

