

**BEFORE THE NATIONAL GREEN TRIBUNAL,
WESTERN ZONE BENCH, PUNE
ORIGINAL APPLICATION NO. 48 OF 2025 (WZ)**

Ameet SinghApplicant

Versus

Pune Municipal
Corporation & Ors.Respondents

**AFFIDAVIT IN REPLY ON BEHALF OF RESPONDENT
NO. 1 PUNE MUNICIPAL CORPORATION (PMC).**

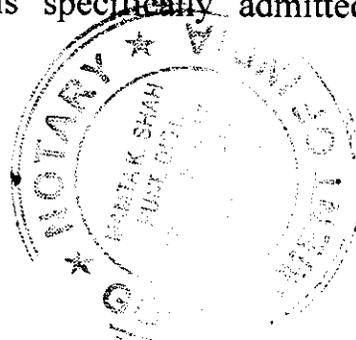
I, Kishori Todmal-Shinde, Deputy Municipal Commissioner, Environment Department of the PMC Respondent Corporation having my office at Pune Municipal Corporation Building Shivajinagar Pune do hereby state on solemn affirmation as under:

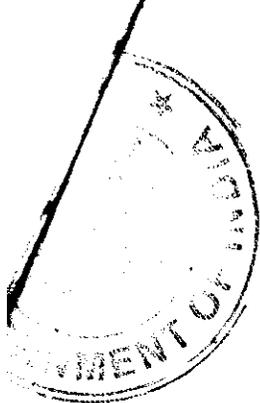
- (1) I am working in the capacity of the Deputy Municipal Commissioner in the Pune Municipal Corporation. I am filing this Affidavit-in-Reply to oppose the contents of the Application preferred and reliefs sought by the Applicant in the above captioned matter. I am filing this



present Affidavit-in-Reply to oppose the grant of any reliefs to the Applicant as prayed in the present Application. I crave leave to file a further Additional Affidavit in Reply as and when sought necessary.

- (2) I am authorized by the Respondents to file this present Affidavit-in-Reply in my official capacity and as such I disassociate myself from any personal assertions made against me by the Applicant in the present Application, I have perused the documents brought on record by the Applicant and have understood the contents of the Application and based on the documents and information available in relation to the said issue.
- (3) At the outset, I deny each and every averment and allegation made in the present Application, which is contrary to and/or inconsistent with what has been stated in the present Affidavit-in-reply and nothing stated therein shall be construed as an admission for the want of any specific and para-wise denial or non-traverse unless and until the same is specifically admitted hereinafter.



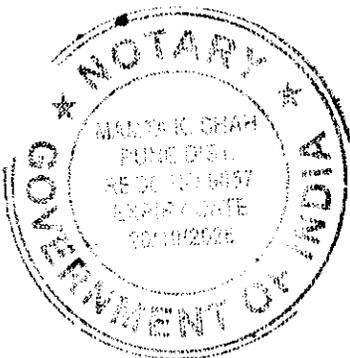


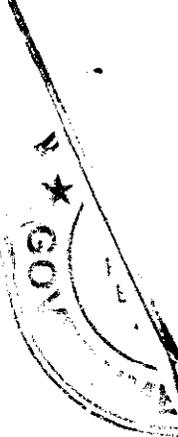
(4) I say and submit that the Applicant has filed the present Original Application seeking the following reliefs:

A. That this Ld. Tribunal be pleased to direct the Respondent No. 1 to conduct a scientific and technical feasibility study in consultation with Institute of Repute appointed under the MoU dated 26th March 2021 prior to the introduction of any technology-based interventions for the mitigation of air pollution in Pune City;

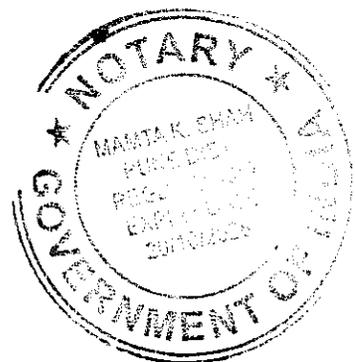
B. A direction be issued to respondent No.1 to undertake cost-benefit analysis with respect to any interventions that are planned for the mitigation of air pollution in consultation with the Institute of Repute appointed under the MoU dated 26th March 2021.

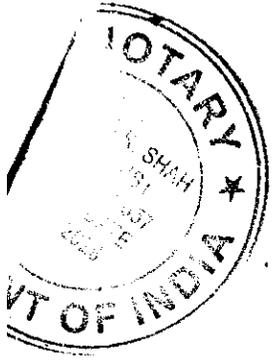
C. Direct Respondent No.1 to frame guidelines and Standard Operating Procedures (“SOPs”) for the use of any technology-based interventions which have been established, to be effective for the mitigation of air pollution in Pune city.





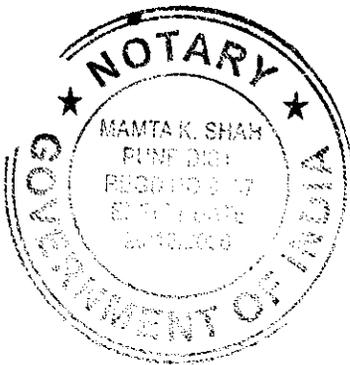
- D. Direct Respondent No.1 be to install high-grade monitors in Pune City to provide accurate and reliable data on air pollution in the public domain.**
- E. Direct respondent No.1 to install sensors in Pune city to track air pollution at appropriate locations ensuring broad spatial coverage and place this data in the public domain.**
- F. Direct Respondent No.2 – MPCB to hold monthly meetings of the City Level Air Quality Monitoring Committee as mandated by the G.R. dated 18th September 2019 issued by the Government of Maharashtra.**
- G. Direct Respondent No. 1, upload the minutes of meeting of the City Level Air Quality Monitoring Committee on its website.**
- H. To restrain the Respondent No.1 from issuing any fresh tenders for the introduction of technology-based interventions for the mitigation of air pollution in Pune City.**





I. That pending the hearing and final disposal of the present Application, this Ld. Tribunal be pleased to restrain the Respondent No. 1 from issuing any fresh tenders for the introduction of technology-based interventions for the mitigation of air pollution in Pune City;

- (5) I say and submit that in relation to Prayer clause a & b of the Original Application, MOU was executed between Maharashtra Pollution Control Board, Savitribai Phule Pune University, Pune (Institute of Repute “IoR”) and Answering Respondent on 26/03/2021. This MOU is executed under the under **National Clean Air Programme (NCAP)** launched by the Ministry of Environment Forest & Climate Change (MOEF&CC), Government of India to tackle all sources of air pollution across the country.



Accordingly, under NCAP Savitribai Phule Pune University, Pune was chosen as IoR. The objective of this MOU is to prepare Action Plan to be implemented by the Maharashtra Pollution Control Board, Pune

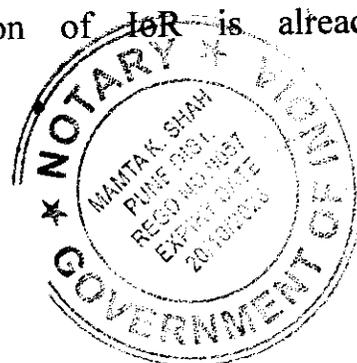
Municipal Corporation along with IoR's as technical partner. Hereto marked and annexed as "Annexure R1-I" is the copy of MOU dated 26/3/2021.

I say that regular meetings are conducted as per the aforesaid MOU with IoR. Hereto marked and annexed as "Annexure R1-II" is the copy of some of the minutes of meeting.

In relation to Prayer a & b of the Original Application I say and submit that Answering Respondent is already consulting IoR. Therefore, Prayer clause a & b does not survive.

- (6) I say and submit that in relation to prayer clause c, Answering Respondent has already prepared an Action Plan which is prepared in consultation of IoR and MPCB for Control of Air Pollution for Pune City. Hereto marked and annexed as "Annexure R1-III" is the copy of Action Plan.

I say and submit that Answering Respondent along with MPCB and in consultation of IoR is already





implementing this programme to improve Air Quality Index in Pune City.

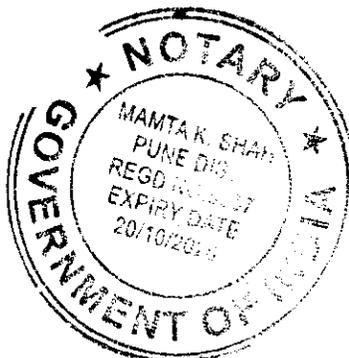
Therefore, I say and submit that prayer clause c does not survive in view of the Action Plan prepared by Answering Respondent.

- (7) In relation to prayer clause d & e, I say and submit that already 9 high grade monitors - Continuous Ambient Air Quality Monitoring Stations (CAAQMS) along with the sensors has already been installed at different location to provide accurate air pollution data ensuring broad coverage. Hereto marked and annexed as “**Annexure R1-IV**” is the chart showing various locations in Pune Municipal Limits where monitors are been installed along with sensors.

- (8) I say and submit that prayer clause f pertains to MPCB.

- (9) In relation to prayer clause g, I say and submit that minutes of meeting of the city level air quality monitoring committee is already being uploaded on

<https://prana.cpcb.gov.in/#/home>.

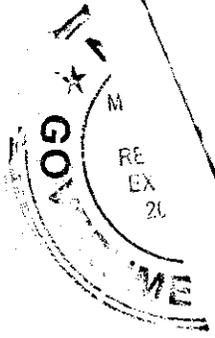


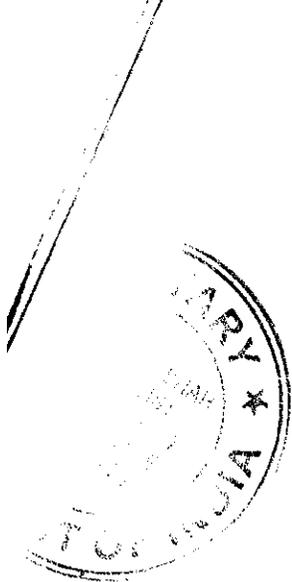
(10) In relation to prayer clause h & i, I say and submit that answering respondent in collaboration with MPCB and IoR is implementing NCAP for improving the Air Quality Index in Pune City. Answering Respondent is also implementing aforesaid action plan prepared by Answering Respondent.

(11) I say and submit that in alignment with the objectives of the National Clean Air Programme (NCAP), the various activities are undertaken by Answering Respondent under NCAP. The Pune Municipal Corporation (PMC) utilizes funds in accordance with the City Action Plan and the directions provided under the NCAP, while strictly adhering to all applicable rules, regulations.

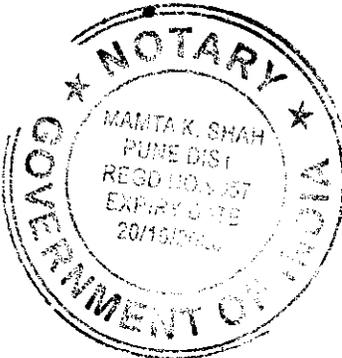
In this context, fog cannons and misting systems have emerged as effective air pollution mitigation measures and are recognized as best practices adopted by several cities and platforms across the country.

(12) I say and submit that in Pune City around 2 lakh vehicles are added to the traffic every year. Two-wheelers are the major mode of transport in the city with 73% of





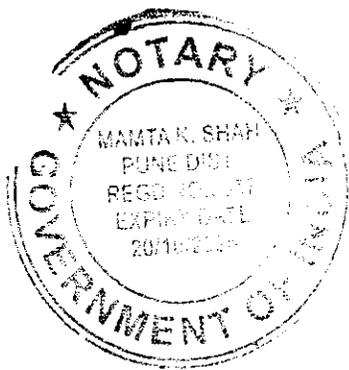
motorized vehicles contributed by Motor Cycle, Scooter and Mopeds. Likewise, the number of vehicle registration has also increased considerably over the years. Such large number of vehicles within a city limits contribute to emission levels on large extents.

- (13) I say and submit that with introduction of UDCPR 2020 by the Government of Maharashtra, redevelopment projects are increasing year on year due to rapid urbanization which causes dust due to construction / demolition of the project.
- (14) I say and submit that abovementioned two sources are the major source of air pollution in Pune City. National Clean Air Programme also recommends stringent control of dust from construction activities using enclosures, fogging machines, and barriers. The Answering Respondent is actively implementing fog cannon machines as part of its on-ground interventions for road dust mitigation. These systems have already demonstrated efficient and measurable results in
- 

reducing particulate matter (PM), contributing significantly to improved air quality within the city.

- (15) I say and submit that considering the city's rapid growth, increasing vehicular traffic, and rising resident and floating population, Answering Respondent has successfully achieved a 9% reduction in air pollution levels compared to 2017-18. Moreover, the trend in air pollution levels has remained stable and has not exceeded previous benchmarks, reflecting the positive impact of Answering Respondent's targeted programs and saturation-based interventions.

Year	PM10 ($\mu\text{g}/\text{m}^3$)
2017-18	102
2018-19	106
2019-20	81
2020-21	69
2021-22	85
2022-23	96
2023-24	98
2024-25	94



- (16) I say and submit that in relation to water requirement for mist Cannon or Dust suppression machine from treated waste water is being used. Answering





pro- grammable logic controller (PLC) along with sensors comprising of proximity, zero switch, machine status, under belt and pollution sensors. The automatic operating mode can be opted from remote operation facility. Water level indicator ensures continuous water supply during the operation and eliminates human intervention.

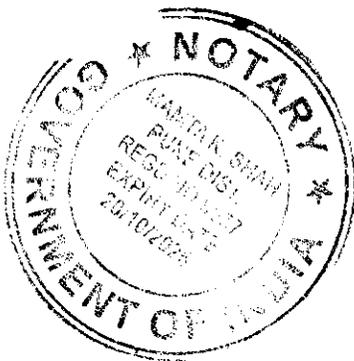
(17) I say and submit that there are various research papers which are in favor of use of Fog Cannon to reduce Air Pollution.

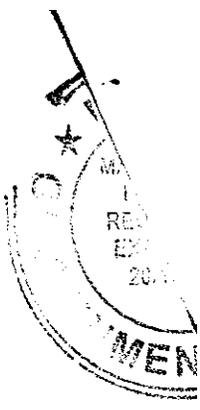
a. Fugitive Dust Emission Control Using Smart Dry Fog System (S.K. Chaulya et al., 2021)

b. Retrofitting Sprinkler Systems for Dust Suppression from Moving Vehicles (Mohamed Thabit & GUO Zong-lou, 2011)

c. Efficiency Analysis of Sprinkler Systems in Construction Activities (Young-Bog Ham et al., 2024)

d. Air-and-Water Spraying Systems in Mining Operations (Dariusz Prostański, 2013)





Respondent runs 5 water canon machines for daily 4 hour per hour water consumption is around 2,400 lit/hour cumulatively 48,000 lit / day is the water consumption for mitigating 600 kms of roads in the city per day, daily water demand in city is 1,663 MLD, and utilised by fog cannons for mitigating air pollution is 0.0000001% of daily water supply, which is minimal use of water to upkeep the health of citizens of the city. The developed dust suppression system is a smart, innovative, and intelligent device combining hybrid, ultrasonic nozzles and atomizing nozzle to spray dry fog through atomization of water drops in the range of sub-micron metre size (1-20 μm size) for accurate agglomeration with dust particles (PM2.5 and PM10). Finally, dust settles down by adding less than 0.1% moisture to the surrounding atmosphere. The removable frustum at the tip of the hybrid nozzle makes the movement of the nozzle flexible for controlling the direction and spreading area of dry fog. It can operate both in the manual as well as automated mode using a



(18) I say and submit that MoEF&CC Government of India has issued Office Memorandum dated 08/01/2025 regarding the conducting of Audit of City Action Plans in line with the guidelines for National Knowledge Network (NKN) & IoR under NCAP. Accordingly, MPCB has appointed current IoR- Savitribai Phule Pune University for technical assistance and CSIR NEERI, Mumbai for conducting Audit of City Action Plan.

Hereto marked and annexed as “Annexure R1-V” is the copy of MoEF&CC OM dated 08/01/2025.

(19) I say and submit that in view of above Answering Respondent is taking all measures to implement NCAP and Action Plan prepared in consultation of IoR and MPCB to improve the Air Quality and reduce Air Pollution. Therefore, this Original Application may please be dismissed.

Pune

Date: 26/11/2025



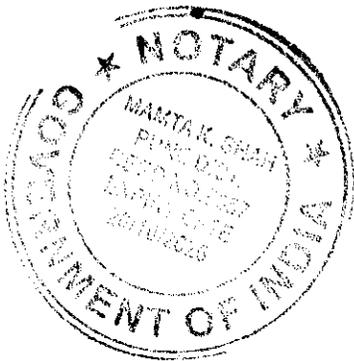

Res. No 1
PMC

VERIFICATION

I, Kishori Todmal- Shinde, Age: Adult, Deputy Municipal Commissioner, authorized signatory for PMC do hereby state on solemn affirmation that what is stated forgoing Para's is true and correct to my own knowledge and belief.

Solemnly affirmed at Pune

This 26th of November, 2025



K. Shinde

Respondent No. 1

Adv. for Respondent No. 1

NOTED AND REGISTERED
AT SR NO. 213400/2025
DATE .. 26 NOV 2025



NOTARIAL

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BEFORE ME

M. K. Shah

MAMTAK K. SHAH
NOTARY
GOVT. OF INDIA
PUNE DISTRICT



महाराष्ट्र MAHARASHTRA

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अनुक्र. ३९ ३४३ दि. 25/03/2021 मु.शु.रकम. 500/-
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दस्तावेज प्रकार
 दस्त नोंदणी करण्यात आलेत का? होय/नाही.

निष्कर्षीचे नाव
 मुद्रांक विकत घेणाऱ्याचे नाव
 पत्ता

पुण्या पत्ता
 वरते व्यक्तीचे नाव व पत्ता

मुद्रांक विकत घेणाऱ्याची सही

सुर्यधरंल सुखदेव गवळी
 परवाना क्र. २२०१०७९
 लेडी काळगेर (वटवाडवमल्ली), ता. हवेली, जि. पुणे

Memorandum of Understanding

Among

Maharashtra Pollution Control Board

And

Savitribai Phule Pune University, Pune

And

Pune Municipal Corporation, Pune

This Memorandum of Understanding ("MoU") is entered into on 26th March, 2021
 (Effective Date) by and among

1 | Page

Nitin R. Shinde



12 MAR 2021

प्रथम मुद्रांक लिपीक
 कोषागार पुणे करिता

Maharashtra Pollution Control Board (MPCB) having its Regional office at Pune, Maharashtra, India, hereinafter referred to as State Pollution Control Board (SPCB), of the FIRST PARTY,

And

Savitribai Phule Pune University, Pune, Maharashtra, India, hereinafter referred to as 'Institute of Repute (IoR)', of the SECOND PARTY,

And

Pune Municipal Corporation, Pune, Maharashtra, India, hereinafter referred to as 'Urban Local Body (ULB)', of the THIRD PARTY.

The aforesaid institutions are hereinafter referred to individually as the Party and collectively as the Parties.

Introduction

The Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India has launched the National Clean Air Programme (NCAP) for pan India to tackle the air pollution problem across the country. NCAP is envisaged as a collaborative, cross sectoral and multi-stakeholder programme to tackle all sources of air pollution.

For the City of Pune, the National Knowledge Network of NCAP in consultation with ULB has chosen Savitribai Phule Pune University, Pune as the IoR to function as a technical partner and provide technical assistance to the ULB and SPCB.

The collaboration will be established within the principles set out in the following sections:

1. Objective

Under the NCAP, city/ cities specific interventions and action plans will be formulated for implementation by the MPCB and ULB, along with IoR as a technical partner for the City. The National Knowledge Network (NKN), Central Pollution Control Board (CPCB) and MoEF&CC will be overseeing the coordination and technical compliance.

Information about the NKN and scientific work carried out by NKN & IoRs shall be available at: <https://www.nkn.urbansciences.in/>

Further information about the NCAP is available at http://moef.gov.in/wp-content/uploads/2019/05/NCAP_Report.pdf.

 Nitin Shinde 

2. Functions of the Parties

Role of IoR: IoR will act as a technical partner for the City/ cities for the implementation of NCAP. IoR will extend all necessary knowledge based support to the SPCB and ULB, in agreement with the guidance provided by CPCB and NKN. IoR may undertake Air quality monitoring and modelling work, data analysis, data utilization, compilation, adherence to interpretation protocols, report preparation, etc. If required, IoR shall also help in compliance verification work of emission norms as a third party to provide independent input to SPCBs/and policy makers. IoR shall be engaged by MoEF&CC for performance assessment (Third Party Audit (TPA)) based on predefined framework for cities other than with whom they are knowledge partners. Research conducted by IoR shall also focus on efficacy and efficiency of various individual measures by various tools and techniques including cost-benefit analysis with support from NKN.

Role of SPCB: SPCB will function as the regulatory body, overseeing the compliance of regulations and intervention policies in the city. SPCB will commit to their city specific action plans and inform IoR of their activities under NCAP, and consult IoR for technical expertise. SPCB will engage IoR in Capacity building with the help of NKN and ensure knowledge uniformity in planning and implementation of NCAP in all Non-Attainment/ Million Plus cities in the State. SPCB as well as ULB will also ensure the use of best practices.

Role of ULB: The ULB shall commit to all air quality targets mentioned for the city under NCAP. City specific interventions and action plans will be formulated by the ULB with advice from IoR. ULB shall update IoR on all progress made so far and consult them on all future activities undertaken as a part of NCAP.

3. Conflict of Interest

Since, the current pool of expertise in air quality domain is limited, it is desirable to include institutions/scientist/faculty members with a proven record in this domain as IoRs, even if they are a part of the NKN. A faculty/scientist affiliated to an IoR will not be involved in the decision making for the activities carried out by the IoR. That is, whenever an NKN Nodal Faculty is approached to provide their consulting services as a nodal faculty/Principal Investigator (P.I.) of their affiliated IoR, they will recuse themselves from the agenda and the proposal will be reviewed by Nodal Faculty experts of any other NKN institute, and not by themselves.

4. Method of Cooperation/Coordination

Whereas the parties to this MoU agree to co-operate in specific assignment(s); they shall share relevant information and experience in their possession with a view to achieve the mutually beneficial and technical association and to satisfy the need of the accomplishment of objective of MoU; except information which may be subject of



with the divide



copyright or technology agreements, royalties in licenses in which case the parties may procure the use of such information on commercial terms. Besides this, all the parties would also share the journals, publications, papers etc., published or any data, monitoring report etc. so that, capacity building of all parties/organization takes place to accomplish the objective. All parties shall appoint one member each to coordinate the activities on its behalf.

MPCB: Nitin Shinde, Regional Officer, Pune

IoR : Dr. Prafulla Pawar, Registrar, Savitribai Phule Pune University

Urban Local Body (ULB): Dr. Kunal Khemnar, Additional Commissioner (E), Pune

Municipal Corporation, Pune

5. Effective date and duration of the MoU

The MoU shall be effective from the date of signing by all the Parties which shall be the Zero Date and shall remain in force till the extent of NCAP. The Parties may extend the term in writing on year-to-year basis subject to the continuation of NCAP scheme.

6. Deliverables

Information about the NKN and scientific work carried out by NKN and IoRs shall be available at: <https://www.nkn.urbansciences.in/>. Progress of city wise work carried out by IoR in collaboration with SPCB/ ULB shall be updated quarterly in www.nkn.urbansciences.in.

7. Confidentiality

All parties reciprocally guarantee that all technical information and data generated under this MoU shall be treated as confidential and shall not be divulged by any party without prior written consent of the other even after the expiry of this MoU

8. Funding

The expenditure incurred for implementation of the MoU for IoR, ULB and SPCB would be met out of NCAP/ Fifteenth Finance Commission funds / any other central or state scheme under implementation for improvement of Air quality available with ULB and SPCB

9. In case, there be a dispute relating to any aspect of academic cooperation, all the Parties will resolve the dispute in a spirit of mutual respect, and shared responsibility, failing which, the unresolved difference or disputes shall be referred to the arbitration by a distinguished authority agreed mutually by all the parties and decision by that authority shall be final and binding.

 Nitin Shinde 

10. Force Majeure

Neither party shall be held responsible for non-fulfillment of their respective obligations under this agreement due to exigency of one or more of the force majeure events such as but not limited to act of God, War, Flood, Earthquakes, Strikes, Lockouts, Epidemics, Riots, Civil Commotion, etc., provided on the occurrence and cessation of any such events, the party effected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation. If the force majeure conditions continue beyond six months, the parties shall jointly decide about the future course of action.

11. Modifications and Amendments:

Modifications and Amendments to this MoU, if any, shall be made in writing by mutual consent of all the parties."

For and on behalf of
MPCB

Signature

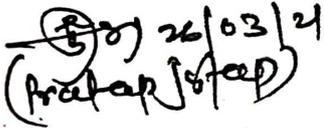

26/III/21

Name : Nitin Shinde

Designation :
Regional Officer

Date : 26/03/2021

Witness


26/03/21
(Pratap Joshi)

For and on behalf of
IoR

Signature

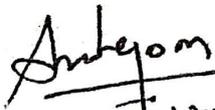

26/03/21

Name : Dr. Prafulla Pawar

Designation :
Registrar, Savitribai Phule
Pune University

Date : 26/03/2021

Witness


26/03/2021
(SURESH GOSAVI)

For and on behalf of
ULB

Signature



Name : Dr. Kunal Khemnar

Designation :
Additional Commissioner
(E), PMC, Pune

Date : 26/03/2021

Witness


26/3/2021
(MANGESH DIGHE)



MINUTES OF MEETING

Subject - Air Quality Monitoring Committee meeting under NCAP for Pune City	
Date : 29.01.2020	Time : 10:30 am
Venue - Office of Municipal Commissioner, Pune Municipal Corporation, Shivajinagar, Pune. 411005	

Members present

SrNo	Name	Designation and Organisation
1	Shekhar Gaikwad	Municipal Commissioner, PMC
2	Rubal Agarwal	Additional Municipal Commissioner (Gen), PMC
3	Dr. Ramchandra Hankare	HOD, Health Department, PMC
4	Aniruddha Pawaskar	HOD, Water Supply Dept, PMC
5	Madhav Jagtap	Dy. Commissioner, Encroachment and Solid Waste Dept, PMC
6	Dr. Anjali Sabane	Health Dept, PMC
7	Ashok Ghorpade	Chief Garden Superintendent, PMC
8	Dr. Suresh Gosavi	HOD, Environment Science Dept, Savitribai Phule Pune University
9	Nehul Shashikant	Research Assistant, Savitribai Phule Pune University
10	Sanjana Jadhav	Field Officer, MPCB
11	Mangesh Dighe	Environment Officer, PMC

A meeting called by Pune Municipal Corporation to discuss about Air pollution aspects and actions with reference to National Clean Air Program. The National Clean Air program launched by Govt. of India to provide roadmap to prevent, control, and abate air pollution with specific targets. There are 102 cities declared as non- attainment cities across India and Pune is one amongst them.

The following points were discussed during the meeting.

1. Air pollution emission issues are associated with many sectors which interalia include power, transport, industry, residential, construction, and agriculture. The impact of air pollution is not limited to health but it gets extended to agriculture and general well-being of human, floral and faunal population. Furthermore, since air pollution is not a localized phenomenon, the effect is felt in cities and towns far away from the source. The following points were discussed during the meeting.
2. Pune city and surrounding is urbanizing at a rapid pace and it's impact can be clearly seen in the form of air pollution faced by the city. To tackle this issue, the city is making efforts on different fronts. Air pollution is a wide subject

which is not under the purview of one specific department of government, but is connected to multi stakeholders and each one has a specific role and contribution towards the subject of Air pollution.

3. Various measures are taken to reduce pollution levels in city and these measures form “Air Quality Action Plan for Pune City”. The use of fossil fuels for vehicles is the primary cause of air pollution. As on March 2018, there were 36 lakh registered vehicles in Pune City. PMC is promoting the use Clean and Green fuels like CNG for auto rickshaws, cars and public transport buses. PMC makes budgetary provisions for giving subsidies to auto rickshaws. New CNG buses are added in the public transport fleet.
4. Pune Mahanagar Parivahan Mahamandal has taken strong step forward and added 125 electric buses to the existing fleet of 2000 buses. The future plan is to reach 500 E buses. To promote mass bus rapid system, BRT buses are already plying on some corridors & the construction of Metro is in progress too.
5. Air quality monitoring - Under the SAFAR program, IITM Pune together with Pune Municipal Corporation has been successfully running 10 real time air monitoring stations in and around Pune, alongwith 10 LED display boards installed at prominent locations in the city. The monitoring is in operation since the year 2015. The data is available in public domain on LED boards, website www.safar.tropmet.res.in and as well as mobile App named SAFAR-Air.
6. Pune Municipal Corporation is focussing on creating better facilities for Non-Motorized transport also. The Public Bicycle Sharing System is in operation on J.M. Road, F.C road, Aundh, Magarpatta etc. The plan is to expand the cycle network. As per the new street design guidelines adopted by PMC, the design elements stress importance on Pedestrian and Cyclist friendly streets.
7. Solid Waste Management department in PMC has tied up with SWACH organisation, who is playing an important role is collecting dry and wet waste separately from the households. The effort is to move towards decentralized waste management. PMC is using, vemicompost, Organic Waste composters, thermal composting, waste to energy plants and various other measures for treating solid waste. There are 21 Bio-methanisation plants for treating wet waste from hotels and converting it into Biogas. The solid waste is transport in enclosed refuse carrier trucks, there is a ban on open burning of waste in Pune city.
8. It is evident from the Emission Inventory Study done by Central Pollution Control Board that the major contribution of approx 60% of suspended particles contributing to Air pollution is coming from re-suspended dust on the road. Thus it is important that this source needs to be tackled by Municipal Corporation by ensuring that the road surface is paved, for MC lanes, cycle tracks, footpaths etc. No road shoulders should be left unpaved. PMC is taking efforts to redesign the streets with the norms laid out in Urban Street Design Guidelines, the emphasis is on making pedestrian friendly streets and NMT friendly streets. From past few years, the building construction practices have seen rise in use of Ready Mix Concrete. This is helping the city in eliminating the dust particle emission form on-site mixing of cement and aggregates.

9. PMC has also looked into the segment of crematoriums from air pollution point of view. To discourage the use of conventional wood based cremation, there are 12 gas based crematoriums installed. The conventional ones are fitted with air pollution control system with water scrubbers. There are 7 Electric crematoriums where the facility is made available for free.
10. Tree plantations and creating more green spaces is on the regular agenda of PMC. The city has 196 gardens and the hill tops and hill slopes preserved for green spaces under the forest department.
11. Hon Municipal Commissioner suggested that the citizen to be made aware about air pollution. Simple graphics on social media of PMC to be used for this purpose.
12. MPCB wants to install 2 Continuous Air Monitoring Stations in Pune city. The Savitribai Phule Pune University was requested to provide space for installation of one of the station. For the other station, it was also discussed to check out possibility of some other college campus where Environment Science is taught. Preferably in the central part of city around Shivajinagar.
13. The Environment Department of Savitribai Phule Pune University suggested that a new Urban Emission inventory was carried out by Indian Institute of Tropical Meteorology. The report of the study is likely to come out within 4 months i.e. till May 2020. This study will bring out the latest fact findings about Air pollution sources in the city.
14. The department of Environment Science suggested measures to be taken to reduce dust emission at Swargate Junction. Hon. Municipal Commissioner suggested that since metro construction is going on at Swargate, a letter to be written to Metro asking them to take measures for dust suppression during construction activity at Swargate. Also, dust suppression measures should be taken by Municipal Corporation. A general Guideline letter to be issued to all departments of Municipal Corporation.

Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Air Quality Monitoring Committee meeting under NCAP for Pune city.	
Date : 10.03.2021	Time : 3.00pm
Venue - Dr. Babasaheb Ambedkar Hall, Pune Municipal Corporation, Shivajinagar, Pune. 411005	

Members present

Sr.No.	Name	Designation and Organisation
1	Dr. Kunal Khemnar	Additional Municipal Commissioner (E), PMC
2	Mr. Sarjerao Bhoi	Field Officer, MPCB, Pune
3	Ashok Ghorpade	Chief Garden Superintendent, PMC
4	Mr. Shashikant Nehul	Professor Environment Department, SPPU
5	Mr. Shrikrishna Dixit	Jr. Engineer, Solid Waste Dept, PMC
6	Mangesh Dighe	Environment Officer, PMC
7	Mr. Hitendra Kurne	Dy. Engineer, Solid Waste Dept, PMC
8	Afroz Inamdar	Jr. Engineer, Solid Waste Dept, PMC
9	Mr.Dinkar Gojare	Executive Engineer, Road Dept, PMC

A meeting called by Pune Municipal Corporation to review the progress of various works specified in National Clean Air Program for Pune City as well as to discuss the potential works that can be taken for improving Air Quality under the funds allocated for Pune City under the 15th Finance Commission. Additional Commissioner of Pune Municipal Corporation chaired the meeting in which the following points were discussed & status of the works was reviewed.

Sr. No	Works as per the directions given by CPCB	Concerned Dept.	Status of Work	Actions to be taken
1.	Mechanical Street Sweepers (2 nos.) – Rs.2 Cr	Solid Waste Dept.	The vehicles required for street sweeping need to be BSVI compliant. The vehicles can be purchased through NCAP & the O & M will be done by the Vehicle depot of PMC. The tender was floated 4 times.	The tender is floated and after opening of tender, it is put-up for Standing Committee's approval. Waiting for the resolution of Standing Committee.
2.	Water Sprinklers (3 nos) – Rs.1 Cr	Solid Waste Dept.	The vehicles with the Water sprinklers can be purchased through NCAP & the O & M will be done by the Vehicle depot of PMC.	The tender is floated, but 1month extension is given. Tender Opening on 18 th Feb 2021

3.	Public Awareness & Capacity Building – Rs. 1 Cr	Solid Waste Dept.	<p>a. The tender was floated, but since only 1 response came, it is discarded. After some changes are made & Commissioner approval is required for floating the tender once again.</p> <p>b. Tender for the printing of the material work is floated.</p> <p>The Citizen engagement program was conducted: competition for the Air Quality Improvement, Cleanliness, Waste, etc. was held. Jingles, Short movies, Posters, Drawing, Murals, Street play were conducted in which the prizes are declared</p>	<p>Commissioner approval being taken for floating the tender 2nd time. Tender is opened and for approval process, the file is in vigilance dept</p> <p>The work order is given.</p> <p>The competition is over; prizes for Rs.1Lac total given.</p>
4.	Promoting cycle track in Pune by creating cycle track – Rs. 2 Cr	Road Dept.	The proposal is put up to the Estimate Committee for approval; in which the major roads in Pashan, Baner, University & NCL areas will be taken up for the construction of Cycle track.	<p>Work order is given.</p> <p>The road dept. has started the work at site. Approx 200 m of length of work is done.</p>
5.	Electric / gas crematoriums – Rs. 2 Cr	Electrical Dept	The tender for the electric crematorium has been floated & the work order is given.	Bavdhan is installed. Wadgaon dhayari in progress. Hadapsar is in progress. No bill paid yet
6.	Creation of green buffers along traffic corridors – 2 Cr	Garden Dept.	Creation of Green buffer on the road Medians & Traffic Islands for the 19 major roads of the city.	Time extension given. 3rd call for extension. Last date of submission is 31 March 2021
7.	Proposing works for the 15 th Finance Commission		<p>Ministry of Finance under the 15th Finance Commission has allocated Rs 793 Cr for the Million plus cities in Maharashtra State.</p> <p>Out of this, Pune City is allocated with Rs. 134Cr for taking actions on Air Quality. The first installment of Rs. 67Cr is sanctioned for Pune agglomeration.</p> <p>CPCB has requested all the cities to send list of works that will be undertaken for the</p>	<p>The discussion was held to enlist the kind of works that can be taken for mitigating the Air Pollution.</p> <p>List of works suggested by the different departments are:</p> <ol style="list-style-type: none"> 1. Mechanized Road Sweeping (SWM Dept.) 2. Air Pollution control equipments in crematoriums and new electric crematoriums (Electrical Dept.) 3. Creating cycle track, footpath, plantation (Road

			sanctioned amount.	Dept.) 4. Electric vehicles for PMC administration staff (Vehicle/ Electrical Dept.) 5. New Garden development & greening of road dividers & island (Garden Dept.) 6. Continuous Ambient Air Quality Monitoring Stations (MPCB) 7. CNG & E-buses for PMPML (PMPML)
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Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Fifteenth Finance Commission (XV-FC) for Air Quality Improvement	
Date : 15.07.2021	Time : 4.00pm
Venue - Dr. Babasaheb Ambedkar Hall, Pune Municipal Corporation, Shivajinagar, Pune. 411005	

Members present

Sr.No.	Name	Designation and Organisation
1	Dr. Kunal Khemnar	Additional Municipal Commissioner (E), PMC
2	Ajeet Deshmukh	HOD SWM, PMC
3	Dr. Manoj Khare	C-DAC Pune
4	Dr. Dilip M. Chate	C-DAC Pune
5	Dr. Santosh Kulkarni	C-DAC Pune
6	Prof. Suresh Gosavi	HOD, Env Dept, SPPU
7	Gojare D.B.	Executive Engineer, Road Dept PMC
8	Mr. Shrikrishna Dixit	Jr. Engineer, Solid Waste Dept, PMC
9	Mangesh Dighe	Environment Officer, PMC
10	Nehul S. S.	Professor, SPPU
11	Sharmila Deo	PRISAR
12	Ashwini Yadav	Educational Officer, Zoo, PMC

A meeting called by Pune Municipal Corporation to review the progress of various works specified in National Clean Air Program for Pune City as well as to discuss the potential works that can be taken for improving Air Quality under the funds allocated for Pune City under the 15th Finance Commission.

Additional Commissioner of Pune Municipal Corporation chaired the meeting in which the following points were discussed & status of the works was reviewed.

- There were several complaints regarding air pollution received from the residents of the Vaikhunth Crematorium area, so M/s. JCLEAN WEATHER TECH PRIVATE LIMITED, agency had proposed MAHADIG (Multiple Antenna Ion Generators) technology which generates negative ions on 230 volts AC supply and requires 300 watts power supply. This agency was called in the meeting to give the technical presentation in front of Air Quality Monitoring Committee.
- Pune Municipal Corporation has signed a Memorandum of Understanding with the Institute of Repute-Savitribai Phule Pune University (SPPU) Pune. The members of SPPU asked several questions to the project proponent agency and reviewed their proposal of Use of Multiple Antenna Ion Generators technology to reduce the various pollutants like PM2.5, PM10, SO_x, NO_x, CO, VOC.

- Central Pollution Control Board has appointed C-DAC as national agency to help in innovating computer modelling programmes as the air pollution mitigation measure. Hence, representatives from the C-DAC were also asked to present in the meeting and give the committee members a complete understanding about the role of C-DAAC and their technical help in execution of the computer modelling programme on air pollution.
- During the meeting all committee members were also attended the Video conference on Air Quality Improvement Actions for 42 Million plus Cities under the XVFC organised by the CPCB and XVFC.

Action Points -

- Take up the preparation on Micro Action Plan for Pune city.
- Fund allocation to other ULB's and their action plans.
- Send letter to different depts. asking for their proposal for XVFC Rs. 82 Cr.

Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Fifteenth Finance Commission (XV-FC) for Air Quality Improvement	
Date : 25.08.2021	Time : 3.00pm
Venue - Maharashtra Pollution Control Board Office, Wakdewadi	

Members present

Sr. No.	Name	Designation and Organisation
1	Nitin R. Shinde	Regional Officer, MPCB
2	Pratap Jagtap	Sub Regional Officer, Pune, MPCB
3	Kiran Hasabnis	Sub Regional Officer, PCMC, MPCB
4	Nehul Shashikant S.	Professor, Savitribai Phule Pune University
5	Mangesh Dighe	Environment Officer, PMC
6	Sukhdev Patil	Assistant Engineer: Pune Cantonment Board
7	Suhas M Sant	A E Khadki Cantonment Board
8	M. A. Sayyed	Dehu Cantonment Board
9	Ashwini Yadav	Educational Officer, Zoo, PMC

A meeting was called by the Maharashtra Pollution Control Board to review the Action Plan to be submitted to the CPCB via MPCB under the National Clean Air Program for Pune City and agglomeration. Regional Officer of Maharashtra Pollution Control Board chaired the meeting in which the following points were discussed & status of the works was reviewed.

- Considering the Air shed approach towards air pollution, it is not only the city, but also the urban local bodies which form a part of bigger city's agglomeration, which play important role towards air quality of city region. It was communicated to all Cantonment Boards by MPCB to prepare Air action plans for their jurisdictions and submit the Action Plan to MPCB at earliest so that it can be send to CPCB for its approval.
- Pune Municipal Corporation had already submitted it's Air Action Plan to MPCB and it was approved by CPCB. The Micro Action Plan has also been submitted to MPCB.
- The 15th Finance Commission has sanctioned 134 Cr to Pune Agglomeration for the first financial year to the two cities PMC and PCMC and 3 cantonment boards, PCB, KCB and DCB for improving its air quality. As funds are received to the PMC the Fund transfer process to the agglomeration is under progress. As per directives of MPCB in their letter dated 19th July 2021, the total of Rs. 1340000000 is to be distributed amongst 5 ULB's as follows PMC: Rs 82,92,44,568, PCMC Rs, 45,98,65,492, Pune Cantonment Board Rs1,91,19,494 Dehu Road Cantonment Board Rs. 1,30,32,112 Khadki Cantonment Board Rs 1,87,38,334. The cantonment boards were requested to

open separate bank account for NCAP in which the funds need to be transferred.

- All the actions suggested in the Action Plan to improve the air quality needs to get approved from the CPCB at earliest so that after approvals funds received under the 15th Finance Commission, can be utilized in the execution of the same.
- Comprehensive list will be prepared of the potential works that can be taken for improving Air Quality under the funds allocated for Pune City and agglomeration under the 15th Finance Commission.
- Savitribai Phule Pune University will help in understanding the utility of proposed projects for improvement of air quality.
- Regional Officer, MPCB asked all the Cantonment Boards to install Electric Crematorium from the funds received from 15th Finance Commission.
- SPPU has also asked to create new portal where all Air Quality Monitoring data of various organisations like MPCB, IITM and IUDX can be displayed on one single online platform which will be accessible for all.
- For increasing the monitoring network, under CAAQMS, another station will be relocated at MPCB Office building and Nehru stadium premises after taking necessary approvals for installation.
- Air Quality Monitoring stations relocation was discussed for areas falling under cantonment board areas. Any new monitoring stations could be installed in KCB , PCB or DCB limits.
- SPPU proposed that the next meeting of the Monitoring Committee could be held at the Environment Department of SPPU where CDAC will be presenting their Air Quality Computer Modelling software for all the ULBs and Committee Members to have understanding of how air quality computer modelling works.

Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Fifteenth Finance Commission (XV-FC) for Air Quality Improvement	
Date : 11.10.2021	Time : 10.30am
Venue - Dr. Ambedkar Haal. 215, 2 nd floor, Pune Municipal Corporation, Shivajinagar, Pune 411005	

Members present

Sr. No.	Name	Designation and Organisation
1	Dr. Kunal Khemnar	Addl. Municipal Commissioner (E), PMC
2	Ajeet Deshmukh	Dy, Commissioner, Solid Waste Dept, PMC
3	Dr. Rajni Panchang	Professor, Savitribai Phule Pune University
4	Shashikant Nehul	Professor, Savitribai Phule Pune University
5	Mr. Pratap Jagtap	Sub Regional Officer, Pune, MPCB
6	Ashish Agarwal	PIU, DMC Special, PMC
7	Ranjit Gadgil	PARISAR, Pune
8	Sharmila Deo	PARISAR, Pune
9	Nidhi Chandra	PIU, DMC Special, PMC
10	Zigisha Mhaskar	PMU, SWM, PMC
11	Dr. Mahesh Doiphode	Vehicle Dept, PMC
12	Hitendra Kurne	Executive Engineer, PMC
13	Mahesh Harhare	Technical Support, PMC
14	Mandar Patil	RMI India
15	Mangesh Dighe	Environment Officer, PMC

A meeting was called at Pune Municipal Corporation to review the Actions for Air pollution in Pune city and to discuss the revision of Action Plan as per the directives of MPCB. Additional Commissioner of PMC chaired the meeting in which the following points were discussed & status of the works was reviewed.

Presentation on XVFC : A presentation was given to all members about provision of funds for XVFC by Govt of India for taking actions to improve air quality during next 5 years under the finance commission for period 2021- 2026. The importance of electric mobility to reduce pollution from exhaust of fossil fuel based vehicles was stressed upon. It is important to focus on use of electric buses for public transport. PMPML in Pune is already plying 150 electric buses from past 1.5 years, these buses have received good response from citizen as buses provide very convenient noiseless, AC environment and a pollution free ride at the same ticket rate as regular buses. If such buses were increased in number, then it will attract modal shift from personalized

vehicle to public transport. This is definitely having a large impact on improving air quality of city.

Pune city has been allocated funds under the XV Finance Commission for taking actions towards improving the air quality in the city. With an understanding that air pollution does not follow boundaries of certain jurisdictions, the idea of Air Shed approach is proposed in which not only Pune city, but also the neighbouring city Pimpri Chinchwad is also included in the agglomeration area. Though there are 5 ULB's under Pune Agglomeration, the Public Transport body is unified, and which serves all the areas of agglomeration. Hence, providing 80% fund for EV of Public Transport will help in the approach of Air shed. Following sectors were suggested by MPCB focussing on Electric Vehicles.

1. The Pune Mahanagar Parviahan Mahamandal Ltd. (PMPML), SWM dept. of PMC and vehicle dept. of PMC can take up several initiatives including adoption of electric buses and setting up the charging infrastructure for them.
2. Mechanical sweepers for major Roads, Cycle Track and Footpath construction can be done for reducing particulate matter and dust.
3. PMC can plan to procure Electric cars on rental basis. These cars will lead a good example to the citizens and encourage them to adopt electric vehicles.
4. A second C&D plant on other side of town can be proposed for processing C& D waste.
5. PMC can plan install or upgrade crematoriums by providing Air Pollution Control Systems for wood fired cremations at different decentralized locations.
6. MPCB as a stakeholder will be functional in strengthening comprehensive air monitoring network over PMC and PCMC. In addition to this, MPCB can also extend its cooperation in framing effective mitigation strategies towards air pollution reduction.

MPCB and SPPU can give the details of works that can be done to strengthen the Air monitoring network and also help in understanding impact of actions on air quality.

The proposal for Electric buses to be taken from PMPML since the share of EV buses is 80% of total share enlisted in the table below

Component s	EV Component	Dust Mitigation	Industries & others (EV for PMC)	C&D activities	Bakeries & Crematoria	Air Quality Monitoring & Strengthening	TOTAL
Dept./ agency	PMPML, PMC's SWM & Vehicle Dept.	SWM, PMC	Vehicle Depot, PMC	SWM, PMC	Electrical, PMC	MPCB	
Share in %	80%	8%	2%	4%	3%	3%	100%

The details of above distribution to worked out and as per the directives received from MPCB, a revised plan is to be prepared and submitted to MPCB for further process of approval.

Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Fifteenth Finance Commission (XV-FC) for Air Quality Improvement	
Date : 13.12.2021	Time : 11.00am
Venue - Municipal Commissioner's Office, Committee Hall, 4 th floor, Pune Municipal Corporation, Shivajinagar, Pune-05	

Members present

Sr. No.	Name	Designation and Organisation
1	Dr. Kunal Khemnar	Addl. Municipal Commissioner (E), PMC
2	Sh. Nitin Shinde	Member Secretary AQMC and Regional Officer, MPCB
3	Dr. Maheshkumar Doiphode	Dy. Commissioner, Vehicle Dept, PMC
4	Sh.V G Kulkarni	Chief Engineer, Road Dept. PMC
5	Sh. Waghmare	Chief Engineer, PMPML
6	Keskar P S	Electric Engineer, PMPML
7	Sh. Ashok Ghorpade	Chief Garden Superintendent, PMC
8	Sh.Moqtik A Bawase	Environment Lab, ARAI
9	Sh.Shashikant Nehul	Professor, Savitribai Phule Pune University
10	Ms.Zigisha Mhaskar	EY, PMU, SWM, PMC
11	Sh. Rajendra Shipecar	SWM, PMC
12	Sh.Mahesh Harhare	Technical Advisor, GIZ
13	Sh.Mangesh Dighe	Environment Officer, PMC
14	Sh. Shrikrishna S. Dixit	JE, SWM, PMC
15	Dr. A D Bharati	Health Officer, Health Dept. PMC
16	Ms Bhagyashree Telang	Engineer, PMC
17	Sh Pavan Navade	Assistant RTO
18	Sh.Hitendra Kurne	Executive Engineer, Vehicle Dept. PMC
19	Sh. Prasad Jagtap	Executive Engineer, SWM, PMC
20	Ms Sanjana Jadhav	Field Officer, MPCB
21	Ms Ashwini Yadav	Educational Officer, Garden Dept. PMC

A meeting was called at Pune Municipal Corporation to update on fund utilization under NCAP, update on proposal prepared under XV FC for Air Pollution Component and Information to be filled up by various stakeholders on the PRANA portal launched by CPCB (<http://www.prana.cpcb.gov.in/#/home>).

Additional Municipal Commissioner (E) of PMC chaired the meeting in which the following points were discussed & status of the works was reviewed.

- Environment Officer, PMC started meeting with the presentation on the fund utilization under the NCAP. Participants were updated on till date 60% budget has been utilized for the various works in progress by the different departments under the NCAP. Additional Municipal Commissioner instructed all the departments to carry out the remaining work as early as possible and finish the 100% funds before March 2021. He also gave orders to all the departments to submit the proposals for unutilized amount of NCAP funds i.e., Rs 1.5 Cr.
- Participants were informed about the various Memorandums of Understanding signed by the PMC with different agencies/stakeholders.
- The Environment Officer briefed about the MoU is going to be signed with CDAC about use of their UrbAir software for decision making. It was discussed that a team of junior engineers from PMC or students of SPPU can be trained for using the same software.
- While updating on proposal prepared under XV Finance Commission for Air Pollution Component for the next five years, Additional Municipal Commissioner instructed all the departments to utilize the maximum funds within first two years of the tenure of the program and resubmit the revised proposal of component wise allocation of XV Finance Commission funds for Air Quality Improvement.
- Various stakeholders are identified (viz. RTO, MPCB, TRAFFIC POLICE DEPT, PMPML, Metro Rail, OIL COMPANIES, MNGL and TORRENT Gas, MSEDCL, IITM, SPPU, ARAI, MCCIA, Pune Municipal Corporation (PMC) – Road, SWM, Vehicle, Garden, Electrical, Health departments) invited for the meeting and all needs to cooperate in the data gathering for the information to be filled up on the PRANA portal launched by CPCB (<http://www.prana.cpcb.gov.in/#/home>). As login credentials would not be shared with every stakeholder, the screenshots/pdf file of information required for PRANA portal would be shared with them. AMC has asked all stakeholders to send the data in time so that it can be uploaded on PRANA portal as early as possible. But still there is ambiguity as there is no clear decision on whether MPCB or city fills data in PRANA portal. During the online meeting held on 06.12.2021 to sensitize for filling up data in PRANA portal with SPCBs; CPCB has directed SPCBs' city wise nodal officers need to collect data from Air Quality Management Cell (AQMC) constituted at ULB and from different stakeholders in city level Implementation Committee and fill City wise data.

RO, MPCB said that they can provide one staff for filling data on PRANA portal.

Although, while filling the data on PRANA portal it was also observed that, there are many software related issues are coming up which needs to be resolved immediately.

- It was instructed that each agency to nominate one person for coordination on NCAP and PRANA portal related data.

- AMC instructed Environment Officer to submit the proposal on appointing consultant/ support unit for coordination and implementation of proposals on air pollution mitigation including central funded schemes such as XV Finance Commission and to strengthen the Environment Cell of PMC.
- Additional Municipal Commissioner has asked SPPU for their involvement in research and IEC activities related to air pollution. He further asked SPPU to put proposal for the IEC activities and air pollution study under the NCAP and XV Finance Commission. SPPU representative said that they can carry out exposure study on impact of air pollution on health as a research project.
- It was also discussed about the demonstrative lung model equipped with the electronic based sensors showing Air Quality Index of the area which will be installation on the JM Road, near Ch. Sambhaji Garden, Shivajinagar, Pune. This is to generate awareness among the people about the air pollution and its consequences and its ill effects on the human health. AMC instructed to send a letter to MPCB, Pune Office for their opinion on the said proposal.
- Additional Municipal Commissioner also appreciated and asked to continue the support received from the external agencies viz. GIZ - Technical Advisory on Air Pollution covering prioritisation of actions under micro action plan, decentralised waste management etc.; RMI- Preparation of Electric Vehicle (EV) Readiness Plan for Pune city, FCDO - Technical Advisory on EV Action Plan for Pune city (in discussion), SDC, TERI, ARAI - Preparing Source Apportionment study and Emission Inventory of Pollutants for Pune, CDAC - MoU will be signed between PMC & CDAC for UrbAir Computer Modeling Software – as a decision support tool in air pollution mitigation) for the NCAP and XV FC activities to improve the air quality in the Pune city.

Meeting ended with vote of thanks to all members present.



Environment Officer
Pune Municipal Corporation



MINUTES OF MEETING

Subject - Fifteenth Finance Commission (XV-FC) for Air Quality Improvement	
Date : 08.06.2022	Time : 12.30pm
Venue - Municipal Commissioner's Office, Committee Hall, 4 th floor, Pune Municipal Corporation, Shivajinagar, Pune-05	

Members Present

Sr. No.	Name	Designation and Organisation
1	Dr Kunal Khemnar	Add Municipal Commissioner (E)
2	Dr Yashwant Mane	Dy Commissioner, Pune Municipal Corporation
3	Pratap Jagtap	MPCB
4	Sanjay Sasane	Dy RTO
5	Anant Bhosale	ARTO
6	Shrinivas Kandul	Chief Engineer, Electrical Department
7	Prof Suresh Gosavi	HoD, Environment Sciences, SPPU
8	Mr Nehul	SPPU
9	Moqtik Bawase	General Manager, ARAI
10	Mangesh Dighe	Environment Officer, PMC
11	Prasad Jagtap	Executive Engineer, SWM, PMC
12	Shrikrishna Dixit	JE, SWM, PMC
13	Pooja Dhole	Environment Department, PMC
14	Shrutik Dange	Environment Department, PMC

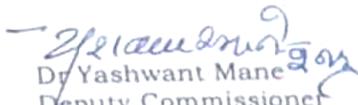
Air Quality Monitoring Committee Meeting was called to discuss the Air Pollution related actions & identify the new initiatives/proposals with different stakeholders in Pune City. The meeting was chaired by Hon. Municipal Commissioner, PMC. A presentation was made in which the analysis of Air Action plan under NCAP was shown. The sections included overall action plan in which the Air Quality Monitoring Stations, Mobility related issues & roads, Green Spaces in the city, Solid Waste management measures, Renewable energy initiatives, & programs to reduce Air pollution from point sources like Crematoriums were discussed.

Following points were discussed -

SrNo	Points	Discussions	Actions
1	National Clean Air Programme (NCAP)	Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, launched National Clean Air Programme (NCAP) in January 2019. <u>National Level target -</u> The national level target of 20%-30% reduction of Particulate Matter (PM10 & PM2.5) concentration by 2024, through the city specific actions NCAP will be implemented in 132 non-attainment cities (identified 2011-2015) including 43 smart cities & a total of 19 cities from Maharashtra Approved Year2019	PMC Environment to update Air action plan – PRANA Portal
2	GRNo. NCA 2018/CR.196(2)/T.C.2	As per GR, MPCB to review the draft interventions submitted by expert committee of IIT(B)/NEERI	MPCB to communicate with IIT(B) & NEERI & forward the report to PMC
3	Clean Air Program	Clean air Dominoes Vehicles retro-fitting	ARAI – to submit the details of retro-fitting
4	NCAP - Components	All the activities completed – Funds utilized fully	Pune city is under Million plus cities & the funding for Air pollution will be under XV-FC (Year2022-2026)
5	City Level Implementation Committee	Total 11no of meetings completed	PMC Environment - Meetings to be conducted every 3months
6	Funds Allocation – NCAP	NCAP -Year 2019-20 – Rs 9.45Cr	Completed
	Funds Allocation – XV-FC	Year 2022-25 – Total Rs 504Cr Pune Agglomeration –(PMC, PCMC, Pune Cantonment, Kirkee Cantonment, Dehu-road Cantonment)	Out of Rs 504Cr – Rs 311.89Cr sanctioned for Pune City (PMC)
7	Impact Analysis	CDAC model has the capabilities to generate scenarios which could be of immense help to city when they plan for a certain action	CDAC & PMC Environment-Impact analysis as per the city initiatives/air action plan shall be completed – with CDAC model (July end)
8	SPPU – Air Quality Monitoring Stations	Mass Spectra machine – in association with Sweden (Name of Org) for monitoring of Air Quality – Past 6months , & IIT kanpur	SPPU - HoD Environment Sciences, shall submit the results after the data analysis to PMC Environment Department

9	XV-FC		The departments were requested to prepare the estimates & tender as per the XV-FC plan components.
10	PRANA Portal	Updated as of now	PMC Environment – to update the portal as per the timely directions given by MPCB/CPCB
11	Crematoriums & Solar Installation	Third party audit for all crematoriums Solar installation – SRA scheme	PMC Electrical department to appoint an agency to carry out the third party audit of electric crematoriums to check the emissions/if any For the component under XVFC – water heating needs in slum areas - Community water heating pilot – SRA scheme can be selected for implementation
12	XV-FC EV Component	500 Electric charging points - PPP Model	PMPML & PMC Electrical - to publish Tender
13	XV-FC EV Component	EV battery swapping Station – Discuss about the size & Voltage Sun Mobility; Oil companies have completed certain survey	PMPML & PMC Electrical - Tender document not yet received
14	XV-FC Dust mitigation	Draft letter – Road & MPCB	For Air pollution control system for Hot mix plant PMC Road department - to publish Tender


Mangesh Dighe
Environment Officer
Pune Municipal Corporation


Dr. Yashwant Mane
Deputy Commissioner
Pune Municipal Corporation


Dr. Kunal Khemnar
Additional Municipal
Pune Municipal Corporation

EV Component									Executing Department
S N	Project	Details	2022	2023	2024	2025	2026	Total	
1	200 e-buses on wet lease basis	200 number of e-buses on OPEX model with electrical and civil infrastructure	60.00	30.00	10.00	0.00	0.00	100.00	PMPML/PMC Vehicle depot
2	6 Nos. of E-bus depot development	Development of e-bus depot for maintenance of e-buses and charging infrastructure	10.00	10.00	10.00	0.00	0.00	30.00	PMPML/PMC Vehicle depot
3	500 Electric charging points	Setting up electric vehicle charging Points at PMPML's depots & bus Stands for PMPML use and public use in Pune	14.00	12.00	14.00	0.00	0.00	40.00	PMPML PMC Electrical
4	400 SWM Vehicles (EV/CNG)	400 SWM Vehicles for Primary Waste Collection	15.00	10.00	15.00	0.00	0.00	40.00	PMC Vehicle depot
5	EV battery swapping Station	625 Swapping stations with 2 set of 16 batteries having a capacity of 1.5 kWh each.	7.00	3.00	5.00	0.00	0.00	15.00	PMPML PMC Electrical
6	EV based first & last mile connectivity	Vehicle & infrastructure development of shared mobility services for first and last mile connectivity	15.00	5.00	5.00	0.00	0.00	25.00	MahaMetro
Total			121.00	70.00	59.00	0.00	0.00	250.00	
Dust Mitigation Measures									Executing Department
S N	Project	Details	2022	2023	2024	2025	2026	Total	
1	Mechanical sweepers for major Roads	3 Routes within the city are being tendered out to be swept using Mechanical sweepers	3.00	5.00	2.00	0.00	0.00	10.00	PMC SWM
2	Cycle Track and Footpath construction	Construction of cycle tracks and footpaths in 2 Kms of roads. This includes both side of the road footpath and Cycle track	8.00	5.00	0.00	0.00	0.00	13.00	PMC Road
3	Air pollution control system for Hot mix plant	Under Road dept, for one hot mix plant to install the air pollution control system	0.50	0.50	0.00	0.00	0.00	1.00	PMC Road
Total			11.50	10.50	2.00	0.00	0.00	24.00	
Industry, Others									Executing Department
S N	Project	Details	2022	2023	2024	2025	2026	Total	
1	Automiser based water fountains for major traffic intersections	PMC has proposed total 5 nos. of Automiser mist based	2.00	3.00	0.00	0.00	0.00	5.00	MahaMetro
Total			2.00	3.00	0.00	0.00	0.00	5.00	
Construction & Demolition (C&D) Waste									Executing Department
SN	Project	Details	2022	2023	2024	2025	2026	Total	
1	C&D waste feeder points at each ward	Developing Feeder points to collect small C&D waste from each ward. The structures will be designed to prevent Dust pollution. 15 Feeder points.	3.00	3.00	2.00	0.00	0.00	8.00	PMC SWM
2	1 No of C&D plant of 250MT capacity	Installation and operation of C&D waste processing plant on DBOT basis	2.00	3.00	0.00	0.00	0.00	5.00	PMC SWM
Total			5.00	6.00	2.00	0.00	0.00	13.00	

Installation of Crematoriums									Executing Department
SN	Project	Details	2022	2023	2024	2025	2026	Total	
1	Air pollution control systems for wood fired cremations	Using vertical water scrubber to clean the smoke coming from pyres.	2.00	6.00	1.92	0.00	0.00	9.92	PMC Electrical
Total			2.00	6.00	1.92	0.00	0.00	9.92	
Air Quality Monitoring and Strengthening									Executing Department
S N	Project	Details	2022	2023	2024	2025	2026	Total	
1	Urban monitoring Stations	2 stations each year	0.60	0.70	0.70	0.00	0.00	2.00	MPCB
2	Background monitoring stations	1 station each year	0.20	0.40	0.40	0.00	0.00	1.00	MPCB
3	Meteorological monitoring	1 station each year	0.10	0.20	0.20	0.00	0.00	0.50	MPCB
4	Ambient Air quality modeling	Computer based modeling system and operations	0.40	0.80	0.80	0.00	0.00	2.00	CDAC PMC Environment
5	Awareness activities Program management unit	IEC activities program management unit	0.80	0.80	0.80	0.80	0.77	3.97	PMC Environment PMC SWM
6	Alternative to woodfire/coal for water heating needs in slum areas	e.g. Community water heating pilot based on solar	0.10	0.10	0.10	0.10	0.10	0.50	PMC Electrical
Total			2.20	3.00	3.00	0.90	0.87	9.97	
Total (Rs Cr)			143.70	98.50	67.92	0.90	0.87	311.89	

Environment Officer
Pune Municipal Corporation

Minutes of Meeting

Subject: Pune Urban Agglomeration- Implementation Committee Meeting Air Quality Improvement under National Clean Air Programme (NCAP)	
Date: 07/04/2025	Time: 12:30-1:30 PM
Venue: Room no.215 Ambedkar hall Pune Municipal Corporation Main Building Pune.	

Sr. No.	Name	Designation
1.	Prithviraj B.P.	Additional Municipal Commissioner (E)
2.	Souvik	Joint CEO Khadki Cantonment Board (KCB)
3.	Sanjay Shinde	Dy. Municipal Commissioner (Environment)
4.	Manisha Shekatkar	Chief Engineer (Electrical)
5.	Amar V Desai	A.R.T.O. RTO Pune
6.	Rajesh Kudale	PMPML Chief Engineer
7.	Mangesh Dighe	Environment Officer PMC
8.	Dr. Nehul	Dept. of Env. Sci. SPPU
9.	Sohan Nikam	Executive Engineer (Environment) PCMC
10.	Santosh Durge	Executive Engineer (Electrical) PCMC
11.	Dr. Jayant Doke	Field Officer MPCB SRO, Pune-1
12.	Hitendra Kurane	S.E. (Mech) Motor Vehicle Dept. PMC
13.	Sanjay Jawadwar	OS/PMPML
14.	Rajendra Shipekar	Executive Engineer Vehicle Dept. PMC
15.	Rajendra V. Tidake	JE, Vehicle depot
16.	Girdhar Sharma	Junior Engineer (Dehuroad Cantonment Board)
17.	Pranjal Kulkarni	ITDP Pune Manager
18.	Sidharth Godbole	ITDP Pune
19.	Madhuri Ghule	Junior Engineer PCMC
20.	Govind Hanvate	PCMC (TUSPL) Consultant
21.	Akshay Lokhande	Consultant (TUSPL) PCMC
22.	Aditya sharma	CII
23.	Harshwardhan Bhoite	WRI
24.	Vaibhav Lad	WRI
25.	Lekha Dhote	CPCB consultant NCAP

Implementation committee meeting under NCAP was called to discuss the overall status of projects under NCAP/XVFC, air quality improvement of city. The meeting was Chaired by Sh. Prithviraj B. P. Additional Municipal Commissioner (E).

The following components were discussed in the presentation:

1. Background and Mandate of the NCAP.
2. Financial status under NCAP and Status of Utilization of funds by Pune Agglomeration

Department	Amount received (Rs. Cr.)	Expenditure (as per PRANA) (Rs. Cr.)	Utilization (%)
PMC	162.86	136.61	83.88
PCMC	88.88	74.16	83.77
PCB	3.74	3.05	81.55
DCB	3.02	2.55	84.43
KCB	3.68	3.64	98.76
Total	261.85	220.01	84.02

3. Works in progress by different departments of Pune Municipal Corporation (PMC) for the control of air pollution in Pune City.
4. The trend of PM₁₀ and PM_{2.5} was also discussed in the meeting. The convener of the meeting graphically depicted the data as monitored by the CAAQMS for the years FY 2017-2024.
5. Updated status of NCAP works- Pune Municipal Corporation has purchased 81 CNG based solid waste collection vehicles (choti ghangadi). Dust mitigation measures also have been taken to reduce PM₁₀ and PM_{2.5} concentration in which truck mounted 5 fog cannon machines are purchased by vehicle department these

vehicles are deployed on 5 major traffic roads. 21 e-buses have been purchased by PMPML for pollution free public transportation system.

6. Reappropriation of XVFC funds for Rs. 304.42 Cr. Various projects under solid waste management, electrical department, PMPML, Road department, Environment department, vehicle department are being carried out in XVFC funds however some new projects like green cover in the form of Miyawaki plantation is added in the proposal, PMPML will also be purchasing 200 CNG buses as PMPML can not solely depend on electric buses for smooth functioning of day to day public transport. To include these new projects reappropriation of funds was discussed.
7. All the department who are involved in XVFC work were requested to place the display board of their works at site in the prescribed format given by MoEF&CC under NCAP. In case of mobile vehicles and equipment's, the logos in the prescribed format should be painted at prominent location of the vehicle.
8. Quarterly progress report of annual action plan FY 2024-25 is approved in the implementation committee meeting.

Departments were instructed to conduct following activities

Sr. no.	Activity	Department
1.	To integrate the API of SAMEER app of Central Pollution Control Board on 'PMC Care' app of Pune Municipal Corporation.	IT department PMC
2.	To make site visit to C&D waste feeder points to check status of work	Environment department PMC

3.	Activate the GPS tracking location of all 5 fog cannon machines. Keep an online record of total work done by these machines.	Environment and Vehicle department, PMC
4.	Graded Response Action Plan (GRAP) for Pune city to be prepared based on the GRAP published by MPCB for the state of Maharashtra and also compare with GRAP published by PCMC. Add Pune specific points in the GRAP, and remove the point like Brick kilns, thermal power plant and off road and on road parking.	Environment Department
5.	The defunct mist fountains to be made functional	Electric department, PMC
6.	ITDP made a presentation on the proposal of low emission zones for Pune city. It was suggested to conduct a workshop with the stake holders, citizen and NGOs for taking their inputs.	Environment department
7.	WRI made a presentation on clean construction practices. Low-cost sensors to be put up at 3 construction sites to monitor effectiveness of the compliances done by the sites.	Environment department

The meeting ended with a vote of thanks to the chair.


 Additional Commissioner (E)
 Chairman Implementation Committee
 NCAP



Pune Municipal Corporation



PUNE CITY REVISED AIR POLLUTION ACTION PLAN

Under XV-FC Grant and EV Convergence

April 2022



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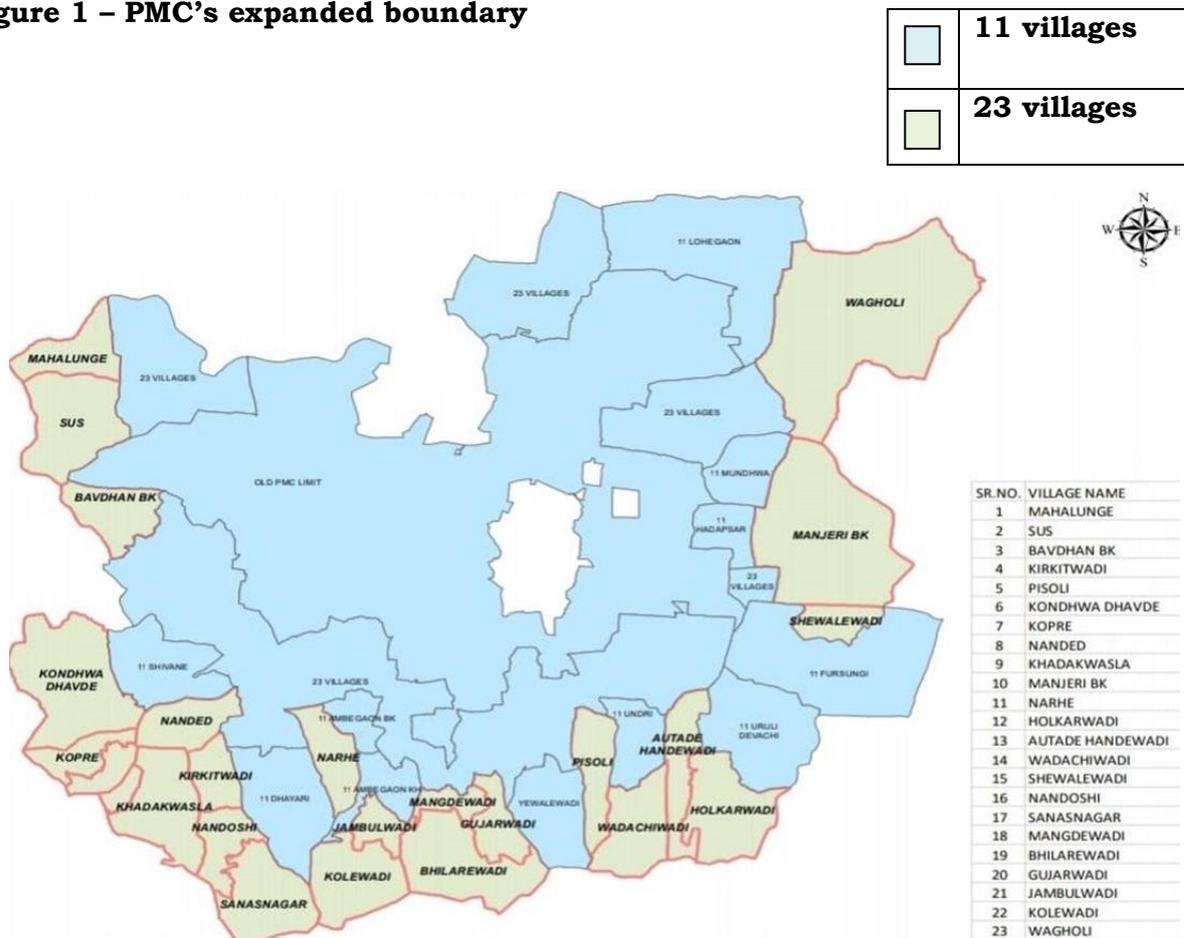
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1. Introduction

1.1. About Pune City

Pune is amongst the top seven cities in India, and after Mumbai, it is the second largest city in the state of Maharashtra. Spread across about 51 sqkm in 1818, Pune has now grown into a metropolitan city covering more than 519 sqkm of area. The city has a glorious past and a promising future. Over the years, the city has been acknowledged & recognized as a rapidly growing centre for the Information Technology, Automotive, Bio-technology, etc. Also, due its rich legacy in education, earned a reputation for being the – Student Capital of India, ‘the Oxford of the East’. Pune city is one of the fastest growing Metro Cities in India, in terms of population as well as infrastructure. The growth of city is seen, with villages bordering the city (11villages in year 2020 + 23 villages in year 2021), which are now being added into the PMC limits, expanding its boundary to 519 sqkm. As Pune & its surrounding is urbanizing at a rapid pace, the rise in number of vehicles is also following this rapid pace and its impact can be clearly seen in rise of air pollution. Pune is no exception with its air quality deteriorating over the years.

Figure 1 – PMC’s expanded boundary



Urban air quality is rapidly becoming a major issue in India, hence, some of the cities suffer from the worst air quality problems in the world, which continue to be a major public health issue.

1.2. Location and Climate

Situated to the west of the Deccan plateau, the city located at the confluence of the rivers Mula and Mutha, which are tributaries of river Bhima. The Sinhagad-Katraj-Dive ghats range forms the southern boundary of the urban area. Geographically, the city is surrounded by hills on three sides, which make the climatic conditions more pleasant. In the Year 2020, Pune city received around 1,152 mm rainfall & the recorded maximum temperature was 40.6°C and minimum temperature was 8.1°C.

Figure 1 - Year-wise Rainfall in mm

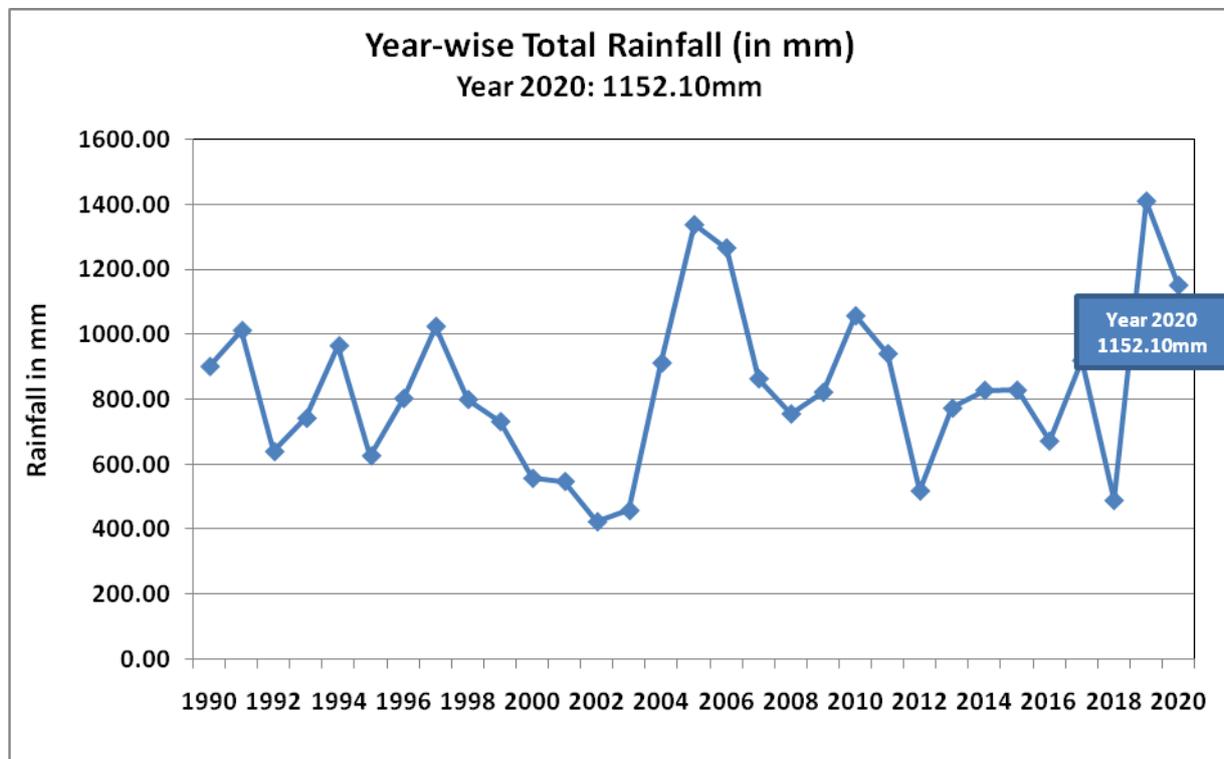
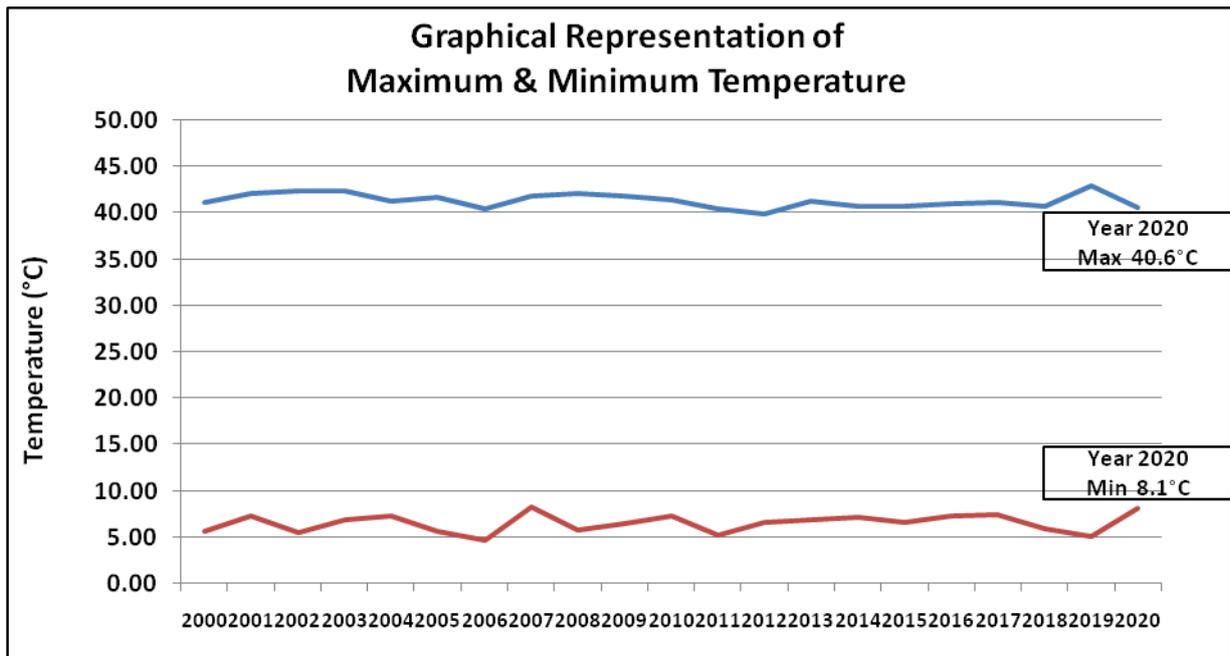


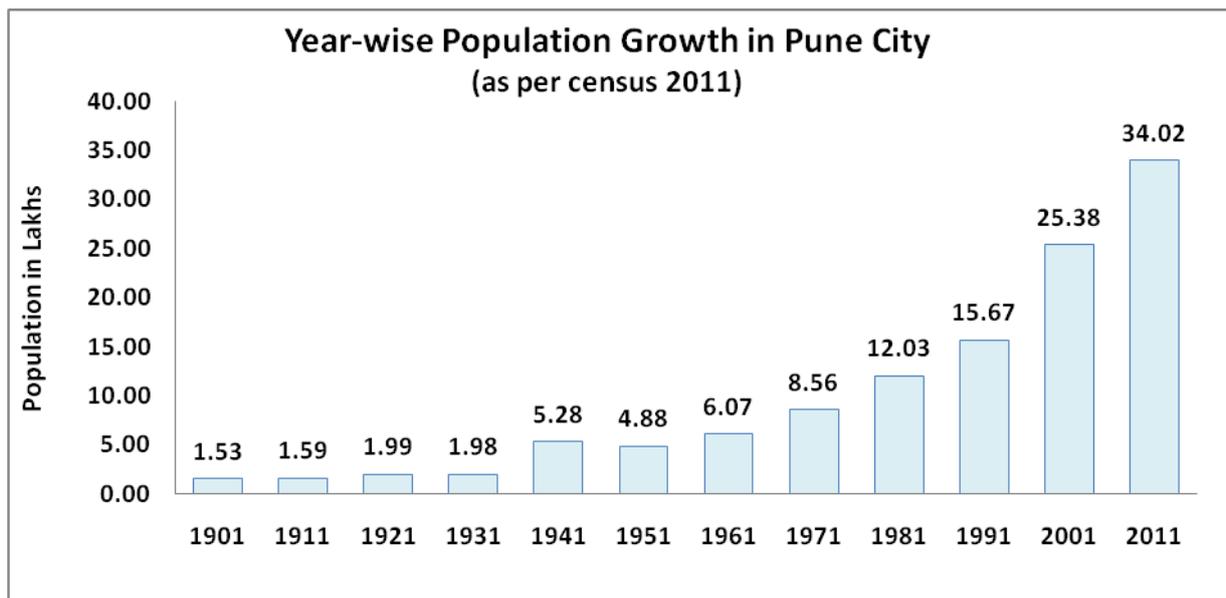
Figure 2 - Year-wise Temperature



1.3. Population

As per the Census 2011, the population of Pune city was 31.24 lakh which has increased to 35.57 lakh (Census 2011) after merger of 23 villages in 2021. The actual population of PMC area in year 2021 can be much more than the Census 2011 population & it is projected that the population would grow to about 57 lakh by the Year 2027.

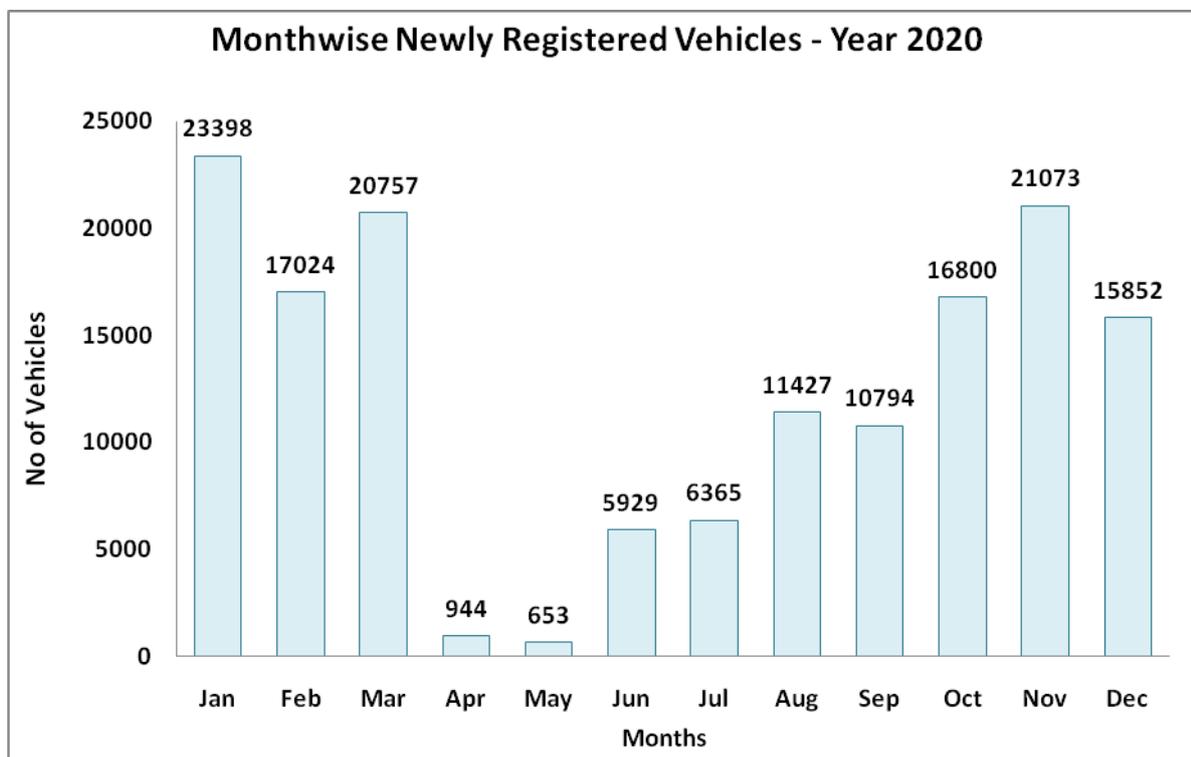
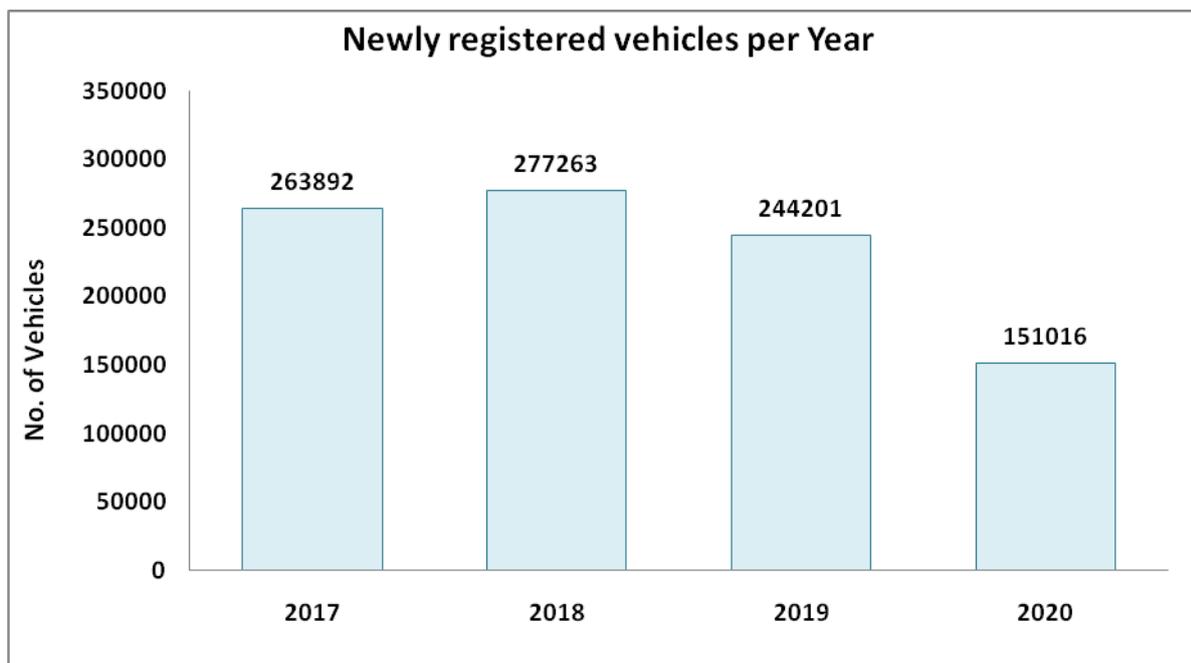
Figure 4 – Year-wise Population Growth



1.4. Registered Vehicles

The increasing population and economic activities have fuelled the demand for mobility, which in turn have led to the growth of private vehicles. The total number of registered vehicles in Pune is 31.53 lakh till June 2021. Following graph shows number of newly registered vehicles per year.

Figure 5 - Newly Registered vehicles in Pune



1.5. Air Pollution – Concentration of PM10 & PM2.5

The increased use of vehicles, migration, extended travelling distance, demand for power and manufactured products, etc, have led to the emission of pollutants within and around the city.

Figure 6 - Concentration of PM10 – Year 2017-2021

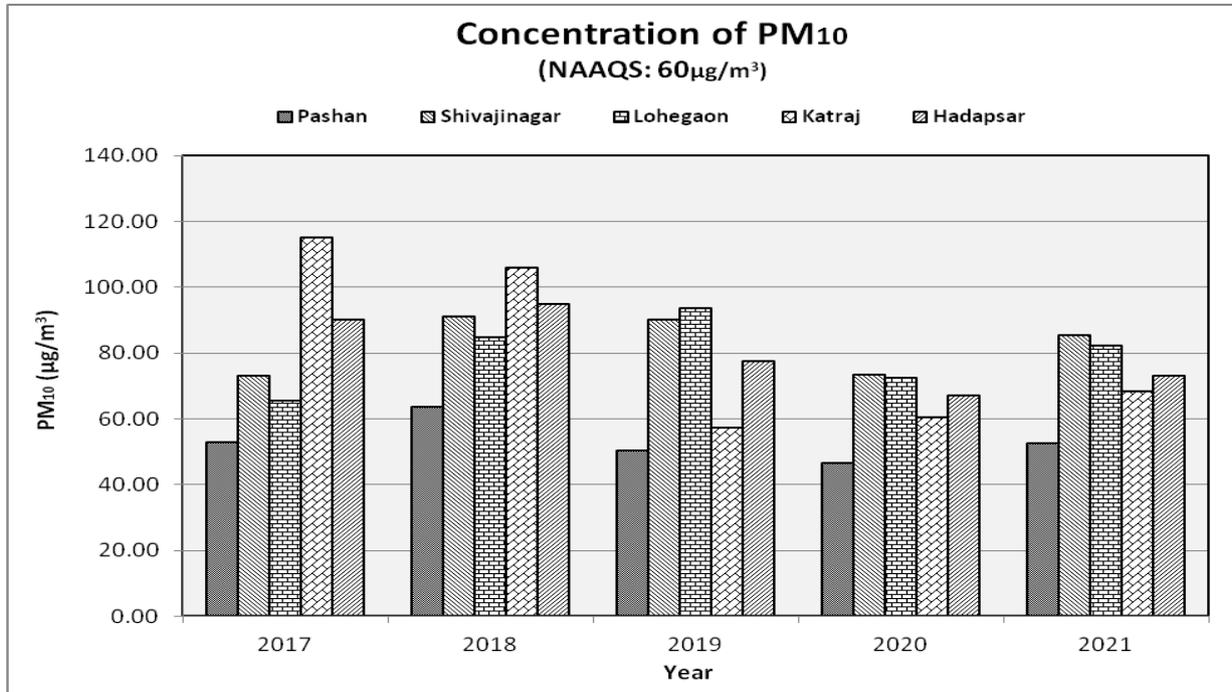
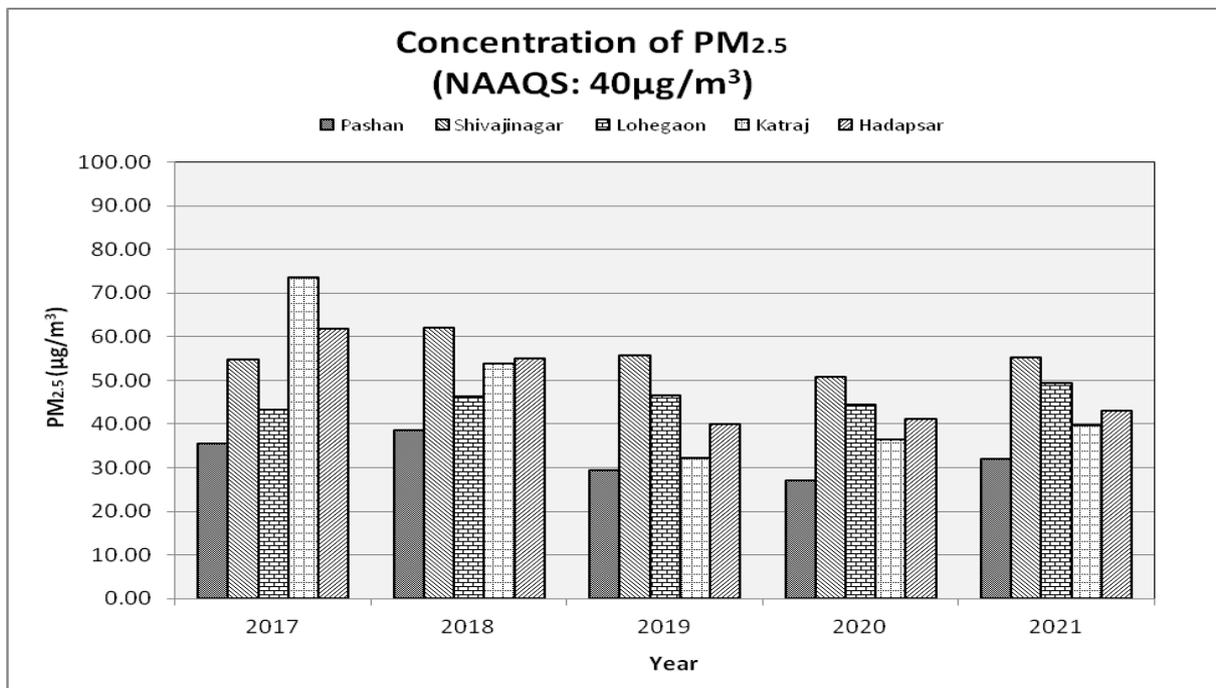
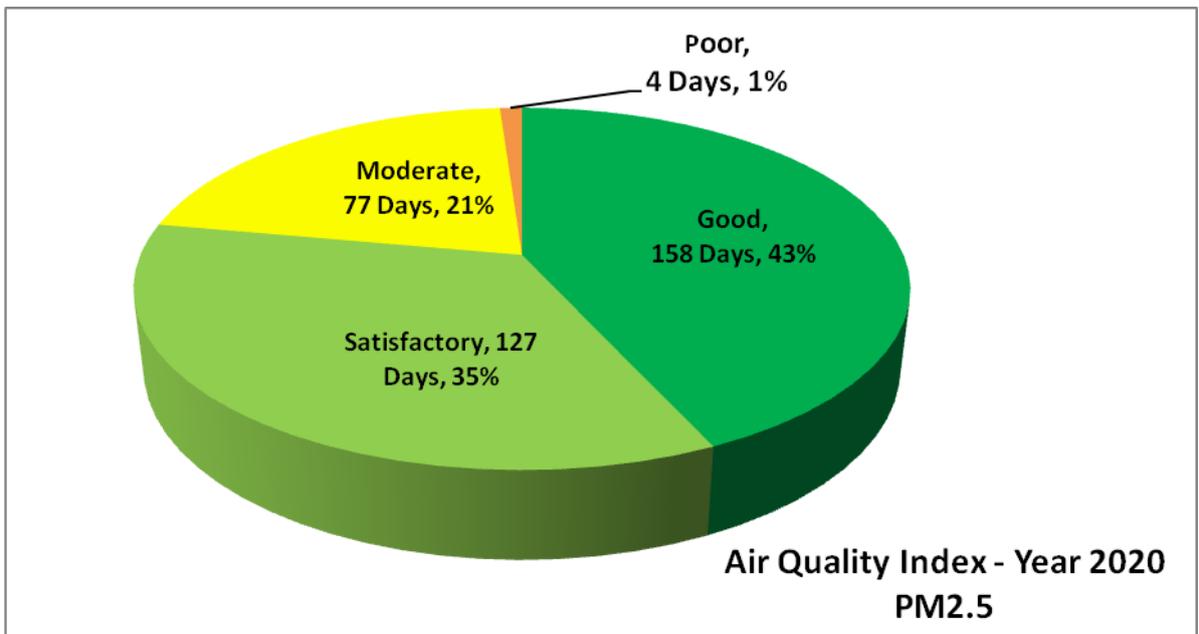
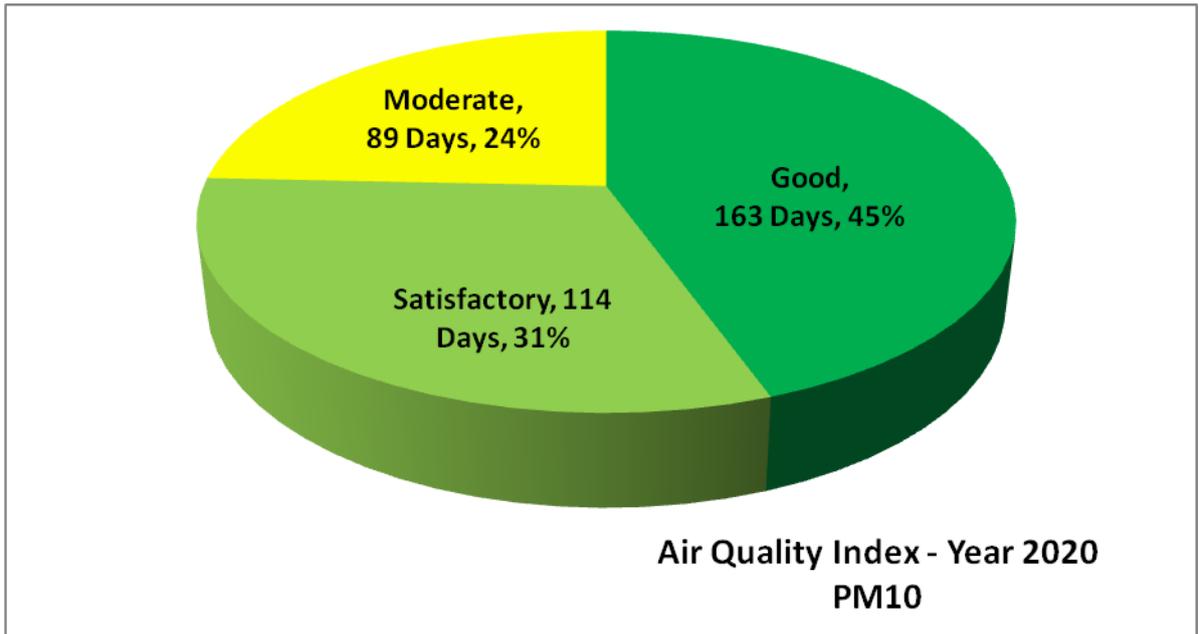


Figure 7 - Concentration of PM2.5 – Year 2017-2021



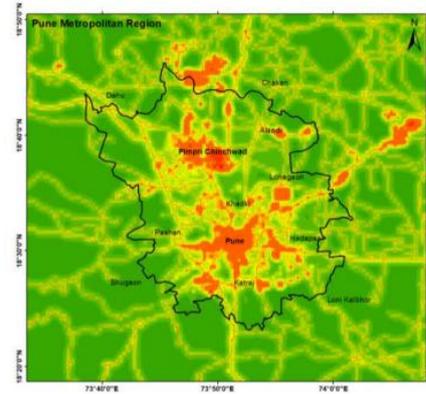
Air Quality Index (AQI)

AQI Category(Range)	PM10 24 - hr ($\mu\text{g}/\text{m}^3$)		PM2.5 24 - hr ($\mu\text{g}/\text{m}^3$)		NO2 24 - hr (ppb)		O3 8 - hr (ppb)		CO 8 - hr (ppm)			
	I low	I high	C low	C high	C low	C high	C low	C high	C low	C high		
Good	0	50	0	50	0	30	0	21	0	25	0.0	0.9
Satisfactory	50	100	50	100	30	60	22	43	26	51	1.0	1.7
Moderate	100	200	100	250	60	90	44	96	52	86	1.8	8.7
Poor	200	300	250	350	90	120	97	149	87	106	8.8	14.8
Very Poor	300	400	350	430	120	250	150	213	107	381	14.9	29.7
Severe	400	500	430	700	250	380	214	750	382	450	29.8	40



1.6. GHG Emissions

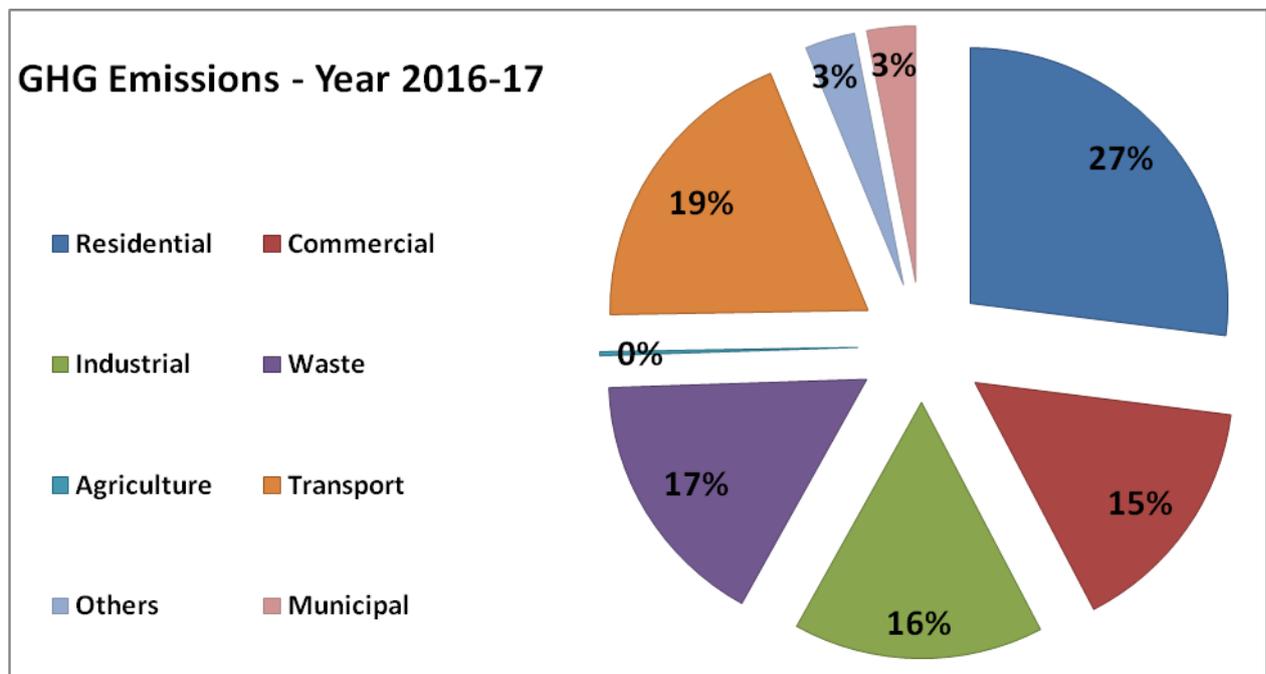
The Greenhouse Gas (GHGs) emissions inventory for Pune Urban agglomeration was conducted by IITM in the Year 2020. The ICLEI SA study reveals that all activities in community as well as municipal sectors in Pune city contributed to 60,11,475 tonnes of CO₂ equivalent (CO₂e) in the year 2016-17. The per capita emission for Pune city was 1.64 tonnes of CO₂e/year in 2016-17.



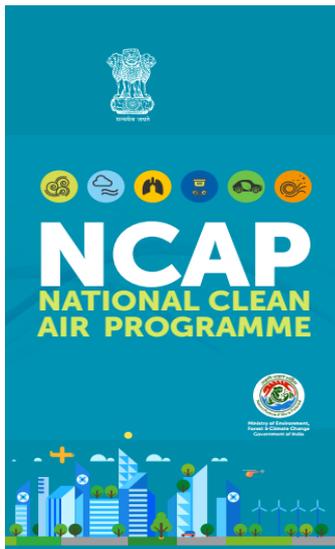
The sector-wise GHG emissions in Pune, 2016-17 (Tonnes of CO₂e)

- Residential : 1,943,343
- Commercial : 1,104,100
- Industrial : 1,128,388
- Agriculture : 18,118
- Transport : 1,372,700
- Others : 225,466
- Municipal : 2,19,358

Figure 8 – Sector-wise GHG emissions Year 2016-17



2. National Clean Air Program (NCAP) & XV-Finance Commission



To take measures for improving air quality in India, the Ministry of Environment, Forests & Climate Change (MoEFCC) launched National Clean Air Programme (NCAP). The goal is to meet the prescribed annual average ambient air quality standards in a stipulated timeframe (long-term). The national level target of 20%–30% reduction of Particulate Matter (PM10 and PM2.5) concentration by 2024 is proposed under NCAP. There are 132 non-attainment cities in India. Out of the 20 non-attainment cities from Maharashtra, Pune City is one of the non-attainment cities.

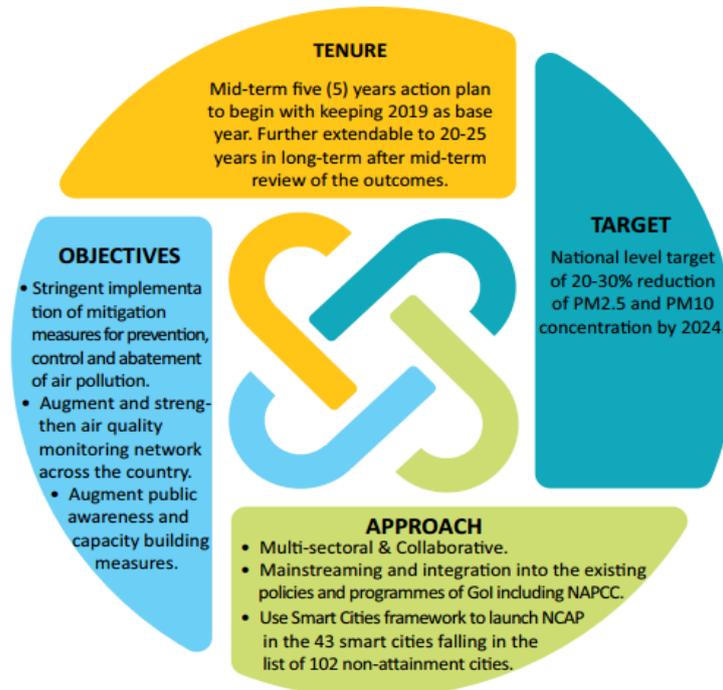
The XV-Finance Commission with the insights on the sources, causes and impacts of air pollution, is the first Commission to specifically discuss and



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FINANCE COMMISSION INDIA

set budget allocations for improving air quality. These budget recommendations signal that sustainable development remains a national priority.



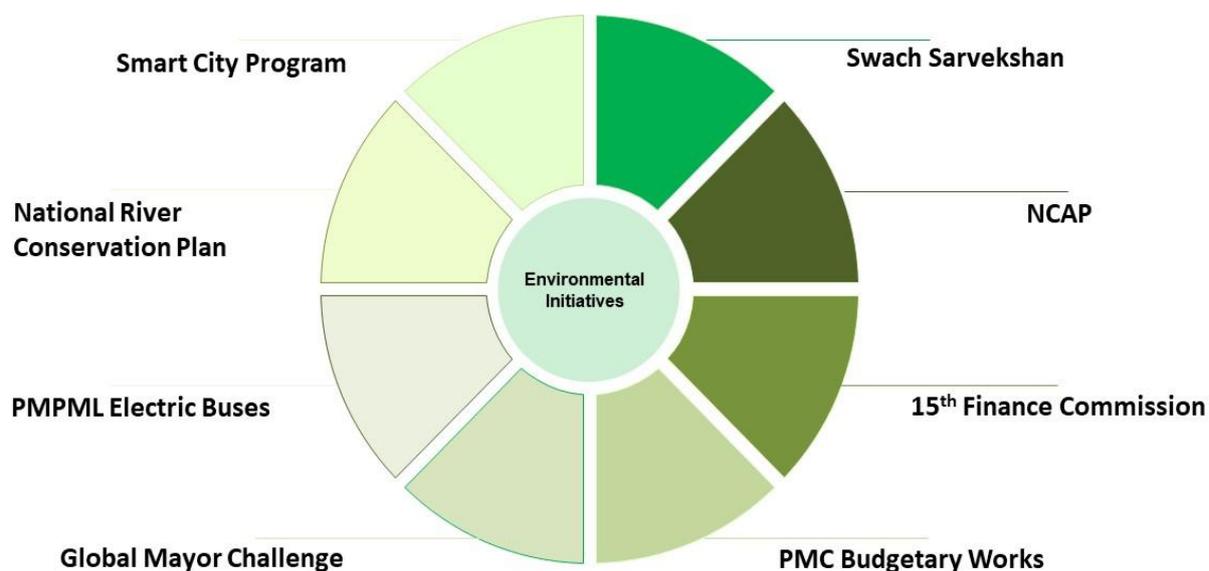
3. Pune City - Key Actions to reduce Air Pollution

The use of fossil fuels for vehicles is one of the major causes of air pollution. As on March 2021, there were 31.53 lakh registered vehicles in Pune City. The city is promoting E-mobility & use of clean and green fuels like CNG, for auto rickshaws, cars, and public transport buses.

Some of the key actions taken by Pune City to reduce air pollution are -

- 3.1 Air Quality Monitoring Stations
- 3.2 Source Apportionment & Emission Inventory
- 3.3 Public Outreach
- 3.4 Initiatives to reduce Vehicular Emissions
- 3.5. Mobility Initiatives
- 3.6 Creation of Green Spaces
- 3.7 Renewable Energy
- 3.8 Solid Waste Management
- 3.9 Crematoriums - Installation of the Air Pollution Control Systems
- 3.10 Good Construction Practices & C&D Waste Management

Figure 9 - Environmental Initiatives



3.1. Air Quality Monitoring Stations

Table 1 - Air Quality Monitoring Stations

SN	Actions	Information
1	Air quality monitoring stations for Pune City Implementation Authority - MPCB PMC IITM	<p>CAAQMS</p> <ul style="list-style-type: none"> - MPCB: 1 station in operation, Location: Kothrud - SAFAR: 10 stations in operation Locations: 1.Pashan, 2.Shivajinagar, 3.Pune Airport, 4.Katraj, 5.Hadapsar, 6.Bhosari, 7.Nigdi, 8.Manjri, 9.Bhumkar Chowk, 10. Alandi <p>Manual Stations</p> <ul style="list-style-type: none"> - MPCB : 2 stations Locations: Nal stop & Swargate - CPCB: 3 stations Locations: Bhosari, Nalstop, Swargate
2	<p>XVFC Component Implementation Authority - MPCB</p> <p>a. Urban monitoring Stations</p> <p>b. Background monitoring stations</p> <p>c. Meteorological monitoring</p>	<p>a. Urban monitoring Stations</p> <ul style="list-style-type: none"> - 2 stations – Locations - Katraj & Savitribai Phule Pune University - Rs. 2Cr (Year2022-2026) <p>b. Background monitoring stations –</p> <ul style="list-style-type: none"> - One station each on the East & West side of Pune City, approximately 5 to 10km away from the new PMC boundary. Low-cost sensors shall be considered. - Rs. 1Cr (Year2022-2026) <p>c. Meteorological monitoring</p> <ul style="list-style-type: none"> - 1station each year - Rs. 0.5Cr (Year2022-2026)
3	<p>XVFC Component Implementation Authority - PMC</p> <p>Ambient Air quality modeling Computer based modeling system and operations</p>	<ul style="list-style-type: none"> - National Super Computing Mission – Urb-Air India – The preparation of the Air quality model for Pune City is in progress by CDAC. - Supporting Partners – IITM, ARAI, SPPU, MPCB - Funds – Rs.2Cr (Year2022-2026)

3.2. Source Apportionment & Emission Inventory

Table 2 – Strengthen Infrastructure and Source Apportionment

SN	Actions	Information
1	Emission Inventory & Source Apportionment Study Implementation Authority – PMC IITM	a. Air Quality Monitoring and Emission Source Apportionment Study for Pune by CPCB-ARAI (Year2010) b. SAFAR - High Resolution Gridded Emissions Inventory (Year2020), by IITM (Partner Institutions – Savitribai Phule Pune University, Pune AND Utkal University, Bhubaneshwar)
2	Source Apportionment Study Implementation Authority – MPCB	a. Source Apportionment study work awarded to NEERI & IITB by MPCB at the cost of Rs. 75 Lakhs - work order MPCB/ APC/SAS/WO/B-1178, dtd. 17/03/2016. Interim report communicated to CPCB and study outcomes incorporated while preparing the city action plan. b. Source Apportionment Study is under progress under CAP India project. Associated organisations – (SDC, NEERI, TERI, ARAI) Funds by Swiss Agency for Development Cooperation
3	Health Impact Studies Exposure Impact Studies Implementation Authority – MPCB	MPCBoard has sanctioned the fund of Rs. 92 Lakhs to J J Hospital for conducting study on "An open label phase IV clinical trial to access the safety and tolerability of Ebastine (10mg) and phenylephrine (10mg) FDC as short duration therapy, with patient with allergic rhinitis.
4	AQM Cell Implementation Authority – PMC	- AQM Cell is Established & Operational in Pune Municipal Corporation. The regular meetings are being conducted with the respective stakeholders ensuring the implementation of city action plan. - MPCBoard is in process to setup Regional Environment Care Center (RECC) at Aurangabad, Kolhapur, Nagpur, Nashik & Pune Regional offices similar to the existing State Environment Care Center (SECC) at MPCB, Sion, Mumbai

SN	Actions	Information
5	Enforcement Units Implementation Authority – PMC	For effective implementation City Level Implementation Committee headed by District Collector/Municipal Corporation Commissioner are constituted in the State of Maharashtra. Maharashtra Government Resolution No. NCA 2018/CR196(2)/T.C.2,dtd.18/09/2019.
6	Emergency Response Plan Implementation Authority – MPCB	For Emergency Response System (ERS) including Graded Response Action Plan (GRAP), MPC Board has prepared the draft plan and is under approval process

3.3. Public Outreach

Table 3 – Public Outreach & Social Media

SN	Actions	Information
1	Daily Air Quality Public Information Dissemination System Implementation Authority - MPCB PMC IITM	PMC Website - https://pmc.gov.in/ MPCB Website - https://www.mpcb.gov.in/air-quality/Pune/0000000077 IITM Website - safar.tropmet.res.in LED display boards at 10locations – 1.Pashan, 2.Shivajinagar, 3.Pune Airport, 4.Katraj, 5.Hadapsar, 6.Bhosari, 7.Nigdi, 8.Manjri, 9.Bhumkar Chowk, 10. Alandi
2	Social Media Platforms Implementation Authority - MPCB PMC IITM	Facebook - PMCPune Twitter - PMCPune Instagram – pmc_pune Others – App – PMCCARE IITM - Public advisory for citizens with reference to AQI levels of the day & also for next day's forecast.



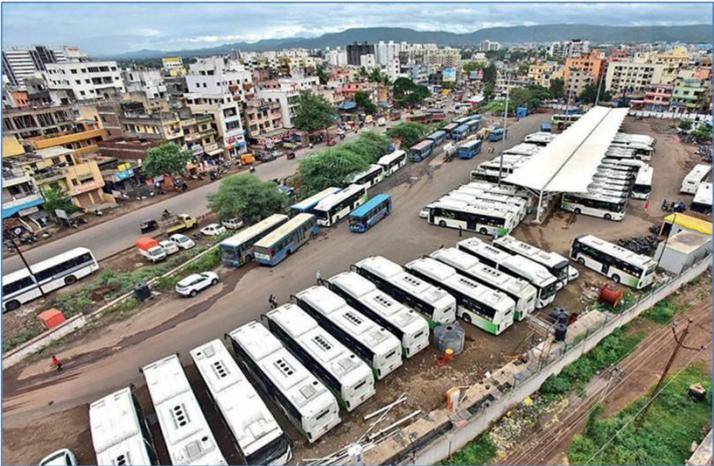
SN	Actions	Information
3	<p>Launch mobile app to update public about status of air quality</p> <p>Implementation Authority - IITM</p>	<p>IITM MobileApp - SAFAR-Air</p> 
4	<p>Public Grievances Redressal System (IT enabled) – App Helpline Number</p> <p>Implementation Authority - PMC</p>	<p>Mobile App – PMCCARE</p> <p>Toll free - 1800 103 0222</p>
5	<p>School flagship program</p> <p>Implementation Authority - IITM PMC</p> 	<p>SAFAR-IITM along with the PMC and partners has already launched a “school flagship program” in Pune. As part of the program, the PMC will develop a program to disseminate pamphlets, hoardings, videos, SMSs to increase awareness of vulnerable groups – especially children in schools. For the school flags program, the PMC and partners would focus on; coordinating with schools to display coloured flags corresponding to AQI levels for each day; studying chronic respiratory illness patients & children sensitization programs with the help of government & private doctors; develop specific sensitization programs for communities living in high level AQI communities in the city; conducting asthma clinics & pulmonary health promotion program; sending SMS & WhatsApp Alerts to school officials; asthma/chronic obstructive pulmonary disease patients.</p>

3.4. Initiatives to reduce Vehicular Emissions

Table 1 – Actions to reduce Vehicular emissions

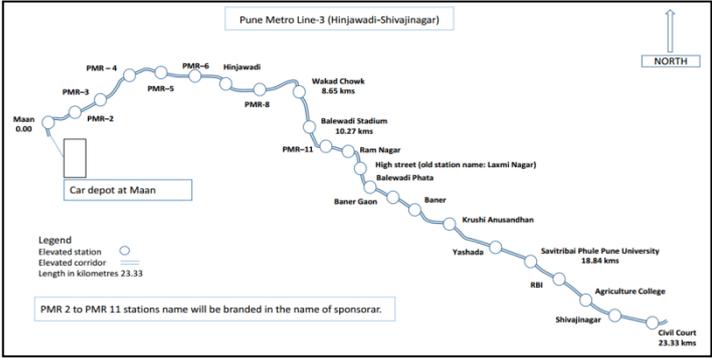
SN	Actions	Information																						
1	<p>Encouraging registration of BS VI vehicles</p> <p>Implementation Authority - RTO</p>	<p>In order to minimize the pollution from the vehicles, the registration of BSVI vehicles has been started by RTO.</p> <table border="1" data-bbox="762 474 1422 645"> <thead> <tr> <th data-bbox="762 474 1023 510">Vehicles</th> <th colspan="2" data-bbox="1023 474 1422 510">Sulphur Content (ppm)</th> </tr> <tr> <td data-bbox="762 510 1023 539"></td> <th data-bbox="1023 510 1222 539">BS IV</th> <th data-bbox="1222 510 1422 539">BS VI</th> </tr> </thead> <tbody> <tr> <td data-bbox="762 539 1023 568">Diesel Vehicle</td> <td data-bbox="1023 539 1222 568">50</td> <td data-bbox="1222 539 1422 568">10</td> </tr> <tr> <td data-bbox="762 568 1023 598">Petrol Vehicle</td> <td data-bbox="1023 568 1222 598">30</td> <td data-bbox="1222 568 1422 598">10</td> </tr> </tbody> </table> <p><i>(Source: indiathinkers.com)</i></p> <p>The Emission from vehicles with BS VI type of engine as compared with BS IV:</p> <ul style="list-style-type: none"> - Sulphur content: 5 times less in Diesel & 3 times less in Petrol Vehicles - Nitrogen Oxide (NO₂): 68% less - Particulate Matter (PM): 82% less 	Vehicles	Sulphur Content (ppm)			BS IV	BS VI	Diesel Vehicle	50	10	Petrol Vehicle	30	10										
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2	<p>Supply of Fuel - Sulphur reduction in diesel</p> <p>Implementation Authority – Petroleum Companies</p>	<p>- The city is being supplied with BSIV stage Diesel which has low Sulphur content</p>																						
3	<p>Subsidy to 3-wheeler Auto-rickshaws running on CNG</p> <p>Implementation Authority – PMC</p>	<p>- Considering the rise in use of fossil fuels in the city, PMC took a policy decision to promote the use of alternative fuel - CNG especially for Auto-rickshaws. The 3wheeler Auto-rickshaws running fossil fuels are given with the subsidy of Rs.12,000/- to covert to CNG. The scheme was running from the year 2011 till March 2020 AND a total of 16,836 Auto-rickshaws have taken the benefit of this scheme.</p> <table border="1" data-bbox="791 1565 1393 1951"> <thead> <tr> <th data-bbox="791 1565 1031 1601">Year</th> <th data-bbox="1031 1565 1393 1601">Beneficiaries of Subsidies</th> </tr> </thead> <tbody> <tr> <td data-bbox="791 1601 1031 1637">2011-12</td> <td data-bbox="1031 1601 1393 1637">1651</td> </tr> <tr> <td data-bbox="791 1637 1031 1673">2012-13</td> <td data-bbox="1031 1637 1393 1673">8739</td> </tr> <tr> <td data-bbox="791 1673 1031 1709">2013-14</td> <td data-bbox="1031 1673 1393 1709">1650</td> </tr> <tr> <td data-bbox="791 1709 1031 1744">2014-15</td> <td data-bbox="1031 1709 1393 1744">2164</td> </tr> <tr> <td data-bbox="791 1744 1031 1780">2015-16</td> <td data-bbox="1031 1744 1393 1780">1140</td> </tr> <tr> <td data-bbox="791 1780 1031 1816">2016-17</td> <td data-bbox="1031 1780 1393 1816">0354</td> </tr> <tr> <td data-bbox="791 1816 1031 1852">2017-18</td> <td data-bbox="1031 1816 1393 1852">0208</td> </tr> <tr> <td data-bbox="791 1852 1031 1888">2018-19</td> <td data-bbox="1031 1852 1393 1888">0627</td> </tr> <tr> <td data-bbox="791 1888 1031 1924">2019-20</td> <td data-bbox="1031 1888 1393 1924">0302</td> </tr> <tr> <td data-bbox="791 1924 1031 1951">Total</td> <td data-bbox="1031 1924 1393 1951">16,836</td> </tr> </tbody> </table>	Year	Beneficiaries of Subsidies	2011-12	1651	2012-13	8739	2013-14	1650	2014-15	2164	2015-16	1140	2016-17	0354	2017-18	0208	2018-19	0627	2019-20	0302	Total	16,836
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SN	Actions	Information																					
4	<p>Encouraging the CNG stations within city</p> <p>Implementation Authority - Maharashtra Natural Gas Limited</p>	<p>- When CNG was launched by Maharashtra Natural Gas Company in 2011, the consumption was barely 20,000 MT per year. As the network increased in the city, the consumption of CNG increased, now many citizen are using CNG for their vehicles.</p> <p>- The total CNG consumption Year 2011-12: 20,000 MT Year 2016-17: 80,000 MT Year 2019-20: 1,52,000 MT</p> <p>- Operational CNG Stations - Total 79nos.</p>																					
5	<p>Encouraging registration of CNG based vehicles</p> <p>Implementation Authority - RTO</p>	<p>Jan to Dec 2020 - 13,950 newly registered CNG vehicles in the city</p> <p>Public Transport buses on CNG - Year2018-19: 1140nos Year2019-20: 1759nos + conversion of 233 diesel midi buses to CNG Year202-22: 1658nos</p>																					
6	<p>CNG buses for public transport</p> <p>Implementation Authority - PMPML</p>	<p>As on Mar 2022,</p> <ul style="list-style-type: none"> - Total 2255 public transport buses are in operation by PMPML. - Out of total fleet of buses, 1658 are CNG buses. - Approx. 70% of Public Transport buses operate on CNG in Pune City - From Mar2022, it has been declared that operational Public buses will be CNG & Electrical. 																					
7	<p>Phasing out old bus fleet of more than 12 years</p> <p>Implementation Authority - PMPML</p>	<p>These buses are to be phased out from the service by PMPML. (Mar2022)</p> <table border="1" data-bbox="815 1469 1366 1709"> <thead> <tr> <th>S.No.</th> <th>Age in years</th> <th>No. of buses</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0 to 5</td> <td>689</td> </tr> <tr> <td>2</td> <td>6 to 8</td> <td>11</td> </tr> <tr> <td>3</td> <td>9 to 10</td> <td>204</td> </tr> <tr> <td>4</td> <td>11 to 12</td> <td>222</td> </tr> <tr> <td>5</td> <td>Greater than 12</td> <td>30</td> </tr> <tr> <td></td> <td>Total</td> <td>1156</td> </tr> </tbody> </table>	S.No.	Age in years	No. of buses	1	0 to 5	689	2	6 to 8	11	3	9 to 10	204	4	11 to 12	222	5	Greater than 12	30		Total	1156
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SN	Actions	Information
8	Promoting Electric buses Implementation Authority – PMPML	<p>Since Feb2019, E- buses are in operational in Pune City. Currently, 310 E-buses are operational & PMPML is planning to have a fleet of total 650 E-buses for the City.</p> <p style="text-align: center;"><u>Pune City - Electric Bus</u></p>  <p style="text-align: center;"><u>Electric Bus Charging Station - Bhekrainagar</u></p> 

SN	Actions	Information
8.1	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML</p> <p>200 e-buses on wet lease basis</p>	<p>200 number of E-buses on OPEX model with electrical and civil infrastructure - Rs 100Cr (Year2022-2026)</p>
8.2	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML</p> <p>6 Nos. of E-bus depot development</p>	<p>Development of E-bus depot for maintenance of and charging infrastructure Location/Names E-bus depot</p> <ol style="list-style-type: none"> 1. Pune Railway station 2. Baner 3. Wagholi 4. Bhosari 5. Moshi 6. Charoli <p>- Rs 30Cr (Year2022-2026)</p>
8.3	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML</p> <p>400 SWM Vehicles (EV/CNG)</p>	<p>400 SWM Vehicles for Primary Waste Collection - Rs 40Cr (Year2022-2026)</p>
8.4	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML</p> <p>500 Electric charging points</p>	<p>Setting up electric vehicle charging Points at PMPML's depots & bus Stands for PMPML use and public use in Pune area - Rs 40Cr (Year2022-2026)</p>
8.5	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML, MahaMetro</p> <p>EV swapping Station</p>	<p>625 Swapping stations with 2 sets of 16 batteries having a capacity of 1.5 kWh each. - Rs 15Cr (Year2022-2026)</p>
8.6	<p>XVFC Component</p> <p>Implementation Authority - PMC, PMPML, MahaMetro</p> <p>EV based first & last mile connectivity</p>	<p>Vehicle and infrastructure development of shared mobility services for first and last mile connectivity. - Rs 25Cr (Year2022-2026)</p>

SN	Actions	Information
9	E- vehicles in the City Implementation Authority - RTO	March 2022, registered E-vehicles in Pune City E - 4 Wheelers - 1416 E - 3 Wheelers - 403 E - 2 Wheelers - 12,441
10	Promoting Bicycles in Pune Implementation Authority - PMC 	Pune Cycle Plan is being prepared by PMC in 2017 through a project supported by the Ministry of Urban Development, Govt. of India. It consists of: - Identification of a city-wide cycle track network and cycle-safe streets. - A detailed project report for a city-wide Public Bicycle Scheme. - Bicycle Parking Facilities and integration with Public Transit. - Design Guidelines for planning and implementing cycle-friendly infrastructure. - Recommendations for Institutional Mechanisms, Capacity-building and Financial Planning for implementing the plan. Strategy for Cycling Promotion and Awareness and Education Campaigns. https://punecycleplan.wordpress.com
10.1	XVFC Component Cycle Track and Footpath construction Implementation Authority - PMC	Construction of cycle tracks and footpaths in 2 kms of roads. This includes both side of the road footpath and Cycle track - Rs 13Cr (Year2022-2026)
11	Bus Rapid Transit – Rainbow BRT Implementation Authority - PMC PMPML	- Sangamwadi to Vishrantwadi Chawk, Alandi Road – 7 km - Yerwada Parnakuti Chawk to Kharadi Nagar Road- 9 km - Sangamwadi to Patil Estate junction -1.2 km - Satara Road Swarget to Katraj - 6.2 km - Aundh Rajiv Gnadhi Bridge to Simla Office- 6.5 km - Harris Bridge to Patil Estate junction- 5.7 km

SN	Actions	Information
12	<p>Metro Rail transport</p> <p>Implementation Authority - Maharashtra Metro Rail Corporation Limited (MahaMetro)</p> 	<p>Total: 33.28km</p> <ol style="list-style-type: none"> 1. Pimpri-Chinchwad to Swargate: 17.53km (14no of Stations) 2. Vanaj to Ramwadi: 15.75km (16no of Stations) 3. PMRDA proposed: Hinjewadi to Shivajinagar: 23.33km (23no of Stations) <p>Website: www.punemetrorail.org</p>  <p>Metro Routes 1 & 2</p>  <p>PMRDA - Proposed</p>



STREET ELEMENTS

All people should be able to move safely, smoothly and conveniently



- Footpath - clear walkway
- Cycle Track - NMT Lane
- Bus stops
- BRT lanes
- Carriage way - MV lane
- Shoulders
- Parking

Make streets safe, clean, attractive and comfortable for people to walk and drive

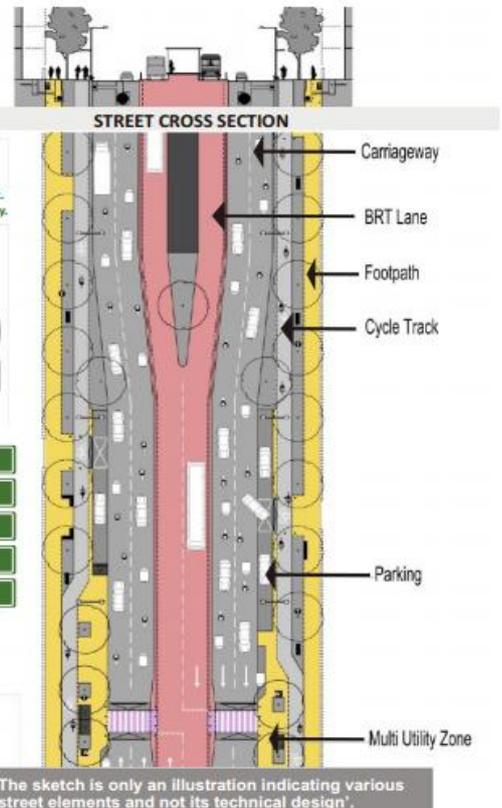


- Pedestrian Crossings
- Traffic calming measures
- Speed breakers
- Traffic Signals
- Central Medians
- Railings
- Bollards
- Street lights
- Street furniture
- Signage, markings

Streets to reduce impact on natural and built environment. To have green streets in the city.

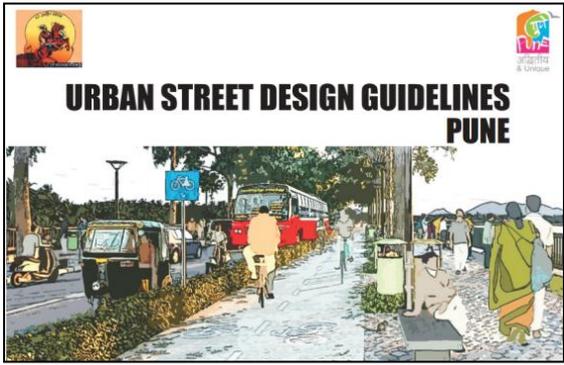


- Plantation
- Utility and services
- Storm water management
- Garbage containers
- Public toilet



3.5. Mobility Initiatives

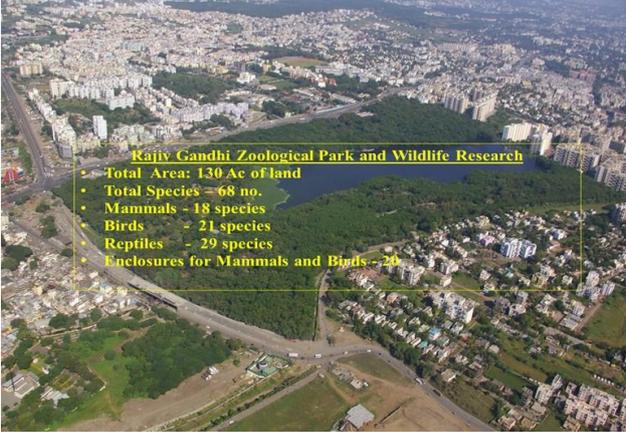
Table 5 - Traffic, Mobility & Road network related initiatives

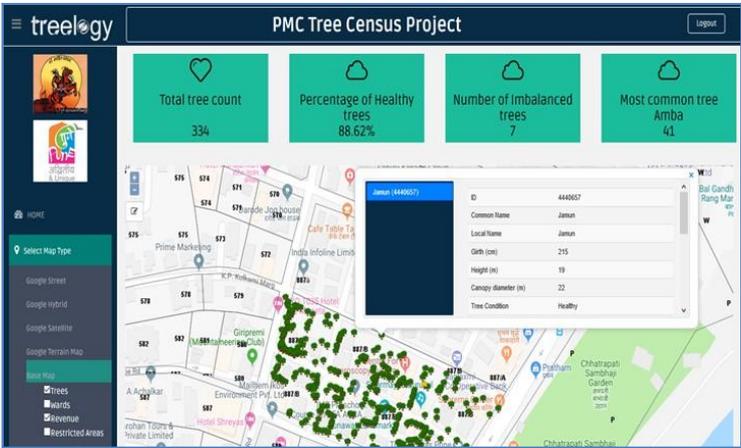
SN	Actions	Information
1	<p>Pune Street Program (PSP)</p> <p>Implementation Authority - PMC</p>	<p>- Development of 100km roads in the city is in progress in 2phases by the Road Department.</p> <p>- The directions as mentioned in 'Urban Street Design Guidelines' & 'Parking Policy' are being used for the road development.</p> <div data-bbox="810 600 1374 965" style="text-align: center;">  </div>
2	<p>Wall to wall paving & Road design improvement</p> <p>Implementation Authority - PMC</p>	<p>- The new roads are being constructed as per the Urban Street design guidelines in which wall to wall paving is provided; includes, cycle tracks, footpaths, service ducts, storm water drain etc.</p> <p>- These design guidelines which take into consideration the latest technologies used in road development as well as the specifications given under Indian Road Congress guidelines and National Urban Transport Policy.</p>
3	<p>Improvement of Infrastructure for de-congestion of Roads</p> <p>Implementation Authority - PMC</p>	<p>- Total length of roads in city is 1398km.</p> <p>- The widening of the roads is being done as per the prescribed road widths in the Development Plan.</p> <p>- Flyovers are constructed as per the recommendations in Comprehensive Mobility Plan of Pune city.</p>

SN	Actions	Information
4	<p>Maintain Pothole Free Roads for Free Flow Traffic</p> <p>Implementation Authority - PMC</p>	<p>- 4 special built Road Maintenance Vans in operation & connected by Mobile Application.</p> <p>- After success of the 4 RMVs, more 8 RMVs are now in stage of being introduced bringing the total number of RMVs to 12.</p> 
5	<p>Black topping of metaled Roads including pavement of Road shoulders</p> <p>Implementation Authority - PMC</p>	<p>- PMC has been providing UTWT- Ultra Thin White Topping treatment for internal roads in the city.</p> <p>- Urban Street Design Guidelines for Pune - Aim to design guidelines for streets in Pune which prioritize streets for people and not for vehicles, thereby reinstating the position of streets of Pune as dominant and most vibrant urban public realm.</p>
6	<p>Parking Policy</p> <p>Implementation Authority - PMC</p>	<p>Development of Multi-layer parking</p> <ol style="list-style-type: none"> 1. Pune Railway Station 2. Next to Mandai 3. Opposite Mandai 4. Hamalwada Parking Narayan Peth 5. JM Road 6. Katraj
7	<p>ITS - Synchronize Traffic movements/Introduce Intelligent Traffic systems for Lane Driving</p> <p>Implementation Authority - PMC PMPML</p>	<p>- Camera Surveillance is being done by the Traffic Police.</p> <p>- ITMS, Passenger Information system, GPS tracking of buses is being done by PMPML. Smart City is providing Command Control Centre.</p>
8	<p>XV-FC Component Air pollution control system for Hot mix plant</p>	<p>One hot mix plant – for the air pollution control system</p> <p>- Total Rs 1Cr (Year2022-2026)</p>

3.6. Creation of Green Spaces

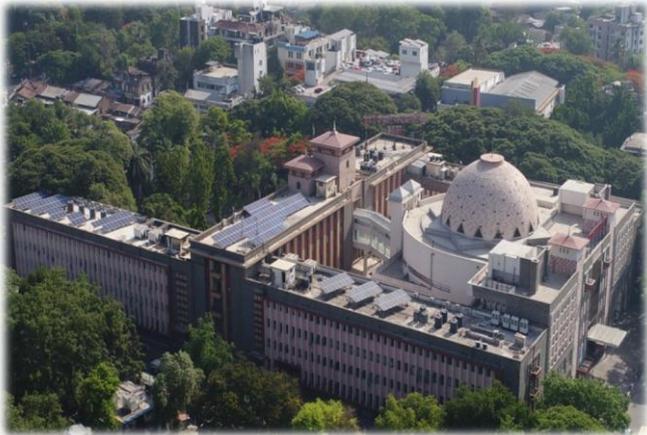
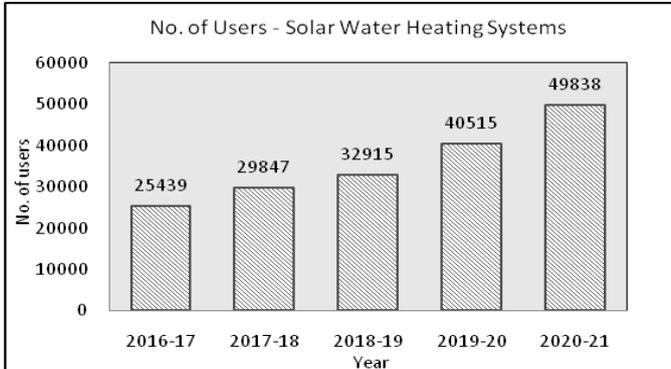
Table 6 - Creation of green spaces

SN	Actions	Information
1	BDP reservation Implementation Authority – PMC BDP Committee	In the Development Plan of PMC total 908 ha of land is reserved as Biodiversity Park.  <p style="text-align: center;">Rajiv Gandhi Zoological Park and Wildlife Research</p> <ul style="list-style-type: none"> • Total Area: 130 Ac of land • Total Species = 68 no. • Mammals - 18 species • Birds - 21 species • Reptiles - 29 species • Enclosures for Mammals and Birds - 20
2	Prepare plan for creation of green buffers along the Traffic corridors Implementation Authority – PMC	There are 36 road medians and traffic islands which are maintained by Private agencies on PPP basis.
3	Greening of open areas, garden, community places, schools and housing societies Implementation Authority – PMC	<p>- Pune city has total 204 gardens developed and maintained by PMC, covering 21,91,504 sqm</p>   <p>- Along with Forest Department, PMC has Joint Forest Management Committee in which 550 Ha of land on hills is maintained green.</p>  

SN	Actions	Information										
												
4	GIS based Tree Census Implementation Authority – PMC	<p>As per the GIS Tree census carried out by PMC, total 47,13,791 trees are being geo-tagged.</p> <table border="1" data-bbox="772 786 1399 1021"> <thead> <tr> <th>Parameter</th> <th>Statistics</th> </tr> </thead> <tbody> <tr> <td>Number of trees</td> <td>47,13,791</td> </tr> <tr> <td>Population of Pune</td> <td>34.02 lakh</td> </tr> <tr> <td>Number of trees/person</td> <td>1.39 Trees/Person</td> </tr> <tr> <td>Total number of Gardens</td> <td>204</td> </tr> </tbody> </table> <p>Website: treecensus.punecorporation.org</p> 	Parameter	Statistics	Number of trees	47,13,791	Population of Pune	34.02 lakh	Number of trees/person	1.39 Trees/Person	Total number of Gardens	204
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3.7. Renewable Energy

Table 7 - Renewable energy related initiatives

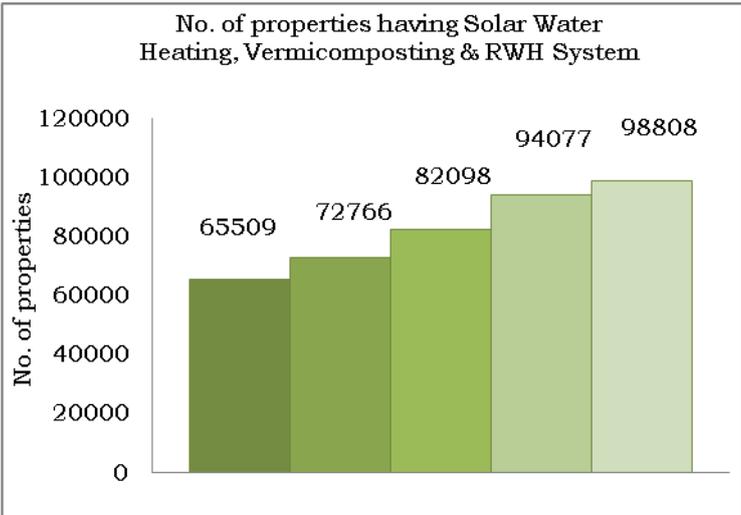
SN	Actions	Information																									
1	Use of Solar Panels Implementation Authority – PMC MSEDCL	<p>Implementation of Grid Connected Rooftop Solar PV System on the Roofs of PMC Buildings:</p> <table border="1" data-bbox="703 465 1444 633"> <thead> <tr> <th></th> <th>Model</th> <th>Electricity Generation (kW)</th> <th>Electricity Saving/per Year</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Capex</td> <td>825</td> <td>1,28,74,716</td> </tr> <tr> <td>2.</td> <td>Resco</td> <td>484.86</td> <td>50,76,840</td> </tr> <tr> <td colspan="2">Total</td> <td>1309.74 kW</td> <td>1,79,51,556</td> </tr> </tbody> </table> <p>Pune Zone & Pune City - Solar Roof top Generation (2019-20)</p> <table border="1" data-bbox="727 730 1422 864"> <thead> <tr> <th>Pune Zone & Pune City</th> <th>Total Consumers</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>Pune Zone</td> <td>4108</td> <td>21,46,19,323</td> </tr> <tr> <td>Pune City</td> <td>2669</td> <td>12,17,95,622</td> </tr> </tbody> </table> 		Model	Electricity Generation (kW)	Electricity Saving/per Year	1.	Capex	825	1,28,74,716	2.	Resco	484.86	50,76,840	Total		1309.74 kW	1,79,51,556	Pune Zone & Pune City	Total Consumers	Units	Pune Zone	4108	21,46,19,323	Pune City	2669	12,17,95,622
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2	Tax benefits – Solar Water Heating Implementation Authority – PMC	<p>PMC provides the tax benefit to the properties who have adopted Solar, Vermi-compost, Rain water harvesting;</p> <p>5% for adopting any one from above, 10% for adopting any 2 measures</p>  <table border="1" data-bbox="746 1559 1417 1928"> <caption>No. of Users - Solar Water Heating Systems</caption> <thead> <tr> <th>Year</th> <th>No. of users</th> </tr> </thead> <tbody> <tr> <td>2016-17</td> <td>25439</td> </tr> <tr> <td>2017-18</td> <td>29847</td> </tr> <tr> <td>2018-19</td> <td>32915</td> </tr> <tr> <td>2019-20</td> <td>40515</td> </tr> <tr> <td>2020-21</td> <td>49838</td> </tr> </tbody> </table>	Year	No. of users	2016-17	25439	2017-18	29847	2018-19	32915	2019-20	40515	2020-21	49838													
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SN	Actions	Information
3	<p>XV-FC Component</p> <p>Alternative to woodfire/coal for water heating needs in slum areas</p> <p>Implementation Authority – PMC</p>	<p>Proposed project - Community water heating pilot based on solar/solar panels installations on the roof of Samaj mandir, within slum areas/hybrid (solar+electricity) will be considered - Rs 0.50Cr (Year2022-2026)</p>

3.8. Solid Waste Management

Table 8 - SWM initiatives of PMC

SN	Actions	Information
1	<p>Regular segregation waste at source</p> <p>Implementation Authority – PMC</p>	<p>Door to door collection of MSW – SWaCH (Ragpickers Association):</p> <ul style="list-style-type: none"> - Households covered daily: 800,000 - Waste Pickers integrated: 3541 - The co-operative is now covering over 90% of the city ensuring daily segregated waste collection from citizens' doorsteps. <p>(https://swachcoop.com/)</p> <ul style="list-style-type: none"> - The quantity of waste sent to landfills gets reduced due removal of recyclable waste, - Reduction in carbon & GHG emissions, responsible for global warming,
2	<p>Ban on open burning</p> <p>Implementation Authority – PMC</p>	<ul style="list-style-type: none"> - Open burning of Solid waste is banned in the city, as per The Solid Waste Management Rules, 2016. The solid waste generated is completely processed using various methodologies; - Door to door waste collection, - Bio-mechanization plants, - Separate E waste collection, - Bio-medical waste collection, - Recycling of materials, - Waste to energy plants, - Incineration, - Capping of old landfill site - Shredder Machines for the garden waste

SN	Actions	Information
3	Ensure carriage of MSW in closed/covered vehicles Implementation Authority – PMC	- Dumper plaser, Bulk Refuse Carriers, Hotel Truck, compactor, Garden Cutting, Tractor, Small tempos, - Vehicles tracked by GPS.
4	Hotel waste management through Bio- methanization plants Implementation Authority – PMC	Hotel waste is collected separately & processed at 9 bio-mechanization plants located at different wards in city. 
5	Incentivizing use of Solar Water Heating, Vermicompost & Rain Water Harvesting for properties Implementation Authority – PMC	- PMC gives benefit up to 10% on property tax to those who adopt to Green methods. - No. of properties taken benefit: Year 2019-20: Total 1,01,022 properties Year 2018-19: Total 86,836 properties - In addition to this, environmental conditions are made compulsory to the new building construction projects. 

SN	Actions	Information
6	Ban on use of Plastic & Thermacol Implementation Authority – PMC	- Use of plastic bags less than 50 micron thickness are banned as per resolution of General Body Res. No. 803 dated 21-2-2014.
7	De-centralized waste management Implementation Authority – PMC	Different types of processing units are operational in the City -Waste processing Units - Dry Waste processing Units: 980 MT Wet Waste processing Units: 770MT Biogas units: 60MT BioCNG: 200MT Mechanical Composting: 210 MT Physical Composting: 250 MT + 150 MT E-collection Centers: 9nos. Biomedical Waste: collection & disposal by Agency C&D Waste: 250MT
8	XV-FC Component Awareness activities and setting up program management unit Implementation Authority – PMC	- Regular IEC programs are conducted at ward levels, slum areas. - Cleanliness drives are conducted under Swach Bharat Mission. - Rs 3.97Cr (Year2022-2026)
9	XV-FC Component Mechanical sweepers for major Roads Implementation Authority – PMC	3 Routes within the city are being tendered out to be swept using Mechanical sweepers. - Rs 10Cr (Year2022-2026)

3.9. Crematoriums - Installation of the Air Pollution Control Systems

Table 9 - Actions related to crematoriums

SN	Actions	Information
1	<p>Encouraging use of Electric crematoriums</p> <p>Implementation Authority – PMC</p>	<p>- Gas based Crematoriums - There are 13 Gas based crematoriums are in operation.</p> <p>- To discourage use of conventional wood, Electric cremation is made available free of cost to those who opt for it.</p> <p>- Total 10nos of Electric crematoriums are operational in the city & one Electric cremator is being proposed.</p>
2	<p>Installation of Air pollution control equipment at existing wood based crematoriums</p> <p>Implementation Authority – PMC</p>	<p>All the existing crematoriums are fitted with pollution control devices which are water scrubber based system. Total 23nos of crematoriums are fitted with the Air Pollution Control Systems.</p> 
3	<p>XV-FC Component</p> <p>Air pollution control systems for wood fired cremations</p> <p>Implementation Authority – PMC</p>	<p>Using vertical water scrubber to clean the smoke coming from pyres, the installation of AirPollutionControlSystems is proposed at -</p> <ol style="list-style-type: none"> 1. Wagholi 2. Sus 3. Narhe 4. Ambegaon 5. Wadgaon sheri 6. Baner 7. Lohegaon 8. Undri-pisol 9. Shivne <p>- Rs 9.92Cr (Year2022-2026)</p>

3.10. Good Construction Practices & C&D Waste Management

Table 10 - Good construction practices

SN	Actions	Information
1	Green Building practices Implementation Authority – PMC	<ul style="list-style-type: none"> - Strict enforcement of CPCB guidelines for construction (use of green screens, side covering of digging sites, etc.) - To create separate space/zone to handle solid waste, C&D waste and other waste in the city - IGBC & GRIHA certified buildings
2	Better construction practices with PM reduction of 50% Implementation Authority – PMC	<ul style="list-style-type: none"> - The building construction projects are directed to take measures for dust suppression like water sprinkling, etc. - Use of Ready Mix Concrete (RMC) is encouraged so that the mixing of aggregates, sand and cement is totally avoided.
3	Ensure carriage of construction material in closed /covered Vessels Implementation Authority – PMC	The transport of building materials is done in closed containers. However, new building construction technologies/Ready Mix concrete which is used in Pune city is transported in closed containers only.
4	Promote recycling of construction and demolition waste Implementation Authority – PMC	<ul style="list-style-type: none"> - C & D Policy is being adopted by PMC for segregation of C&D waste (a network of decentralized C&D waste segregation and collection sites across the city) - The C & D waste is being transported to the processing plant located at Wagholi for processing. - Some part of C&D waste is used for backfilling at construction sites
5	XV-FC Component C&D waste feeder points at each ward Implementation Authority – PMC	Developing Feeder points to collect small C&D waste from each ward. The structures will be designed to prevent Dust pollution. 15 Feeder points. - Rs 8Cr (Year2022-2026)

SN	Actions	Information
6	XV-FC Component 1 No of C&D plant of 250MT capacity Implementation Authority – PMC	Installation and operation of C&D waste processing plant on DBOT basis - Rs 5Cr (Year2022-2026)

4. XV-FC - Funding for Air Quality Improvement

Pune city has been allocated funds under the XV-FC for taking the actions towards improving their quality in the city. With an understanding that air pollution does not follow boundaries of certain jurisdictions, the idea of Airshed approach is being proposed. Though there are 5 ULB's under Pune Agglomeration (PMC, PCMC, Pune Cantonment Board, Kirkee Cantonment Road, Dehu-road Cantonment Board), the Public Transport body is unified, and which serves all the areas of agglomeration. The following chart gives the distribution of sectors as suggested by MPCB and the distribution of funds till the year 2026.

Funds proposed for Pune agglomeration (PMC Rs 311.89Cr + PCMC Rs 172.97Cr + Pune cantonment Rs 7.19Cr + Dehu road Cantonment Rs 4.90Cr + Kirkee Cantonment Rs 7.05Cr = Rs. 504 Cr.)

Table 2 Component wise allocation of XV-FC funds

Components	EV Component	Dust Mitigation	Industries & others	C&D activities	Bakeries & Crematoria	Air Quality Monitoring & Strengthening	TOTAL
Dept./ agency	PMC's SWM, Vehicle Dept.& PMPML	SWM, PMC	-	SWM, PMC	Electrical Dept, PMC	MPCB, PMC	
MPCB Suggested Share in %	80%	8%	2%	4%	3%	3%	100%
Proposed share by PMC (%)	80.2%	9.3%	0%	4.2%	3.1%	3.2%	100%
PMC share 66%* (Rs. crore)	250.00	29.00	0	13.00	9.92	9.97	311.89

*PMC and PCMC share is calculated based on respective city's population share. This share is calculated based on PMC population of 35 lakh and PCMC population of 17 lakh as per Census 2011. PCMC share is 34% (Rs. 172.97 Cr). *PMPML- Pune Mahanagar Parviah Mahamandal Ltd.

EV Component

Table 3 EV component - (PMPML, SWM & PMC Vehicle Dept)

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	200 e-buses on wet lease basis	200 number of e-buses on OPEX model with electrical and civil infrastructure	60	30	10	0	0	100
2	6 Nos. of E-bus depot development	Development of e-bus depot for maintenance of e-buses and charging infrastructure	10	10	10	0	0	30
3	500 Electric charging points	Setting up electric vehicle charging Points at PMPML's depots & bus Stands for PMPML use and public use in Pune area)	14	12	14	0	0	40
4	400 SWM Vehicles (EV/CNG)	400 SWM Vehicles for Primary Waste Collection	15	10	15	0	0	40
5	EV swapping Station	625 Swapping stations with 2 set of 16 batteries having a capacity of 1.5 kWh each. Incentive amount shall be Rs. 5000 per kWh of battery capacity. Total amount = (5000 (incentive/kWh) *1.5 (battery capacity) *625 (swapping stations) *16 (No. of batteries) * 2 (sets of batteries)	7	3	5	0	0	15
6	EV based first & last mile connectivity	Vehicle and infrastructure development of shared mobility services for first and last mile connectivity.	15	5	5	0	0	25
Total			121	70	59	0	0	250

Dust Mitigation Measures

The SWM and Road department has undertaken several activities in the last few years to reduce Dust (SPM) pollution.

Table 4 Dust mitigation measures

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	Mechanical sweepers for major Roads	3 Routes within the city are being tendered out to be swept using Mechanical sweepers	3	5	2	0	0	10
2	Cycle Track and Footpath construction	Construction of cycle tracks and footpaths in 2 Kms of roads. This includes both side of the road footpath and Cycle track	8	5	0	0	0	13
3	Automizer based water fountains for major traffic intersections	"PMC has proposed total 5 nos. of Automiser mist based	2	3	0	0	0	5
4	Air pollution control system for Hot mix plant	Under Road dept, for one hot mix plant to install the air pollution control system	0.5	0.5	0	0	0	1
Total			11.5	10.5	2	0	0	2

Industries, Others

PMC has proposed procurement of Automizer based water fountains for the major traffic intersections.

Table 5 procurement of Automizer based water fountains

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	Automizer based water fountains for major traffic intersections	PMC has proposed total 5 nos. of mist based Automizer	2	3	0	0	0	5

Construction & Demolition (C&D) waste

The Solid Waste Management department of PMC has worked out measures for C&D activities.

Table 6 C&D activities

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	C&D waste feeder points at each ward	Developing Feeder points to collect small C&D waste from each ward. The structures will be designed to prevent Dust pollution. 15 Feeder points.	3	3	2	0	0	8
2	1 No of C&D plant of 250MT capacity	Installation and operation of C&D waste processing plant on DBOT basis (Location: South-West Area of Pune)	2	3	0	0	0	5
Total			5	6	2	0	0	13

Upgradation/ installation of Crematoriums

PMC plans to install/upgrade following crematoriums by providing Air Pollution Control Systems for wood fired cremations at the following locations -

1. Wagholi smahsanbhumi
2. Sus smahsanbhumi
3. Narhe smahsanbhumi
4. Ambegaon-budruk smahsanbhumi
5. Wadgaon Sheri smahsanbhumi
6. Baner Smahsanbhumi
7. Lohegaon Smahsanbhumi
8. Undri-PisolSmahsanbhumi
9. Shivne smahsanbhumi

Table 16 Crematorium

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	Air pollution control systems for wood fired cremations	Using vertical water scrubber to clean the smoke coming from pyres.	2	6	1.92	0	0	9.92
Total			2	6	1.92	0	0	9.92

Air Quality Monitoring and strengthening

MPCB as a stakeholder will be functional in strengthening comprehensive air monitoring network over PMC and PCMC. In addition to this, MPCB will also extend its co-operation in framing effective mitigation strategies towards air pollution reduction. Recommendations from MPCB are given in the following table;

Table 17 Air quality monitoring

SN	Project	Details	2022 Cr	2023 Cr	2024 Cr	2025 Cr	2026 Cr	Total Cr
1	Urban monitoring Stations	2 stations each year	0.6	0.7	0.7	0	0	2
2	Background monitoring stations	1 station each year	0.2	0.4	0.4	0	0	1
3	Meteorological monitoring	one station each year	0.1	0.2	0.2	0	0	0.5
4	Ambient Air quality modeling	Computer based modeling system and operations	0.4	0.8	0.8	0	0	2
5	Awareness activities and setting up program management unit	IEC activities and program management unit	0.8	0.8	0.8	0.8	0.77	3.97
6	Alternative to wood fire/ coal for water heating needs in slum areas	e.g. Community water heating pilot based on solar	0.1	0.1	0.1	0.1	0.1	0.5
Total			2.2	3	3	0.9	0.87	9.97

Summary of Funding

The following chart gives the distribution of sectors as suggested by MPCB and the distribution of funds till the year 2026.

Funds proposed for Pune agglomeration –
 PMC Rs.311.89Cr + PCMC Rs.172.97Cr + Pune cantonment Rs.7.19Cr + Dehu road Cantonment Rs.4.90Cr + Kirkee Cantonment Rs.7.05Cr = Rs.504Cr

Table 18 Component wise allocation of XV FC funds

Components	EV Component	Dust Mitigation	Industries & others	C&D activities	Bakeries & Crematoria	Air Quality Monitoring & Strengthening	Total
Dept./ agency	PMC SWM, PMC Vehicle Dept, PMPML	SWM, PMC	-	SWM, PMC	Electrical Dept, PMC	MPCB, PMC	
MPCB Suggested Share in %	80%	8%	2%	4%	3%	3%	100%
Proposed share by PMC (%)	80.2%	7.7%	1.6%	4.2%	3.1%	3.2%	100%
PMC share 66%* (Rs. Cr)	250.00	24.00	5.0	13.00	9.92	9.97	311.89

**PMC and PCMC share is calculated based on respective city's population share. This share is calculated based on PMC population of 35 lakh and PCMC population of 17 lakh as per Census 2011. PCMC share is 34% (Rs 172.97 Cr). *PMPML- Pune Mahanagar Parviahan M ahamandal Ltd.*

5. Action Plan as per revised template for Pune City, Maharashtra

Table 11 Action Plan as per revised template

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
I. Monitoring Stations								
1	Air quality monitoring stations for Pune City	--	Yes	Ongoing monitoring activity	Implemented	Implemented	PMC & IITM	There are 10nos. of monitoring stations located at various places in city such as 1.Pashan, 2.Shivajinagar, 3.Pune Airport, 4.Katraj, 5.Hadapsar, 6.Bhosari, 7.Nigdi, 8.Manjri, 9.Girinagar, 10. Alandi LED display boards are installed at 12 places in & around the Pune city. Website: safar.tropmet.res.in MobileApp: SAFAR-Air
2	Air Quality Monitoring and strengthening including Awareness activities and setting up program management unit	--	Yes	20	Short	2022	MPCB, PMC	<ul style="list-style-type: none"> • Urban monitoring Stations: 2 stations each year • Background monitoring stations: 2 stations each year • Meteorological monitoring: one station each year • Ambient Air quality modeling: Computer based modeling system and operations • Awareness activities and setting up program management unit: IEC activities and program management unit

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
II. Source Apportionment (SA) & Emission Inventory (EI)								
1	Air Quality Monitoring and Emission Source Apportionment Study for Pune	--	Yes	Completed	Completed	Completed	CPCB, MPCB, ARAI Pune	<ul style="list-style-type: none"> The report on Source Apportionment & Emission Inventory was prepared by ARAI, & submitted to CPCB. The report is available online on: http://mpcb.gov.in/ereports/pdf/pune_report_cpcb.pdf As per the report, the total PM10 emission is 32.27TPD; out of which Dust from Paved Roads is 15.4TPD (47.8%), Dust from Un-paved Road 4.30TPD (13.3%), Mobile Sources 5.9TPD (18.3%), Construction 1.4TPD (4.4%), Slums 1.8 TPD(5.7%), Agricultural 0.5TPD (1.8%), Hotels/Bakeries/Street Vendors 1TPD (3.14%), Industry 0.4TPD (1.25%), Residential 0.4 TPD (1.43%), Others 0.8 TPD (2.58%). The total NOx emission is 41.42TPD; out of which Mobile Sources is 39.19 (94.62%), Slums 0.39TPD (0.94%), Hotels/Bakeries/Street Vendors 0.24TPD (0.58%), Industry 0.89TPD (2.16%), Residential 0.39TPD (0.96%), Others 0.3TPD (0.74%)

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
III. Vehicle emission/Transport/ Industries								
1	Sulphur reduction in diesel	High	Yes	--	Long	BS IV fuel implemented	Petroleum Companies	City is being supplied with BS IV stage Diesel which has low sulphur content. As per GoI regulations, when new norms will be suggested, the new type of fuels will be introduced in the city, in consultation with Oil companies.
2	Promotion of CNG fuel: Subsidy to three wheeler Auto-rickshaws running on CNG	High	Yes	Rs. 1Cr	Medium	2020	PMC	<ul style="list-style-type: none"> • Since 2012, PMC has given subsidy of Rs. 12000 per auto fitted with CNG kit. Till 2019, total 16,534 Auto-rickshaws have taken benefit of this subsidy. • The budget of Rs.1Cr has been allotted for the Year 2020. The subsidy work for year 2019 is under progress and will be completed by Dec 2019.
3	Encouraging more CNG stations within city	High	Yes	Rs. 10 Cr.	Long	2020	Maharashtra Natural Gas Limited	<ul style="list-style-type: none"> • The total CNG consumption has gone upto 56,491 MT per year in 2018. The CNG consumption was 20,000 MT in 2012. There are 61 CNG stations operational in city. • The use of PNG for domestic fuel purpose has gone up from 0.70 MMSCM (Million metric standard cubic meter) to 3.9 MMSCM in 2018.
4	Encouraging registration of CNG based vehicles	High	Yes	--	Short	Ongoing	RTO	As on March 2018, the CNG based registered vehicles are: 30670 three wheelers, 36,888 four wheelers and 1226 Public Transport buses. Also CNG two wheelers are on trial basis.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
5	Purchasing of new CNG buses for public transport.	High	Yes	Rs. 273 Cr.(Purchase of new CNG Buses, E-Buses, Diesel Buses, Renting of Buses, Maintenance, etc.)	Medium	2020	PMPML a joint venture of PMC & PCMC	Out of 1974 public transport fleet, there are 1140 CNG buses.200 midi buses are in operation, work order for 400 new buses has already been given.
6	Phasing out old bus fleet of more than 12 years	Medium	Yes	Rs. 123 Cr.	Medium	2020	PMPML	Out of 1974 bus fleet, there are 123 buses more than 12 years old. These buses are to be phased out from service.
7	Promoting Electric buses	High	Yes	Rs. 750 Cr.	Medium	2026	PMPML/ PMC	25 Electric buses made operational since Feb2019. Considering the successful running of Electric buses, 125 new Electric Buses have been added to fleet, thus totalling upto 150 Electric buses. Bidding stage for buying 350 more E-buses to reach the target of 500 E-buses for Pune City. Funding under XV Finance Commission is sought for E-buses and allied infrastructure.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
8	Promoting Bicycles in Pune	High	Yes	Rs. 500 Cr	Medium	2026	PMC	<p>Pune Cycle Plan was prepared by PMC in 2017 through a project supported by the Ministry of Urban Development, Govt. of India.</p> <p>It consists of :</p> <ul style="list-style-type: none"> - Identification of a city-wide cycle track network and cycle-safe streets. - A detailed project report for a city-wide Public Bicycle Scheme. - Bicycle Parking Facilities and integration with Public Transit. - Design Guidelines for planning and implementing cycle-friendly infrastructure. - Recommendations for Institutional Mechanisms, Capacity-building and Financial Planning for implementing the plan. Strategy for Cycling Promotion and Awareness and Education Campaigns. <p>https://punecycleplan.wordpress.com</p>
9	Synchronize Traffic movements/Introduce Intelligent Traffic systems for Lane Driving	High	Yes	Rs. 10 Cr.	Medium	2024	Smart City, PMPML, Traffic Police	<p>Camera Surveillance is done by Traffic Police. ITMS, Passenger Information system, GPS tracking of buses is done by PMPML. Smart City is providing Command Control Centre.</p>

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
10	Metro Rail transport	High	Yes	Rs. 11420 Cr	Long	2026 (In phasewise manner)	Maharashtra Metro Rail Corporation Limited (MAHA-METRO)	A total 31.25kms of Metro in 1st Phase; Construction work already in progress Corridor 1: PCMC to Swargate: 16.6km & with 14 stations. PMRDA has proposed extension from Swargate to Katraj. Corridor 2: Vanaz to Ramwadi: 14.7km & with 16 stations; launch expected by Dec19. PMRDA has proposed new corridor from Hinjewadi to Shivajinagar 23.33km. www.punemetrorail.org
11	Procurement of electric cars for PMC on rental basis	Medium	Yes	Rs. 30 crore	Medium	2026	PMC - vehicle depot	Currently PMC owns 80 vehicles running on fossil fuel. It intends to replace these with electric cars over the period in phase wise manner. Under the XV finance commission grant, PMC plans to procure 17 number of Electric cars on rental basis. These cars will lead a good example to the citizens and encourage them to adopt electric vehicles.
12	Industries located within the city jurisdiction	Low	Yes	...	Medium	ongoing	MPCB	The industries located within PMC area are mostly food processing units, assembling plants and majorly software IT parks. These are not contributing to air pollution since electrical energy is used by these industries. MPCB has not permitted coal burning for industrial use within the city.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
IV. Road Design								
1	Wall to wall paving & Road design improvement	High	Yes	Rs. 500 Cr.	Ongoing	Ongoing	PMC Road Department	The new roads are constructed as per the Urban Street design guidelines in which wall to wall paving is provided which includes, cycle tracks, footpaths, service ducts, storm water drain etc. These design guidelines which takes into consideration the latest technologies used in road development as well as the specifications given under Indian Road Congress guidelines and National Urban Transport Policy.
2	Prepare action plan for widening of road and improvement of Infrastructure for de-congestion of Roads.	High	Yes	Rs. 600 Cr.	Ongoing	Ongoing	PMC Road Department	Total length of roads in city is 2065 km. PMC has been widening roads as per the prescribed road widths in the Development Plan. Flyovers are constructed as per the recommendations in Comprehensive Mobility Plan of Pune city.
3	Maintain Pothole Free Roads for Free Flow Traffic	Medium	Yes	Rs. 500 Cr.	Ongoing	Ongoing	PMC Road Department	4 special built Road Maintenance vans in operation and connected by mobile app. After success of the 4 RMVs, more 8 RMVs are now in stage of being introduced bringing the total number of RMVs to 12.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
4	Black topping of metaled Roads including pavement of Road shoulders	High	Yes	Rs. 100 Cr.	Ongoing	Ongoing	PMC Road Department	PMC has been providing UTWT- Ultra Thin White Topping treatment for internal roads in the city. Urban Street Design Guidelines for Pune. Aim to design guidelines for streets in Pune which prioritize streets for people and not for vehicles, thereby reinstating the position of streets of Pune as dominant and most vibrant urban public realm. (Ref : http://itdp.in/wp-content/uploads/2016/07/Urban-street-design-guidelines.pdf)
5	Dust Mitigation measures	High	Yes	Rs. 40 crore	Medium	2026	PMC - SWM dept., Road Dept.	Mechanical sweepers for major Roads, and Air pollution control system for Hot mix plant
V. Creation of Green Spaces								
1	Prepare plan for creation of green buffers along the Traffic corridors	Medium	Yes	On PPP basis	Short	Ongoing	PMC Garden Department	There are 36 road medians and traffic islands which are maintained by Private agencies on PPP basis.
2	Greening of open areas, garden, community places, schools and housing societies	High	Yes	Rs. 10 Cr.	Ongoing	Ongoing	PMC Garden Department	Pune city has total 196 gardens developed and maintained by PMC. Along with Forest Department, PMC has Joint Forest Management Committee in which 550 Ha of land on hills is maintained green.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
3	GIS based Tree Census	Medium	Yes	Rs. 2 Cr.	Completed	2020	PMC Garden Department	Tree Census is carried out by PMC. As per the census total 47,13,719 trees are Geo-tagged along with attributes like Girth, Canopy Dia., Height, etc. Website: treecensus.punecorporation.org A separate Tree Authority looks after permission for tree cuttings in the city. New Tree plantation is done with a ratio of 1: 3. Under the Joint forest management, the hills within the city are protected and the plantation drives are taken.
VI. Biomass/Trash Burning								
1	Ban on open burning	Medium	Yes	Rs. 100 Cr.	Ongoing	Ongoing	PMC, Solid Waste Department	Open dumping of solid waste has stopped since 2012. Various methodologies include, door to door waste collection, biomethanation plants, separate E waste collection, Bio Medical Waste collection, recycling of materials, Waste to energy plants, incineration, capping of old landfill sites. The garden waste is collected in separate trucks & special shredder machines are installed in gardens to shred the biomass to use it as compost. The solid waste generated is completely processed using various methodologies.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
2	Ensure carriage of municipal solid waste in closed / covered vehicles	Medium	Yes	Rs. 20 Cr.	Ongoing	Ongoing	PMC, Solid Waste Department	There are a total of 693 vehicles for SWM management. The different types of vehicles include Dumper plaser, Bulk Refuse Carriers, Hotel Truck, compactor, Garden Cutting, Tractor, Small tempos which pick up garbage. these vehicles are tracked by GPS. Garbage transfer stations are constructed to transfer garbage from small trucks to big compactor trucks. This has reduced the number of vehicle required for transportation of waste.
3	Hotel waste management through decentralised Bio methanization plants	Medium	Yes	Rs.100 Cr.	Ongoing	Ongoing	PMC, Solid Waste Department	Hotel waste is collected separately and processed at 23 biomethanation plants located at different wards in city. 5 more plants of 5 MTD are proposed. Additionally 300 MTD of wet waste is processed using Biogas and the gas generated will be utilized by industries. Waste to energy project construction is under progress.
4	Door to Door Collection of Waste	Medium	Yes	Rs. 5 Cr	Ongoing	Ongoing	PMC, Solid Waste Department	Out of total 10 lakh households, approx 52% households are served by SWACH association (Ragpickers association), who segregate the dry and wet waste at the doorstep of houses. They also recycle the recyclable material from household waste. This reduces the burden on transport of waste to a large extent.

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
5	Incentivising use of Solar Water Heating, Vermicompost and Rain Water Harvesting for existing properties	Low	Yes	Provision from Corporation budget	Ongoing	Ongoing	PMC Tax Dept	PMC gives tax benefit upto 10% on property tax to those who adopt to Green methods. Till 2021, more than 1 lakh properties have taken benefit of this scheme. In addition to this, environmental conditions are made compulsory to the new building construction projects.
6	Banning use of plastic and thermacol	Medium	Yes	Ongoing	Ongoing	PMC, Solid Waste Department	Uses of plastic bags less than 50 micron thickness are banned as per resolution of General Body Res. No. 803 dated 21-2-2014.
7	Public Awareness of Waste management	Medium	Yes	Rs. 2 cr.	Ongoing	Ongoing	PMC, Solid Waste Department	Regular IEC programs are conducted at ward levels, slum areas. Cleanliness drives are conducted under Swach Bharat Mission.
VII. Enforcement of Construction & Demolition Waste								
1	Better construction practices with PM reduction of 50%	Medium	Yes	Practices by Project Proponents	Ongoing	Ongoing	PMC	The building construction projects are directed to take measures for dust suppression like sprinkling of water. Also use of Ready Mix Concrete is encouraged so that the mixing of aggregates, sand and cement at site is totally avoided.
2	Ensure carriage of construction material in closed	Medium	Yes	Practices by Project Proponent	Ongoing	Ongoing	PMC building permisso	The transport of building materials is done in closed containers. However, new building construction technologies are encouraged in

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
	/covered Vessels			s			n dept	which Ready Mix concrete is widely used in Pune city. The RMC is transported in closed containers only.
3	C&D waste collection facility at Feeder points and C&D waste processing plant of 250 TPD.	Medium	Yes	Rs. 20 crore	Medium	Ongoing	PMC SWM Department	Developing Feeder points to collect small C&D waste from each ward. The structures will be designed to prevent Dust pollution. 15 Feeder points. Transportation of the waste to C&D processing plants Installation and operation of a C&D waste processing plant on DBOT basis
VIII. Crematorium								
1	Gas based Crematoriums	Medium	Yes	Rs. 5 Cr	Mid term	2024	PMC, Electrical Department	To discourage use of conventional wood, 12 Gas based crematoriums are in operation.5 Crematoriums proposed.
2	Encouraging use of Electric crematoriums	Low	Yes	Rs. 2 Cr.	Short Term	Ongoing	PMC, Electrical Department	Electric cremation is made available free of cost to those who opt for it. Total 8 crematoriums are having this facility. Two more Electric cremators are proposed.
3	Installation of pollution control equipment at existing wood based	Medium	Yes	Rs. 20 Cr.	Medium	2026	PMC, Electrical Department	Air pollution control systems using water scrubbers are installed at 7 crematoriums. Installation of Air pollution control systems proposed at 10 more crematoriums

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
	crematoriums							
IX. Public Awareness								
1	Public Awareness of Waste management	Medium	Yes	Rs. 2 cr.	Ongoing	Ongoing	PMC, Solid Waste Department	Regular IEC programs are conducted at ward levels, slum areas. Cleanliness drives are conducted under Swachh Bharat Mission.
2	Website & Mobile App	--	--	Ongoing	Implemented	Implemented	PMC, IITM, MPCB	For public dissemination of information related to air pollution, online data is made available on Website: safar.tropmet.res.in. Also www.mpcb.gov.in MobileApp: "SAFAR-Air" is made available on mobile platform.
X. City Specific Action Points								
<p>City Specific Action points for PM and NOx:</p> <p>The city specific action points for addressing PM & NOx are as follows;</p> <ol style="list-style-type: none"> 1. Use of CNG for as Green fuel for Public transport buses, 3wheeler Auto-rickshaws & private vehicles. 2. Increasing CNG distribution pumps in city 3. Giving subsidy to 3wheeler Auto rickshaws for conversion from Petrol to CNG 4. Phasing out public transport buses more than 12 years old 5. Use of Electric buses for Public transport 								

S N	Action	Impacts	Technical Feasibility	Requirement of Financial Resources	Implementation Period (Short/Mid/Long term)	Time target for implementation	Responsible Agency(ies)	Information
	<p>6. Promoting non-motorised transport by encouraging Public bicycle sharing system & better street design for pedestrian facilitation including plantation along footpaths as per design of Pune Smart City plan.</p> <p>7. Construction of Metro-the high density corridors</p> <p>8. Promoting use of Ready mix concrete instead of in-situ concrete mixing.</p> <p>9. Wall to wall paving of streets as per Urban Street Design Guidelines</p> <p>10. Giving tax rebate for properties using Solar, Vermi-compost</p> <p>11. Construction of bio-methanisation plants in a de-centralised way to reduce the transport emission from the garbage trucks</p> <p>12. Providing service for door-to-door waste collection with the help of rag picker's association</p> <p>13. Pollution control systems using water scrubbers at crematoriums</p> <p>14. Providing electric based cremation free of cost & promoting gas based crematoriums instead of conventional wood.</p> <p>15. Pune is having a special 'Pune Model' implemented for the supply of electricity, wherein 100% electricity is ensured to whole of the city. This was possible with understanding with CII, wherein deficit in electricity demand was fulfilled by industry sector through CII. This has reduced the dependency on usage of non-industrial generators.</p>							

Region CAAQMS Locations in Pune Muncipal Corporation (PMC) area				
Sr.No.	Station Name	Address	Latitude	Longitude
1	Hadapsar, Pune - IITM	System Of Air Quality And weather Forecasting Research Ram Manohar Lohiya Udyan, Pune Solapur Road, Hadapsar	18.501793	73.927532
2	Karve Road, Pune - MPCB	Karve road olid ward office near railway reservation center.	18.51256536	73.83967945
3	Katraj Dairy, Pune - MPCB	Katraj Dairy Campus, in front of Sarhad college of arts, commerce and science, Near Pune-Kashmir Maitri chowk, Katraj, Pune.	18.45445	73.854155
4	MIT-Kothrud, Pune - IITM	System Of Air Quality And weather Forecasting Research Maharashtra Institute Of Technology (MIT) S No124, Paud Road, Kothrud, Pune 411038	18.517754	73.8214883
5	Opposite Pune airport, Pune - IITM	System Of Air Quality And weather Forecasting Research CWE Office, Near Mhada Colony,Viman Nagar, In Front Of Airport, Pune	18.57792306	73.90919415
6	Revenue Colony-Shivajinagar, Pune - IITM	System Of Air Quality And weather Forecasting Research India Meteorological Department, University Rd, Revenue Colony, Shivajinagar, Pune	18.52974978	73.84968215
7	Savitribai Phule Pune University, Pune - MPCB	Department of Environmental Sciences, Savitribai Phule Pune University Premises, Ganeshkhind Road, Pune.	18.547056	73.826908
8	Panchawati Pashan, Pune-IITM	System Of Air Quality And Weather Forecasting Research, IITM, Dr. Homi Bhabha Road, Panchawati, Pashan	18.536457	73.805454
9	Dhankawadi, IITM PUNE	Bharati Vidyapeeth Campus, Dhankawadi, Pune.	18.459883	73.852193

File No.: Q-16017/40/2020-CPA
Government of India
Ministry of Environment, Forest and Climate Change
(CP Division)

Indira Paryavaran Bhawan,
Jorbagh Road,
New Delhi – 110 003
Dated: 08th January, 2025

OFFICE MEMORANDUM

Subject: Conducting Audit of City Action Plans in line with the guidelines for NKN & IoR under National Clean Air Programme (NCAP) - reg.

With reference to Ministry's guidelines dated 22nd September, 2022 in regard to National Knowledge Network (NKN) and Institutes of Repute (IoRs) under NCAP and further OM's dated 30th December, 2022 and 27th March, 2024 (*copies enclosed*) regarding conducting city level audit and disbursement of funds to IoRs for carrying out audit of city action plans.

2. Further, MoEF&CC vide sanction dated 29th November 2022 has released Rs. 1.27 crore (25% of the sanctioned amount of Rs. 5.10 crore) to SPCBs/PCCs for onward release to IoRs for conducting audit of city action plans. As per the guidelines, an amount of Rs. 4.5 lakh for cities with more than 10 lakh population, Rs. 3 lakhs for cities with 3-10 lakh population, Rs. 1.5 lakh for cities with less than 3 lakh population is to be paid to IoRs for conducting the audit of city action plans and submitting the audit report.

3. Ministry has also issued guidelines for conducting audit for implementation for city action plan under National Clean Air Programme on 5th June, 2024 (*copy enclosed*).

4. In order to complete independent third party audit of city action plans, Ministry has assigned the IoRs to the 130 cities as enclosed at **Annexure I**.

5. In this regard, SPCBs/PCCs are requested to release the funds to IoRs as provided by the sanction order 29th November, 2022 and instruct the IoRs to conduct audit of city action plan and submit the report by 15th February, 2025. The funds shall be released in the following manner:

- i. 25% of the funds while providing instructions to IoRs;
- ii. 50% on submission of audit report to SPCBs/PCCs &
- iii. 25% on acceptance of audit report by SPCBs/PCCs

N. Subrahmanyam

6. In view of the above, SPCBs/PCCs are requested to issue necessary instructions to IoRs as per the **Annexure I** for conducting third party audit of city action plan as per the above mentioned timelines.

This issues with approval of the Competent Authority.

N. Subrahmanyam
08/01/25
(N. Subrahmanyam)
Scientist-E

To:

1. Member Secretary, Central Pollution Control Board
2. Member Secretary, 24 SPCB/PCCs

Copy to:

- i. Director, NCAP, MoEF&CC
- ii. Div. Head, AQM & NCAP, CPCB
- iii. Municipal Commissioners, 130 cities
- iv. Nodal Officers, SPCB/PCC
- v. PPS to AS (NPG), MoEF&CC
- vi. PS to JS (VPM), MoEF&CC

City-wise details of Institutes of Repute (IoRs) for conducting Audit of City action plan:

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
1	Andhra Pradesh (13)	1.Guntur	IIT, Tirupati	Andhra University
2		2.Kurnool	NARL, Gadanki	CSIR – NEERI, Hyderabad
3		3.Nellore	IIT, Tirupati	IIT, Madras
4		4.Vijayawada	IIT, Tirupati	CSIR – NEERI, Hyderabad
5		5.Vishakhapatnam	Andhra University	NARL, Gadanki
6		6.Anantapur	NARL, Gadanki	IIT, Tirupati
7		7.Chittoor	NARL, Gadanki	IIT, Madras
8		8.Eluru	Andhra University	NARL, Gadanki
9		9.Kadapa	NARL, Gadanki	IIT, Tirupati
10		10.Ongole	IIT, Tirupati	Andhra University
11		11. Rajahmundry	Andhra University	NIT, Warangal
12		12.Srikakulam	Andhra University	IIT, Tirupati
13		13.Vizianagaram	Andhra University	NARL, Gadanki
14	Assam (05)	1.Guwahati	IIT, Guwahati	NIT Silchar
15		2.Nagaon	Tezpur University	IIT, Guwahati
16		3.Nalbari	IIT, Guwahati	CSIR – NEIST, Jorhat
17		4.Sibsagar	CSIR - NEIST, Jorhat	Tezpur University
18		5.Silchar	NIT Silchar	IIT, Guwahati
19	Bihar (03)	1.Patna	IIT, Patna	IIT - ISM, Dhanbad
20		2.Gaya	IIT, Patna	IIT - ISM, Dhanbad
21		3. Muzaffarpur	IIT, Patna	IIT - ISM, Dhanbad
22	Chandigarh (01)	1.Chandigarh	Punjab University	PGIMER, Chandigarh
23	Chhattisgarh (03)	1.Bhilai	IIT, Bhilai	NIT, Raipur
24		2.Korba	IIT, Bhilai	NIT, Raipur
25		3.Raipur	IIT, Bhilai	NIT, Raipur
26	Delhi (01)	1.Delhi	Indian Institute of Technology, Delhi	NIT Kurukshetra
27	Gujarat (04)	1.Surat	TERI, Gujarat	Physical Research Laboratory (PRL), Ahmedabad
28		2.Ahmedabad	PRL, Ahmedabad	IIT, Gandhinagar

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
29		3.Vadodara	Physical Research Laboratory (PRL), Ahmedabad	IIT, Gandhinagar
30		4.Rajkot	IIT, Gandhinagar	Physical Research Laboratory (PRL), Ahmedabad
31	Haryana (1)	1.Faridabad	NIT Kurukshetra	Indian Institute of Technology, Delhi
32	Himachal Pradesh (7)	1.Baddi	IIT, Roorkee	Doon University, Dehradun
33		2.Damtal	IIT Mandi ,Himachal Pradesh	Doon University, Dehradun
34		3.Kala Amb	Central University of Himachal Pradesh	IIT Mandi
35		4.Nalagarh	IIT Mandi ,Himachal Pradesh	Central University of Himachal Pradesh
36		5.Paonta Sahib	Central University of Himachal Pradesh	IIT Mandi
37		6.Parwanoo	Aryabhata Research Institute of Observational Sciences(ARIES), Nainital, Uttarakhand	Central University of Himachal Pradesh
38		7.Sunder Nagar	Doon University, Dehradun	IIT Mandi
39	Jammu & Kashmir (2)	1.Jammu	Central University of Jammu	University of Kashmir
40		2.Srinagar	University of Kashmir	Central University of Jammu
41	Jharkhand (03)	1.Dhanbad	Indian Institute of Technology (ISM), Dhanbad	BIT, Mesra
42		2.Jamshedpur	Birla Institute of Technology, Mesra, Ranchi	IIT (ISM), Dhanbad
43		3.Ranchi	Birla Institute of Technology, Mesra, Ranchi	IIT (ISM), Dhanbad
44	Karnataka (04)	1.Bangalore	CSTEP, Bangalore	IISc., Bangalore
45		2.Devanagere	CSTEP , Bangalore	NIT, Surathkal

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
46		3.Gulbarga	National Institute of Technology, Surathkal	IISc., Bangalore
47		4.Hubli-Dharwad	National Institute of Technology, Surathkal	IISc., Bangalore
48	Madhya Pradesh (07)	1.Bhopal	Maulana Azad National Institute of Technology, Bhopal	IIT, Indore
49		2.Dewas	Indian Institute of Technology, Indore	MANIT, Bhopal
50		3.Indore	Indian Institute of Technology, Indore	MANIT, Bhopal
51		4.Sagar	Indian Institute of Technology, Indore	MANIT, Bhopal
52		5.Ujjain	Indian Institute of Technology, Indore	MANIT, Bhopal
53		6.Gwalior	Maulana Azad National Institute of Technology, Bhopal	IIT, Indore
54		7.Jabalpur	Maulana Azad National Institute of Technology, Bhopal	IIT, Indore
55	Maharashtra (19)	1.Akola	Government College of Engineering, Amravati	Visvesvaraya National Institute of Technology, Nagpur
56		2.Amravati	Government College of Engineering, Amravati	Visvesvaraya National Institute of Technology, Nagpur
57		3.Aurangabad	COEP Technological University, Pune/ Government college of Engineering, Aurangabad	Government College of Engineering, Amravati
58		4.Badlapur	Indian Institute of Technology (IIT), Bombay	CSIR NEERI Mumbai
59		5.Chandrapur	Visvesvaraya National Institute of Technology, Nagpur	NEERI, Nagpur

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
60		6.Jalgaon	Savitribai Phule Pune University	Indian Institute of Technology (IIT), Bombay
61		7.Jalna	COEP Technological University, Pune/ Government college of Engineering, Aurangabad	Government College of Engineering, Amravati Amravati
62		8.Kolhapur	Walchand College of Engineering, Sangli	Visvesvaraya National Institute of Technology, Nagpur
63		9.Latur	COEP Technological University, Pune/ Government college of Engineering, Aurangabad	Government College of Engineering, Amravati
64		10.Mumbai	CSIR NEERI, Nagpur	Indian Institute of Technology (IIT), Bombay
65		11.Nagpur	Visvesvaraya National Institute of Technology, Nagpur	NEERI, Nagpur
66		12.Nashik	Savitribai Phule Pune University	Indian Institute of Technology (IIT), Bombay
67		13.Navi Mumbai	CSIR NEERI, Nagpur	Indian Institute of Technology (IIT), Bombay
68		14.Pune	Savitribai Phule Pune University	CSIR NEERI, Mumbai
69		15.Sangli	Walchand College of Engineering, Sangli	Visvesvaraya National Institute of Technology, Nagpur
70		16.Solapur	Indian Institute of Technology (IIT), Bombay	CSIR NEERI, Mumbai
71		17.Ulhasnagar	CSIR NEERI, Mumbai	Indian Institute of Technology (IIT), Bombay

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
72		18.Thane	Indian Institute of Technology (IIT), Bombay	CSIR NEERI, Mumbai
73		19.Vasai-Virar	CSIR NEERI, Nagpur	Indian Institute of Technology (IIT), Bombay
74	Meghalaya (01)	1.Byrnihat	CSIR-NEERI Nagpur	NIT, Nagaland
75	Nagaland (02)	1.Dimapur	National Institute of Technology, Nagaland	IIT, Guwahati
76		2.Kohima	National Institute of Technology, Nagaland	IIT, Guwahati
77	Odisha (07)	1.Angul	Indian Institute of Technology, Bhubaneswar	IMMT, Bhubaneswar
78		2.Balasore	National Institute of Technology, Rourkela	Indian Institute of Technology, Bhubaneswar
79		3.Bhubaneswar	Indian Institute of Technology, Bhubaneswar	IMMT, Bhubaneswar
80		4.Cuttack	Utkal University	National Institute of Technology, Rourkela
81		5.Rourkela	National Institute of Technology, Rourkela	Indian Institute of Technology, Bhubaneswar
82		6.Talcher	National Institute of Technology, Rourkela	Indian Institute of Technology, Bhubaneswar
83		7.Kalinga Nagar	Utkal University	National Institute of Technology, Rourkela
84	Punjab (09)	1.Dera Bassi	Punjab Engineering College	Indian Institute of Technology, Ropar
85		2.Gobindgarh	Post Graduate Institute of Medical Education & Research (PGIMER), Chandigarh	Punjab Engineering College, Chandigarh

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan	
86		3.Jalandhar	Indian Institute of Technology, Ropar	Punjab Engineering College	
87		4.Khanna	Post Graduate Institute of Medical Education & Research (PGIMER), Chandigarh	Punjab Engineering College, Chandigarh	
88		5.Ludhiana	Indian Institute of Technology, Ropar	PGIMER, Chandigarh	
89		6.Naya Nangal	Indian Institute of Technology, Ropar	PGIMER, Chandigarh	
90		7.Pathankot/Dera Baba	Punjab Engineering College	Indian Institute of Technology, Ropar	
91		8.Patiala	Punjab Engineering College	Indian Institute of Technology, Ropar	
92		9.Amritsar	Indian Institute of Technology, Ropar	PGIMER, Chandigarh	
93		Rajasthan (05)	1.Alwar	MNIT, Jaipur	BITS, Pilani
94			2.Jaipur	Birla Institute of Technology & Science, Pilani	MNIT, Jaipur
95	3.Jodhpur		Indian Institute of Technology, Jodhpur	CSIR, Pilani	
96	4.Kota		MNIT, Jaipur	BITS, Pilani	
97	5.Udaipur		CSIR, Pilani	IIT, Jodhpur	
98	Tamilnadu (04)	1.Thoothukudi	Indian Institute of Technology, Chennai	NARL Tirupati, Andhra Pradesh	
99		2.Trichy	Indian Institute of Technology, Chennai	NARL Tirupati, Andhra Pradesh	
100		3.Madurai	Indian Institute of Technology, Chennai	IIT, Tirupati	
101		4.Chennai	Indian Institute of Technology, Chennai	IIT, Tirupati	

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
102	Telangana (03)	1.Hyderabad	Indian Institute of Technology, Hyderabad	EPTRI, Hyderabad
103		2.Nalgonda	NIT, Warangal	CSIR-NEERI, Hyderabad
104		4.Sangareddy	CSIR - National Environmental Engineering Research Institute (NEERI), Hyderabad Zonal Centre	EPTRI, Hyderabad
105	Uttar Pradesh (17)	1.Agra	IIT Kanpur	TERI
106		2.Allahabad	Banaras Hindu University	IIT Kanpur
107		3.Anpara	Institute of Environment & Sustainable Development, BHU	TERI
108		4.Bareilly	Harcourt Butler Technical University	IIT, BHU
109		5.Firozabad	Rajkiya Engineering College, Manipuri	IIT Kanpur
110		6.Gajraula	Rajkiya Engineering College, Bijnor	IIT Kanpur
111		7.Ghaziabad	IIT, Delhi	AMU, Aligarh
112		8.Jhansi	Bundelkhand Institute of Engineering & Technology Jhansi	Kamla Nehru Institute of Technology, Sultanpur
113		9.Kanpur	Indian Institute of Technology, Kanpur	IIT, BHU
114		10.Khurja	Aligarh Muslim University, Aligarh	IIT, Delhi
115		11.Lucknow	TERI- The Energy and Resources Institute	IIT, BHU
116		12.Moradabad	Aligarh Muslim University, Aligarh	IIT, Delhi
117		13.Noida	Indian Institute of Technology, Delhi	AMU, Aligarh
118		14.Raebareli	Kamla Nehru Institute of	IIT, Delhi

S.No.	State	Cities	Current IoR for technical assistance	IoR for conducting Audit of City Action Plan
			Technology, Sultanpur	
119		15.Varanasi	Banaras Hindu University	Kamla Nehru Institute of Technology, Sultanpur
120		16.Gorakhpur	Madan Mohan Malviya University of Technology, Gorakhpur	Kamla Nehru Institute of Technology, Sultanpur
121		17.Meerut	Indian Institute of Technology, Roorkee	Madan Mohan Malviya University of Technology, Gorakhpur
122		1.Kashipur	IIT, Roorkee	Doon University
123	Uttarakhand (03)	2.Rishikesh	Doon University	Aryabhata Research Institute of observational sciences
124		3.Dehradun	Aryabhata Research Institute of observational sciences	IIT, Roorkee
125		1.Kolkata	Bose Institute, Kolkata	CSIR-NEERI, Kolkata
126		2.Asansol & Raniganj	CSIR-NEERI, Kolkata	IIT, Kharagpur
127	West Bengal (06)	3.Barrackpore	Bose Institute, Kolkata	CSIR-NEERI, Kolkata
128		4.Durgapur	CSIR-NEERI, Kolkata	IIT, Kharagpur
129		5.Haldia	IIT, Kharagpur	Bose Institute, Kolkata
130		6.Howrah	CSIR-NEERI, Kolkata	Bose Institute, Kolkata