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

Ameet Singh .....Applicant

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 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 present Additional Affidavit-in-Reply in compliance of order dated 06/04/2026.

(2) I say and submit that, various NCAP cities have adopted vehicle-based dust suppression and water-

NOTARY
ADV. JAYKUMAR C. GEDAM
DIST. PUNE MAHARASHTRA
REGN. NO. 38730
EXPIRY DATE 07/02/2030
GOVERNMENT OF INDIA

sprinkling measures, including Delhi's anti-smog guns and sprinklers, Ghaziabad's jetting machines and water sprinkling, Indore's mechanized sweeping with recycled water use, and Parwanoo's road-dust control through paving and supporting infrastructure, under the Compendium of Best Practices under National Clean Air Programme, 2025 release by Ministry of Environment Forest and Climate Change Hereto marked and annexed as **"Annexure R1-I"** is the copy of Compendium of Best Practices under National Clean Air Programme, 2025 release by Ministry of Environment Forest and Climate Change (MoEF&CC).

City	Best practice adopted	Short reference text
Delhi	Fog cannon / anti-smog gun vehicles and water sprinkling	Delhi implemented targeted road-dust control at major hotspots through **mechanized sweeping**, **large-scale water sprinkling using sprinklers**, and deployment of **anti-smog guns** for dust suppression.
Ghaziabad	Jetting / water-based dust suppression with mechanized cleaning	Ghaziabad Nagar Nigam implemented integrated road-dust management, including **mechanized sweeping**, **water sprinkling**, and **jetting machines** to suppress road dust.
Indore	Mechanized road sweeping with recycled water use	Indore deployed mechanized road-sweeping machines and coordinated use of **recycled water** for dust control on primary and commercial roads.
Parwanoo	Road paving plus drainage	Parwanoo controlled fugitive road dust

	and dust-suppression support	through paving, black-topping, road maintenance, drainage works, and dust-suppression-oriented infrastructure improvements.

(3) I say and submit that, regular water sprinkling and fogging are essential measures for effective dust control, particularly at construction, demolition, debris-handling, and road-dust-prone areas. The CPCB-circulated CSIR-NEERI document on dust management highlights that dust emissions should be controlled at source through measures such as sprinkling, dust suppressants, covering of material stockpiles, controlled transportation of debris, and use of mist/fogging systems during demolition activities. Adoption of sprinkling and fogging helps suppress fugitive dust, reduce particulate matter dispersion, and ensure better compliance with environmental safeguards. Hereto marked and annexed as **"Annexure R1-II"** is the copy of CPCB-circulated CSIR-NEERI document

(4) I say and submit that, since air pollution in Pune city is increasing and the Air Quality Index (AQI) level is rising, the frequency and timing of spraying through

fog cannon vehicles should be increased in order to reduce the levels of PM10 and PM2.5 in the air. To reduce the amount of dust on roads, regular spraying is carried out through fog cannon machine vehicles. These vehicles are also used at various developments sites of Answering Respondent where construction work is ongoing, roads around CAAQMS stations, and other essential areas.

It has been instructed that, flow meters should be installed in the gensets fitted in the fog cannon vehicles. This will help determine the exact quantity of diesel being used and prevent wastage of fuel. A maximum of 60 litres of diesel per day should be used at one time, and if gas is required, 20 litres should be used at one time. In one shift, approximately 30 litres of diesel and 80 litres of gas should be used in the fog cannon vehicles.

It has also been directed that, fog cannon vehicles should operate daily in two shifts. If two rounds are carried out in a day, the quantity of diesel and gas refilling should be double the prescribed quantity. The

diesel and gas refilling centres should be located along the planned routes assigned to the fog cannon vehicles. instructions have been given to determine refilling centres for diesel and gas, for reducing the increasing air pollution in the city. A revised schedule should be prepared for the planned routes, newly revised road routes, trips of fog cannon vehicles, diesel and gas refilling locations.

Refilling centres: Instead of keeping diesel and gas refilling centres at a single location, they should be decentralised and made available at locations near the planned routes.

Speed Alert: If the speed of a fog cannon vehicle exceeds the prescribed limit, the app should have a facility to show a pop-up alert. The idling time currently observed should be reduced during early morning and evening hours. In the app developed by Ashok Leyland, the average speed of all fog cannon vehicles should be visible. Each fog cannon vehicle should complete spraying over a distance of 80 kilometres in 10 hours

per day. Hereto marked and annexed as **"Annexure R1-III"** is the copy of operation of Fog Cannon Machines.

(5) I say and submit that, currently there are currently 5 Fog Cannon operational on the following routes:-

Details of fog cannon vehicle

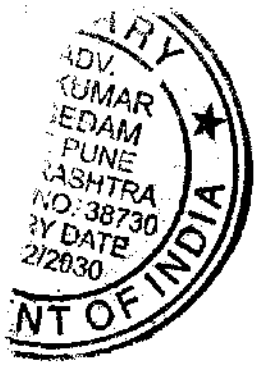
Sr. no.	Vehicle number	Routes
1.	MH12XM8130	Agriculture College / University → अभिमान श्री IITM → साधाण चौक → सुस रोड → सुसगाव → माणे World → निसर्ग → ओंडी शोरूम (गोलाणा) → सह्याद्री → बालेवाडी साखर संकुल → शनिवारवाडा → मनपा → RMC मेट्रो स्टेशन → अभिनव चौक → जुना बाजार (Pride) → बालेवाडी → शिवाला चौक
2.	MH12XM8131	काँग्रेस भवन → डेक्कन → कर्वे रोड → चांदणी चौक → भूगाव चौक → मार्विन गार्डन → वारजे → NDA → उत्तमनगर → कोंढवे-धावडे → खडकवासला → गारेड सिटी → धायरी → प्रगेजा सिटी → वारजे → अल्का चौक → Cummins कॉलेज → वनदेवी → SNDP पुलळा → टांडेकर पूल
3.	MH12XM8132	टांडेकर पूल → सिंहगड रोड → हायवे → आंबेगाव → कात्रज चौक → सातारा रोड → स्वारगेट → सारसबाग → ABC चौक → शनिवारवाडा → दगडूशेठ → पेशवे उद्यापती → टिळक रोड → टांडेकर पूल
4.	MH12XM8134	कात्रज → कोंढवा → हांडेवाडी चौक → हडपसर गाडीतळ → कात्रज → सोलापूर रोड → मंजरी बु. → मंगरपट्टा → रंगाधाम
5.	MH12XM8135	खराडी → पेरणा → गुजन चौक → Airport → वडगाव शेरी → वाघोली चौक → वाघोली–शिवडी रोड→ जेल रोड → C&D प्लांट (विश्रांतवाडी) → लोहगाव → विमाननगर → विश्रांतवाडी

(6) I say and submit that, moreover, there is demand for the Fog Cannon machine by Councilors and resident of the answering respondent.

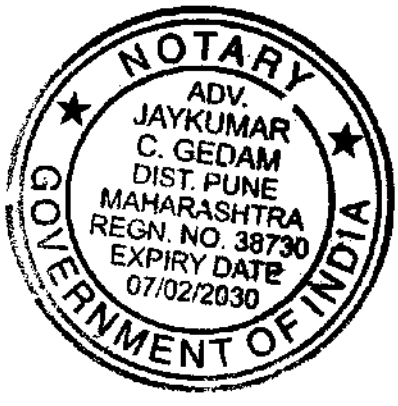
Hereto marked and annexed as **"Annexure R1-IV"** is the copy of letters received by the answering respondent.

(7) I say and submit that, circular has been issued regarding sensor-based monitoring at construction sites and the guidelines to be followed for reducing air pollution.

NOTARY ADV. JAYKUMAR C. GEDAM DIST PUNE MAHARASHTRA REGN. NO. 38730 EXPIRY DATE 07/02/2030 GOVERNMENT OF INDIA



The answering respondent has initiated a significant program to effectively control dust at construction sites. Under this initiative, a structured framework has been developed to assess dust levels at construction sites using a sensor-based monitoring system. In this context, answering respondent has conducted a co-location study at IITM, Pune, to shortlist suitable makes and models of sensors. A Task Force Committee has been constituted to establish a sensor-based air quality monitoring system and develop a centralized dashboard to control air pollution caused by dust at construction sites. Additionally, answering respondent has developed an internal monitoring platform (dashboard) to track dust levels and guide builders accordingly. As part of this initiative, it has been made mandatory for all construction projects with an area of 5,000 sq. m. or more to install sensor systems along with LED indicator displays. The LED indicator system reflects the intensity of dust levels and helps on-site personnel take necessary control measures. Answering respondent has also issued a circular dated 15/12/2025, introducing



a mandatory control checklist for all construction sites, along with an action plan based on dust intensity levels. At present, this system has been installed at 316 construction sites, out of which 313 sites have been successfully integrated with the answering respondent dashboard, across various construction sites in the answering respondent area, with 46 sensors in Zone 1, 89 in Zone 2, 19 in Zone 3, 52 in Zone 4, and 10 in Zone 5. Hereto marked and annexed as **"Annexure R1-V Colly"** is the copy of sensor-based monitoring.

Pune

Date: 28/04/2026

Res. No 1

उप आयुक्त
पर्यावरण विभाग
पुणे महानगरपालिका

NOTARY
ADV. JAYKUMAR C. GEDAM
DIST. PUNE
MAHARASHTRA
REGN. NO. 38730
EXPIRY DATE 07/02/2030
GOVERNMENT OF INDIA

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 28th day of April, 2026

Adv. for Respondent No. 1

Respondent No. 1
उप आयुक्त
पर्यावरण विभाग
पुणे महानगरपालिका

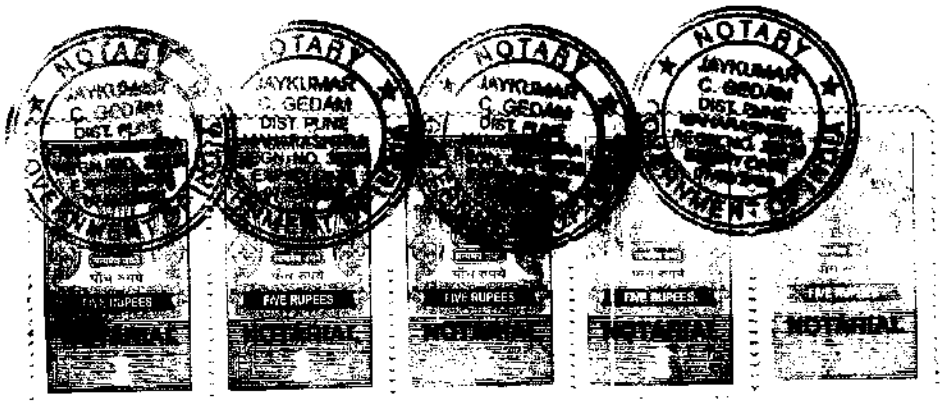
NOTED AND REGISTERED
AT SR. NO. A946
DATE... 28/04/2026

BEFORE ME

JAYKUMAR C. GEDAM
ADVOCATE & NOTARY
GOVT. OF INDIA

28 APR 2026

NOTARY
ADV.
JAYKUMAR
C. GEDAM
DIST. PUNE
MAHARASHTRA
REGN. NO. 38730
EXPIRY DATE
07/02/2030
GOVERNMENT OF INDIA



ANNEXURE R1-I

Compendium of

Best Practices under National Clean Air Programme

2025

मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
भारत सरकार

सत्यमेव जयते

भूपेन्द्र यादव
BHUPENDER YADAV

MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA

FOREWORD

Air pollution is a major concern in urban areas. With more than 40% of country's population estimated to be living in urban areas by 2030, Hon'ble Prime Minister Shri Narendra Modi in his Independence Day 2020 address announced a special program to address air pollution in more than 100 cities for providing better air quality for citizens.

To take forward the commitment made by Hon'ble Prime Minister, I am happy to inform that the Government has been implementing National Clean Air Program (NCAP), a meticulously designed program, with a comprehensive, integrated and collaborative approach to address air pollution in 130 cities of the country.

I am pleased to know that urban local bodies have been implementing a wide range of air quality improvement measures as part of clean air action plans under NCAP in Mission mode. I commend the efforts made by all cities and congratulate the cities for implementing innovative technologies and solutions to address air pollution including the creation of mini forests in urban areas.

I am sure this compendium not only encourages cities to showcase their innovative approaches and best practices but also provides a guidance to other cities to adopt these practices as suitable to their local conditions to develop sustainable urban infrastructure and achieve the objective of 'Clean Air for All'.

8th September, 2025
New Delhi

(Bhupender Yadav)

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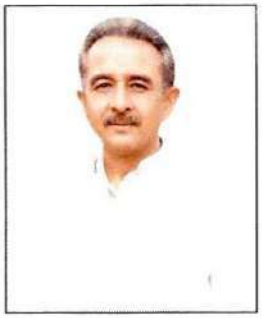
स्वच्छ भारत
एक कदम स्वच्छता की ओर

सत्यमेव जयते

राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
विदेश मंत्रालय
भारत सरकार
MINISTER OF STATE
ENVIRONMENT, FOREST AND CLIMATE CHANGE
EXTERNAL AFFAIRS
GOVERNMENT OF INDIA

कीर्तवर्धन सिंह
KIRTI VARDHAN SINGH



FOREWORD

Recognising the importance and benefits of providing better air quality for people of the country, Government has launched a flagship programme 'National Clean Air Programme (NCAP)' to improve air quality in 130 cities through implementation of National, State and city action plans.

I congratulate all Central Government agencies, State Governments, urban local bodies and eminent institutions associated with the programme for playing pivotal role in bringing their expertise and contribution towards planning, coordination, execution and monitoring of clean air initiatives under NCAP.

I am delighted to know that this collaboration has brought innovation and modern technology in transformation of urban landscapes into sustainable green infrastructure while implementing clean air action plans.

This compendium of best practices is a reflection of the hard work, dedication and commitment of cities in pursuit of providing better air quality for all citizens. This provides an opportunity for other cities to learn from their peers for expeditious execution of clean air initiatives in respective cities.

I encourage all cities to consider this compendium as a reference for applying these best practices and innovative solutions in their cities to achieve objective of National Clean Air Programme (NCAP).

(Kirti Vardhan Singh)

8th September, 2025
New Delhi

कार्यालय: 5वां तल, आकाश विंग, इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली-110003, दूरभाष: 011-20819418, 011-20819421, फैक्स: 011-20819207, ई-मेल : mos.kvs@gov.in
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तन्मय कुमार
TANMAY KUMAR

सत्यमेव जयते

सचिव
भारत सरकार
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

FOREWORD

Government of India's 'National Clean Air Programme (NCAP)' aims to address transboundary nature of air pollution through collaborative approach and actions of Central Govt., State Govt., their agencies and urban local bodies.

It is heartening to to see National, State, and City-level action plans getting implemented with innovative technology and locally grounded solutions in cities to reduce pollution in targeted 130 cities.

This Compendium presents a selection of successful initiatives undertaken under key thematic areas of NCAP, including road dust control, vehicular pollution, waste management, industrial pollution and developing mini forests in ubran areas. These best practices and innovative approaches have been tested and implemented by cities that have yielded positive outcomes in terms of reducing air pollution.

I am confident that this Compendium will serve as a valuable resource for all urban local bodies and stakeholders of NCAP for emulation and adoption of these innovative solutions clean air strategies.

I congratulate Central Pollution Control Board, State Pollution Control Board and all stakeholders who have compiled these best practices of NCAP.

(Tanmay Kumar)

September 8, 2025
New Delhi.

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वीर विक्रम यादव, आई.ए.एस.
Vir Vikram Yadav, IAS

सत्यमेव जयते

अपर सचिव
भारत सरकार
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
ADDITIONAL SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
& CLIMATE CHANGE

Shri Vir Vikram Yadav
Additional Secretary
Ministry of Environment, Forest and Climate Change
Government of India

National Clean Air Programme (NCAP), launched by the Government of India, is a landmark initiative aimed at systematically improving air quality across 130 cities through multi-sectoral and multi-level actions. With rapid urbanisation and increasing population density, addressing air pollution has become priority for Government to ensure the health and well-being of our citizens.

It is encouraging to witness the growing commitment of States, urban local bodies, and implementing agencies in operationalising clean air action plans in a structured and time-bound manner. The integration of local innovation, global best practices, and advanced technologies in addressing sources of pollution under NCAP is truly commendable.

This Compendium serves as a repository of best practices and successful interventions undertaken by cities in key thematic areas. It is a reflection of the collaborative spirit and knowledge-sharing that are vital for the success of the Programme.

I am confident that this Compendium will act as a beacon to scale these successful initiatives in other cities and contribute towards achieving the goal of 'Clean Air for All.'

08th September 2025
New Delhi

(Vir Vikram Yadav)

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नीलेश कुमार साह
संयुक्त सचिव
Neelesh Kumar Sah
Joint Secretary

सत्यमेव जयते

LiFE Lifestyle for Environment

भारत सरकार
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
Government of India
Ministry of Environment, Forest & Climate Change

Shri Neelesh Kumar Sah
Joint Secretary
Ministry of Environment, Forest and Climate Change
Government of India

The journey of improving air quality in 130 cities of country through execution of 'National Clean Air Programme (NCAP)' of Govt. of India has witnessed a growing momentum among cities to implement targeted interventions with emphasis on global best practices and modern technology.

This Compendium on air quality improvement measures encapsulates the essence of collective journey—showcasing not just the technical interventions, but also the collaborative efforts and innovation that brought these success stories.

From dust control to construction & demolition activities, from waste management to waste to wealth, from vehicular pollution to sustainable transport, from urban greening to mini forests, from industrial pollution to cleaner fuels and clean technologies, State Governments and cities have undertaken varied air pollution mitigation activities that has led to achieving their annual air pollution targets. This is a testimony to creativity and adaptability of cities in addressing their unique challenges to reduce air pollution.

I congratulate Central Pollution Control Board, State Pollution Control Board, Cities and all stakeholders for successful implementation of best practices. I am confident that the cities that have implemented these best practices will mentor, guide and facilitate other cities to take up clean air initiatives in their respective cities to achieve common goal of 'Clean Air for All'.

Nsah

9th September 2025
New Delhi

(Neelesh Kumar Sah)

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2 Control of Vehicular Emissions

3 Solid Waste Management

4 Construction & Demolition Waste Management

5 Control of Industrial Pollution

6 Greening of Urban Spaces

7 Capacity Building and Public Awareness

Road Dust Control

1 DELHI

Road Dust Reduction via Multi-Agency Coordination and Infrastructure

Delhi implemented targeted dust control over thirteen major hotspots identified via comprehensive source apportionment studies. Measures include mechanized sweeping (18 nos.; 40 km per day per unit), large-scale water sprinkling (using 609 sprinklers), installation of anti-smog guns (337 nos.), dust suppressant spraying, and bottleneck removals. The Green Delhi App facilitated public participation and grievance redressal.

Problems Addressed

Road dust and construction activities are leading PM10 and PM2.5 sources, aggravated by poorly maintained roads, traffic congestion, and industrial emissions.

Implementation Timeline

Started in 2019

6 years

Cost

₹28 Crores

Impacts

14% PM10 and 13% PM2.5 reduction, improved visibility and health, reduced respiratory issues among vulnerable populations, and stronger governance through citizen engagement.

Transformation

- Cleaner, smoother roads with reduced dust layers, safer commutes, and a replicable hotspot-specific mitigation model established.

Challenges and Mitigation

- Space constraints for equipment, recurring unpaved areas, high infrastructure costs, and multiple pollution sources handled by increased monitoring, enforcement, and citizen reporting.

Contact

Dr. Chetna Anand, Senior Scientific Officer, Dept. of Environment, GNCTD
Email: dr.chetnaanand@delhi.gov.in

2 DURG-BHILAI

Road Dust Suppression and Infrastructure Maintenance

Durg–Bhilai implemented road pavement works, bituminous road construction, patch-hole repairs, and roadside green cover development under NCAP using the XV Finance Commission funds. Efforts aimed to reduce dust resuspension, stabilize roads, and improve air quality for residents.

Problems Addressed

Road dust accounted for 48% of PM10 emissions, with industries and domestic sources also contributing.

Implementation Timeline

- FY 2023–24 and FY 2025–26

2 years

Cost

₹51.69 crore

Impacts

Reduced dust dispersion, improved roadside aesthetics, stabilized roads, and healthier urban environment.

Transformation

- Smoother traffic flow, decreased roadside dust, and visibly greener and cleaner landscape.

Challenges and Mitigation

- Interdepartmental coordination gaps addressed by focused collaboration between industrial zones and pollution control boards.

Contact

Shri Deepak Kumar Joshi, Superintending Engineer, Bhilai Municipal Corporation
Email: nigam_bhilai@yahoo.co.in

3 GHAZIABAD

Integrated Road Dust Management and Mechanized Cleaning

Ghaziabad Nagar Nigam implemented large-scale paving and black-topping of roads (335 km), mechanized sweeping (350 km/day), and water sprinkling (400 km/day) to combat road dust pollution. The intervention included expansion of sweeping fleets and jetting machines to suppress dust effectively.

Problems Addressed

High particulate matter from road dust, illegal construction debris dumping, low public awareness, and minimal urban green cover.

Implementation Timeline

FY 2019–20

to

FY 2025–26

Cost

₹2.36 crore

(total under NCAP and ULB funds)

Impacts

44% reduction in PM10 levels, improved public health and awareness, increased plantation-driven carbon sequestration, and energy-efficient mechanization.

Transformation

- Enhanced operational efficiency, reclaimed spaces, improved public engagement, and alignment with clean air goals.

Before

After

Challenges and Mitigation

- Overcame limited public participation through engagement campaigns, ensured fund utilization via monitoring, and institutionalized mechanized sweeping for sustainability.

Contact

Shri Vikramaditya Singh Malik, Municipal Commissioner, Ghaziabad Municipal Corporation
Email: gzb.nagar.nigam@gmail.com | Phone: +91-8303701099

4 INDORE

Road Dust Management (Mechanized Road Sweeping)

Indore Municipal Corporation (IMC) has established Mechanized Road Sweeping (MRS) as a core component of its air quality strategy, addressing the major urban challenge of road dust, a significant contributor to PM10 emissions—especially during winter. Mechanized sweeping is done using certified, PM10-efficient sweepers operating at 8 km/h, capable of removing more than 80% of road dust particles disturbed by vehicular traffic. Operating since 2018, the program combines daily mechanized and manual street cleaning, followed by proper dust disposal at designated sites to prevent re-suspension. Notably, the city has innovated a smart sweeping cart for smaller roads, which requires neither a motor nor a battery.

Problems Addressed

- High levels of airborne PM10 and PM2.5 attributable to road dust
- Health impacts and increased respiratory illnesses
- Limitations of manual sweeping: lower efficiency, limited workforce, and higher labor costs

Implementation Timeline

- Regular ongoing activity since 2018

Implementation Process

- 27 MRS machines deployed in two shifts, covering approx. 800 km of primary roads daily
- Commercial corridors swept twice daily, residential areas once
- Six machine types tailored to area requirements (ELGIN PELICAN, DULEVO 6000, BRODDSON, RAVO, CITYNET, NILFISK)
- Operations use recycled water and coordinate with waste processing infrastructure
- Smart sweeping carts developed and awarded for innovation

Cost

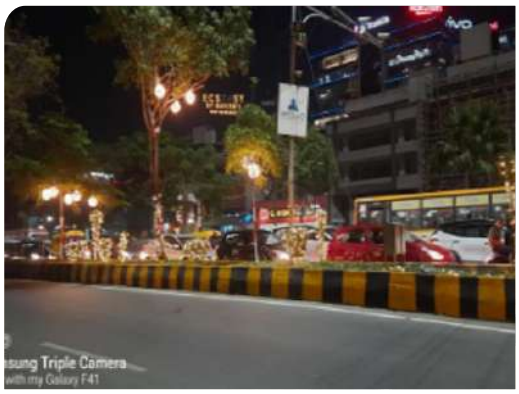
- Approx. ₹2.20 Crore per month (Funded by NCAP and ULB)

Impacts

- **Air Quality:** Reduction in PM10 and PM2.5 by 8.3% and 5%, respectively; RSPM lowered from 145 mg/Nm³ to 75–80 mg/Nm³
- **Economic/Employment:** 320 jobs generated, with re-skilling of former manual sweepers and ragpickers
- **Urban Aesthetics:** Consistently clean, dust-free city roads; improved city image and public satisfaction

Transformation

- Efficient, modernized road maintenance replacing mostly manual systems
- Enhanced city planning with fully paved roads and raised dividers for effective dust control and green buffers
- Integrated approach has contributed to Indore retaining its image as India's cleanest city



Before

After

Challenges and Mitigation

- **Traffic Congestion:** Sweeping is scheduled mainly at night on major roads, with staggered machine operations
- **Low Road Divider Heights:** Central dividers raised to collect more dust and support green buffers
- **Unpaved Roads:** City has upgraded most corridors to fully paved, pothole-free status

Contact

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5 PARWANOO

Road Dust Control (Paving and Maintenance of Roads)

Parwanoo, Himachal Pradesh, ranked road dust as a significant source of PM10 and PM2.5 pollution—especially on poorly surfaced arteries (60% of the network). Under the National Clean Air Programme (NCAP), the city undertook a systematic intervention to pave, black-top, and maintain end-to-end road surfaces across priority hotspots. This included the Old Kasauli Road to Dhaggar Market, Parwanoo-Kasauli and Dharampur Road, and a series of internal roads in industrial and residential sectors. Work was funded through a mix of NCAP and local municipal sources and prioritized the use of interlocking paver blocks and concrete berms for high-dust stretches, simultaneously enhancing city aesthetics.

Problems Addressed

- High ambient air pollution from fugitive road dust emissions, with unpaved, broken, or potholed roads acting as hotspots
- Community exposure to dust contributing to respiratory ailments and a lower urban quality of life

Implementation Timeline

- Initiated: FY 2019-20
- Ongoing: Continuous improvement and maintenance as funds permit

Implementation Process

- Comprehensive survey to identify highest dust-generating road stretches
- Layering of approx. 8041 sqm of interlock tiles (funded under NCAP, ~₹94 lakh)
- Black-topping, pothole-removal, and end-to-end paving (~₹42 lakh, NCAP)
- Beautification and infrastructural upgrades for major nodes (e.g., Gabriel Chowk)
- Construction and repair of key feeder roads in multiple sectors
- Drainage and footpath integration with edging and concrete for dust suppression
- Strategic deployment of funds: ~₹3 Crore (NCAP + ULB Own Funds)

Impacts

- **Air Quality:** Notable reduction in PM10 and improved local AQI
- **Health:** Lower prevalence of dust-related respiratory problems
- **Environment:** Enhanced urban ecosystem and city appearance

Transformation

- Visible shift from dusty, degraded roads to modern, paved corridors and pathways
- Heightened public awareness and involvement in maintaining road cleanliness
- Embedded sustainable practices in routine road repair and construction, protecting both infrastructure and residents

Challenges and Solutions

- **Fragmented and poor surface quality:** Resolved by prioritizing black-topping and interlock tiles on high-traffic and vulnerable stretches
- **Funding limitations:** Tackled through a blend of NCAP support and local ULB budgeting
- **Drainage and run-off concerns:** Addressed through coordinated paver/drain integration
- **Sustained community engagement:** Fostered through beautification projects and outreach

Contact

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6 SANGAREDDY

Road Dust Management through Road Infrastructure Improvement

Under the National Clean Air Programme (NCAP), Sangareddy Municipality implemented comprehensive road infrastructure upgrades to reduce ambient air pollution caused by road dust and traffic congestion. The intervention included end-to-end paving of roads(6 km.), blacktopping damaged stretches (2.5 Km.), repairing potholes (2,000 potholes), and daily mechanical sweeping (91 km. perday) to minimize dust generation and improve road safety and mobility, thereby enhancing air quality and residents' health.

Problems Addressed

Road dust was a major contributor to PM10 and PM2.5 levels in Sangareddy, worsened by poorly maintained roads, unpaved shoulders, and frequent potholes. Vehicular movement on these surfaces caused re-suspension of dust, deteriorating air quality and increasing emissions due to traffic congestion and idling.

Implementation Timeline

2021–2022 and 2023–2024

2 years

Cost

₹4.08 crore

(funded under NCAP, Finance Commission, NHAI)

Impacts

Significant reduction in road dust and PM10 levels, improved driving conditions, smoother traffic flow, and positive public feedback on urban cleanliness.

Transformation

Roads transformed from dusty and uneven corridors into well-paved, uniform surfaces with institutionalized maintenance. Complemented by green infrastructure initiatives.

Image before the work

Image after the work

Challenges and Mitigation

Funding sourced from multiple grants; public resistance managed by awareness campaigns; contractor delays controlled by supervision; maintenance ensured by mechanical sweepers and trained teams.

Contact

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7 VADODARA

Comprehensive Road Improvement and Dust Control

Vadodara Municipal Corporation launched extensive road improvement under NCAP, focusing on end-to-end pavement of 139 km of city roads between 2019 and 2024. The goal was to cover earthen shoulders, repair damaged stretches, and strengthen carriageways to reduce dust particle resuspension, integrated within the city's Clean Air Action Plan.

Problems Addressed

Road dust contributed nearly one-third of PM10 pollution, causing respiratory issues, poor visibility, and hazards. Poor pavement worsened silt re-deposition and drainage problems amidst increasing traffic.

Implementation Timeline

2019 - 2024

5 years

Cost

₹607 Crores

from NCAP, Smart City, State Government, and local funds.

Impacts

PM10 levels dropped by 36% (from 133 to 85 µg/m³), improved vehicular efficiency and emissions, fewer respiratory illnesses, smoother traffic, and climate co-benefits.

Transformation

- Marked dust reduction, enhanced commuting comfort, resilient roads, and improved local governance reputation.

Challenges and Mitigation

- Funds mobilized via multiple sources; detailed stakeholder consultations and grievance redressal; night work minimized disruption; quality ensured by monitoring and penalties.

Contact

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Vadodara Municipal Corporation
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SANDRA TO DANDA
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10
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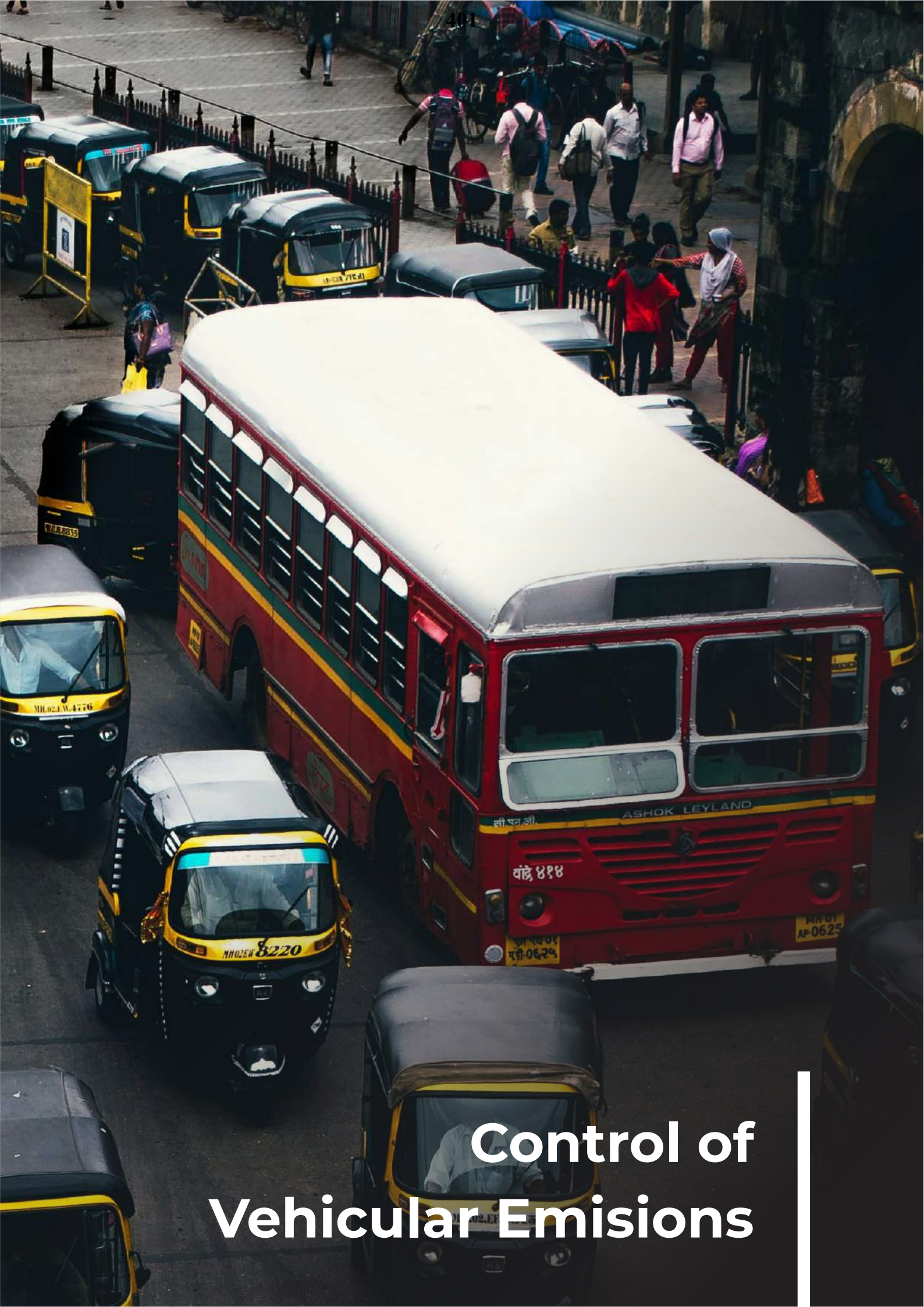
MUMBAI



Control of Vehicular Emisions

8 AHMEDABAD

Bus Rapid Transit System (BRTS)

Ahmedabad developed a 45 km BRTS network offering dedicated bus lanes, electric buses, and integration with feeder routes to reduce private vehicle dependence, lower emissions, and improve access to safe, affordable transport for vulnerable populations.

Problems Addressed

- **Increasing private vehicle usage and urban congestion**
- **Poor, underutilized public transit before BRTS**
- **High pollution and greenhouse gas emissions from urban transport**

Project Timeline

- Planning and pilot phase from 2005-2007
- Initial operations in 2009, network expansion until 2024
- E-bus introduction and scaling ongoing to 2026

Cost

Initial phase approx.

₹495 Crores with ongoing investments

Impacts

- Saved over 15 million liters of fuel
- Reduced 18.7 million kg CO2 equivalent emissions
- Increased ridership to over 160,000 per day
- Enhanced equity and reduced travel costs for low-income riders

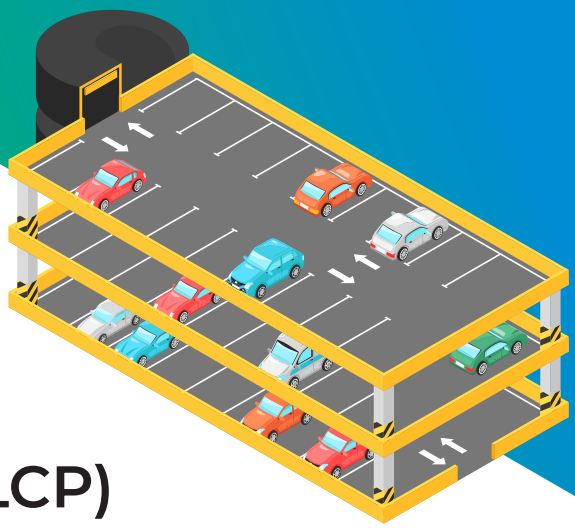
Transformation

- Introducing cleaner, greener urban mobility options
- Enabling last-mile connectivity improvements
- Catalyzing urban redevelopment and social inclusion

Challenges and Mitigation

- Road space allocation conflicts resolved by community engagement
- Land acquisition and infrastructure constraints overcome by innovative planning
- Affordable fare structures and feeder improvements ongoing

9 ANANTHAPURAMU



Development of Multi-Level Car Parking (MLCP)

Under the National Clean Air Programme (NCAP), Ananthapuramu Municipal Corporation implemented a Multi-Level Car Parking facility in the Old Town market area to mitigate air pollution and traffic congestion caused by unregulated roadside parking. Utilizing a puzzle parking system that allows vertical stacking of two-wheelers, the project optimizes limited urban space, shifts parked vehicles off the roads, and decreases vehicle idling, a significant source of vehicular emissions. The MLCP project is a part of a larger ₹3.55 crore clean air investment by the municipality, which also includes junction beautification, pavement upgrades, and digital IEC awareness campaigns. As of late 2023, construction was 70% complete, with full operation expected by the end of 2024.

Problems Addressed

- **Unregulated roadside parking leading to traffic congestion and narrowed roads.**
- **Elevated PM10 levels, consistently exceeding national standards, due to vehicle idling and traffic bottlenecks.**
- **Inefficient land use in dense commercial zones with limited space for parking.**
- **Lack of systematic urban mobility and traffic pollution management in key economic and residential hotspots.**

Implementation Process and Timeline

2020–2021
Planning and identification of parking needs in high-density zones.

2021–2022
Project approval and NCAP fund allocation of ₹50 Lakhs.

2022–2023
Construction and mechanical system installation; 70% progress.

2024 onwards
Expected operationalization and system ramp-up.

Cost

₹50 Lakhs
funded through NCAP.

Impacts

- Reduction in PM10 concentrations from 80 µg/m³ (2017-18) to near 60 µg/m³ (2024-25).
- Improved vehicle flow rate, with decreased waiting times and increased average speeds in congested areas.
- Enhanced urban environment and pedestrian safety due to decluttered roadways.
- Energy savings achieved through reductions in idle fuel consumption and improved traffic fluidity.
- Encouraged behavioral shifts to structured parking use and sustainable city mobility.

Transformation

- Shift from unregulated, disorderly parking to efficient, final structured vertical parking.
- Creation of safer and more accessible pedestrian corridors and public spaces.
- Reduction of vehicular emissions contributes to improved urban air quality in key hotspots.
- Adoption of innovative infrastructure aligns urban planning with clean air goals.

Challenges and Strategy to Resolve

- Funding: Secured NCAP funds by aligning project with national clean air targets.
- Public Adoption: Conducted awareness drives and community interactions to educate residents and businesses on benefits.
- Technical Complexity: Employed expert consultation to design and site the puzzle parking system for minimal disruption.
- Maintenance: Envisioned a self-sustaining revenue model via user fees with contract-based upkeep services.

Related Documents and Contacts

- NCAP Fund Utilization Reports and project presentations.
- Sri P.V.V.S. Murthy, Municipal Commissioner, Ananthapuramu Municipality.

10 DELHI

Electric Vehicle (EV) Charging Infrastructure Development

The Delhi government has undertaken a comprehensive and forward-looking initiative to develop and expand the EV charging infrastructure across the city. This program aims to accelerate the adoption of electric vehicles, particularly two- and three-wheelers, which are significant contributors to urban vehicular pollution.

As of 22nd September 2023, over 2.38 lakh electric vehicles (EVs) have been registered in Delhi. The city currently hosts 3,100 charging stations, 4,793 charging points, and 318 battery swapping stations. By 2025, Delhi aims to establish 18,000 public and 30,000 private or semi-public charging stations to support its growing EV ecosystem.

Additionally, Delhi plans to set up 500 public charging stations and battery swapping units at 100 locations under a public-private partnership model.

This infrastructure expansion complements Delhi's broader air quality management efforts, which include increasing the electric bus fleet and enforcing strict vehicle emission norms.

Problems Addressed

High Vehicle Density

High vehicular density causing substantial PM and NOx emissions

Idling Vehicles

Idling emissions at bus depots and congested intersections

Poor Roads & Traffic Management

Poor road infrastructure and traffic management aggravating pollution

Old Diesel Vehicles

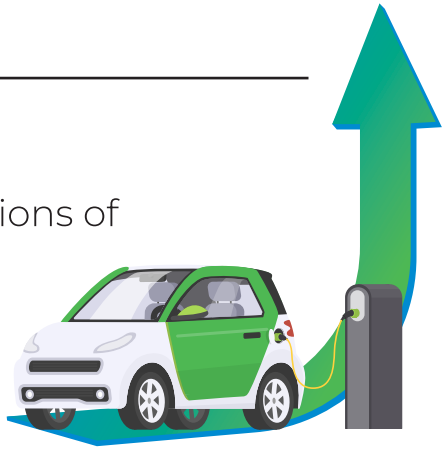
Idling emissions at bus depots and congested intersections

Implementation Timeline

Started 2015

ongoing interventions with micro-level action plans since 2019

Ongoing expansions of **EV network** targeting **48,000** **charging points by 2025**



Impacts

30%
reduction in CO2 from transport sector by 2023

15.8 %
improvement in PM10 levels in 2024-25 as compared to baseline levels of 2017-18

630
electric buses inducted

Growing EV
fleet supported by extensive charging network

Transformation

- Substantial shift to electric and cleaner-fuel vehicles
- Established real-time monitoring and enforcement mechanisms

After

Before

Challenges and Mitigation

- Land acquisition for infrastructure addressed via government land allocation
- Multi-department coordination through working groups
- Large-scale behavioral and regulatory enforcements rolled out

Contact

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11 JABALPUR

Repurposing Scrap Buses for Community Use ('Kabaad se Kamaal')

Jabalpur Municipal Corporation transformed old, decommissioned buses into mobile night shelters, women's changing rooms, and community libraries to reduce pollution from scrap vehicles and address critical social infrastructure gaps. The initiative aligns with circular economy principles.

Problems Addressed

- Pollution from scrap bus degradation
- Lack of homeless shelters and women's sanitary facilities in key urban areas
- Underutilization of old municipal assets

Project Timeline

- Concept proposed in late 2022
- Initial implementations mid-2023
- Expansion and recognition ongoing through 2025

Cost

₹51 Lakhs

Impacts

- Significant reduction in ambient PM10 levels
- Provision of safe, dignified urban spaces for vulnerable groups
- Demonstration of low-cost, high-impact urban innovation

Transformation

- Waste-to-resource urban solution
- Inclusive social infrastructure creation
- Enhanced governance and community participation

After

Before

Challenges and Mitigation

- Public skepticism managed by education and demonstration
- Cost constraints alleviated by local innovation and NGO partnerships
- Compliance with land and building regulations through mobile, non-permanent units

12 KADAPA

Junction Improvement and Road Widening (Ambedkar Circle to Y Junction)

Kadapa Municipal Corporation executed significant urban infrastructure improvements targeting vehicular pollution reduction. Works include redevelopment of key roads and traffic junctions such as Ambedkar Circle and Y Junction, stormwater management installations, and pedestrian-friendly pathway construction. Public spaces were beautified with green landscaping and cultural elements, transforming previously underutilized spaces into community assets. These actions contributed to measurable air quality improvements and enhanced urban livability.

Problems Addressed

- **Rising vehicular pollution driven by increased vehicle ownership, predominated by two-wheelers.**
- **Vehicle emissions exacerbated by inadequate monitoring and physical traffic congestion.**
- **Insufficient pedestrian and non-motorized transport facilities.**
- **Unpaved roads contributing to dust emissions and poor urban drainage.**

Implementation Timeline

2023
Road upgrades and junction redevelopment, stormwater drainage, and greening

2024
Expansion of pedestrian infrastructure and green corridors

2025
Continued road paving and green space development, increased street cleanliness programs

Cost

Approximately
₹21 Crores

Impacts

- Reduction in PM10 levels from 89 µg/m³ in 2017 to 43 µg/m³ in 2020, with stabilization close to standards afterward.
- Enhanced pedestrian safety and accessibility, increasing walkability in key zones.
- Significant curbing of dust emissions through road paving, stormwater management, and road sweeping.
- Promotion of environment-friendly transport modes and behavioral shifts towards sustainable commuting.

Transformation

- Tangible improvement in ambient air quality and reduction of urban dust pollution.
- Urban areas evolving into more walkable and pedestrian-centric environments.
- Elevated civic engagement and pride due to beautified public spaces and safer roads.
- Institutional strengthening and enhanced coordination among municipal and state bodies.

Challenges and Strategy to Resolve

- Public concerns addressed via extensive consultations and inclusive design for informal vendors and locals.
- Financial limitations managed by funding amalgamation including NCAP, state grants, and urban development authorities.
- Coordination bottlenecks eased through creation of multiagency committees.
- Maintenance ensured through regular inspections, community participation, and monitoring initiatives.

Related Documents and Contacts

- NCAP reports, finance commission documents, and urban planning files.
- Shri V. Vijaya Chander, Commissioner, Kadapa Municipal Corporation.

13 PUNE

Integrated Road Design for Clean Air and Inclusive Mobility

Under the Pune Streets Program, a series of transformative road design interventions have addressed escalating vehicle emissions while promoting sustainable mobility in line with the National Clean Air Programme (NCAP). Efforts encompassed building wide, continuous footpaths, dedicated cycle tracks, improved junctions, and universal accessibility features. Iconic roads such as FC Road, JM Road, Satara Road, and Aundh DP Road underwent landmark conversions, with key junctions transformed to provide shaded walk zones, signalized crossings, and safe pedestrian infrastructure.

The 2025 milestone includes 200 km of street and 100 km of footpath redesigns. Street design shifted focus from private vehicles (73% of fleet as two-wheelers, with 2 lakh registrations annually) towards public transport and non-motorized modes. Rainbow BRT expansion, CNG and electric bus induction, and the embedding of a 400 km city-wide bicycle plan further anchored modal shift.

Scope

200 km of redesigned streets, 100 km of advanced footpaths (as of 2025); 86 km of cycle tracks existing, 100 km planned; expansion of Rainbow BRT to 50 km (target: 90 km) and introduction of CNG/electric fleet

Problems Addressed

- **Dominance of private vehicles, increased congestion, and lack of coordinated street design**
- **Road dust and vehicular emissions (road dust: ~61% of PM; vehicles: ~18%)**
- **Unsafe pedestrian infrastructure, encroachments, poor public space management**

Timeline

- **2012 – Concept introduced**
- **2015 – Rainbow BRTS (28 km); pilot redesigns**
- **2016 – Urban Design Guidelines, Pedestrian Policy adopted**
- **2017 – Full-scale rollout (3 km); expansion continues**
- **2018 – Parking Policy; CNG/electric bus induction; public bike share**
- **2019 – Bicycle Plan merged in city development strategy**
- **2025 – 200 km streets, 100 km footpaths achieved; scaling up**

Cost

₹172 Crores

Funded via PMC budget, Smart Cities Mission, and NCAP

Implementing Agencies

Pune Municipal Corporation (PMC); Urban Design Cell; Bicycle Department; Traffic Police; Maharashtra Pollution Control Board; ITDP (technical); National Institute of Urban Affairs (training)

Impacts

- Modelled PM10 reduction from 177.62 µg/m³ to 55.24 µg/m³; NOx from 193.08 µg/m³ to 60.05 µg/m³ by 2025 (68% reduction)
- Shift to 200 CNG and 25 electric buses; modal shift toward cleaner mobility
- Increased safety, accessibility; reclaimed public spaces and improved citizen satisfaction
- Estimated daily operational/emission cost saving of ₹3 crore from reduced VKT

Transformation

- Streetscapes now feature tactile paving, landscaping, cycle tracks, and safe crossings
- Modal shift towards walking, cycling, and buses
- Air quality improved; notable health and societal co-benefits
- Institutional reforms: dedicated Urban Design and Bicycle Cells, policies adopted

After

Before

Related docs & Contact

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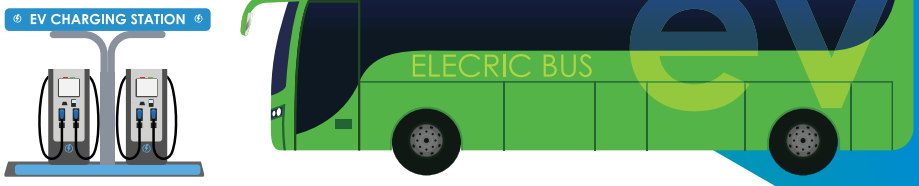
14 VASAI VIRAR



Deployment of 40 Electric Buses for Urban Transport

VVMC introduced 40 electric buses operating under a net cost contract model, complemented by necessary charging infrastructure and training programs, to promote clean and efficient urban transport while reducing emissions, noise, and fossil fuel dependence.

Problems Addressed

- High diesel bus emissions and noise pollution
- Overdependence on fossil fuels in public transit
- Lack of infrastructure and operational expertise for Evs

Timeframe

Phased deployment ongoing with training and infrastructure since 2023

Cost

₹62.8 Crores

Impacts

- Zero tailpipe emissions improving local air quality
- Improved public transport passenger comfort and reduced noise
- Contribution to climate mitigation goals and sustainable energy use

Transformation

- Shift to zero-emission urban buses
- Capacity building for sustainable transport management
- Promotion of citizen awareness and green commuting

Challenges & Mitigation

- Funding gaps partially bridged by VVMC's own funds
- Public adoption encouraged through awareness campaigns
- Infrastructure readiness ensured via planned charging stations

Contact

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Solid Waste Management

15 AGRA

Legacy Waste Remediation and Urban Greening

Agra remediated **19 lakh tonnes** of legacy waste at the Kuberpur Integrated Waste Management Complex. The reclaimed **47-acre site now hosts a 10-acre landscaped park and 10-acre urban forest.** The intervention included biomining, bioremediation, and infrastructure development (C&D plant, bio-CNG unit), significantly improving air quality and public health.

Problems Addressed

- Methane emissions and odor pollution
- Open burning and environmental contamination
- Public health risks

Implementation Timeline

2018 – 2023

5.5 years

Cost

₹61.56 crore

(funding source: SBM 1.0 + 15th Finance Commission)

Impacts

- Reduction in PM10, PM2.5, SO_2, NO_2
- Improved groundwater quality
- Community use of reclaimed space
- Enhanced carbon sequestration

Transformation

- Pollution hotspot converted into sustainable urban park and forest, restoring ecosystem services.

Reclaimed Kuberpur dumpsite occupied with Integrated Waste Management Complex, landscape park & urban forest

Challenges and Mitigation

- Public acceptance and technical complexity
- Funding mobilized through convergence

Contact

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16 ALWAR

Legacy Waste Remediation and Park Development

Alwar successfully remediated 89,872 tons of legacy waste at its municipal dump site, completed in June 2024. The reclaimed 6-acre site was transformed into a public park with grass cover and Miyawaki plantation. This initiative tackled open burning, dust emissions, and health risks from stray animals and nearby settlements, contributing to improved air quality and urban aesthetics.

Problems Addressed

11% of PM10 emissions contributed from waste dumping and burning worsening ambient air quality.

Health risks and environmental contamination due to Frequent burning of waste at the dumpsite released toxic fumes and particulate matter, posing serious respiratory risks.

Implementation Timeline

Feb 2024

June 2024

5 months

Cost

₹4.90 crore
(SBM for remediation)

₹0.016 crore
(NCAP for greening)

Impacts

- Elimination of methane emissions
- Improved air quality through reduction in PM levels
- Plantation of 50,000 saplings
- Recycled materials reduced fossil fuel use
- Enhanced health and aesthetics

Transformation

Legacy dump converted into green public space, improving air quality and encouraging nearby habitation.

6-acres of reclaimed land transformed into a public park with grass cover and Miyawaki plantation

Challenges and Mitigation

Limited funding addressed via SBM/NCAP

Technical complexities managed through expert engagement

Contact

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17 BHOPAL

Legacy Waste Remediation and Scientific Closure with Bio-mining

Bhopal's remediation of the Bhanpur dumpsite stands as one of India's most ambitious legacy waste management projects under the Swachh Bharat Mission. Spanning approx. 37 acres, the site had accumulated over 7.23 lakh metric tonnes of waste, posing serious environmental and health risks to surrounding communities.

The intervention began with bio-mining, where legacy waste was scientifically excavated, segregated, and processed. Recyclables were recovered, inert materials were used for road construction, and non-recyclables were sent to cement kilns as RDF. Once the waste was cleared, the site underwent scientific closure, which included capping with geo-synthetic liners, leachate collection systems, and gas venting infrastructure to prevent future contamination.

Post-remediation, the reclaimed land was developed into green belts and buffer zones, using native vegetation to stabilize the soil and improve biodiversity. This transformation led to measurable improvements in air quality, groundwater safety, and land usability, while drastically reducing methane emissions and vector-borne disease risks.

Problems Addressed

- Methane emissions and groundwater contamination
- Aesthetic degradation and disease risks

Implementation Timeline

Jan 2018 – Dec 2021

Cost

₹58.38 crore

(NCAP Fund and SBM 1.0)

Impacts

- Elimination of foul odours
- Reduced disease incidence
- Improved soil and groundwater quality
- Enhanced urban green space

Transformation

- Pollutant-laden dump converted into reclaimed green land supporting environmental health.

Remediated Bhanpur Khanti Dumpsite

Challenges and Mitigation

- Heterogeneous waste volumes
- Funding secured through SBM and state schemes

Contact

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18 GORAKHPUR

Legacy Waste Remediation and Miyawaki Forest Development

Gorakhpur's transformation of the EKLA BANDHA dumpsite is a standout example of sustainable urban remediation aligned with India's Green Credit Programme. The site, once a major source of pollution and public health concern, was remediated through biomining and bioremediation of approximately 1.96 lakh metric tonnes of legacy waste. This process involved scientific excavation, segregation, and treatment of waste materials, with recoverables reintegrated into value chains and non-recyclables sent to cement kilns as RDF (Refuse-Derived Fuel).

Following remediation, the city undertook an ambitious afforestation drive using the Miyawaki method, planting over 1.2 lakh saplings to create a dense urban forest. This Japanese technique promotes rapid growth and biodiversity by planting native species close together, resulting in self-sustaining green cover that requires minimal maintenance. The intervention significantly reduced methane emissions, improved soil and water quality, and eliminated the foul odour that had plagued nearby communities.The reclaimed site now serves as a vibrant green space, contributing to Gorakhpur's improved air quality and ecological resilience.

Problems Addressed

- Methane and GHG emissions
- Groundwater contamination
- Health and environmental degradation

Implementation Timeline

June 2022 – April 2023

10 months

Cost

₹10.19 crore

(Source of fund: NCAP)

Impacts

- PM10 reduced below national standards
- Improved soil and groundwater quality
- Increased green cover and public health

Transformation

- Degraded landfill converted into thriving urban forest with strong community participation.

Ekla Bandha dumpsite before remediation

Plantation for Miyawaki forest development in remediated the EKLA BANDHA dump site

Challenges and Mitigation

- Technical complexity and community skepticism
- Long-term forest maintenance planned

Contact

Mr. Gaurav Singh Sogarwal, Municipal Commissioner, Gorakhpur Nagar Nigam
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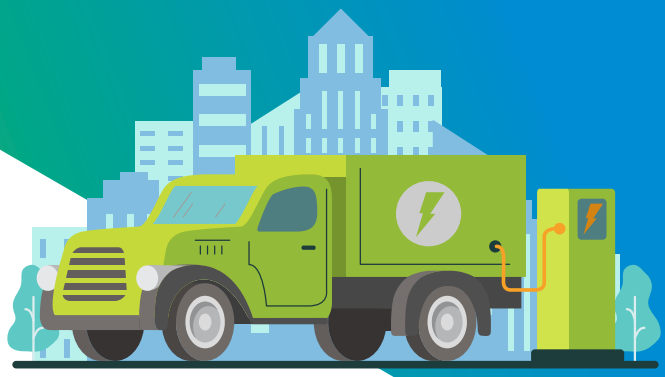
19 GWALIOR



Deployment of Electric and CNG Vehicles in Municipal Solid Waste Management

Gwalior Municipal Corporation initiated the deployment of electric and CNG-powered waste collection vehicles, including 9 electric tippers and 50 electric/CNG vehicles. A dedicated EV charging station was also installed to support the transition. This intervention aims to reduce emissions from the municipal fleet, enhance operational efficiency, and promote clean mobility adoption.

Problems Addressed

- High vehicular emissions from aging diesel fleet
- Lack of EV charging infrastructure
- Noise pollution and poor fuel efficiency

Implementation Timeline

Ongoing
(Procurement and deployment progressing in 2025)

Cost

₹1.68 crore

Impacts

- Reduction in PM and GHG emissions
- Improved fleet efficiency and noise reduction
- Strengthened compliance with air quality norms

Transformation

- Shift towards sustainable municipal fleet operations, improved institutional capacity, and enhanced public health outcomes.

Challenges and Mitigation

- Public awareness and behavioral change
- Skilled manpower and infrastructure development
- Funding mobilization through convergence and state support

Contact

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20 MORADABAD

Legacy Waste Remediation via Bio-mining

Moradabad Municipal Corporation undertook scientific remediation of approximately 5.8 lakh metric tonnes of legacy waste at the Rampur Road trenching ground. Remediation was implemented using funds from the 15th Finance Commission. Compost and Refuse-Derived Fuel (RDF) generated from the processed waste are being sold to vendors by the implementing agency. To date, 98% of the legacy waste has been successfully disposed of, reclaiming nearly 20 acres of urban land. The Corporation plans to develop a city garden on the reclaimed site.

Problems Addressed

- Methane and GHG emissions
- Foul odour, leachate seepage, and fire hazards
- Groundwater contamination and public health risks

Implementation Timeline

Jan 2022 – ongoing

Cost

₹51.01 crore

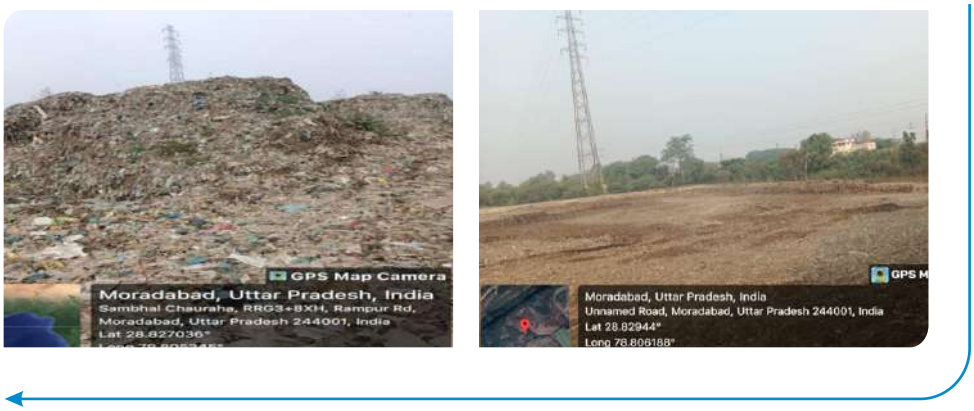
(funded through the 15th Finance Commission grants)

Impacts

- Reduction in PM10 and PM2.5 concentrations
- Elimination of open waste burning
- Improved respiratory health for vulnerable populations
- Reduction in methane and Co_2 emissions

Transformation

- Landfill site has been revitalized into productive urban land, enhancing environmental health and advancing circular resource practices.



Challenges and Mitigation

- Public apathy and funding constraints
- Lack of designated disposal sites
- Poor road infrastructure

Contact

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21 VADODARA

Legacy Waste Remediation via Bio-mining and Circular Resource Recovery

Vadodara Municipal Corporation undertook scientific remediation of approximately 4 lakh metric tonnes of legacy waste at the Makarpura landfill. Using bio-mining techniques, waste was excavated, segregated, and processed—recovering recyclables for reuse, inert materials for construction, and combustible fractions for energy generation as Refuse-Derived Fuel (RDF). The site was then capped and stabilized, with green belts and buffer zones developed to prevent future contamination and enhance ecological value. This intervention led to marked improvements in air, water, and soil quality, while significantly reducing methane emissions, leachate seepage, and public health risks.

Problems Addressed

- Methane and GHG emissions from legacy waste
- Open fires and toxic pollutants
- Groundwater contamination and urban pollution

Implementation Timeline

Feb 2021 – Feb 2023 (2 years)

Cost

₹33.68 crore

Impacts

- CO_2 mitigation equivalent to forest carbon sequestration
- Elimination of landfill fires
- Reuse of inert/plastic waste as alternative fuels and materials
- Improved air and water quality

Transformation

- Polluting landfill converted into reclaimed land supporting healthier urban environment and resource efficiency.

Challenges and Mitigation

- Technical complexity in waste treatment
- Ensuring complete remediation
- Sustained funding through SBM and convergence

Contact

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22 VIJAYAWADA

Comprehensive Waste Management and Biomining with Modern Fleet Deployment

Vijayawada has emerged as a model city in integrated waste management through a comprehensive strategy that tackled legacy waste, modernized collection systems, and promoted circular economy practices. The city biomined over 3.5 lakh tonnes of legacy waste from the Ajith singh nagar dumpsite, reclaiming 45 acres of land that was transformed into a vibrant public park. This initiative not only eliminated a major source of air pollution but also created green public spaces and infrastructure for sustainable waste processing. The city installed a Material Recovery Facility (MRF), bio-methanation and composting units, and a 70 TPD construction and demolition waste plant. To further modernize operations, Vijayawada deployed 250 CNG-powered waste collection vehicles equipped with GPS, RFID, and CCTV, significantly reducing emissions and improving service delivery.

Problems Addressed

- Legacy waste and plastic pollution
- Inefficient waste collection
- High vehicular emissions from diesel fleet

Implementation Timeline

2003 – 2024
(21 years, major biomining in recent years)

Cost

₹25.92 crore

Impacts

- Reduction in PM10 and GHG emissions
- Increased green cover
- Energy generation via bio-CNG and WtE
- Improved sanitation and public health

Transformation

- Modernized waste management system with green energy and public participation.

Before and after pictures of Ajith Singh Nagar dumpsite

Challenges and Mitigation

- Processing capacity and infrastructure funding
- Behavioral resistance addressed via awareness

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Construction & Demolition Waste Management

23 AHMEDABAD

Policy for Good Construction Practices

Ahmedabad faced rising dust pollution due to rapid construction growth, with PM10 levels reaching 158 µg/m³ in FY 2018–19. A source apportionment study attributed 16% of this pollution to the construction sector. In response, Ahmedabad Municipal Corporation (AMC), in partnership with Gujarat Pollution Control Board (GPCB), launched the Policy for Good Construction Practices in March 2025, formally inaugurated by the Hon'ble Chief Minister in July 2025.

The policy mandates:

- **Mandatory use of green netting and windshields**
- **Covered storage and transport of C&D waste**
- **Real-time data display and monitoring for transparency**

These measures have significantly improved air quality in high-density zones and institutionalized responsible construction practices across the city.

Problems Addressed

- **41,878 citizen complaints (2021–2023) were addressed**
- **Prolonged exposure from 6–18-month construction cycles causes respiratory and cardiovascular issues**

Implementation Timeline

From March 2025(formally inaugurated by the Hon'ble Chief Minister in July 2025.) and still ongoing
Key Components: The key components of the policy for Good Construction Practices include

- **All construction sites must implement dust control measures such as water sprinkling, dust screens, and wind barriers.**
- **Loose construction materials (e.g., sand, cement) must be covered and stored in enclosed areas to prevent dispersion.**
- **Sites above a certain size threshold must install wheel washing stations to prevent dust tracking onto public roads.**
- **Projects must maintain vegetative buffers or plant trees around the perimeter to trap airborne particles.**
- **Builders must register their sites with AMC and submit a self-declared compliance checklist before starting work.**

- Fines escalate based on the severity and recurrence of violations, ranging from ₹25,000 to ₹5 lakh.
- Citizens can report violations via AMC's grievance portal or mobile app.
- Projects adopting advanced dust control technologies or sustainable materials may receive fast-track approvals or tax rebates.
- AMC and GPCB conduct workshops for contractors and site managers on best practices and regulatory updates.
- The policy complements AMC's greening mandates, including the 5% green cover requirement in new TP schemes.

Cost

- Air Quality Monitoring Sensor: ₹2 lakh
- Green Net, Windshield, Barricades: ₹1 lakh

Impacts

- PM10 reduced from 158 µg/m³ (2018–19) to 89 µg/m³ (2022–23)
- Enables AMC to proactively manage emissions and enforce compliance

Transformation

- Dust control mainstreamed into project planning and approvals
- ₹3.13 crore penalties collected in FY 2023–24; ₹1.72 crore in FY 2024–25

Challenges and Mitigation

- Worker Health Risks: Respiratory, cardiovascular, and neurological impacts
- Awareness Gaps: Addressed through training and visual demonstrations
- Compliance Resistance: Mitigated via penalties and low-cost solutions

Contact

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24 JAIPUR

Jaipur – Construction & Demolition Waste Processing Plant (PPP Model)

To address the escalating issue of unmanaged construction and demolition (C&D) waste in Jaipur, Nagar Nigam Greater Jaipur and Nagar Nigam Heritage Jaipur have jointly established a 300-tonne-per-day C&D Waste Processing Plant at Langdiawas under a Public-Private Partnership (PPP) model. Operated by M/s Shivalik Silica and Arghya Engineering Pvt. Ltd. JV, the facility ensures scientific collection, transportation, processing, and recycling of C&D waste into usable products such as aggregates and paver blocks. With six strategically identified C&D waste collection centers across the city, the initiative significantly curbs illegal dumping, mitigates dust pollution, and fosters circular economy practices. By promoting environmentally sound waste management, the system contributes to cleaner urban surroundings and aligns with the Solid Waste Management Rules, 2016, as well as the objectives of the National Clean Air Programme (NCAP), offering a replicable model for sustainable urban infrastructure.

Problems Addressed

- Roadside dumping and dust pollution
- Parceling issues and urban flooding risks

Implementation Timeline

- 2020 - 2024 Plant operational

Cost

₹6 crore (PPP funded)

Impacts

- Reduced dust and improved urban environment
- Health benefits and enhanced city aesthetics
- Sustainable construction material adoption

Transformation

- Institutionalized C&D waste handling
- Circular economy integration

Challenges and Mitigation

- Builder resistance addressed via IEC and enforcement

Before

After

Contact

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25 LUCKNOW

Lucknow – Construction & Demolition Waste Processing Plant

To combat illegal dumping and dust pollution, Lucknow Municipal Corporation commissioned a 300 TPD wet processing plant in 2025. The facility uses advanced technologies like Hydro Cyclones and Aqua Cycle, producing recycled bricks, pavers, and aggregates. Waste collection is managed via 8 zone-wise centers and a 311 mobile app under a PPP model.

Problems Addressed

- Unregulated dumping causing flooding and pollution
- Dust-related health impacts (~6% sector contribution)
- Lack of structured recycling infrastructure

Implementation Timeline

- 2023 – 2025 (2 years)

Cost

- ₹10 crore (₹5 crore funded by municipal corporation + ₹5 crore under PPP)
- ₹1.4 crore for collection centers (Funded via 15th Finance Commission and private investment)

Impacts

- Improved air quality and reduced particulate matter
- Circular economy promoted through recycled products
- Job creation and economic uplift
- Enhanced urban cleanliness and reduced flooding

Transformation

- Structured waste management replacing illegal dumping
- Integration of recycling into urban infrastructure

Challenges and Mitigation

- Behavior change institutionalized via IEC and helpline
- Scalability addressed by expanding collection nodes

Lucknow – Construction & Demolition Waste Processing Plant

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26 UJJAIN

Stakeholder Awareness for Dust Mitigation in Construction & Demolition

Ujjain, a major Hindu pilgrimage city, is undergoing 47 hectares Mahakaleshwar Temple Corridor expansion project. The project was divided into phases. Under the phase-I of the project, largecale Construction and demolition (C&D) activities during this were a significant contributor to the 94.3 µg/m³ of PM 10 Levels. Recognizing that contractors and labourers lacked adequate awareness about the impact of air pollution from such activities, the Ujjain Municipal Corporation (UMC) initiated a stakeholder sensitization programme. The campaign focused on promoting dust mitigation practices, including the use of metal sheet barricades and green netting around active construction sites. The intervention led to a noticeable improvement in ambient dust and improving site management, especially in high-footfall areas of Mahakal Lok, directly benefiting 1.5 lakh people per day by the year 2028

Problems Addressed

- Lack of professional knowledge on dust impacts and mitigation
- Uncontrolled dust emissions exceeding 114 µg/m³
- Public health risks from prolonged exposure

Implementation Timeline

- Initiated in 2022; ongoing awareness and enforcement activities

Cost

Low-cost intervention using reused materials and participatory methods

Impacts

- PM10 reduced to 85 µg/m³ in affected zones
- ~1,50,000 daily residents and visitors benefited
- Cleaner site management practices adopted
- Dust control recognized as mandatory in local policy

Transformation

- Shift in contractor behavior through visual and participatory training
- Safer work environments and improved public health

Before

After

Challenges and Mitigation

- Training gaps addressed via visual demonstrations
- Contractor resistance mitigated through low-cost solutions like reused scaffolding sheet

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Control of Industrial Pollution

27 DEWAS

Replacing Fuel in Industries to CNG

A dedicated awareness campaign was launched for industries and bakeries to promote the shift from traditional fuels to CNG, emphasizing its health and environmental benefits. Tandoors and other coal/wood-based heating systems were converted to CNG-compatible units.

In winter, public bonfires were replaced with CNG-based heaters to limit seasonal air pollution spikes.

Since its inception, the project has demonstrated sustained implementation without external financial assistance. It resulted in a reduction of harmful emissions, improvement in public health, and enhanced environmental sustainability. Moreover, the intervention also generated local employment and set a replicable model for clean energy transitions in other urban industrial zones.

Problems Addressed

- High pollution from biomass/coal use
- Winter pollution spikes; bonfires
- Respiratory harm, toxic emissions

Time Duration

2021-23
ongoing monitoring

Implementation

Dewas Municipal Corporation

No. of industries shifted to cleanfuel
30

Impacts

Current
PM10: 89 µg/m³

Improved health, reduced forest fuel dependence

Energy efficiency, local employment

Transformation

- Model for voluntary, self-financed compliance
- Mindset shift towards sustainability

After

Before

Challenges & Strategies

- Initial reluctance, technical unfamiliarity
- No dedicated fund; used existing capacity, voluntary approach
- Monitoring via compliance checks, supplier partnerships

Related docs & Contact

NCAP Document, Dewas Municipal Corporation

28 SURAT

Pilot Project: Emissions Trading Scheme for Particulate Matter (ETS-PM)

In 2019, Surat launched India's pioneering **Emissions Trading Scheme (ETS) for Particulate Matter (PM)** focused on more than 300 textile units, aiming to transform air quality regulation while offering flexibility in compliance strategy. The ETS marked Surat as a national leader in employing market-based environmental policy, providing direct economic incentives for industries to cut pollution.

Under this initiative, the **Gujarat Pollution Control Board (GPCB)** set an overall cap for PM emissions, allocating emission permits based on boiler size for each participating unit. These permits could be traded in a regulated market, rewarding industries investing in abatement technology and penalizing excessive emitters. **Live trading** commenced among 155 industries, while 145 units with continuous emission monitoring systems (CEMS) acted as controls.

Problems Addressed

Unchecked PM emissions from industrial boilers

Inflexibility and high costs of "command & control" regulatory mandates

Lack of transparent and real-time emissions monitoring

Implementation Timeline

ETS-PM launched and trading started September 2019; ongoing scaling to other cities

Cost

Funded through own resources of participating industries and support from international nonprofits/development agencies

Impacts

- Trading plants averaged 18% lower PM emissions than non-trading control units
- Generation of a comprehensive, publicly accessible emissions database via CEMS and live website/app
- Significantly reduced overall cost of compliance for industries compared to inflexible technology mandates

Transformation

- Incentivised installation and upgradation of best-available PM control technologies
- Created a transparent, real-time monitoring system accessible to all stakeholders
- Shifted towards a market mechanism, replacing rigid regulatory platforms

Positive Impact/Outcome

- Immediate, measurable reduction in ambient PM emissions in trading units
- Lower financial burden for industry compliance
- Innovation recognized and replicated in Ahmedabad, another non-attainment city

Challenges and Mitigation

- Coordinating among a large, diverse base of industrial stakeholders
- Ensuring reliable CEMS installation and operation
- Meeting and enforcing CPCB's 150 mg/Nm³ PM emission standard

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Related docs & Contact

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29 VISAKHAPATNAM

Steam Recovery & Emission Control Using Noble-Metal Catalyst

Near Plot-32 and surrounding units in Parawada, industries traditionally relied on coal-fired boilers, which generated significant carbon monoxide (CO) emissions and particulate dust through stack releases. The fundamental source of pollution was the inefficient burning of coal for steam generation, leading to poor air quality and environmental hazards in the vicinity.

To address this, Kanoria Chemicals adopted a best practice intervention centered on the recovery of process heat from emission control systems. By channeling process gas through a noble-metal catalyst and metal oxide catalyst within the ECS (Emission Control System), the resulting heat is recovered and efficiently used to generate steam, rather than being lost as waste heat through the stack. This innovative process occurs prior to gas emission from the stack, transforming an emission source into a resource.

Target Area

Plot-32, Kanoria Chemicals & Industries Ltd., Parawada

Problems Addressed

High coal consumption leading to elevated CO emissions

Particulate pollution from industrial stack

Poor air quality afflicting nearby regions

Implementation Timeline

Project initiated and completed over 6 months

Cost

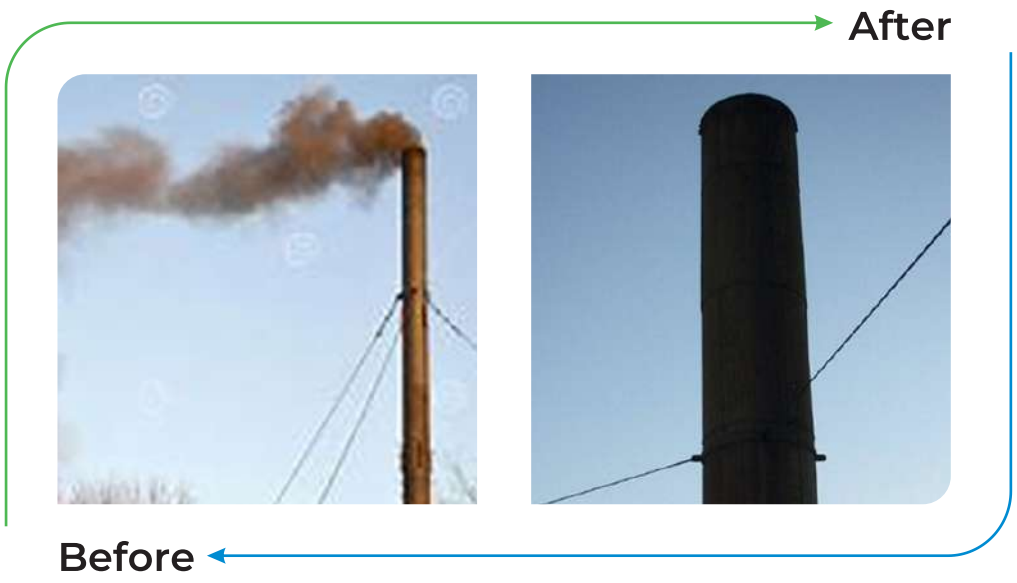
Incurred principally for catalyst procurement; sourced in-house

Impacts

- Active supply of approximately 100 metric tons of steam per day to adjacent industries
- Enabling industries to reduce reliance on coal, preventing an estimated 40 metric tons of coal-related CO emissions daily
- Exemplifying resource efficiency and a commitment to environmental sustainability

Transformation

- Shift from conventional coal-fired boiler steam generation to resource-recycling via catalyst-driven heat recovery
- Streamlined integration of emission control with productive industrial operations
- Economic utilization of advanced emission control technology



Positive Impact/Outcome

- Ongoing sales of recovered steam to local industries
- Substantial coal savings and CO emission reduction
- Strategic environmental benefit for the area

Challenges and Mitigation

- Necessitated capital expenditure for catalyst acquisition
- Sourced funds internally
- Implementation efficiently completed within the set time frame

Greening of Urban Spaces


SHREEPATI

30 AMRAVATI

Greening Activities

- Greening activities include development of 53 gardens, approx. 90,000 tree plantations, and greening of dividers and open corridors.
- Mini forest of approx. 26,500 saplings created over 5 acres in Rahatgaon under "Ek Ped Maa K Naam" and "Harit Maharashtra Samrudha Maharashtra" schemes. Indigenous species planted for urban ecological benefits.

Problems Addressed

AMC lacks technical support from selected Institutes of Repute for scientific studies and pollution control improvements. Support would strengthen air quality management.

Timeline of Intervention and Implementation

Plantation drives every monsoon include government schemes like "One Home One Tree" and "Ek Ped Maa K Naam".

Implementing Authority:
Amravati Municipal Corporation

Source of Funds:
NCAP, other State Government funds, Urban Local Body (ULB) funds

Total Cost of Intervention

₹0.16 Cr. spent for greening activities like roadside dividers under NCAP.

Impacts of the Intervention

- Increased green cover including plantations on dividers, urban forests, Miyawaki forests, and oxygen parks. Shivtekadi barren hill converted into dense vegetation with conservation practices.
- A 25% improvement in PM10 pollution levels was recorded: from 102 µg/m³ in base year 2017-18 to 76 µg/m³ in 2024-25.
- Enhanced societal benefits such as better health and environment from air quality improvements.

Transformation due to the Intervention

- Amravati awarded for clean air achievement under Swachh Vayu Survekshan: 3rd Rank in 2022, 1st Rank in 2023, and 2nd Rank in 2024.
- The city has experienced overall developmental progress over the past five years linked to these interventions.

Challenges Faced and Strategies to Resolve Them

Funding shortages and manpower limitations affect implementation efficiency.

Contact

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31 JHANSI

Miyawaki Plantation

Urban greening is being promoted through the establishment of Miyawaki plantations at five selected sites. These dense, native-species plantations cover a total area of 18,404 square meters and include 78,850 saplings. By increasing greenery within the city, these plantations help absorb particulate matter, sequester carbon, and provide natural cooling, contributing to overall environmental health. Together, the combination of improved road infrastructure, dust management practices, and extensive urban greening is effectively reducing air pollution levels. These interventions not only lower dust emissions but also create a cleaner, healthier urban environment, benefiting residents' well-being and enhancing the city's aesthetic and ecological quality.

Problems Addressed

Road dust emerges as the largest contributor, accounting for 72% of the total PM10 emissions.

Vehicular emissions are the second major source, contributing 19%, followed by industrial sources and domestic sources, each contributing 3%.

Implementation Timeline

2 years

Cost

1098 lakhs

Impacts

- The city's air quality has seen significant improvement due to the implemented interventions.
- The Miyawaki plantation initiative complemented other measures by creating dense green areas at selected sites.

Transformation

From FY 2017-18, air pollution levels have decreased by 42%, reflecting a significant improvement in the city's air quality. Enhanced traffic management and the introduction of electric buses have reduced vehicular emissions, while stricter controls on waste burning and better segregation practices have minimized smoke and particulate matter in the atmosphere. Dust and debris from construction sites have also declined due to regulatory measures, and public awareness initiatives are fostering sustainable behaviors that help maintain cleaner air.

Challenges and Mitigation

Dust generation from nearby crusher mines is a major challenge, contributing to air pollution. To resolve this, dust suppression techniques, such as water spraying and enclosures, will be implemented. Regular monitoring and collaboration with mining companies will ensure effective control and community involvement.

Contact

Municipal corporation Jhansi

32 KOLKATA

Miyawaki Forest Plantation in Urban Water Body Surroundings

KMC implemented the Miyawaki technique to develop dense native forest patches at Rabindra Sarobar and Subhas Sarobar urban water bodies. This initiative, funded under the XV Finance Commission, aimed to increase green cover, improve air quality, and restore biodiversity in congested urban settings, engaging botanists and local communities.

Problems Addressed

Urbanization caused reduced green cover, poor air quality, and biodiversity loss. The project provided dense forest ecosystems in limited urban spaces to tackle these challenges.

Implementation Timeline

Commenced November 2023, ongoing maintenance after initial planting.

Cost

₹42.5 lakhs funded by XV Finance Commission.

Impacts

Improved air purification, carbon sequestration, urban temperature regulation, biodiversity restoration, public awareness, and enhanced aesthetics.

Transformation

Created forest-like dense ecosystems that restored ecological balance and improved quality of life for residents.

Challenges and Mitigation

Limited land availability and community mobilization were mitigated by expert planning, species selection, and outreach campaigns.

After

Before

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33 NELLORE

Greening Traffic Corridors and Open Areas

Nellore Municipal Corporation executed a large-scale greening initiative to reduce air pollution at traffic junctions and corridors in FY 2024–25 under NCAP. Over 7,000 saplings were planted across major roads and 25 open spaces were converted into landscaped green parks with amenities such as walking and seating areas. Native shade-providing trees were prioritized and supported by tree guards and regular maintenance.

Problems Addressed

High dust and pollution from vehicular emissions, urban heat, loss of biodiversity, and insufficient green cover in congested areas were the focus.

Implementation Timeline

Implemented during FY 2024–25.

Cost

₹5.33 crore (₹4.13 crore under NCAP + ₹1.20 crore from ULB Fund)

Impacts

PM_{10} levels reduced from 64 µg/m³ to 51 µg/m³, green belts acted as filters, parks enhanced public health and mental well-being, and the city's aesthetics improved significantly.

Transformation

Traffic junctions and corridors became greener, cooler, cleaner, and more inviting public spaces with measurable air quality improvements.

Challenges and Mitigation

Limited land availability, plantation survival rates (~80%), encroachments, and maintenance demands were managed via regular monitoring, use of tree guards, and dedicated municipal resources.

After

Before

After

Before

Contact

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34 RAJKOT

Miyawaki Forest Plantation on Legacy Waste Dumping Site

Rajkot Municipal Corporation transformed the Nakrawadi waste dumping site, which held about 16 lakh tonnes of legacy waste, into a thriving dense urban forest using the Miyawaki afforestation method. By processing legacy waste into refuse-derived fuel, compost, and inert material, the project integrated circular economy principles. Over 2,35,000 native trees were planted on a 30-acre site using recycled water irrigation, turning a polluted landfill into a green carbon sink that improves air quality and biodiversity.

Problems Addressed

- Lack of urban green spaces
- Poor air quality
- Urban heat island effects
- Soil degradation

Implementation Timeline

Execution occurred over multiple phases, including legacy waste processing, soil preparation, dense planting over 2–3 years.

Impacts

The project significantly improved air quality by filtering particulate matter and gaseous pollutants, contributed to climate change mitigation through carbon sequestration and local cooling effects, yielded energy savings from reduced cooling demand, and provided societal benefits through green spaces for recreation and education.

Transformation

- The formerly barren, polluted land became a multi-layered, self-sustaining urban forest supporting diverse flora and fauna, and acting as a vital ecological corridor.

After

Before

Challenges and Mitigation

- Large volumes of mixed, compacted, and contaminated legacy waste posed operational challenges, addressed through specialized machinery and landfill remediation.
- Community resistance, monsoon delays, and technical expertise gaps were overcome via community engagement and strategic monitoring.

Contact

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Capacity Building & Public Awareness


EMERGENCY EVACUATION

35 DURGAPUR

Capacity Building & Public Outreach

The Durgapur Municipal Corporation, under the National Clean Air Programme (NCAP), has undertaken continuous capacity building and public outreach initiatives to raise awareness among citizens, students, and communities about air pollution sources, impacts, and sustainable management practices to 5000 participants so far. The interventions include daily street cleaning, water sprinkling, greening of open spaces, and door-to-door solid waste collection to curb open burning, along with awareness campaigns in schools, colleges, and public forums. Additionally, the introduction of CNG and e-buses has promoted cleaner mobility and reduced dependence on private vehicles. These integrated efforts have not only improved ambient air quality and reduced public health risks but also enhanced the overall livability and aesthetics of the city. Importantly, the initiatives have strengthened public trust in municipal governance, fostered behavioral change through citizen participation, and created a replicable low-cost model for sustainable dust and pollution management that can inspire similar interventions in other urban centers.

Problems Addressed

- **High PM10 levels from road dust, industrial activities, vehicular movement and garbage burning.**
- **Low public awareness and participation in dust control and clean transport initiatives.**
- **Need for municipal staff training in O&M for sustainable practices.**

Implementation Timeline

2021 onwards till date

4 years

Cost

Rs. 0.038 Cr.

Impacts

- Improved air quality, improved visibility and cleaner roads.
- Public health benefits
- Social and governance benefits: stronger public trust improved community aesthetics.
- Environmental benefits: greener roadside vegetation and improved plant health.

Transformation

- Students in schools and colleges became active messengers of environmental stewardship, spreading the importance of dust control, waste segregation, and reduced use of polluting vehicles within their families and communities.
- Residents reported greater willingness to adopt sustainable practices such as avoiding open waste burning, participating in greening drives, and supporting the use of CNG and e-buses.

Contact

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36 KOHIMA

Capacity Building and Public Outreach

To address the increasing health risk of High PM10 levels the Kohima Municipal Council (KMC), in coordination with concerned departments and local stakeholders, implemented a series of public outreach and capacity-building initiatives under the National Clean Air Programme (NCAP). These efforts aimed to increase awareness about air pollution, its health and environmental impacts, and the importance of adopting sustainable, eco-friendly practices. Activities were designed to engage a wide range of stakeholders—including municipal staff, school students, and the general public—through direct interaction, educational campaigns, and media outreach. The intervention helped cultivate a shared sense of responsibility for cleaner air and adopting sustainable, eco-friendly practices among 17000 (approx.) people.

Problems Addressed

Limited Public Awareness: There was a widespread lack of understanding regarding the causes, consequences, and control measures for air pollution.

Low Public Participation: This knowledge gap led to minimal involvement from the public in existing air quality improvement initiatives, limiting their effectiveness.

Implementation Timeline

2019 onwards till date

6 year

Cost **1.39 crore**

Impacts

- Air Quality Improvement: Enhanced public understanding led to increased adoption of eco-friendly practices, contributing to a reduction in air pollutants.
- Societal Benefits: Strengthened community participation in air quality initiatives, especially among youth and local leadership.

- Climate Benefits: Promotion of sustainable practices resulted in a decrease in local emissions, positively impacting the climate.

Transformation

- Increased public awareness and participation in air quality improvement initiatives.
- Enhanced capacity of municipal officials to manage and monitor air quality effectively.
- Greater emphasis on environmental education in local schools.

Challenges and Mitigation

- **Challenge: Initial public apathy and resistance to behaviour change**
- **Strategy: Addressed by crafting locally relevant messages and involving respected community leaders, teachers, and influencers to build trust and drive participation**

Contact

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37 PATNA

Public Awareness

The Patna Municipal Corporation developed robust and well-coordinated control room to support city cleanliness and beautification efforts to address environmental concerns. This facilitates citizens with accessible and transparent channels to report real time real-time monitoring of garbage collection vehicles through an online tracking system. The facility is accessible via a toll-free number (155304) and a dedicated WhatsApp chatbot (9264447449), enabling citizens to lodge grievances and seek assistance efficiently operating from 6:00 AM to 10:00 PM on daily basis through control room. The initiative equipped with a wireless communication network, the control room enables seamless coordination between field personnel and senior officials, thereby enhancing operational transparency and accountability. A total of 86 operators, including reserve staff, work in rotational shifts to oversee 19 municipal zones. Their responsibilities include managing toll-free calls, generating operational reports, and maintaining communication across multiple channels.

Problems Addressed

- Inefficient garbage collection and management.
- Delays in addressing public grievances related to waste management.
- Lack of transparency and accountability in garbage collection operations.
- Ineffective coordination among field workers and higher officials.

Implementation Timeline

15th March 2024 to till now

1 year

Cost

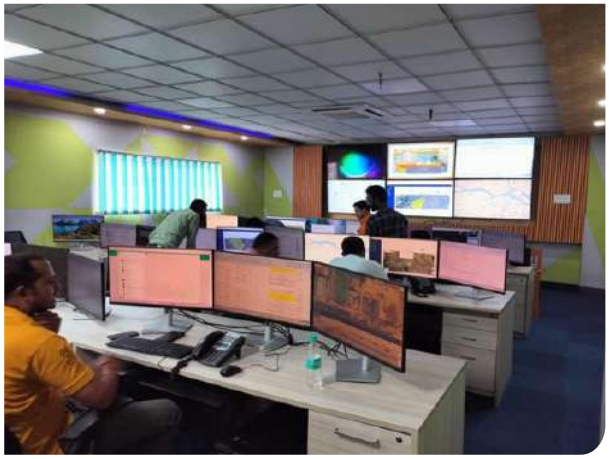
Rs.25 lakhs

Impacts

Efficient garbage collection systems have led to improved air quality, reduced emissions, and notable fuel savings through optimized vehicle routing. Timely grievance redressal has enhanced public satisfaction, while integrated monitoring and communication tools have strengthened transparency and accountability in waste management operations.

Transformation

- Significant improvement in the efficiency and transparency of garbage collection operations.
- Enhanced coordination among field workers and higher officials.
- Increased public satisfaction due to timely resolution of grievances.
- Optimization of resources and reduction in operational costs.



Contact

Shri Kanhiya Kumar, Deputy Municipal Commissioner, Patna Municipal Corporation,
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38 RISHIKESH

Capacity Building and Public Awareness

Mission LiFE initiative, a series of public awareness campaigns were conducted to promote clean air, responsible energy use, and reduction of open garbage burning and single-use plastic. The program primarily targeted local communities, tourists, and students, especially during the Char Dham Yatra, Shri Hemkund Yatra, and Kanwar Yatra, encouraging adoption of eco-friendly habits in daily life.

Problems Addressed

- **During normal time of year waste generation per day is 80 MTPD which surges to 95-105 MTPD during such Yatras and events.**
- **Increased waste generation due to floating population, particularly during Char Dham Yatra, leading to a 25–30% rise in solid waste.**
- **Widespread tendency toward wasteful consumption and limited awareness of the link between daily practices, air quality, and the environment.**

Implementation Timeline

During 2019 to date

6 years

Cost

₹1.17 crore

Impacts

- Positive impacts: Educated floating population during Char Dham Yatra and other mass gatherings; improved public awareness (≈80% increase) on pollution sources and sustainable lifestyle practices. Citizens actively participated in rallies, clean-air pledges, and adopted eco-friendly habits such as avoiding open waste burning, conserving electricity, and reducing single-use plastic.

- Societal benefits: Distribution of jute/cloth bags and installation of plastic banks (1–1.5 tons/week collected, 100% sent to recycling units or MRF centers
- Through rallies, spiritual gatherings, and the distribution of educational materials, citizens gained knowledge about pollution sources, control measures, and sustainable lifestyle choices.
- The involvement of community leaders and institutions helped build trust and engagement.

Transformation

- The intervention brought a significant behavioural and societal transformation in the target areas, particularly during mass gatherings like Char Dham Yatra, Shri Hemkund Sahib Yatra, and Kanwar Yatra, where floating populations were the highest.
- Schools, religious institutions, and local organizations played a vital role in spreading awareness, helping to build a more informed, engaged and environmentally conscious community.

Challenges and Mitigation

- **Community engagement through Nukkad Nataks to connect with people in a relatable way.**
- **Mass IEC activities including rallies, oath-taking ceremonies, drawing competitions, cycling events, and spiritual gatherings to encourage collective participation.**
- **Motivational incentives such as awards and recognition for winners to sustain interest and promote positive behaviour change.**

Contact

Shri Deepak Kumar Joshi, Superintending Engineer, Bhilai Municipal Corporation
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MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

GOVERNMENT OF INDIA

Annexure R1-II

ANNEXURE R1- II

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE GOVT. OF INDIA

SPEED POST

No. B-31013/72/2019/UPC-I/ ४९६१-४९९५ Date: November 13, 2019

To

The Member Secretary
All SPCBs/ PCCs

Subject: Dust Management in Urban Regions: Road Map.

Sir,

You are aware that, rising air pollution in country especially in urban regions is a matter of concern, especially with regard to high levels of particulate matter. For effective management of dust, the CSIR-NEERI has prepared a document on **'Dust Management in Urban Regions: Road Map'**.

Copy of the said document is enclosed herewith for kind perusal. It is further requested that the same may be circulated among concerned Authorities/Executive Agencies under your jurisdiction so that dust management be fruitfully taken care of at different levels.

Encl.: as above

Yours faithfully

[Divya Sinha]
Divisional Head, UPC-I Division

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
निर्गत 14/11/19
दिनांक 20/11/19

c/c

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032
दूरभाष/Tel : 43102030, 22305792, वेबसाईट/Website : www.cpcb.nic.in

suppressed using water but it lasts only until the water evaporates from thesurface. Evaporation can be slowed down by adding dust suppressants to the water.The main dust suppressants that have been tested on paved roads in Europe to reduce PM10 concentrations are:

- magnesium chloride ($MgCl_2$);
- calcium chloride ($CaCl_2$);
- calcium magnesium acetate (CMA); and
- potassium formate (referred to as KF in some publications)

Typically these are combined with lignosulphonates and surfactants in very small quantities. These are tested on different types of surfaces and then applied.

Amato et al. (2010)[4] showed that application of $MgCl_2$at dosage between 20 and 40 g/m^2has resulted in 56% of reduction of PM10 and 70% reduction of PM2.5. They applied it for 10 continuous days to achieve this success.

In order to achieve the maximum effect in terms of dust control and to reduce the environmental and other impacts; CSIR – NEERI evaluated few options of dust suppressant. It has been validated through laboratory studies and field trials under Indian conditions and scenarios. When, it was applied in Delhi for trials, it showed about 6-8 hours of effectiveness from its applications. Hence, dust suppressant can be used to control road side dust.

At Delhi, water sprinkling was effective for 10-15 mins while dust suppressant was effective for more than 6-8 hours after its applications

D. Control of Dust at Construction and Demolition sites

Dust from construction and demolition activities must be controlled using dust suppressants along with water sprinkling.

Action Plan for use of dust suppressant for Storage piles

- For some materials, hard crusts can be built-up on storage piles by application of dust suppressants. Crusts reduce the dust blown off the storage piles. Care is required to avoid application of dust suppressants to a degree that may erode or settle the fines to the bottom of the pile
- Storage piles that are greater than 2.5 m (8 feet) in height and not covered may have a road bladed to the top to allow water truck access or should have operational water irrigation system that is capable of complete stockpile coverage
- Disturbed areas of a construction site, including storage piles of fill dirt and other bulk materials that are not being actively utilized for construction purposes for a period of 7 days or more, should be stabilized with a chemical dust stabilizer or enzymatic dust suppressant

[4]Amato F, A. Karanasiou, P. Cordoba, A. Alastuey, T. Moreno, F. Lucarelli, S. Nava, G. Calzolai, and X. Querol, 2014. Effects of road dust suppressants on PM levels in a Mediterranean urban area. Environmental Science and Technology. 48, 8069-8077.

- A much more effective technique (than applying water to the storage pile) is to apply chemical agents (such as surfactants) directly to the storage pile, which permit more extensive wetting

Other actions must be followed are:

- Developers should avoid the use of long-term stockpiles on-site wherever possible unless it performs the function of visual or noise screening
- Make sure that stockpiles exist for the shortest possible time
- Do not build steep sided stockpiles or mounds or ones which have sharp changes in shape
- Stockpiles should be kept away from the site boundary, sensitive receptors, water courses and surface drains
- Enclose stockpiles or keep them securely sheeted
- Fine or powdery material (under 3mm in size) should be stored inside buildings or enclosures

The covering of stockpile in scientific manner to control dust emission is given in Figure 3.

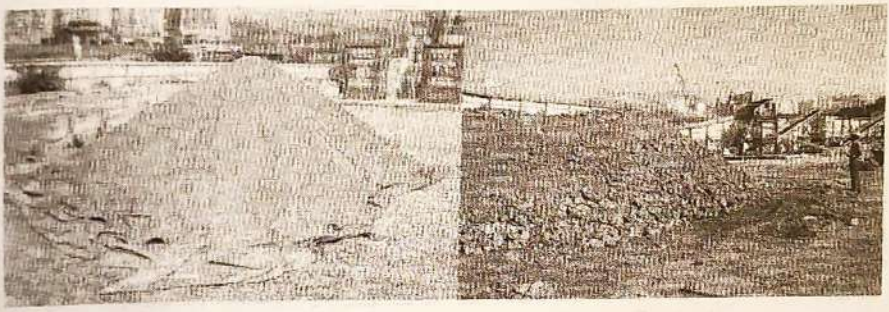


Figure 3: Proper covering and application of dust suppressant on the stockpile

E. Dust Suppression for Road Surfaces

Road surfaces dust loads have also been controlled in many places. However, in Indian city roads dust are primarily laden with local dust from unpaved surfaces or from dust/debris falling from transportation trucks. Over a period of time, these accumulations are too high and mere application of dust suppressant may have limited benefits.

Road surfaces should primarily be controlled through better construction practices and also contracting practices. Application of good road quality surfacing can improved the condition and dust loads from the road alone can get reduced substantially. Road degradation due to poor construction is an another source which can not be easily solved only through dust suppressant.

Action Plan for use of dust suppressant for Road Surfaces

Water can be sprayed on road surfaces to control emission. Control efficiency of water depends on:

(i) Amount (per unit road surface area) of water added during each application

(ii) period of time between applications

(iii) Weight, speed and number of vehicles travelling over the watered road during the period between applications

The control effectiveness of chemical dust suppressants depends on:

(i) the dilution rate used in the mixture

(ii) the application rate (volume of solution per unit road surfaced area)

(iii) the time between applications

(iv) the size, speed and amount of traffic during the period between applications

(v) Meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period

Diagrammatic representation of chemical dust suppressant application is given in Figure 4.

Figure 4: Application of dust suppressants for unpaved roads

F. Dust Control for Debris and other construction material transportation

Delhi and NCR witnesses huge transportation loads of trucks carrying material as also debris. These numbers vary based on status of construction in residential premises, metro work, roads resurfacing and redevelopment of old structures. The action plans for this sector specific dust control warrants multiple options and careful monitoring of the agencies implementing these projects. There is a need to incorporate some of the best practices in the code of practices of construction.

Action Plan for use of dust suppressant for Transportation of debris

- Closed vehicles like dumpers can be used for this purpose
- The top surface of the material to be transported should be applied with dust suppressant prior to loading and/or the entire surface area
- Materials may be sprayed with dust suppressant, 15 minutes prior to handling and/or at points of transfer
- Dust suppressant may be applied at the feed and/or intermediate points in the conveyor system as needed
- Water or dust suppressant couls be sprayed during unloading of the materials and debris (refer**Figure5 and 6**)

Figure 5: Control of Dust during unloading of materials

Figure 6: Washing the wheels of vehicles with dust suppressants

G. Demolition Activities

Demolition activities are the main reason for the generation of dust in a very specific region/area. In order to minimize this dust generation, one must use clean technologies or dust suppressant methods. Water is the most commonly used dust suppressant which do not allow the dispersion of dust to greater extent. Thus, suitably, sufficient quantity of water must be sprayed to control dust emission.Spraying should be carried out prior to and during demolition activities. Dust suppressants may be applied during the following situations:

i. unpaved surface areas within 30 meters (100 feet) where materials from demolition will fall.
ii. debris piles immediately following blasting and periodically afterwards
iii. the surrounding area following demolition (distance of minimum 30 metres)
iv. unpaved surface area where equipment will operate.

Diagrammatic representation of dust management during demolition activities are given in Figure 7.

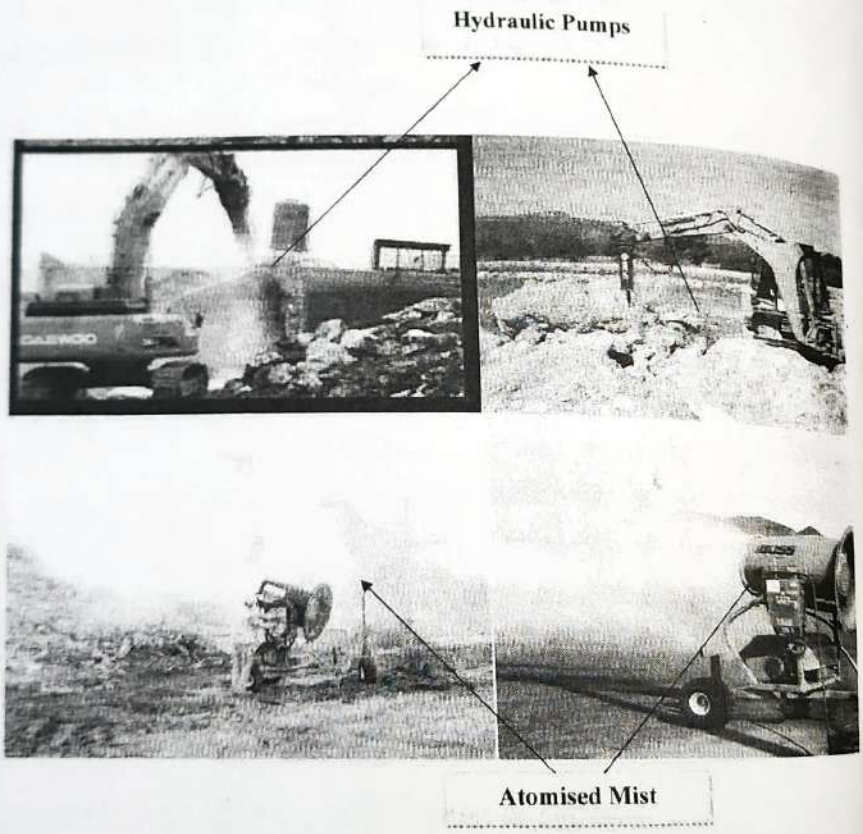


Figure 7: Management plan for dust management from demolition activities

Conclusions and Recommendation

- Dust suppressant must be made compulsory for construction and demolition activities
- They must be used to reduce the dust level at source and at road side as well
- Road side dust must be controlled through better construction practices and later only for construction material piles, dust suppressants can be used.
- Online monitoring system for dust (Particulate Matter) must be made compulsory and it should be displayed at the site and connected to CPCB for record
- Also dust suppressant must be complemented with mechanical sweeping to reduce piling or accumulation of road side dust
- Dust management guidelines of MOEFCC must also include use of dust suppressant for construction, demolition, traffic junctions, along with roles and responsibilities of stakeholders, government bodies, regulatory bodies and citizen
- Environmental monitoring mechanism for dust management

Annexure : Comparison of Water and Dust suppressant costs

Water can be considered as one of the ancient dust palliative, as it is readilyavailable to apply to spraying over the surface of road. Water is used apply moistureto the surface area, but the capacity of dust suppression is less due to evaporation.EPRI which carried out the pilot application last year using Dust Suppressant (hygroscopic liquid compound) helped to reduce 50%- 60%pollutants for 5-6 hours, as compared to water i.e. 25%- 30% which holds moisture for about 15 minutes. Dust suppressant spraying showed more efficiency to reducedparticulate matter emission as compared to water spraying.The cost of EPRI's Dust Suppressant is less i.e. 50 paise/ sq.m with limited maintenanceand suitable for surface area mainly at construction sites as also road side debris and construction material transportation. Some of the mechanized system at construction sites may be more expensive when large scale equipments are deployed for atomization.

The cost comparison of water and a typical dust suppressant indicates that the cost of suppressantis effective as it gives more efficiency and durability with minimal cost as comparedto water/ recycled water.

For Example: (6 Hours)

Water Sprinkling

Water Sprinkling

Area (Sq. m)	Water Requirement	Costing of Water	Application in 6 hrs.	Total Cost in Rupees for 6 hrs.
100	2 Lit. Sq/mt Total Water requirement for 100 Sq. mt = 2 x 100 = 200 Litres	45 paise/lit Total costing of Water for 100 Sq. mt = 45 x 200 = 9000 paise (90 rupees)	24 times	90 x 24 = 2160

Dust Suppressant Sprinkling

Area (Sq. m)	Water Requirement	Costing of Dust Suppressant including water	Application in 6 hrs.	Total Cost in Rupees for 6 hrs.
100	2 Lit. Sq/mt Total Water requirement for 100 Sq. mt = 2 x 100 = 200 Litres	50 paise /sq mt Total costing of Dust suppressant with water for 100 Sq. mt = 50 x 200 = 10,000 paise (100 rupees)	1 times	100 x 1 = 100

Dust suppressant of the varieties which will last longer having lignosulphonates and surfactants will still be cheaper when used for sustained period of 7-10 days.

It is clear from above example the cost of Dust Suppressant is cost effective than single water sprinkling.

ANNEXURE R1- III



पर्यावरण विभाग,
पुणे महानगरपालिका.
जावक क्र: १०४६
दिनांक : 23/02/2026

प्रति,
मा. उपआयुक्त,
मोटार वाहन विभाग,
पुणे महानगरपालिका.

यांजकडेस...

विषय:- Fog Canon Vehicles संदर्भात बैठकीचे इतिवृत्ताच्या अनुषंगाने काम करणेबाबत.

संदर्भ:- मा. अतिरिक्त महापालिका आयुक्त (इ), पुणे महानगरपालिका यांचे कार्यालयात दि.३०/१२/२०२५ रोजी घेण्यात आलेली बैठक.

मा. महोदय,

पुणे शहरातील हवा पातळी गुणवत्ता निर्देशांक (AQI) पातळीत माहे नोव्हेंबर- डिसेंबर मध्ये वाढ झालेचे दिसून आले असता, सदरबाबत मा. अतिरिक्त महापालिका आयुक्त (इ), पुणे महानगरपालिका यांचे दालनात दि. ३०/१२/२०२५ रोजी बैठक घेण्यात आली होती. सदर बैठकीत मा. अतिरिक्त महापालिका आयुक्त (इ) यांचेमार्फत विविध सूचना व आदेश देण्यात आले होते.

तरी, सदर बैठकीचे इतिवृत्त तयार करण्यात आले असून याबाबतचे इतिवृत्त आपले माहितीस्तव व पुढील कार्यवाहीसाठी सोबत जोडून पाठवित आहोत.

मा.स.कळावे,

(किशोरी मोडमल-शिंदे)
उप आयुक्त,पर्यावरण विभाग
पुणे महानगरपालिका

यांजकडे सविनय सादर...

सोबत:- बैठकीचे इतिवृत्त

बैठकीचे इतिवृत्त (Minutes of Meeting)

बैठकीचा विषय: पुणे शहरातील हवा प्रदूषण (AQI) कमी करण्यासाठी fog cannon वाहने याबाबत चर्चा.

बैठकीची दिनांक:- ३०/१२/२०२५ वार – मंगळवार वेळ:- दु. १.०० ते २.००

स्थळ :- मा. अतिरिक्त महापालिका आयुक्त (इ) यांचे कार्यालय, पुणे महानगरपालिका.

उपस्थित मान्यवर:- (उपस्थितीची यादी परिशिष्ट १ मध्ये जोडली आहे)

१) मा.अतिरिक्त महापालिका आयुक्त (इ)

२) मा. उपआयुक्त (पर्यावरण विभाग)

३) मा. पर्यावरण अधिकारी (पर्यावरण विभाग)

४) कार्यकारी अभियंता (मोटार वाहन विभाग)

५) कनिष्ठ अभियंता (मोटार वाहन विभाग)

६) प्रदूषण नियंत्रण अधिकारी तथा एज्युकेशनल ऑफिसर (पर्यावरण विभाग)

७) वेंडर/ठेकेदार-High Tech Pvt Ltd. fog cannon वाहने

८) CPCB Consultant

बैठकीची सुरुवात उप आयुक्त, पर्यावरण विभाग, पुणे महानगरपालिका यांनी आपल्या प्रास्ताविक मार्गदर्शनातून केली. या बैठकीमध्ये १५ व्या वित्त आयोग अंतर्गत हवा प्रदूषण कमी करणेकरिता खरेदी करण्यात आलेल्या ५ fog cannon वाहने याबाबत चर्चा हे उद्दिष्ट होते.

चर्चेचा मुद्दा	करावयाची कृती
१. Fogging वाहने	• मा. अतिरिक्त महापालिका आयुक्त (इ) यांचे मार्फत पुणे शहरातील हवा प्रदूषण वाढत असल्याचे हवा पातळी गुणवत्ता निर्देशांक (AQI) पातळीत वाढ झाल्याने पी. एम १० आणि पी. एम २.५ यांचे हवेतील प्रमाण कमी करण्यासाठी fog cannon वाहने द्वारे फवारणी करण्यासाठी वाहनांची वारंवारता (Frequency) व वेळ (Timing) वाढविण्याचे निर्देश दिले गेले आहेत. • रस्त्यांवरील धुळीचे प्रमाण कमी करण्याच्या दृष्टीने सदर fog Cannon machine वाहनांद्वारे नियमित फवारणी करण्यात येते तसेच पुणे महानगरपालिकेचे विविध विभाग तसेच विभागांची खोदाई कामे, बांधकाम कामे चालू असलेली सार्वजनिक ठिकाणे, CAAQMS च्या आसपासचे रस्ते व अत्यावश्यक परिसर येथेही या वाहनांचा वापर करण्यात यावा. • fog Cannon वाहनांमध्ये असलेल्या जनसेटमध्ये तासमापी मीटर बसविण्यात यावेत यामुळे वापरण्यात येणाऱ्या डिझेल चे अचूक प्रमाण समजण्यात मदत होईल व इंधनाचा अपव्यय टाळता येईल. • Ashok Leland यांच्या द्वारे बनविण्यात आलेल्या aap मध्ये सर्व fog cannon वाहने यांचा सरासरी वेग वघता यावा. • प्रतिदिन एका fog Cannon वाहनांमार्फत १० तासांमध्ये ८० किलोमीटर अंतर फवारणी करून पूर्ण करण्यात यावे.

	• प्रतिदिन ६० लिटर प्रतिदिन डिझेल एका वेळी वापरण्यात यावे. तसेच गॅस असल्यास ४० लीटर एका वेळी वापरण्यात यावा. • एका शिफ्टमध्ये अंदाजे ३० लिटर इतके डिझेल व ४० लिटर गॅस fog cannon वाहनांमध्ये वापरण्यात यावा. • मा. अतिरिक्त महापालिका आयुक्त (इ), पुणे महानगरपालिका यांनी देण्यात आलेल्या आदेशानुसार दररोज २ शिफ्टमध्ये fog cannon वाहनांचे काम करण्यात यावे व एका दिवशी दोन वेळा फेरी असल्यास डिझेल व गॅस यांचे पुनर्भरण प्रमाण हे दिलेल्या प्रमाणापेक्षा दुप्पट भरण्यात यावे. • डिझेल व गॅस पुनर्भरण करण्याचे केंद्र हे fog cannon वाहनांना दिलेल्या नियोजित रस्त्यांच्या मार्ग क्रमात असाव्यात. • मा. अतिरिक्त महापालिका आयुक्त (इ) यांचे मार्फत शहरातील वाढते हवा प्रदूषण कमी करणेसाठी नियोजित मार्गावर व नवीन सुधारित मार्गावरील रस्ते, fog cannon वाहनांचे फेऱ्या,व डिझेल व गॅस पुनर्भरण करण्याचे ठिकाण तसेच जवळच्या STP येथील पाणी पुनर्भरण करणे यासाठी तेथील पुनर्भरण केंद्र ठरविण्यात यावीत व त्या वाहनांचे सुधारित वेळापत्रक तयार करण्यात यावे असे निर्देश देण्यात आले. • पुनर्भरण केंद्र :- एकाच ठिकाणी डिझेल व गॅस पुनर्भरण केंद्र ठेवण्याऐवजी त्याचे विकेंद्रीकरण करून ते नियोजित मार्गाच्या जवळच्या ठिकाणी उपलब्ध करून देण्यात यावे. • स्पीड अलर्ट (स्पीड Alert) :- जर fog cannon वाहनांचा वेग मर्यादेपेक्षा जास्त झाला, तर तसा पॉप-अप (अलर्ट) यावा अशी ॲप मध्ये सुविधा असावी. • सद्यस्थितीत आढळून येत असणारा Idling Time पहाटेच्या व संध्याकाळी कमी करण्यात यावा.

(किशोरी शिंदे)
उप आयुक्त, पर्यावरण विभाग,
पुणे महानगरपालिका

Translated Copy

Page 1

Annexure R1-III

Environment Department,
Pune Municipal Corporation.
Outward No: 1046
Date: 23/02/2024

To,

Hon. Deputy Commissioner,

Motor Vehicle Department,

Pune Municipal Corporation.

To them...

Subject:- Regarding taking action in pursuance of the minutes of the meeting regarding Fog Canon Vehicles.

Reference:- Meeting held on 30/12/2025 in the office of the Hon. Additional Municipal Commissioner (E), Pune Municipal Corporation.

Hon. Sir,

As it was observed that the Air Quality Index (AQI) level in Pune city had increased during the months of November-December, a meeting was held in this regard in the chamber of the Hon. Additional Municipal Commissioner (E), Pune Municipal Corporation on 30/12/2025. In the said meeting, various instructions and orders were given by the Hon. Additional Municipal Commissioner (E).

Therefore, the minutes of the said meeting have been prepared and are being sent herewith for your information and further action.

For your kind information,

(Kishori Jodmal-Shinde)

Deputy Commissioner, Environment Department

Translated Copy

Pune Municipal Corporation

Submitted with respect...

Enclosure:- Minutes of the meeting

Page 2

Minutes of Meeting

Subject of the meeting: Discussion regarding fog cannon vehicles to reduce air pollution (AQI) in Pune city.

Date of the meeting:- 30/12/2025 Day - Tuesday

Time:- 1:00 PM to 2:00 PM

Venue:- Office of Hon. Additional Municipal Commissioner (E), Pune Municipal Corporation.

Dignitaries Present:- (List of attendees is attached in Appendix 1)

1. Hon. Additional Municipal Commissioner (E)
2. Hon. Deputy Commissioner (Environment Department)
3. Hon. Environment Officer (Environment Department)
4. Executive Engineer (Motor Vehicle Department)
5. Junior Engineer (Motor Vehicle Department)
6. Pollution Control Officer and Educational Officer (Environment Department)
7. Vendor/Contractor - High Tech Pvt Ltd. fog cannon vehicles
8. CPCB Consultant

The meeting was initiated by the Deputy Commissioner, Environment Department, Pune Municipal Corporation, with his introductory guidance. The objective of this meeting was to discuss the 5 fog cannon vehicles purchased under the 15th Finance Commission to reduce air pollution.

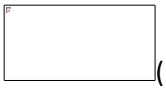
Translated Copy

Point of Discussion	Action to be taken
1. Fogging vehicles	• Due to the increasing air pollution in Pune city and the rise in the Air Quality Index (AQI) level, instructions have been given by the Hon. Additional Municipal Commissioner (E) to increase the frequency and timing of spraying by fog cannon vehicles to reduce the amount of PM 10 and PM 2.5 in the air. • To reduce the amount of dust on the roads, regular spraying should be done by mother fog cannon machine vehicles. Also, these vehicles should be used at various departments of the Pune Municipal Corporation, excavation works of departments, public places where construction work is ongoing, roads around CAAQMS, and essential premises. • A thermometer meter should be installed in the generator of the fog cannon vehicles, which will help in understanding the exact amount of diesel being used and will avoid wastage of fuel. • The average speed of all fog cannon vehicles in the app provided by Ashok Leyland should be checked. • An 80-kilometer distance should be completely covered by spraying through one fog cannon vehicle in 10 hours per day.

Page 3

- 60 liters of diesel should be used per day at one time. Also, 40 liters of gas should be used at one time.
- Approximately 30 liters of diesel and 40 liters of gas should be used in fog cannon vehicles in one shift.
- As per the order given by the Hon. Additional Municipal Commissioner (E), Pune Municipal Corporation, the work of fog cannon vehicles should be done in 2 shifts daily, and if there are two rounds in a day, the diesel and gas refilling quantity should be filled double the given quantity.
- The diesel and gas refilling centers should be on the planned route given to the fog cannon vehicles.
- Through the Hon. Additional Municipal Commissioner (E), instructions have been given to determine the routes, new improved routes, rounds of fog cannon vehicles, diesel and gas refilling locations, as well as the water refilling center at the nearby STP for refilling water, to reduce the increasing air pollution in the city, and to prepare an improved timetable for those vehicles.
- Refilling Center: - Instead of keeping the diesel and gas refilling center at one place, it should be decentralized and made available at a nearby location on the planned route.
- Speed Alert: - If the speed of the fog cannon vehicle exceeds the limit, there should be a facility in the app for a pop-up (alert) to appear.
- The Idling Time currently observed should be reduced in the morning and evening.

Translated Copy

 (Kishori Gadman-Shinde)

Deputy Commissioner, Environment Department,

Pune Municipal Corporation

ANNEXURE R1- IV

अनिल दिलीप सातव पाटील

सभासद, पुणे महानगरपालिका

जावक क्र.१४०/०४/२६

दि.०१/०४/२०२६

प्रति,

मा. उपायुक्त पर्यावरण विभाग,
पुणे महानगरपालिका, पुणे.

विषय: वाघोली भावडी रोड परिसरात धूळ नियंत्रण वाहन नियमित सुरू करण्याबाबत विनंती.

महोदय,

सविनय विनंती की, वाघोली भावडी रोड परिसरात सध्या मोठ्या प्रमाणावर धूळ उडत असून नागरिकांना त्याचा मोठा त्रास सहन करावा लागत आहे. या रस्त्यावर वाहनांची मोठ्या प्रमाणावर ये-जा होत असल्यामुळे तसेच सुरू असलेल्या बांधकाम कामांमुळे धुळीचे प्रमाण अधिक वाढले आहे.

या धुळीमुळे स्थानिक नागरिकांच्या आरोग्यावर परिणाम होत असून श्वसनाचे त्रास, ॲलर्जी तसेच इतर आजार वाढण्याची शक्यता निर्माण झाली आहे. तसेच रस्त्यावरून जाणाऱ्या वाहनचालकांनाही दृष्यमानतेचा त्रास होत आहे.

म्हणून आपणास विनंती आहे की, सदर वाघोली भावडी रोड परिसरात धूळ नियंत्रणासाठी विशेष धूळ नियंत्रण वाहन दररोज किमान एक वेळ नियमितपणे सुरू करण्यात यावे, जेणेकरून धुळीचे प्रमाण कमी होऊन नागरिकांना दिलासा मिळेल.

आपण या मागणीची तात्काळ दखल घेऊन योग्य ती कार्यवाही कराल, ही अपेक्षा.

धन्यवाद.

आपला,

अनिल दिलीप सातव पाटील
सभासद,पुणे महानगरपालिका, पुणे.

सभासद
पुणे महानगरपालिका, पुणे

पर्यावरण विभाग
पुणे महानगरपालिका
आवक क्र. 20
दि. ०७/०४/२०२६

पर्यावरण संवर्धन अधिकारी
पुणे महानगरपालिका

कार्यालय: ३०१ कृष्णा कॉम्प्लेक्स, फडई चौक, वाघोली. पुणे-४१२२०७
७३७८९९११२२/८३७८९९११२२ anilsatavpatil@gmail.com www.anilsatavpatil.com

मुख्य अभियंता (विद्युत) कार्यालय
पुणे महानगरपालिका
जा.क्र. ४२९१ ४२९२
दि. 20-3-26

E-115580/2026-ED

प्रति.
मा. उप-आयुक्त
मोटार वाहन विभाग
पुणे महानगरपालिका

यांजकडेस .....

विषय : वैकुंठ स्मशानभूमी येथे दररोज धूळनियंत्रण (फॉग कॅनन) वाहन फवारणी करिता पाठवणे बाबत.

वैकुंठ स्मशानभूमी येथे APC यंत्रणेमध्ये होणाऱ्या शवदहनामुळे थोड्या फार प्रमाणात धूर बाहेरील हवेत पसरतो व झाडामुळे जमिनीपासून थोड्या उंचीवर साठून राहतो. यामुळे प्रदूषण होते. सबब मा. अति महापालिका आयुक्त (इ) यांनी वैकुंठ स्मशानभूमी येथे संध्याकाळी ५ वाजता व रात्री १० वाजता धूळनियंत्रण (फॉग कॅनन) वाहन पाठवून फवारणी करणे बाबत आदेश दिले आहेत.

तरी वैकुंठ स्मशानभूमी येथे दररोज संध्याकाळी ५ वाजता व रात्री १० वाजता धूळनियंत्रण (फॉग कॅनन) वाहन पाठवणेस विनंती आहे.

कळावे.

(मनिषा शेकटकर)
मुख्य अभियंता (विद्युत)
पुणे महानगरपालिका

प्रत: उप-आयुक्त, पर्यावरण विभाग, पुणे महानगरपालिका

Forwarded

प्रदूषणाचे कारण: RMC प्लांट्स आणि बांधकाम
पत्ता: पुराणिक अभितांते जवळ,
बावधन बुद्रूक, पुणे २१

ओंकार गार्डन चौक ते RMC प्लांट्स या रस्त्यावर अँटी-स्मॉग गन (Anti-smog guns) आणि पाणी फवारणी करणाऱ्या गाड्या (Water Sprinkling Vehicles) पाठवावे ही विनंती

1:02 PM

ANNEXURE R1-V

पृथ्वीराज बी.पी. (भा.प्र.से.)
अतिरिक्त महापालिका आयुक्त

अतिरिक्त महापालिका आयुक्त (इस्टेट) कार्यालय,
पुणे महानगरपालिका
पुणे म.न.पा. भवन, शिवाजीनगर, पुणे ४११ ००५.
दूरध्वनी क्र. : ०२०-२५५०१४६३
E-mail : addmce@punecorporation.org

जा. क्र. : अति. मि-अ. (इ)/५मार्ग/८३७ दिनांक : 15.12.2025

बांधकाम प्रकल्पांच्या ठिकाणी हवा गुणवत्ता तपासणी प्रणाली बसविणेबाबतचे परिपत्रक

राज्यातील अनेक शहरांमध्ये पी.एम २.५ आणि पी. एम. १० या धुलीकणांमुळे वायू प्रदूषण वाढत असल्याने राज्य सरकारकडून मार्गदर्शक तत्वे जारी करण्यात आली आहेत. महाराष्ट्र प्रदूषण नियंत्रण मंडळ यांच्या दि.२/११/२०२३ रोजी पर्यावरण (संरक्षण) अधिनियम १९८६, कलम ५ अन्वये देण्यात आलेल्या निर्देशानुसार बांधकाम प्रकल्पांच्या ठिकाणी सेन्सर-आधारित हवा गुणवत्ता तपासणीसाठी प्रणाली उभारणे आवश्यक आहे. एआरएआय (ARAI,२०२२) च्या अहवालानुसार, बांधकाम क्षेत्र हे धूळ उत्सर्जनात प्रमुख योगदान देणारे क्षेत्र आहे. त्यामध्ये पीएम१० धूलिकणांची पातळी जवळपास २३% आहे. यानुसार बांधकामाच्या ठिकाणी धूळ नियंत्रित करणेसाठी अत्यावश्यक बाब आहे.

वरील बाबींच्या अन्वये पुणे महानगरपालिकेने हवा गुणवत्ता सेन्सर उत्पादकांना इंडियन इन्स्टिट्यूट ऑफ ट्रॉपिकल मेटेरॉलॉजी (IITM), पाषाण, पुणे येथे सह-स्थान अभ्यास (Co-location Study) करण्यास सूचित केले होते. त्यान्वये उपकरणांसाठीची आवश्यक तांत्रिक वैशिष्ट्ये परिशिष्ट-अ मध्ये देण्यात आली असून IITM च्या सह-स्थान अभ्यास द्वारे लघुसूचित करण्यात आलेले सेन्सर मेक आणि मॉडेल्सची यादी परिशिष्ट- ब मध्ये देण्यात आली आहे.

सदर परिपत्रकान्वये पुणे महानगरपालिकेद्वारे निर्देश देण्यात येतात की, पुणे महानगरपालिका हद्दीतील बांधकाम क्षेत्रफळ ५००० चौरस मीटर (Built-up Area) व त्याहून अधिक क्षेत्रफळ असलेल्या सर्व खाजगी व सार्वजनिक निवासी आणि व्यावसायिक बांधकाम प्रकल्पांमध्ये तसेच सर्व पायाभूत सुविधा प्रकल्पांमध्ये (Infrastructure Projects), बांधकामाच्या ठिकाणी पी.एम.(PM)२.५ आणि पीएम (PM) १० मोजण्यासाठी सेन्सर-आधारित हवा गुणवत्ता देखरेख प्रणाली स्थापित करण्यात यावी. तसेच धूळ प्रदूषण तीव्रता दर्शविण्यासाठी एलईडी इंडिकेटर (LED Signal) प्रणाली बसविण्यात यावी, ज्यामुळे बांधकामाच्या ठिकाणावरील कर्मचाऱ्यांना तेथील हवेच्या गुणवत्तेची स्थिती समजून घेता येईल आणि त्यानुसार प्रदूषण कमी करणेसाठी त्वरित उपाययोजना करता येतील.

पुणे शहरातील बांधकामाच्या ठिकाणी बसविण्यात येणारे सदरचे सेन्सर हे परिशिष्ट – अ मध्ये दिलेल्या तांत्रिक वैशिष्ट्यांनुसार असावेत. परिशिष्ट - ब मध्ये देण्यात आलेल्या सेन्सर उत्पादकांमधून सूचीबद्ध केलेल्या मेक आणि मॉडेलमधून निवडलेले असणे बंधनकारक आहे तसेच सेन्सर उत्पादकांची सुधारित यादी वेळोवेळी पुणे महानगरपालिकेच्या संकेत स्थळावर प्रसिद्ध करण्यात येईल. बांधकामाच्या ठिकाणी बसविण्यात येणाऱ्या सेन्सरमधून उपलब्ध होणारी हवा-गुणवत्ताबाबतची वास्तविक माहिती पुणे महानगरपालिका प्रशासनाच्या देखरेखीसाठी केंद्रीयकृत हवा गुणवत्ता संकेतस्थळावर एकत्रित केली जाईल.

सर्व बांधकाम व्यावसायिकांना परिशिष्ट - क नुसार हवा प्रदूषण नियंत्रण उपाययोजनांचे काटेकोरपणे पालन करणे बंधनकारक आहे. याशिवाय, एलईडी इंडिकेटर (LED Signal) प्रणालीद्वारे दर्शविण्यात येणाऱ्या धूळ तीव्रता पातळीनुसार कृती मार्गदर्शक तत्वांचे पालन करण्यात यावे.

सर्व विद्यमान व नवीन सुरू होणाऱ्या प्रकल्पांनी (क्षेत्रफळ ५००० चौरस मीटर व अधिक) हे परिपत्रक प्रसिद्ध झाल्यापासून १५ दिवसांच्या आत हवा गुणवत्ता देखरेख प्रणाली आणि एलईडी इंडिकेटर (सिग्नल) बांधकामाच्या ठिकाणी बसवावेत. नवीन बांधकाम प्रकल्पांच्या बाबतीत, १५ दिवसांचा कालावधी हा बांधकामाच्या ठिकाणी प्रत्यक्ष कोणतेही कामकाज सुरु झाल्याच्या दिनांकापासून गृहीत धरण्यात येईल.

सदर परिपत्रकानुसार देण्यात आलेल्या निर्देशांचे पालन न केल्यास कारणे दाखवा नोटीस / काम थांबवण्याचे आदेश आणि लागू असलेली इतर दंडात्मक कारवाई केली जाईल याची कृपया नोंद घेण्यात यावी.

सोबत :-

- **परिशिष्ट-अ :-** बांधकाम ठिकाणांवर बसविण्यात येणाऱ्या हवा गुणवत्ता देखरेख प्रणालीची आवश्यक तांत्रिक वैशिष्ट्ये.
- **परिशिष्ट-ब :-** IITM च्या सह-स्थान अभ्यास द्वारे लघुसूचित करण्यात आलेले सेन्सर मेक आणि मॉडेल्सची यादी.
- **परिशिष्ट-क :-** बांधकाम व्यावसायिकांसाठी हवा प्रदूषण नियंत्रण उपाययोजना व धूळ तीव्रता पातळीनुसार कृती मार्गदर्शक तत्वे.

15/12/25

(पृथ्वीराज बी. पी.)
अतिरिक्त महापालिका आयुक्त (इ)
पुणे महानगरपालिका

Circular regarding installation of air quality inspection system at construction project sites

In many cities of the state, air pollution due to PM 2.5 and PM 10 particles is increasing, so the state government has issued guidelines. As per the directions issued by the Maharashtra Pollution Control Board under Section 5 of the Environment (Protection) Act, 1986 dated 2/11/2023, it is necessary to set up a system for sensor-based air quality monitoring at construction sites. According to the report of ARAI (ARAI, 2022), the construction sector is a major contributor to dust emissions. The level of PM 10 particles in it is about 23%. Accordingly, it is essential to control dust at construction sites.

In view of the above, the Pune Municipal Corporation had invited the air quality sensor manufacturers to conduct a co-location study at the Indian Institute of Tropical Meteorology (IITM), Pashan, Pune. The required technical specifications for the devices are given in Annexure-A and the list of sensor makes and models shortlisted through the co-location study of IITM is given in Annexure-V.

Under this circular, the Pune Municipal Corporation has directed that in all private and public residential and commercial construction projects with a built-up area of 5000 square meters and above as well as in all infrastructure projects within the limits of the Pune Municipal Corporation, a sensor-based air quality monitoring system should be installed to measure PM 2.5 and PM 10 at the construction site. Also, an LED indicator system should be installed to indicate the intensity of dust pollution, so that the workers at the construction site can understand the air quality condition there and take immediate measures accordingly to reduce pollution.

The sensors to be installed at construction sites in Pune city shall be as per the technical specifications given in Annexure A. It is mandatory to select the sensor manufacturers from the make and model listed in Annexure V and the revised list of sensor manufacturers shall be published on the website of Pune Municipal Corporation from time to time. Actual air quality information available from the sensors installed at construction sites shall be compiled on a centralized air quality website for the monitoring of Pune Municipal Corporation administration.

All construction professionals are required to strictly follow the air pollution control measures as per Annexure C. In addition, action guidelines should be followed as per the dust intensity level indicated by the LED indicator system.

All existing and new construction projects (area 5000 sq m and above) shall install Air Quality Monitoring System and LED Indicator (SIGRAL) at the construction site within 15 days from the date of publication of this circular. In case of new construction projects, the period of 15 days shall be deemed to be from the date of commencement of any actual work at the construction site.

Please note that failure to comply with the instructions given as per this circular will result in show cause notice/stop work order and other applicable penal action.

Along with :-

Annexure-A: Required technical specifications of air quality monitoring systems to be installed at construction sites.

Appendix-V: List of sensor makes and models shortlisted by IITM's co-location study.

Appendix-A:- Air pollution control measures and action guidelines for construction professionals according to dust intensity levels.

Additional Municipal Commissioner (E) Pune Municipal Corporation