



Compendium of *Best Practices under* **National Clean Air Programme**



September, 2026



मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
भारत सरकार



भूपेन्द्र यादव
BHUPENDER YADAV



MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA



FOREWORD

As India continues to urbanise rapidly, providing clean air to all has become national priority. Recognizing this, Hon'ble Prime Minister Shri Narendra Modi, on Independence Day address in 2020, has announced the Government's commitment to reduce air pollution in selected 100 cities in mission mode, through holistic approach, integrated approach, use of modern technology and Jan bhagidari.

In line with this vision, the Government of India launched the National Clean Air Programme (NCAP), a comprehensive and collaborative initiative aimed at improving air quality across 130 cities. The programme provides a robust framework for coordinated action among the Central Government, State Governments, Urban Local Bodies and other stakeholders, with strong emphasis on state-specific action plan, city-specific interventions, enhanced monitoring, innovation, and measurable results.

It is heartening to witness the commitment demonstrated by States and Urban Local Bodies in implementing clean air action plans with dedication and commitment. I commend the sustained efforts of the cities in adopting innovative technologies, locally appropriate solutions and nature-based interventions, including the creation of mini forests and other urban green infrastructure, to address the sources of air pollution.

I am confident that this Compendium of Best Practices will provide a valuable platform for cities to document and showcase successful initiatives and facilitate the exchange of knowledge, ideas and experience. It will also encourage other cities to adapt and replicate similar practices in accordance with their local conditions, thereby contributing to sustainable urban development and also strengthening the goal of providing clean air to all.

(Bhupender Yadav)

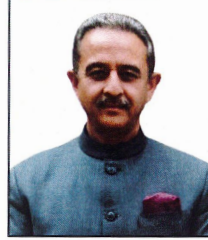
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कीर्तवर्धन सिंह
KIRTI VARDHAN SINGH



MESSAGE

Acknowledging the importance of a healthy environment and the benefits of improved air quality for citizens, the Government of India has undertaken the National Clean Air Programme (NCAP) as a flagship initiative to improve air quality in 130 cities through coordinated implementation of National, State and City-level action plans.

I extend my appreciation to the Central Government agencies, State Governments, urban local bodies and eminent institutions associated with NCAP for their valuable contributions to the planning, coordination, implementation and monitoring of clean air initiatives. Their collective efforts have been instrumental in translating the objectives of the Programme into action at the city level.

It is encouraging to witness the application of innovative approaches, modern technologies and locally relevant solutions in transforming urban areas into more sustainable and resilient environments. These initiatives demonstrate the importance of coordinated action and institutional collaboration in addressing the multifaceted challenges associated with air pollution.

This Compendium of Best Practices implemented by States and Urban local bodies reflects the dedication, commitment and collective efforts of cities in advancing air quality improvement. It provides an opportunity for cities to learn from one another and facilitates the wider adoption of effective interventions suited to local circumstances.

I encourage all cities and stakeholders to use this Compendium as a reference for adapting and implementing innovative practices and effective solutions in their respective areas, thereby strengthening efforts towards Clean Air Action under the National Clean Air Programme.

(Kirti Vardhan Singh)

7th September, 2026
New Delhi

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TANMAY KUMAR



सत्यमेव जयते



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SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

MESSAGE

The Government of India's National Clean Air Programme (NCAP) is designed to address the multifaceted challenges of air pollution through a coordinated and collaborative framework involving the Central Government, State Governments, their agencies, and Urban Local Bodies. The programme provides a structured platform at Centre, State and District level for integrated action to improve air quality across 130 identified cities.

The growing adoption of innovative technologies, evidence-based interventions, and locally driven solutions under National, State, and City-level action plans is a promising step towards cleaner and healthier urban environments. The active participation of cities and stakeholders reflects an increasingly strong and collaborative movement for sustainable air quality improvement.

This Compendium showcases a range of impactful initiatives implemented under the key thematic areas of the National Clean Air Programme (NCAP), including road dust management, vehicular emission reduction, waste management, industrial pollution control, sustainable mobility, urban greening, and the development of mini forests. These examples highlight innovative and effective interventions undertaken by cities to improve air quality, offering valuable insights and practical lessons that can inform adaptation, replication, and scaling up in other urban contexts.

I am confident that this Compendium will serve as a valuable reference for urban local bodies and other stakeholders associated with NCAP. It will facilitate the sharing of knowledge, replication of suitable interventions and adoption of effective clean-air strategies, while supporting the broader objectives of Clean Air Action.

I commend the Central Pollution Control Board, State Pollution Control Boards, Urban Local Bodies, and all stakeholders whose dedicated efforts have made the documentation and compilation of these best practices possible. By capturing and sharing valuable experiences and successful interventions, they are contributing significantly to the effective implementation of NCAP and the promotion of cleaner and healthier urban environments across India.

(Tanmay Kumar)

Place: New Delhi
Dated: September 3, 2026

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अमनदीप गर्ग, आई.ए.एस.
Amandeep Garg, IAS



सत्यमेव जयते



अपर सचिव

भारत सरकार

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

ADDITIONAL SECRETARY

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT, FOREST
& CLIMATE CHANGE



FOREWORD

The National Clean Air Programme (NCAP), an initiative of the Government of India, marks a significant step towards systematically improving air quality across 130 cities through coordinated, multi-sectoral action. Amid rapid urbanisation and rising population density, tackling air pollution has become a critical national priority for safeguarding public health, environmental integrity and citizen welfare.

It is heartening to note the growing resolve of States, Urban Local Bodies and implementing agencies in operationalising clean air action plans in a structured, time-bound manner. The integration of local innovation, global best practices, scientific methods and advanced technology to address diverse pollution sources under NCAP merits appreciation.

This Compendium compiles best practices and successful interventions by cities across key thematic areas, reflecting the collaboration, institutional coordination and importance of knowledge-sharing to strengthen the NCAP's implementation and achieving sustained air quality gains.

I hope that this Compendium will serve as a valuable resource for States, Urban Local Bodies and other stakeholders, enabling the adoption and replication of successful initiatives according to local needs. Such collective efforts will contribute meaningfully towards advancing the goal of Clean Air Action.

(Amandeep Garg)

7th September, 2026
New Delhi

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Waste to Energy Plant (62.5 MW)

Development of 'Braj Dham Theme Waste to Wonder Park' at Gandhi Park
Indore's 550 TPD Bio-CNG Plant Sets National Benchmark for Zero-Waste
Wet Waste Processing

Telangana - Hyderabad

Uttar Pradesh - Firozabad

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Uttar Pradesh - Ghaziabad

Uttar Pradesh - Prayagraj

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Uttar Pradesh - Ghaziabad

Assam - Nalbari

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A Technology-Enabled Platform for Managing Urban Air Pollution Sources
Strengthening Ambient Air Quality Monitoring and Dissemination through
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Rajkot RECON: Hyperlocal Air-Pollution Source Mapping and Ward-Level
Decision-Support Dashboard

Indore-311 Mobile Application & Public Grievance Redressal System

Air Quality Decision Support System of Thane

Deployment of a Fleet of 22 Mobile Continuous Ambient Air Quality
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Bihar - BSPCB

Delhi - DPCC

Gujarat - Rajkot

Madhya Pradesh - Indore

Maharashtra - Thane

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The Air We Share: Bridging Policy & Public Action- Interactive Multi-
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Mission Clean Patiala

Nagaland - NPCB Dimapur)

Nagaland - NPCB (Kohima &
Dimapur)

Punjab- Patiala

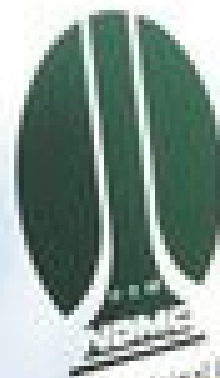
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Ensuring a Cleaner
for a Safer Tomorrow



New Delhi Municipal Council





Control and Management of Road Dust

1 VADODARA - GUJARAT

At a Glance

19

Mechanical Sweeper

~300 km

Major Roads Covered

52%

Dust Share of PM₁₀

133→111

PM₁₀ (µg/m³)

Mechanised Sweeping of Major Roads

What Is It?

- Vadodara Municipal Corporation (VMC) has strengthened mechanized road sweeping as a key measure for control of resuspended road dust. VMC has 6 mechanical sweepers. VMC strengthened the intervention by deploying 13 new rented mechanical sweepers and 1 additional sweeper through CSR initiative for control of road dust in Vadodara City.
- Mechanised sweeping of major 4 lane & 6 lane carried out, covering approximately 300 km.

The Problem It Solves

- Source-apportionment findings identified road dust as a major source of PM₁₀ (52%). Manual sweeping alone was insufficient for consistent removal of deposited dust from high-traffic corridors responsive of road dust reduced.

Who Is Involved

Implementing Agency	Vadodara Municipal Corporation
Supporting Departments / Agencies	Gujarat Municipal Finance Board
Implementation Timeline	2025-26 (September onwards)
Key Polluting Sources	Dust (52% of PM ₁₀), transport (26% of PM _{2.5}), industry, domestic sources, secondary aerosols and refuse burning.

Impact

- 19 mechanical sweepers deployed.
- 300 km of major roads covered through mechanized sweeping.
- Night sweeping conducted on high-traffic corridors to improve operational efficiency.
- Improved road-dust removal and reduced dust re-suspension.

Evidence

The photograph below shows mechanized road sweeping in operation on the major roads of Vadodara City.



Dulevo D3 (Euro 6) mechanical road sweeper deployed for road-dust control, VIP Road, Vadodara

PM₁₀ Reduction

- Average concentration of PM₁₀ in 2025-26 reduced by 16.5% from 111 $\mu\text{g}/\text{m}^3$ in 2025-26 to 133 $\mu\text{g}/\text{m}^3$ in 2017-18.

Recommendations for Other Cities

- Cities may adopt source-apportionment-based prioritisation of road-dust hotspots and combine ULB-owned, rented and CSR-supported sweepers to rapidly expand mechanized sweeping coverage.

Contact:

Shri Arun Mahesh Babu, IAS, Municipal Commissioner, Vadodara Municipal Corporation
Email: commissioner@vmc.gov.in

2 FARIDABAD - HARYANA

At a Glance

850+

Potholes Repaired

24 hrs

Typical Repair Time

₹ 2.5 Cr

Project Cost

229→176

PM₁₀ (µg/m³)

Pothole Ambulance Initiative

What Is It?

- Municipal Corporation Faridabad launched the “Pothole Ambulance” – a dedicated Rapid Response Pothole Repair & Maintenance Van service. Citizens report potholes through the **Mhari Sadak App** or a dedicated helpline; the reports are geo-tagged and assigned to the nearest van, enabling swift identification and repair, typically within 24 hours of reporting.

The Problem It Solves

- Potholes on city roads pose a road-safety hazard for riders and pedestrians, cause traffic congestion and vehicle damage, and generate road dust that degrades ambient air quality (PM₁₀/PM_{2.5}), directly undermining NCAP goals.

Who Is Involved

Implementing Agency	Municipal Corporation Faridabad
Implementation Timeline	From 2025 (Ongoing)

Impact

- Over 850 potholes repaired since launch of Pothole Ambulance.
- Improved road safety and smoother commuter movement.
- Reduced road dust and vehicular emissions, leading to cleaner air.
- Enhanced public confidence in urban governance.

Evidence

The photographs below show the Pothole Repair & Maintenance van and its crew repairing road stretches on the ground, along with media coverage of the initiative.

MEDIA COVERAGE



Pothole Repair & Maintenance van and equipment deployed on site, Sector 8, Faridabad



Media coverage of the Pothole Repair & Maintenance Van service



Pothole repaired — bituminous patch laid and compacted, Sector 8

PM₁₀ Reduction

- Average concentration of PM₁₀ in 2025-26 reduced by 20.5% from 229 µg/m³ in 2017-18 to 182 µg/m³ in 2025-26.

Recommendations for Other Cities

- Cities facing similar challenges of potholes and road dust can replicate this cost-effective, technology-driven model by deploying dedicated repair vans and integrating citizen reporting through mobile apps and helplines.
- This approach enables quicker grievance resolution, improves road safety, and helps reduce air pollution caused by road dust.

Contact:

Sh. Yashendra Singh, Municipal Corporation Faridabad

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3 RAJASTHAN - JODHPUR

At a Glance

2.1 m

Footpath width

60 mm

Interlocking Blocks

₹75.52L

Project Cost

189→115

PM₁₀ (µg/m³)

Development of Pedestrian Infrastructure

What Is It?

- The project involves the development of a 2.1 m wide paved footpath along the roadside using 60 mm interlocking/paving blocks with a minimum compressive strength of 300 kg/cm², along with M-20 grade precast concrete kerb stones separating the carriageway, parking and pedestrian zones.
- The project includes organised roadside parking, protective bollards, green strips with Neem, Champa and Gulmohar plantation, and proper surface slope and drainage arrangements.

The Problem It Solves

- The project addresses roadside dust pollution caused by exposed/unpaved surfaces and vehicular movement over loose soil, along with haphazard parking and pedestrian encroachment.
- It provides a safe and continuous pedestrian pathway, improves parking management, prevents water stagnation through proper drainage, and reduces PM₁₀ dust re-suspension.
- The project also improves road safety, walkability, accessibility, greenery and overall roadside aesthetics.

Who Is Involved

Implementing Agency	Municipal Corporation Jodhpur
Supporting Departments / Agencies	NA
Implementation Timeline	2025-26 (06 months)

Impact

- Developed footpath replaced exposed/unpaved surfaces.
- Reduction in road-dust generation and PM₁₀ re-suspension.
- Improved pedestrian safety and walkability.
- Organised roadside parking.
- Improved streetscape and roadside environment.

Evidence: Before & After

The photographs below document the roadside stretch before the intervention and the completed pedestrian infrastructure after implementation along Umed Bhawan Palace Road.

BEFORE



Before — unpaved, dust-generating roadside shoulder



Before — exposed roadside verge with loose soil

AFTER



After — paved footpath with kerb separation and protective bollards



After — completed interlocking-block footpath

PM₁₀ Reduction

- Average PM₁₀ concentration reduced by 39.2% in 2025-26 from 189 µg/m³ in 2017-18 to 115 µg/m³ in 2025-26.

Recommendations for Other Cities

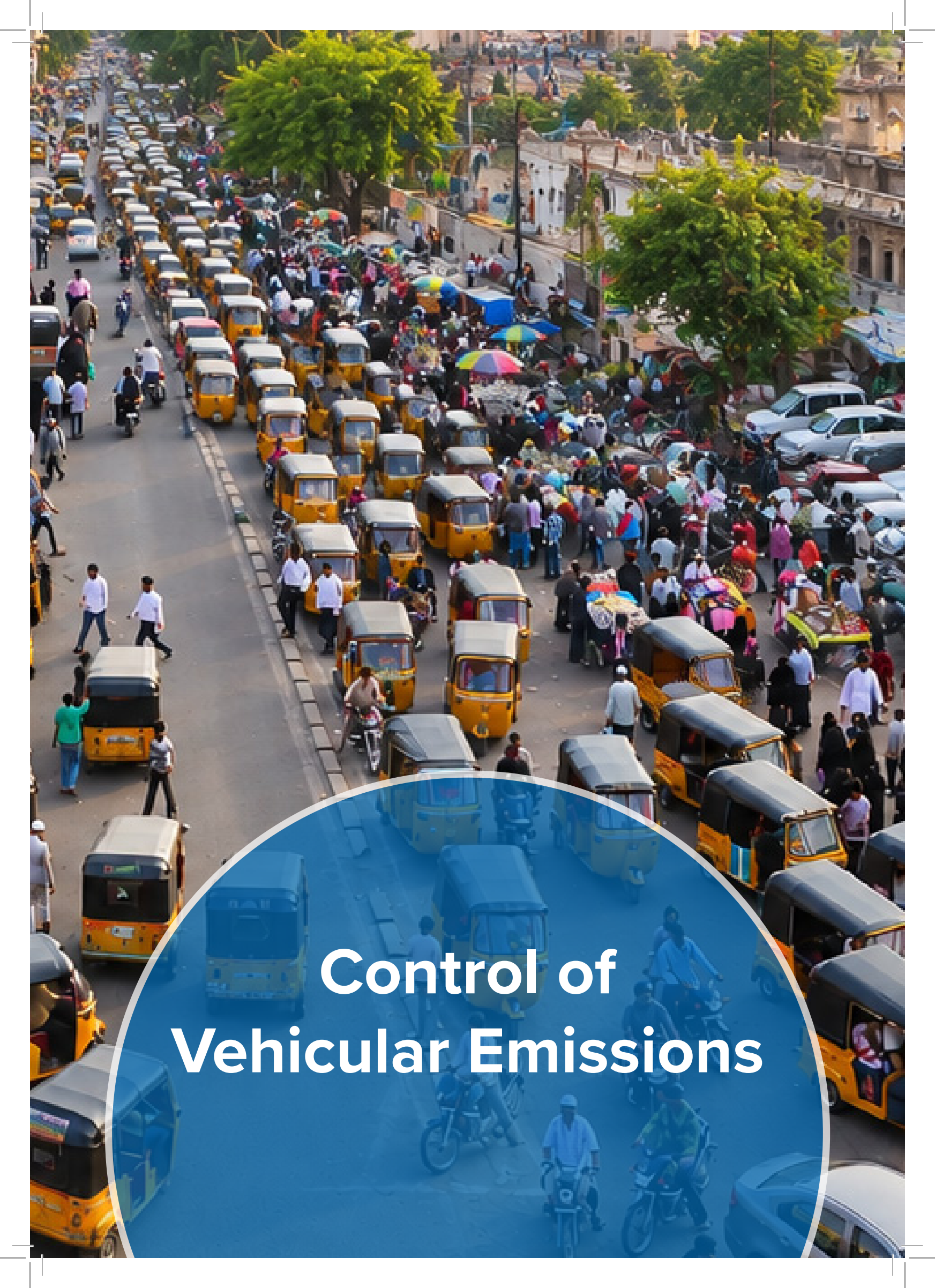
- Identify and prioritise unpaved roadside stretches having high pedestrian movement and potential for road-dust generation.
- Develop 2.0–2.5 m wide paved footpaths using durable interlocking/paving blocks with proper kerb separation.
- Integrate organised parking, protective bollards and pedestrian pathways to prevent vehicle encroachment and dust re-suspension.
- Provide proper drainage, green strips and suitable roadside plantation wherever site conditions permit.
- Replicate the intervention under NCAP/annual action plans with before-and-after monitoring of road-dust and PM10 levels to assess its impact.

Contact:

Sh. Rahul Jain, Municipal Corporation Jodhpur

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An aerial photograph of a very busy street in India, likely in a city like Delhi. The street is filled with a large number of yellow auto-rickshaws, which are a common mode of public transport. Pedestrians are walking on the sidewalks and crossing the street. There are also some motorcycles and other vehicles visible. The street is lined with trees and buildings. A large blue circular graphic is overlaid on the bottom right of the image, containing the text "Control of Vehicular Emissions".

Control of Vehicular Emissions

1 GHAZIABAD - UTTAR PRADESH

At a Glance

750+

Vehicles Tracked

4

VTMS Established

285→189

PM₁₀ (µg/m³)

Vehicle Tracking & Monitoring System (VTMS)

What Is It?

- The Ghaziabad Nagar Nigam (GNN) implemented a centralised Vehicle Tracking & Monitoring System (VTMS) to digitally manage, track and optimise its large fleet of municipal vehicles.
- The VTMS actively monitors a large-scale municipal fleet of 750+ vehicles including Mechanised Road Sweeping (MRS) machines, anti-smog guns, water sprinklers, and door-to-door waste collection vehicles.
- The implementation combines GPS & IoT telematics hardware installed across the fleet to transmit live location, speed, route history and operational status; a centralised, web-based dashboard is operational.

The Problem It Solves

- Ghaziabad's massive municipal fleet of over 750 vehicles could not be tracked in real time, leaving blind spots in fleet visibility, challenges in monitoring activities, made it difficult to log operational hours, measure distance travelled, or hold operators accountable.
- The VTMS addresses these gaps by bringing the entire fleet under continuous, centralised digital surveillance, replacing manual logbooks with automated, evidence-based reporting and enabling data-driven route optimisation.

Who Is Involved

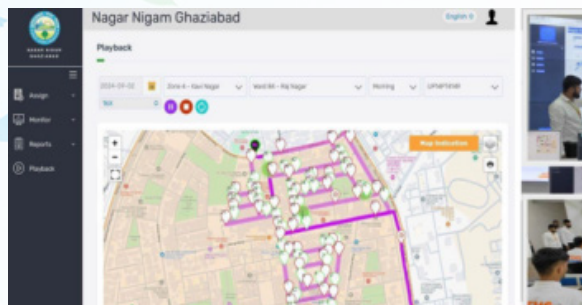
Implementing Agency	Ghaziabad Nagar Nigam
Supporting Departments / Agencies	UPPCB, GDA, UPSIDA, UP PWD, UP Awas Vikas Parishad, Transport Department (RTO) & Traffic Police
Implementation Timeline	2025-26 (Ongoing)
Key Polluting Sources	Road and resuspension dust (non-attainment city)

Impact

- Real-time fleet visibility: successfully brought 750+ municipal vehicles under continuous, centralised digital surveillance, eliminating the blind spots of manual fleet management.
- Enhanced operational accountability: shifted from manual logbooks to automated, evidence-based reporting.
- Optimised resource utilisation: data-driven route optimisation reduced redundant travel and overlapping coverage, maximising the efficiency of municipal resources.
- Effective pollution mitigation: ensured that critical dust-suppression and sanitation activities executed reliably across the city, directly supporting Ghaziabad's clean air targets.

Evidence

The images below, from Ghaziabad Nagar Nigam's submission, show the ITMS command centre concept and its operational control room, along with live camera feeds from ITMS-integrated junctions.



VTMS dashboard interface and control-room briefing session, Ghaziabad Nagar Nigam



Live VTMS dashboard displaying real-time locations of tracked municipal vehicles across Ghaziabad



VTMS control room with operators monitoring the centralised fleet-tracking dashboard



Officials reviewing vehicle route playback and geo-fencing data on the VTMS platform

PM₁₀ Reduction

- The Average PM₁₀ concentration reduced by 33.7% in 2025-26 from 285 µg/m³ in 2017-18 to 189 µg/m³ in 2025-26.

Recommendations for Other Cities

- Cities should adopt GPS/IoT tracking, equipping all municipal fleets — particularly those dedicated to sanitation and environmental management — with GPS hardware to monitor live locations and operational status.
- A centralised, web-based operational dashboard should be built to integrate vehicle-tracking data and give municipal authorities real-time visibility and control over city-wide deployments. Cities should leverage the tracking system's automated analytics for evidence-based reporting.

Contact:

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2 GHAZIABAD - UTTAR PRADESH

At a Glance

41

Junctions Upgraded

3 Systems

ATCS, ANPR & RLVD

₹53 Cr

Project Cost

285→189

PM₁₀ (µg/m³)

Integrated Traffic Management System (ITMS)

What Is It?

- To combat severe traffic congestion and its impact on air quality, Ghaziabad Nagar Nigam (GNN) executed a city-wide technological overhaul of its traffic infrastructure in 2025, shifting from manual and static traffic management to a fully dynamic, data-driven model.
- Heavy-duty monitoring and enforcement hardware was installed at 41 high-volume junctions prone to severe bottlenecks and vehicle idling, all networked into a centralised command and control centre.
- Each junction was equipped with three advanced systems: an Adaptive Traffic Control System (ATCS) that replaces fixed-timer signals with smart signals adjusting automatically to real-time vehicle density; Automatic Number Plate Recognition (ANPR) for digitally tracking vehicle movement and enforcement; and Red Light Violation Detection (RLVD) cameras that instantly capture signal violations. The new technology is paired with automated e-challans, using RLVD and ANPR to enforce stop-line and signal discipline.

The Problem It Solves

- Ghaziabad's major intersections suffered acute bottlenecks and prolonged vehicle idling contributing to elevated exhaust emissions and resuspended road dust. Manual policing was insufficient to manage high-volume traffic violations.
- The ITMS addresses these gaps by dynamically adjusting signal timings to reduce idling and congestion-induced pollution, automating enforcement through ANPR and RLVD to drive behavioural change, and centralising live monitoring for faster incident response and data-driven planning.

Who Is Involved

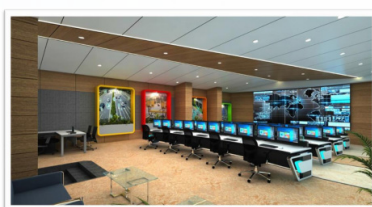
Implementing Agency	Ghaziabad Nagar Nigam
Supporting Departments / Agencies	GDA, UPSIDA, UP PWD, UP Awas Vikas Parishad, Transport Department (RTO) & Traffic Police, Forest Department, NHAI and DSO
Implementation Timeline	2025 (installation); ongoing operations
Key Polluting Sources	Road and resuspension dust; vehicular emissions from congestion-induced idling (non-attainment city)

Impact

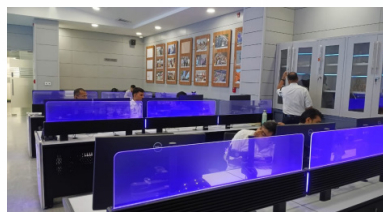
- **Reduced vehicle idling and emissions:** Dynamically optimised signal timings significantly decreased wait times at 41 critical junctions, directly curbing exhaust pollution and resuspended road dust.
- **Smoother traffic flow:** Replacing static timers with real-time, intelligent traffic regulation, ensuring efficient vehicular movement across high-volume corridors.
- **Enhanced road safety:** automated enforcement of traffic rules through RLVD and ANPR.
- **Centralised urban mobility:** shifted the city from manual traffic policing to a data-driven model.
- **Support for clean air goals:** effectively linked traffic management with environmental targets, mitigating congestion-induced pollution in a non-attainment city.

Evidence

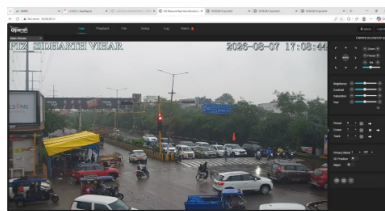
The images below, from Ghaziabad Nagar Nigam's submission, show the ITMS command centre concept and its operational control room, along with live camera feeds from ITMS-integrated junctions.



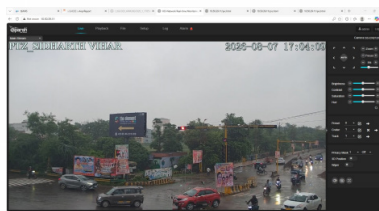
Before — unpaved, dust-generating roadside shoulder



Officials monitoring live traffic feeds at the ITMS command and control centre



Live PTZ camera feed from an ITMS-integrated junction (Sidharth Vihar) showing real-time traffic



Live feed from another ITMS-integrated junction, part of the 41-junction monitoring network

PM₁₀ Reduction

- The Average PM₁₀ concentration reduced by 33.7% in 2025-26 from 285 µg/m³ in 2017-18 to 189 µg/m³ in 2025-26.

Recommendations for Other Cities

- Cities should integrate adaptive technologies, moving away from static traffic lights to ITMS with Adaptive Traffic Control Systems (ATCS) that adjust in real time to live traffic volumes.
- Automated traffic enforcement through ANPR and RLVD should be deployed to enforce compliance without heavily relying on on-ground personnel. A centralised command and control facility should consolidate real-time monitoring, data collection and system management into a single actionable hub.

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3 RAJKOT - GUJARAT

At a Glance

225

Clean-Fuel Buses

Zero

Diesel Buses

56%

Fleet Fully Electric

150→94

PM₁₀ (µg/m³)

Transition to 100% Clean-Fuel Municipal Public Transport

What Is It?

- Rajkot Municipal Corporation has transitioned its municipal public-transport fleet entirely away from diesel. Within approximately three years the city more than doubled its electric-bus fleet and completed the shift to clean fuel, operating 125 electric and 100 CNG buses — 225 clean-fuel buses and zero diesel buses in the municipal fleet.

The Problem It Solves

- The initiative addresses the dependence of municipal public transport on conventional diesel buses.

Who Is Involved

Implementing Agency	Rajkot Municipal Corporation
Supporting Departments / Agencies	Government of India (FAME-II / PM-eBus Sewa)
Mode of Implementation	FAME-II, NCAP and Gross Cost Contract (GCC) arrangements; ₹42.38 crore of NCAP funds utilised
Implementation Timeline	2021-2026 (ongoing)
Key Polluting Sources	Vehicular Emission Road dust, construction activity, industries and solid waste

Impact

- 100% of the municipal public-transport fleet shifted away from diesel.
- 125 electric buses and 100 CNG buses operational.
- Approximately 56% of the clean-fuel fleet is already fully electric.
- Around 15 lakh passenger journeys supported every month.
- Diesel tailpipe emissions eliminated from municipal bus operations.
- Reduced roadside smoke, particulate emissions and engine noise along bus routes.

Evidence: Before & After

The photographs below show Rajkot's clean-fuel municipal bus fleet at induction — electric buses that have replaced diesel services.



A newly inducted electric bus in the Rajkot municipal fleet



The clean-fuel bus fleet lined up at induction

PM₁₀ Reduction

- Average concentration reduced by 33.7% from 150 $\mu\text{g}/\text{m}^3$ in 2017-18 to 94 $\mu\text{g}/\text{m}^3$ in 2025-26.

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4 HYDERABAD - TELANGANA

At a Glance

190

Public Charging Points

470+

Private Chargers Facilitated

25,000+

Tonnes CO₂ Avoided / Year

50%

Renewable-Energy Integration

Establishment of 190 EV Charging Stations

What Is It?

As Telangana's State Nodal Agency for EV charging infrastructure, TGREDCO established a citywide public charging network across Greater Hyderabad under NCAP. It set up 190 public EV charging points spanning all six GHMC zones and thirty administrative circles, and facilitated the establishment of 470+ private EV chargers. Charging sites cover government premises, parking areas, transport hubs, commercial clusters and residential zones, aligned with Telangana's EV & Energy Storage Policy 2020–30.

- Site selection guided by GIS mapping of key transport corridors and high-footfall areas.
- TGEV mobile application providing real-time charger visibility and booking.
- Single Window Clearance system streamlining NOCs and approvals.
- 50% renewable-energy integration across the charging network.
- ₹35 crore funded under NCAP, with an estimated Economic Internal Rate of Return (EIRR) of about 25%.

The Problem It Solves

- The initiative addresses the shortage of accessible and reliable public EV charging in Hyderabad; the difficulty of identifying suitable land and locations for charging stations; the challenge of providing power connections and upgrading grid infrastructure; rising vehicular emissions and CO₂ from petrol and diesel vehicles; the limited visibility and accessibility of available chargers; and the need for a simple, streamlined process for obtaining NOCs and approvals.

Who Is Involved

Implementing Agency	Telangana Renewable Energy Development Corporation (TGREDCO) — State Nodal Agency (SNA)
Supporting Departments / Agencies	GHMC, TGSPDCL, TGIIC and HMDA; TGPCB, EPTRI, Transport and Traffic Police Departments and ASCI supported impact assessment
Mode of Implementation	NCAP-funded (₹35 crore utilised); multi-department coordination anchored by a dedicated EV Accelerator Cell
Implementation Timeline	2022–2026
Key Polluting Sources	Vehicular emissions from petrol and diesel vehicles are a major source of particulate matter, NO _x and CO ₂ across Hyderabad, which is identified as a non-attainment city under NCAP.

Impact

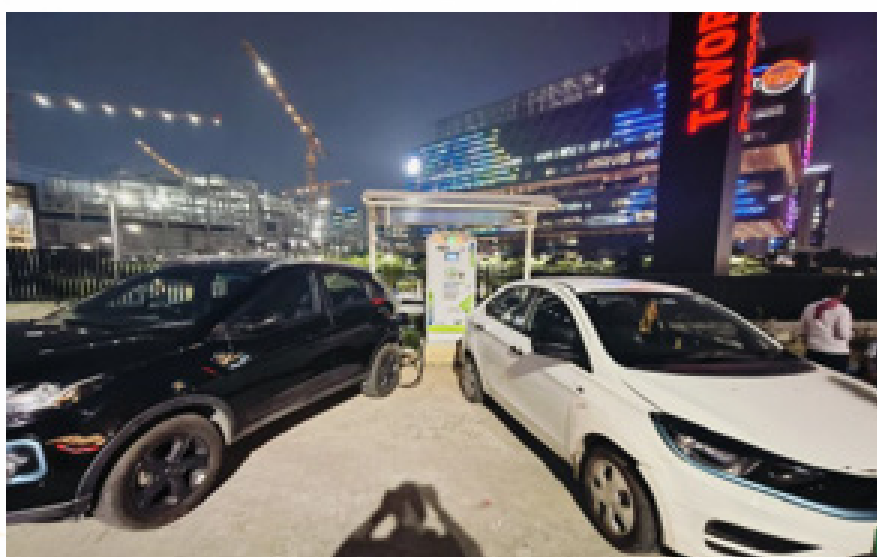
- 190 public EV charging points established, alongside facilitation of 470+ private EV chargers.
- Public EV charging electricity consumption rose from 34 lakh units in FY 2022–23 to 1,215.4 lakh units in FY 2025–26.
- Over 25,000 tonnes of CO₂ avoided annually.
- Over 25,000 electric four-wheelers registered in the city.
- 50% renewable-energy integration achieved across the charging network.
- An ASCI study found that 25 chargers commissioned in 2023 avoided 1,221.6 tonnes of CO₂, 12.3 kg of PM_{2.5} and 13.7 kg of PM₁₀ annually.

Evidence

The photographs below show Hyderabad's NCAP-funded public EV charging infrastructure in operation.



A newly inducted electric bus in the Rajkot municipal fleet



The clean-fuel bus fleet lined up at induction

Contact:

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A photograph of an industrial facility, likely a steel mill, with large structures and smokestacks. A thick plume of smoke or steam rises from one of the stacks against a warm, orange-hued sky, suggesting a sunset or sunrise. In the foreground, a large blue circular graphic contains the title text.

Control of Industrial Pollution

1 DPCC - DELHI

At a Glance

1,943

Industrial Units Transitioned to Clean Fuel

100%

Clean-Fuel Transition Achieved

17

Red-Category Units on OCEMS

241→200

PM₁₀ (µg/m³)

Clean Fuel Transition and Continuous Emission Monitoring for Industrial Pollution Control in Delhi

What Is It?

Industrial emissions arising from fuel combustion and industrial processes constitute an important source of air pollution in urban areas. Effective control requires a combination of source-level emission reduction measures and robust, continuous monitoring of significant emission sources. The Delhi Pollution Control Committee (DPCC) has implemented a two-pronged intervention for control of industrial pollution in Delhi:

1. Clean-Fuel Transition

- 1,943 industrial units were identified for transition to clean fuel; all 1,943 identified units have been shifted to clean fuel, achieving 100% implementation against the identified target.
- Implementation involved identification of applicable units, communication of the clean-fuel requirement, transition of fuel-use systems, and verification of compliance through the regulatory framework of DPCC.

2. Online Continuous Emission Monitoring (OCEMS)

- OCEMS have been installed in applicable industrial units, providing continuous measurement and recording of prescribed emission parameters from industrial stacks / processes, as applicable to the concerned industry.
- The intervention covers 17 Red Category industrial units, including 3 sectors — food, textiles and metal industries — located in the vicinity of Delhi.

This integrated approach strengthens preventive pollution control as well as regulatory compliance, and provides a framework that can be adapted by other cities and States based on their industrial profile, fuel-use pattern, pollution potential and applicable regulatory requirements.

The Problem It Solves

- Emissions from industrial fuel combustion —transition to cleaner fuels reduces emission.
- Need for complete transition to cleaner industrial fuels — partial adoption limits the effectiveness of a source-control programme, so the intervention focuses on complete transition; all 1,943 identified units have transitioned (100%).
- Limitations of periodic emission monitoring — conventional inspections and periodic stack measurements provide information only for specific events; OCEMS addresses this by providing continuous emissions data.
- Need for continuous regulatory oversight — OCEMS strengthens oversight by providing continuous, time-stamped emissions data.
- Need for source-specific pollution control —project targets industrial sources through fuel substitution and continuous source-level monitoring.
- Need for a replicable industrial pollution-control framework — the combination of cleaner-fuel transition, compliance verification and continuous emissions monitoring provides a structured framework for replication across multiple industrial units.

Who Is Involved

Implementing Agency	Delhi Pollution Control Committee (DPCC)
Scope of Intervention	(i) Transition of identified industrial units to cleaner fuels; and (ii) Installation of OCEMS in applicable industrial units
Clean-Fuel Transition	1,943 industrial units (100% of the identified target)
OCEMS Coverage	17 Red Category industrial units, across 3 sectors — food, textiles and metal — located in the vicinity of Delhi
Implementation Timeline	2023–2026
Total Project Cost	₹0 (regular activity of DPCC)

Impact

- All identified 1,943 units shifted to clean fuel, achieving 100% implementation.
- 17 Red Category industrial units have been covered under the applicable OCEMS intervention, including 3 sectors — food, textiles and metal industries — located in the vicinity of Delhi.
- OCEMS provides continuous emissions data from applicable industrial sources and strengthens the technical basis for regulatory monitoring and compliance assessment.
- The achievement of 100% clean-fuel transition among the identified 1,943 industrial units demonstrates effective implementation at scale and provides a measurable outcome for assessment under the objectives of the National Clean Air Programme (NCAP).

Evidence



Piped Natural Gas (PNG) installation with Indraprastha Gas Limited safety signage at an industrial unit



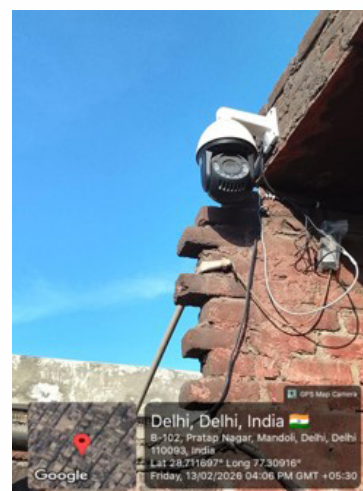
PNG supply line and caged gas installation at an industrial unit, Delhi



Piped Natural Gas (PNG) installation with Indraprastha Gas Limited safety signage at an industrial unit



RS485 datalogger transmitting continuous emission data, Badli Industrial Area, Delhi



Surveillance camera at a monitored industrial unit, Mandoli, Delhi

PM₁₀ Reduction

- Average PM₁₀ reduced by 17%, from 241 ug/m³ in 2017-18 to 200 ug/m³ in 2025-26.

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Sh. M.S. Rawat, Senior Environment Engineer, DPCC, msrawat.dpcc@nic.in

2 MUMBAI - MAHARASHTRA

At a Glance

70%+

Licensed Bakeries
Transitioned

750

Bakeries Engaged
in Camps

20+

Collaborating Agencies

161→81

PM₁₀ (µg/m³)

Transition Bakeries to Clean Fuel (PNG / Electric) in Mumbai

What Is It?

- Brihanmumbai Municipal Corporation (BMC), with technical support from WRI India, is driving the transition of Mumbai's licensed bakeries from conventional fuels (such as wood and coal) to cleaner, more energy-efficient alternatives — PNG and electricity.
- Over 70% of operational licensed bakeries have transitioned to clean fuel, with others at advanced stages, moving towards complete industry transition.

The Problem It Solves

- The use of conventional fuels in bakery operations is a localized industrial source of air pollution. The initiative reduces the air pollution and emissions caused by conventional fuels in bakery operations, while supporting a transition to cleaner and more energy-efficient alternatives such as PNG and electricity.

Who Is Involved

Implementing Agency	Brihanmumbai Municipal Corporation (BMC)
Supporting Departments / Agencies	WRI India; 20+ collaborating agencies and BMC departments
Mode of Implementation	Bakery operators' own funds (approx. ₹2,50,000)
Implementation Timeline	Ongoing
Key Polluting Sources	Vehicular exhaust from dense traffic congestion, widespread construction dust, and localized industrial operations.

Impact

- Over 70% of operational licensed bakeries transitioned to clean fuel; others at advanced stages, moving towards complete industry transition.
- Continuous monitoring by BMC departments and a city-level data repository established.
- Governance structure and licensing processes modified to ensure transparency and smooth processes.
- A toolkit is being developed to share insights with other cities.

Evidence: Before & After

The photographs below document before conventional bakery oven & after clean rotary bakery oven.

BEFORE



Before — a conventional (wood/coal-fired) bakery oven under assessment, Chinchpokli, Mumbai

AFTER



After — a clean-fuel (PNG / electric) rotary bakery oven

PM₁₀ Reduction

- Average concentration reduced by 49.7%, from 161 ug/m3 in 2017-18 to 81 ug/m3 in 2025-26.

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3 MPCB - MAHARASHTRA

At a Glance

6

Continuous Online Stations

24+

VOC / Odour Molecules Speciated

ppb–ppt

Detection Sensitivity

₹18 Cr

Project Cost (excl. GST)

Setting up of Continuous Online VOC / Odour / Ammonia (NH₃) Monitoring Stations at Major Industrial Clusters

What Is It?

Setting up of 6 Continuous Online VOC / Odour / NH₃ Monitoring Stations at fenceline locations of major industrial clusters in Maharashtra: Tarapur, Taloja, Roha, Mahad, Lote Parashuram and Mahul (Mumbai). The network complements MPCB's existing CAAQMS network across the State, integrating VOC / odour / NH₃ data additionally onto the MPCB server.

Technology deployed (Make: Chromatotec, France)

- airmoVOC 624 — GC-FID analyzer for ~24 ambient VOC / odour molecules (Benzene, Toluene, Xylene, Acetaldehyde, MTBE, etc.), at ppb / ppt sensitivity.
- airmoMEDOR (ppt) — GC-ECD analyzer for sulfur odour compounds (Methyl-Mercaptan, Dimethyl Sulphide, etc.).
- DET NH₃ — FTUV analyzer for continuous ammonia monitoring.
- Each station also includes a multi-gas calibrator, weather station, UPS, gas sampling system, display board and data-logging software, with a gateway transmitting real-time data to the MPCB server.

The Problem It Solves

- Addresses health and environmental risks from VOCs / odour / ammonia emitted by industrial clusters — exposure causing throat / eye / nose irritation, headaches, asthma triggers, and VOCs' role in ground-level ozone formation.
- Moves from time-consuming manual / grab sampling and laboratory analysis to real-time, continuous, automated monitoring, in line with CPCB's Guidelines.
- Enables objective quantification and speciation of industrial VOC / sulfur-odour / ammonia emissions at industrial clusters, supporting faster, evidence-based redressal of odour-nuisance complaints from surrounding communities.
- Provides MPCB with continuous, centrally accessible emission data for regulatory follow-up, comparable to how CAAQMS is used for ambient air quality.

Who Is Involved

Implementing Agency	Maharashtra Pollution Control Board (MPCB)
Station Locations	6 fenceline stations — Tarapur, Taloja, Roha, Mahad, Lote Parashuram and Mahul (Mumbai)
Implementation Timeline	Commissioned in 2024–2025 (ongoing O&M up to 2030)
Total Project Cost	~₹18.00 crore (excluding GST)
Annual O&M Cost	~₹1.15 crore per year (comprehensive maintenance, calibration and consumables for the 6 stations)
Maintenance	1-year warranty followed by a 5-year CAMC with quarterly-paid, penalty-linked service levels
Source of Funds	Others

Impact

- 6 continuous, real-time Online VOC / Odour / NH₃ Monitoring Stations commissioned at Tarapur, Taloja, Roha, Mahad, Lote Parashuram and Mahul (Mumbai) — key industrial belts of Maharashtra prone to odour and VOC complaints.
- Real-time VOC, sulfur-odour and ammonia concentration data now streamed continuously to the MPCB server, replacing periodic manual / lab-based sampling.
- Detection capability down to ppb / ppt concentration levels enables early identification of exceedances and faster regulatory response.
- Provides an auditable, continuous data trail to support quicker and more objective redressal of odour-nuisance complaints from communities near industrial clusters.
- A 5-year CAMC with penalty clauses (linked to equipment uptime) ensures sustained data availability and long-term reliability of the network.
- Establishes a replicable, technology-driven model combining tender-based procurement, phased civil / technical rollout, system integration with the SPCB server, and a long-term CAMC that other SPCBs / PCCs can adopt for industrial VOC / odour monitoring.

Evidence

The photographs below are from the Maharashtra Pollution Control Board's submission.



MPCB-branded monitoring station on its concrete plinth at an industrial-cluster fenceline



Station shelter within a secured, fenced compound at a major industrial cluster



Analyzer racks inside the station: GC-FID (VOC), GC-ECD (sulfur-odour) and FTUV (NH₃) units



Station cabin sited amid a coastal industrial belt



On-site operator workstation with real-time data logging to the MPCB server

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Management of Construction and Demolition Waste

1 VIJAYAWADA - ANDHRA PRADESH

At a Glance

2018

Facility Established
(Ongoing)

3.5 Acres

ISWM Site,
Ajith Singh Nagar

200 MT/Day

Design Processing
Capacity

₹5.00 Cr

Total Project Cost

C&D Waste to Resource- Recycling and Reuse Initiative

What Is It?

The Construction & Demolition (C&D) Waste Management Project was implemented in 2018 at the Integrated Solid Waste Management (ISWM) Site, Ajith Singh Nagar, Vijayawada, over approximately 3.5 acres, at a project cost of ₹5.00 Crore. It scientifically manages C&D waste by converting discarded construction material into reusable construction products through mechanical segregation, sorting, crushing and screening.

- The facility is run by a private agency on a Build-Operate-Transfer (BOT) basis with Vijayawada Municipal Corporation (VMC).
- Recovers and produces coarse aggregates, fine aggregates, recycled sand and paver blocks, graded into standard sizes such as 40mm, 20mm, 6mm and -2 sand.
- Since 2019, building-plan approvals for new construction require old-building debris to first be deposited at the C&D processing unit.
- A per-tonne processing fee is charged to builders who deliver debris to the facility.

Facility Status: Operational since 2018 - processing 75-100 MT/day against a 200 MT/day design capacity

The Problem It Solves

- Vijayawada generated an estimated 25,550 MT of C&D waste annually, much of it dumped unscientifically on open spaces, roadsides, low-lying areas and canal bunds — obstructing drains and public spaces and creating environmental and public health risks. The city had limited recycling or resource-recovery capacity, and construction activity remained heavily dependent on natural aggregates and sand.

Who Is Involved

Implementing Agency	Vijayawada Municipal Corporation (VMC)
Supporting Departments / Agencies	Swachh Andhra Corporation; private C&D waste management agency (BOT operator)
Mode of Implementation	Build-Operate-Transfer (BOT) with a private agency; ₹5.00 Crore project cost, ₹96 Lakh annual O&M
Implementation Timeline	2018–19, ongoing
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Construction and demolition debris dumped in open spaces, roadsides, low-lying areas and canal bunds

C&D WASTE MANAGEMENT PROCESS FLOW



Evidence

The photographs and process flow below are from Vijayawada Municipal Corporation's submission, showing C&D waste before processing, the recycling facility at Ajith Singh Nagar, and its recovered and processed products.

C&D WASTE DUMPING — BEFORE PROCESSING



Unscientifically dumped C&D debris prior to collection



A debris pile with the processing facility visible in the background

THE C&D WASTE PROCESSING FACILITY, AJITH SINGH NAGAR



C&D Waste Recycling Unit of 200 TPD



The processing plant's conveyor and crusher setup

GRADED AGGREGATES & RECYCLED PRODUCTS (Size-wise)



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2 CHANDIGARH

At a Glance

150 TPD

C&D Processing Facility

1.60 lakh MT

C&D Waste Processed

25

Collection Points

2022

C&D Waste Policy

Policy-backed C&D Waste Processing & Recycling- Recycling and Reuse Initiative

What Is It?

Chandigarh has adopted a comprehensive approach to the scientific management, processing and recycling of Construction & Demolition (C&D) waste. The Chandigarh C&D Waste Management Policy, 2022 (notified on 1 February 2022) emphasises segregation, collection, transportation, recovery, reuse and recycling. Municipal Corporation Chandigarh operates a dedicated 150 TPD C&D Waste Processing Facility at Industrial Area, Phase-I, operational since May 2019.

- The facility processes C&D waste into recycled aggregates and other construction materials, used in engineering works and to manufacture PCC/RCC products.
- 25 designated C&D waste collection points have been established across the city where residents can deposit C&D waste.
- A call-based, door-to-door collection service is available on a toll-free number (0172-2787200) for segregated C&D waste on a payment basis.
- Monitoring and enforcement against unauthorised dumping is carried out regularly, with fines imposed on transporters/generators for illegal dumping.
- The initiative advances the Sustainable Development Goals, particularly SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production).

The Problem It Solves

- The initiative addresses the unscientific disposal and illegal dumping of construction and demolition (C&D) waste by promoting its scientific processing and reuse, while reducing dependence on virgin materials for construction activities.

Who Is Involved

Implementing Agency	Municipal Corporation Chandigarh
Supporting Departments / Agencies	Chandigarh Pollution Control Committee
Mode of Implementation	Swachh Bharat Mission (SBM); project cost approximately ₹2.5 crore
Implementation Timeline	Facility operational since May 2019; C&D Policy notified February 2022
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Improper disposal of C&D waste, open dumping, dust generation from construction activities, and transportation/handling of construction debris.

Impact

- PM10 reduced from 114 $\mu\text{g}/\text{m}^3$ (2017–18) to 90 $\mu\text{g}/\text{m}^3$ (2024–25) — a 21% reduction against the initial values.
- The C&D waste processing facility has enabled Chandigarh to move from disposal-oriented management towards processing, recycling and resource recovery, having processed more than 1.60 lakh MT of C&D waste to date.

Evidence

The photographs below are from Municipal Corporation Chandigarh's submission, showing the C&D waste processing and recycling facility and the manufacture of recycled paver blocks.

C&D PROCESSING & RECYCLED-PRODUCT MANUFACTURE



Recycled-aggregate processing and paver-block production line



Screening and recovery of recycled aggregate from C&D waste



Manufacture of paver blocks from recycled C&D material

Recommendations for Other Cities

- The Chandigarh model can be replicated by other urban local bodies by establishing an integrated C&D waste management system consisting of mandatory source segregation, designated collection centres, organised transportation, dedicated processing/recycling facilities and utilisation of recycled products in public works.
- Cities may formulate a dedicated C&D Waste Management Policy with clear responsibilities for waste generators and Government departments.
- Public and private contractors should be encouraged to incorporate the use of recycled C&D products in their works wherever technically feasible.

The Chandigarh experience demonstrates that C&D waste can be converted from a disposal problem into a resource for construction materials, while simultaneously reducing illegal dumping, environmental impacts and dependence on virgin aggregate.

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3 PUNE - MAHARASHTRA

At a Glance

~600

Vehicles Tracked

≥ 5,000 m²

Asset Categories

23%

C&D Share of PM10
(ARAI 2021)

2025-26

Portal Running Cost

Sensor-Based Air Quality Monitoring at Construction Sites

What Is It?

Pune Municipal Corporation (PMC), in collaboration with WRI India, established a framework for sensor-based air-quality monitoring and dust mitigation at construction sites. Construction sites with a built-up area of 5,000 sq.m or more are required to install sensor-based air-quality monitoring systems under the framework.

- The ARAI emission inventory for Pune district (2021) estimates that construction and allied activities contribute 23% of PM10 emissions.
- The system monitors PM10 and PM2.5 that communicates indicative dust severity against predefined PM10 thresholds, giving site personnel a simple visual cue to trigger real-time mitigation.
- Sensor specifications were developed and validated through a co-location exercise with technical support from IITM Pune.
- A clean-air portal (cleanair.pmc.gov.in), developed by PMC with WRI India, integrates all field sensors, with map-based visualisation, nearest-CAAQMS comparison, high-dust alerts and offline/measurement-anomaly detection (beta).
- When a high-dust event is detected, an automated email alert is sent to the project proponent to support timely mitigation.
- One-click reports let PMC officials review city-level status, violations and zone-wise performance for prioritised follow-up.
- An open, technology-neutral pathway lets sensor providers apply and be shortlisted after meeting technical specifications and completing co-location/validation.

The Problem It Solves

- Sensor-based air-quality monitoring at construction sites, develops the mechanism for centralised monitoring.

Who Is Involved

Implementing Agency	Pune Municipal Corporation (PMC)
Supporting Departments / Agencies	WRI India; IITM Pune (sensor co-location / validation)
Mode of Implementation	Portal developed and run by PMC (~₹1,200/month); site sensors procured and installed by project proponents per the PMC framework
Implementation Timeline	2026-27
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Construction dust (PM10 and PM2.5) generated at construction and demolition sites.

Evidence

The photographs below are from Pune Municipal Corporation's submission, showing the on-site sensors and LED air-quality indicators installed at construction sites and the monitored site environment.

SITE SENSORS & LED DUST INDICATORS



On-site sensor with LED indicator showing green (within threshold) and the monitoring unit below



LED indicator showing red — a high-dust alert state at a site



Green LED indicator and sensor at a site gate



CCTV and LED indicator at a construction site



A monitored construction site (excavation and foundation stage) within PMC limits

Recommendations for Other Cities

- Adopt an open, technology-neutral pathway for sensor providers: shortlist manufacturers who meet prescribed technical specifications and complete a co-location/validation process, while maintaining defined quality and performance requirements.
- Mandate sensor-based monitoring for larger construction sites (for example, $\geq 5,000$ sq.m) and integrate all site sensors into a single municipal clean-air portal.
- Pair on-site LED dust indicators with automated high-dust alerts and one-click reporting to link monitoring with enforcement and reduce reliance on physical inspections.

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4 THANE - MAHARASHTRA

At a Glance

2024–26

Portal Development Period

15 Jul 2026

Portal Launch Date

BPMS-Linked

Registration Gateway

Pro Bono

Development Cost
(with CEEW)

C&D Waste Management Portal

What Is It?

- Thane Municipal Corporation (TMC), with the support of the Council on Energy, Environment and Water (CEEW), developed a Construction & Demolition Waste Management Portal to monitor, track and manage C&D waste across a project's timeline.
- Linked with the Building Plan Management System (BPMS) — C&D registration is required ahead of the Commencement Certificate (CC).
- Builders are being progressively onboarded following the portal's launch.
- Complements TMC's dedicated C&D processing facility — Maharashtra's first Construction & Demolition Waste Processing Facility.

Portal Status: Live — onboarding builders (as of August 2026)

The Problem It Solves

- High levels of PM2.5 and PM10 resulted from open dumping of C&D waste across the city. Uncontrolled and mismanaged dumping also caused drainage blocks during the monsoon, and TMC had no prior digital system to track or manage the C&D waste generated in the city.

Who Is Involved

Implementing Agency	Thane Municipal Corporation (TMC)
Supporting Departments / Agencies	Council on Energy, Environment and Water (CEEW); Environment Department and Town Planning Department, TMC
Mode of Implementation	Developed pro bono with CEEW; linked with the Building Plan Management System (BPMS)
Implementation Timeline	2024–2026 (launched 15 July 2026)
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Construction and demolition waste dumping (PM2.5 and PM10)

Impact

- Prevents open dumping of C&D debris and reduces the drainage blockages it previously caused during the monsoon.
- Links C&D waste tracking to the statutory BPMS approval process, embedding compliance into a project's building-plan workflow.
- In FY2025–26, the processing facility processed 58,388 MT and sold 38,958 MT of C&D waste, against 61,873.61 MT collected (target: 108,900 MT).
- Builder onboarding onto the portal is underway following the July 2026 launch.

Evidence

The photographs and data below are from Thane Municipal Corporation's submission, showing Maharashtra's first C&D waste processing facility and its FY2025–26 collection and processing performance.

SITE PHOTOGRAPHS AT THE C&D PROCESSING FACILITY



Crushing and conveyor unit at the C&D waste processing facility



Facility building — “Maharashtra’s First Construction & Demolition Waste Processing Plant”



Crusher and conveyor system processing C&D waste at the facility

Contact:

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5 CHENNAI - TAMIL NADU

At a Glance

800 MT/Day

Combined Processing
Capacity (2 Plants)

20 Years

DBFOT-PPP Concession
Period

₹374.4 Cr

Total Project Value

2,92,000 MT/Yr

C&D Waste Diverted from
Open Dumping

DBFOT-PPP C&D Processing Facilities

What Is It?

Greater Chennai Corporation (GCC) manages Construction & Demolition (C&D) waste generated from approximately 6,885 annual building approvals, and established C&D waste processing facilities at Kodungaiyur (KDG) and Perungudi (PDG) Dumping Grounds under a 20-year Design-Build-Finance-Operate-Transfer (DBFOT) model on a Public-Private Partnership (PPP) basis.

- M/s. Westarts Communication India Pvt. Ltd., the successful bidder, designed, built, financed and operates both facilities, investing ₹9.50 Crore per plant against a total project value of ₹374.4 Crore, commissioned in May 2021.
- Each plant has a minimum assured processing capacity of 400 MT/day (±10% tolerance), converting raw C&D debris into reusable Soil, Washed Sand, and Aggregates (including 40mm+ Coarse Aggregates).
- Recovered material is supplied to 24 empanelled consumers, including Larsen & Toubro and Sobha Limited, for reuse in construction.
- GCC pays a processing fee of ₹752 per MT (escalating 5% annually) and recovers land-use charges of ₹1 per sq.m from the concessionaire, while an Independent Engineer monitors performance against KPIs.

Facility Status: Operational since May 2021 — over 4 years of continuous operation

The Problem It Solves

- GCC accords approximately 6,885 building approvals annually, covering 48,04,631 sq.m of built-up area and generating an estimated 3,76,409 MT of C&D waste per year. While a portion is used by developers to level low-lying areas in erstwhile local bodies, the remaining 2,92,000 MT/year previously required formal collection and had no scientific processing route — contributing to uncontrolled dumping in low-lying areas and waterbodies, mounting pressure on landfill capacity at KDG and PDG, loss of recoverable resources, and fugitive dust and particulate emissions from open, unprocessed debris.

Who Is Involved

Implementing Agency	Greater Chennai Corporation (GCC)
Supporting Departments / Agencies	M/s. Westarts Communication India Pvt. Ltd.
Mode of Implementation	20-year DBFOT model under PPP; ₹374.4 Crore total project value, ₹9.50 Crore per plant invested by the concessionaire
Implementation Timeline	Commissioned and operational since May 2021
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Fugitive dust and particulate emissions from open, unprocessed C&D debris dumped in low-lying areas and waterbodies

Impact

- Reduced open dumping of C&D debris in low-lying areas and waterbodies across North and South Chennai, cutting fugitive dust and particulate emissions in line with NCAP's air quality goals.
- Diverts 2,92,000 MT/year of C&D waste from KDG and PDG, extending the operational life of both dumping grounds.
- Established a circular-economy model: recovered sand, soil and aggregates substitute virgin material extraction, easing pressure on river-sand mining and quarrying.
- Created a functioning market for recycled construction material with 24 empanelled consumers, including Larsen & Toubro and Sobha Limited, demonstrating commercial viability.
- Shifted the ₹19 Crore capital investment burden to the private concessionaire; GCC pays only a per-MT processing fee — an asset-light, financially sustainable model.
- Established a KPI-linked, Independent-Engineer-monitored governance framework that is replicable for future PPP-based waste management projects in the city.
- Provides a stable, scalable platform, with a 20-year concession period and a proven operational track record since 2021.

Evidence

The photographs below, from Greater Chennai Corporation's submission, show the C&D waste processing facilities in operation at Thoraipakkam and the Kodungaiyur (KDG) landfill site.

C&D WASTE PROCESSING FACILITIES — KDG & PDG



Conveyor, crusher and screening unit processing C&D debris at Thoraipakkam



Aerial view of the Kodungaiyur (KDG) processing facility

Recommendations for Other Cities

- Structure large-scale C&D processing as a DBFOT-PPP concession to shift capital investment and operating risk to a private concessionaire, keeping the ULB's cost exposure to a predictable per-tonne processing fee.
- Set a minimum assured processing capacity with a tolerance band, and appoint an Independent Engineer to verify KPI compliance and link payments to performance.
- Proactively empanel consumers, including large construction firms, for recovered aggregates, sand and soil to guarantee offtake and the long-term commercial viability of the facility.

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WET WASTE

Food Waste
Garden Waste



DRY WASTE

Paper
Plastic
Metal
Glass





DOMESTIC HAZARDOUS WASTE

Sanitary Waste
Diapers
Used Masks
Household Hazardous Waste
(e.g. bulbs, batteries, paint, etc.)



REJECT WASTE

Soiled Waste
Multilayered Plastic
Non-recyclable Waste



DOMESTIC
HAZARDOUS WASTE



REJECT WASTE



HANDLING WITH CARE
WHAT CANNOT BE RECOVERED

Management of Municipal Solid Waste (MSW)

1

HUBBALLI-DHARWAD - KARNATAKA

At a Glance

1.1 km

Pilot Road, Lingaraj Nagar

8%

 Plastic Waste in
Bitumen Mix

88%

Overall Rate

3 Cities

Gaya · Muzaffarpur · Patna

Use of Plastic Waste for Road Construction

What Is It?

Hubballi-Dharwad Municipal Corporation (HDMC) has used plastic waste in road construction, completing a 1.1 km stretch in the city with 8% shredded plastic waste blended with bitumen in the asphalt mix, and is planning to extend the approach to other locations.

- Non-recyclable plastic waste is collected, segregated, cleaned, dried and shredded before being blended into the hot aggregate/bituminous mix under controlled conditions.
- The initiative delivered savings of approximately ₹1.5 lakh per km of road constructed, compared to conventional bituminous roads.
- Plastic-modified stretches have shown enhanced strength and resistance to water damage and potholes.
- A further 1.7 km stretch near a construction and demolition plant in Shivalli village is planned using the same technology.

Project Status: 1.1 km completed at Lingaraj Nagar, Hubballi — further stretches planned citywide

The Problem It Solves

Hubballi-Dharwad faced growing accumulation of non-recyclable plastic waste, much of it disposed of through landfilling and open dumping, creating environmental hazards and a risk of water-body pollution. Conventional bituminous roads also showed comparatively lower resistance to water damage and pothole formation.

Who Is Involved

Implementing Agency	Hubballi-Dharwad Municipal Corporation (HDMC)
Mode of Implementation	In-house asphalt mixing facility, with plastic-waste shredding integrated into road-construction operations
Implementation Timeline	2025, 11 months
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Biomass burning, vehicular emissions, re-suspended dust, crustal and non-exhaust emissions

Evidence

The photographs below are from Hubballi-Dharwad Municipal Corporation's submission, showing plastic-modified asphalt being laid and the completed road at Lingaraj Nagar, Hubballi.

PLASTIC-WASTE ROAD CONSTRUCTION AT LINGARAJ NAGAR, HUBBALLI



Laying the plastic-modified bituminous mix on the prepared road surface



The completed 1.1 km plastic-waste road at Lingaraj Nagar

Impact

- PM10 reduced from $79 \mu\text{g}/\text{m}^3$ (2017–18) to $61 \mu\text{g}/\text{m}^3$ (2024–25) — a 22.78% reduction against the initial values.
- Provides a cost-effective, resource-efficient road-construction solution, with benefits during implementation and throughout the road's service life.
- Promotes productive reuse of plastic waste, supporting the World Environment Day 2025 #BeatPlasticPollution theme, and reduces the quantity requiring conventional disposal.
- Plastic-modified roads show improved strength, durability, water resistance and resistance to deformation, reducing maintenance requirements.
- Supports circular-economy principles by converting waste into a useful construction resource.
- Partial replacement of conventional bitumen with processed plastic reduces bitumen consumption and contributes to cost savings.
- Dust-mitigation measures around the CAAQMS area - water sprinkling, housekeeping, paved surfaces, controlled vehicle movement - help minimise fugitive dust and particulate emissions.

Recommendations for Other Cities

- Adopt waste plastic-based road construction by integrating suitable non-recyclable plastic waste into bituminous road works.
- Establish proper segregation, collection, shredding and quality-control systems in coordination with road agencies.
- The approach reduces plastic pollution, minimises landfill waste, conserves conventional construction materials, and promotes sustainable, resource-efficient infrastructure.

2

GOBINDGARH - PUNJAB

At a Glance

15 TPD

Plant Capacity

~1,000

Units Electricity/Day

₹2.98 Cr

Project Cost

129→123

PM10 (µg/m³)Waste to Energy Plant (Bio-Methanation Plant)

What Is It?

The project involves the establishment of a 15 TPD wet-waste Bio-Methanation Plant (Waste-to-Energy Plant) by Municipal Council, Gobindgarh for the scientific and sustainable management of segregated organic municipal solid waste generated from households, shops, vegetable markets and eateries. The project was implemented over a period of one year with an investment of Rs. 2.98 crore (Rs. 298 lakh) from ULB own funds.

Segregated wet waste is collected through dedicated vehicles and transported to the plant, where it is processed through anaerobic digestion technology in the absence of oxygen to produce biogas. The biogas is utilised for electricity generation, with the plant generating approximately 1,000 units of electricity per day. The electricity generated is primarily used for operating the plant, while surplus electricity is sold to Punjab State Power Corporation Limited (PSPCL). The process also generates compost, which is utilised in local parks and agriculture.

The Problem It Solves

The project addresses the major problem of scientific management and disposal of wet organic municipal solid waste generated from households, markets, shops and eateries in Gobindgarh. Before the intervention, biodegradable wet waste was often dumped in open areas or sent to a dumpsite, or converted to compost via compost pits, resulting in foul odour, unhygienic conditions, attraction of disease-carrying pests, and environmental pollution. Unmanaged organic waste also contributes to the generation of methane and other greenhouse gases during decomposition. Through the Bio-Methanation Plant, segregated wet waste is scientifically treated through anaerobic digestion and converted into biogas, renewable electricity and compost, thereby reducing open dumping and landfill dependency, lowering greenhouse gas emissions, improving environmental conditions and promoting a sustainable circular waste-management system.

Who Is Involved

Implementing Agency	Municipal Council, Gobindgarh
Supporting Departments / Agencies	Govt. of India and Deptt. of Local Government, Punjab
Implementation Timeline	2024 to 2025 (01 year)
Population Category	Under 3 Lakh population
Key Polluting Sources	Road dust, industrial and vehicular emissions.

Impact

- PM10 reduced from 148 $\mu\text{g}/\text{m}^3$ (2017–18) to 123 $\mu\text{g}/\text{m}^3$ (2024–25) — a 16.89% reduction against the initial values.
- The electricity generated is used for operating the plant, while surplus electricity is sold to PSPCL, creating an additional revenue stream for the Municipal Council.
- The intervention has reduced open dumping and landfill dependency of wet waste, helping to improve local environmental conditions, reduce foul odour and pest-related problems, and lower greenhouse gas emissions associated with unmanaged organic waste.
- The project also produces compost, utilised in local parks and agriculture, promoting resource recovery and a circular economy.

Evidence

The photographs below show the Bio-Methanation Plant in operation, along with media coverage of the initiative.



Segregated wet waste fed to the processing line at the Bio-Methanation Plant, Gobindgarh



Biogas pressure vessel, blowers, scrubbers and generator at the plant

3 CHENNAI - TAMIL NADU

At a Glance

~6,150 TPD
Waste Addressed

15/15
Zones Covered (100%)

6,249+
Vehicles Deployed

40%
Source Segregation

Door-to-Door Collection of Municipal Solid Waste

What Is It?

- Greater Chennai Corporation (GCC) has implemented a four-stream Solid Waste Management system - wet, dry, sanitary, and special-care waste - in compliance with SWM Rules, 2026, covering all 15 zones of the city. The city generates approximately 3,200 TPD of wet waste, 2,450 TPD of dry waste and 500 TPD of inert waste, a combined ~6,150 TPD, which is processed through decentralised units set up across all zones.
- The collection fleet comprises 1,450 GCC-operated battery-operated vehicles (BOVs), HMTV/LMV compactors, tippers and mechanical sweepers, supplemented by 4,979 private BOVs and additional equipment - a combined fleet of over 6,249 vehicles. More than 27,000 workers (permanent, contract and SHG) support daily operations.
- Service delivery is monitored through KPI-linked concession agreements - tying concessionaire payments to source segregation and door-to-door collection performance - and a Centralised SWM Portal that provides real-time digital tracking of collection, segregation and processing across all zones and operators. Sustained IEC (Information, Education, Communication) campaigns have driven source segregation from a low base to 40%, with room to scale further.

The Problem It Solves

- Before this system, mixed waste collection reduced recyclability, complicated processing, and left sanitary and special-care waste (diapers, napkins, batteries, expired medicines, bulbs) unsafely mixed with general waste, exposing sanitation workers to health hazards. Centralised processing at a single point over a large metropolitan area also meant limited real-time oversight and weak accountability among private operators, while low public participation kept segregation rates low. Open dumping, uncontrolled burning and mismanaged inert waste additionally undermined air-quality goals under NCAP. Four-stream segregation, decentralised zonal processing, KPI-linked concession agreements, digital monitoring through the Centralised SWM Portal, and sustained IEC campaigns together address these gaps — increasing recovery rates, protecting worker safety, strengthening accountability, and directly supporting particulate-matter reduction under the National Clean Air Programme.

Who Is Involved

Implementing Agency	Greater Chennai Corporation (GCC), Solid Waste Management Department
Mode of Implementation	M/s Urbaser Sumeet and M/s Chennai Enviro Pvt. Ltd./Ramky - conservancy concessionaires for 12 of 15 zones
Implementation Timeline	Ongoing (compliance with SWM Rules, 2026)
Population Category	Ongoing (compliance with SWM Rules, 2026)
Key Polluting Sources	Above 10 Lakh plus population
Key Polluting Sources	Biomass burning, vehicular emissions, re-suspended dust, crustal and non-exhaust emissions

Impact

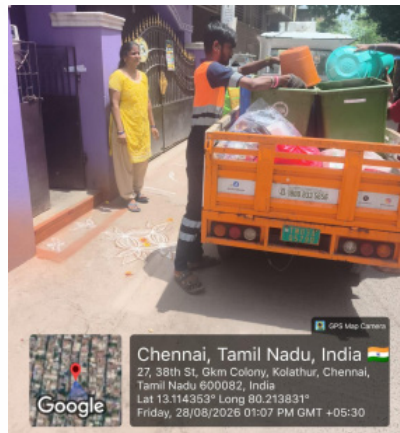
- Segregated handling of sanitary and special-care waste protects citizens and sanitation workers from hazardous and infectious material.
- Decentralized processing enables higher recovery of recyclables and organics for composting/bio-methanation, reducing landfill dependency.
- By reducing open dumping, uncontrolled burning and mismanaged inert waste, the project directly supports particulate-matter reduction goals under NCAP.
- Segregated BOVs with IEC audio improve source segregation and waste processing.
- ICCC cameras enable real-time GVP monitoring and rapid intervention.

Evidence

The photographs below, from Greater Chennai Corporation's submission, document door-to-door collection and conservancy operations across the city's zones.



Conservancy worker with a GCC battery-operated collection vehicle during door-to-door pickup, K.K. Nagar, Chennai



Household waste being loaded onto a GCC collection vehicle as part of daily door-to-door conservancy operations



A sanitation worker collecting segregated waste from a residence under the four-stream door-to-door system



A GCC worker operating a Battery-Operated E-rickshaw (BOV) with segregated waste compartments during door-to-door collection



Live SWM camera feeds at Garbage Vulnerable Points across GCC zones, part of the ICCC's 100-camera monitoring network

4 HYDERABAD - TELANGANA

At a Glance

62.5 MW

Installed Capacity

~3,200 TPD

MSW Processed

110→81

PM10 ($\mu\text{g}/\text{m}^3$)

26.37%

PM10 Reduction

Waste to Energy Plant (62.5 MW)

What Is It?

- Greater Hyderabad Municipal Corporation, through its concessionaire M/s Hyderabad Integrated Municipal Solid Waste Management Ltd. (HiMSW), operates Waste-to-Energy (WTE) plants that provide scientific and beneficial utilisation of approximately 3,200 TPD of the segregated combustible fraction of municipal solid waste, converting it into electricity through a cumulative installed capacity of 62.5 MW at Jawaharnagar and Dundigal.
- The project is implemented on a Public–Private Partnership (PPP) basis at an approximate cost of ₹25 crore per MW (about ₹1,562.5 crore).
- By diverting the combustible fraction of municipal solid waste to energy recovery, the plants strengthen the city's waste-processing infrastructure, reduce the quantity of waste requiring storage at the landfill, promote resource recovery and reduce dependence on conventional fossil fuels.

The Problem It Solves

- The initiative addresses the challenge of managing the large volume of municipal solid waste generated in Hyderabad and the burden of dumping it at landfill sites. By utilising the segregated combustible fraction of municipal solid waste to generate electricity, it reduces the quantity of waste sent to the dumpsite and the associated impact of pollution on groundwater and air quality in the vicinity of the site, while lowering dependence on conventional fossil fuels for power generation.

Who Is Involved

Implementing Agency	Greater Hyderabad Municipal Corporation (GHMC)
Supporting Departments / Agencies	M/s Hyderabad Integrated Municipal Solid Waste Management Ltd. (HiMSW) — concessionaire
Mode of Implementation	Public–Private Partnership (PPP), concessionaire model; approx. ₹25 crore per MW (about ₹1,562.5 crore)
Implementation Timeline	2020–2025 (commissioned in phases)
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road dust, construction and demolition (C&D) waste and vehicular emissions

Impact

- PM10 reduced from 110 $\mu\text{g}/\text{m}^3$ (2017–18) to 80 $\mu\text{g}/\text{m}^3$ (2024–25) — a 27.27% reduction against the initial values.
- Approximately 62.5 MW of electricity generated from municipal solid waste, reducing the burden of dumping at the landfill site.
- Reduced impact of pollution on groundwater and air quality in the vicinity of the dumpsite.
- Strengthened the city's waste-processing infrastructure and promoted resource recovery.
- Reduced dependence on conventional fossil fuels for power generation.

Evidence

The photographs and data below, from Greater Hyderabad Municipal Corporation's submission, document the Waste-to-Energy plants and the resulting air-quality improvement.

WASTE-TO-ENERGY PLANT

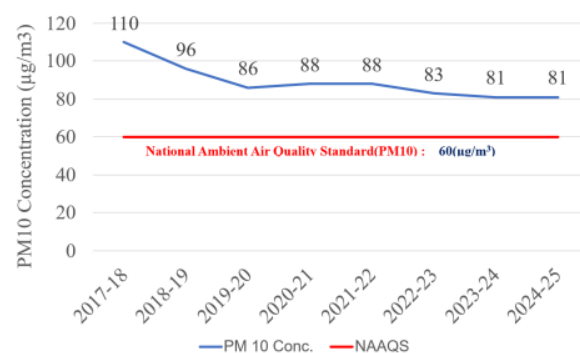


An aerial view of Hyderabad's Waste-to-Energy plant, part of the city's 62.5 MW WTE capacity

AIR QUALITY IMPROVEMENT — PM10 (2017–18 TO 2024–25)

Status of Air Quality Improvement year on year progress: Hyderabad (2017-18 to 2024-25)

S.No.	Year	PM10 ($\mu\text{g}/\text{m}^3$) (Annual Average)
1	2017-18	110
2	2018-19	96
3	2019-20	86
4	2020-21	88
5	2021-22	88
6	2022-23	83
7	2023-24	81
8	2024-25	81



Air Quality
PM10 levels(Annual Average)

110 $\mu\text{g}/\text{m}^3$
PM10 (FY2017-18)

81 $\mu\text{g}/\text{m}^3$
PM10 (FY2024-25)

26.37%
Improvement

Improvement in Air Quality: There is significant improvement in reduction of particulate matter (PM10). Particulate Matter(PM10) was reduced from 110 $\mu\text{g}/\text{m}^3$ (2017-18) to 81 $\mu\text{g}/\text{m}^3$ (2024-25).

Hyderabad's annual-average PM10 fell from 110 $\mu\text{g}/\text{m}^3$ (2017–18) to 81 $\mu\text{g}/\text{m}^3$ (2024–25), a 26.37% improvement

5

FIROZABAD - UTTAR PRADESH

At a Glance

FY 2025–26

 Implementation Period
(~1 Year)

9

 Waste-to-Art
Installations

₹2.5 Cr

Total Project Cost

100 µg/m³

 Annual Avg. PM10
(2025–26)

Development of ‘Braj Dham Theme Waste to Wonder Park’ at Gandhi Park

What Is It?

Nagar Nigam Firozabad developed the Braj Dham Theme Waste to Wonder Park at Gandhi Park by upcycling municipal scrap metal, discarded iron, and waste such as glass, used tyres and vehicle rims into sculptures depicting Braj cultural heritage.

- Installations include a replica of the Banke Bihari temple exterior, Govardhan Leela, Kanha's Murli, Sheshnag Leela, a cow nursing a calf, Makhan Matki, Krishna Jhula and Mor Pankh (peacock feather) — all fabricated from waste materials.
- The park integrates paved walkways, landscaped green cover and recreation zones, transforming the city's central public park.
- Delivered in partnership with specialised waste-to-art fabricators for structural safety, aesthetic quality and initial maintenance.

Park Status: Completed and open to the public (FY 2025–26)

The Problem It Solves

- Gandhi Park previously saw disposal and accumulation of municipal metal scrap, glass waste, used tyres and vehicle rims, alongside unpaved open soil patches generating fugitive dust. The city also lacked culturally engaging green spaces that promote 3R (Reduce, Reuse, Recycle) awareness among the public.

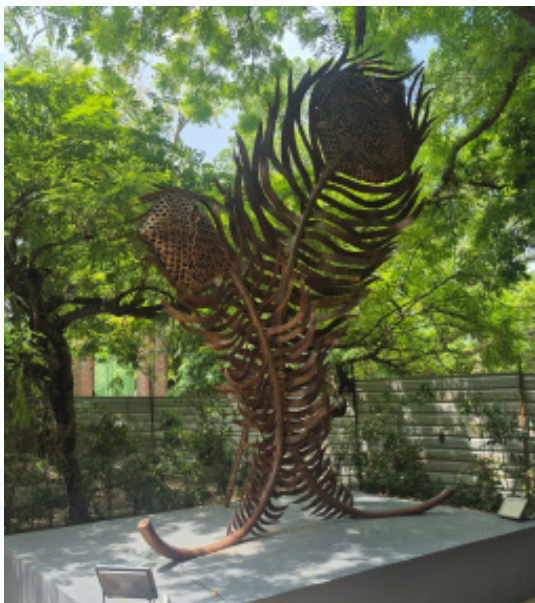
Who Is Involved

Implementing Agency	FY 2025–26 (approximately one year)
Supporting Departments / Agencies	Nirman Vibhag (Works Department), Nagar Nigam Firozabad
Mode of Implementation	Delivered with specialised waste-to-art fabrication partners; ₹2.5 Crore project cost
Implementation Timeline	2020–2025 (commissioned in phases)
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road dust, construction and demolition (C&D) waste and vehicular emissions

Evidence

The photographs below, from Nagar Nigam Firozabad's submission, show three of the waste-to-art installations at the Braj Dham Theme Waste to Wonder Park, Gandhi Park.

WASTE-TO-ART INSTALLATIONS AT GANDHI PARK



Mor Pankh — a peacock feather sculpture fabricated from scrap metal



Replica of the Banke Bihari temple exterior



Makhan Matki — a butter-pot sculpture made from waste metal and glass

Recommendations for Other Cities

- Adopt waste plastic-based road construction by integrating suitable non-recyclable plastic waste into bituminous road works.
- Establish proper segregation, collection, shredding and quality-control systems in coordination with road agencies.
- The approach reduces plastic pollution, minimises landfill waste, conserves conventional construction materials, and promotes sustainable, resource-efficient infrastructure.

6 INDORE - MADHYA PRADESH

At a Glance

22

Mobile Monitoring Vans
(15 large + 7 small)

12

Regional Offices
Covered

₹31.25 Cr

Total Cost (Supply +
Install + 5-yr O&M)

5 Years

O&M Period (extend-
able up to 3 years)

Indore's 550 TPD Bio-CNG Plant Sets National Benchmark for Zero-Waste Wet Waste Processing

PPP-based Circular Economy Model converts segregated wet waste into Bio-CNG, compost and resource value while reducing 1.3 lakh tonnes of CO₂ emissions annually



Aerial view of Indore Municipal Corporation's 550 TPD Gobardhan Bio-CNG Plant.

Indore leads wet waste circularity through large-scale Bio-CNG innovation

Indore, Madhya Pradesh: Indore Municipal Corporation (IMC), the urban local body of India's cleanest city, has developed one of the country's most significant circular economy models for municipal wet waste processing through its 550 TPD Gobardhan Bio-CNG Plant.

The initiative is positioned as a Zero Waste Discharge Model that aims to eliminate landfill dependency, maximize resource recovery and convert daily wet waste into marketable green products. Built under a public-private partnership model, the plant has been established with an investment of approximately Rs 150 crore over 15 acres of land and is designed to process 550 tonnes per day of wet waste.

Quick Facts

State	Madhya Pradesh
Local Body	Indore Municipal Corporation - 802273
Sector	Wet Waste Processing / Municipal Solid Waste
Initiative	550 TPD Gobardhan Bio-CNG Plant
Duration	Operational since February 2022
Model	Public-Private Partnership (PPP)
Investment and Land	Approx. Rs 150 crore over 15 acres
Core Outcome	Wet waste to Bio-CNG, compost, reusable water and future CO ₂ applications

Goals and Objectives

- Transform wet waste into Bio-CNG and CO₂ while reducing approximately 1.3 lakh tonnes of CO₂ emissions every year.
- Promote recycling, reuse and value-added products to minimize waste generation and landfill disposal.
- Generate revenue through Bio-CNG, compost and future CO₂ applications while ensuring long-term financial viability.
- Develop a replicable model for other Indian cities to reduce the environmental impact of urban wet waste.

Key Activities and Operational Measures

- Advanced biomethanation technology is used for high-quality Bio-CNG generation.
- Bio-CNG is sold for public transport and commercial use, contributing to cleaner fuel adoption.
- Compost production of approximately 100-105 TPD is sold at Rs 2.5 per kg for agricultural use.
- CO₂ capture and reuse is under evaluation for industrial-grade and food-grade applications.
- Energy-efficient operations include solar energy integration covering around 20% of power needs, reducing monthly power costs by around Rs 3-4 lakh.

Circular Economy Integration

Circular Economy Component	Output / Practice	Impact
Bio-CNG Production	Around 17-21 TPD Bio-CNG produced	Green fuel for public transport and commercial use; reduced fossil fuel dependency. Approx. 146 city buses run on this cleaner, cheaper fuel
Compost Production	Around 100 TPD compost; document also records 100-105 TPD	Supports agriculture, soil health and organic farming
CO₂ Capture and Reuse	Future scope for industrial-grade and food-grade CO ₂	Creates additional value stream and reduces emissions potential
Water Reuse	75% treated wastewater reused in plant operations	Reduces fresh water demand and improves resource efficiency

Financial, Social and Environmental Impact

Financial Impact	Revenue generation of approximately Rs 2.5 crore per month; Opex management of approximately Rs 1.4 crore per month; royalty to IMC of approximately Rs 2.52 crore annually; cost savings of Rs 3-4 lakh per month through solar integration.
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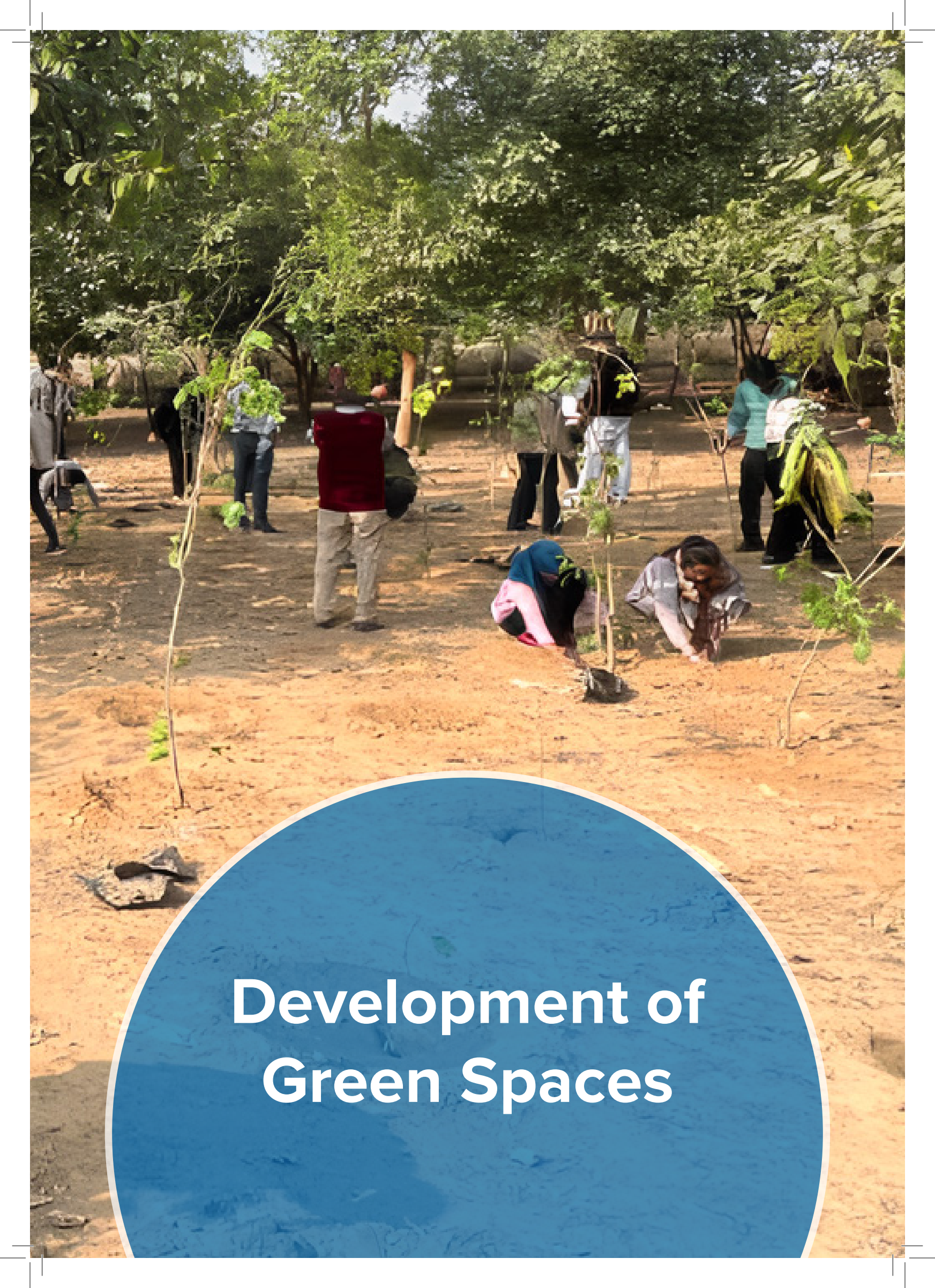


Mor Pankh — a peacock feather sculpture fabricated from scrap metal



Compressed Bio-CNG storage plant operations and Bio-CNG



A group of people are engaged in a tree-planting activity in a dry, open area. Several individuals are visible, some standing and others kneeling, working with young saplings. The ground is reddish-brown and sandy. In the background, there are larger, established trees with green foliage. A large blue circular graphic is overlaid on the bottom half of the image, containing the text "Development of Green Spaces".

Development of Green Spaces

1 RAIPUR - CHHATTISGARH

At a Glance

6,41,947 MT
Legacy Waste Processed

~28 acres
Land Reclaimed

~6,000
Saplings Planted

₹18.16 Cr
Project Cost

Plantation on Reclaimed Land after Legacy Waste Remediation

What Is It?

- The project involved the remediation of legacy waste accumulated at the Sarona Slum Area and the reclamation of approximately 28 acres of land at a total project cost of ₹18.16 crore.
- A total of 641,947 metric tonnes of legacy waste was processed through biomining technology.
- Approximately 6,000 saplings were planted across 30,000 square feet as part of plantation and greening activities.

The Problem It Solves

- The intervention addresses the accumulation of legacy waste at the Sarona Slum Area, which caused foul odour, dust, smoke, leachate risk and potential contamination of surrounding soil and water resources.
- Reduces environmental and health risks and improves local hygiene, environmental conditions and quality of life around the Sarona Slum Area.

Who Is Involved

Implementing Agency	Municipal Corporation Raipur
Supporting Departments / Agencies	Municipal Corporation Raipur (with state government funding support)
Implementation Timeline	Three years
Population Category	Above 10 Lakh plus population

Impact

- Legacy waste processed: 641,947 metric tonnes.
- Land reclaimed: approximately 28 acres.
- Community benefit: improvement in local hygiene, environmental conditions and quality of life around the Sarona Slum Area.
- Waste-processing method: excavation, windrow formation, bio-culture application, trommel screening and fraction-wise segregation.
- Post-remediation use: plantation, greening and ecological restoration.



Evidence: Before & After

The photographs below document the reclaimed Sarona site before greening and the dense plantation established on the reclaimed land after implementation.

BEFORE



AFTER



Recommendations for Other Cities

- Cities having similar legacy waste issue may adopt this practice.

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 Organisation: Municipal Corporation Raipur
 Email: nigam.raipur.cg@nic.in

2 GHAZIABAD - UTTAR PRADESH

At a Glance

₹9.99 Cr
Project Cost (15th FC)

3-Tier
Vegetation Structure

Citywide
Road Corridors Greened

2025–26
Implementation

Roadside Greening and Afforestation for Road-Dust Control

What Is It?

- To combat high levels of resuspended road dust, Ghaziabad Nagar Nigam (GNN) — a designated non-attainment city under NCAP — executed a large-scale urban greening and plantation project across major transport corridors.
- The initiative converts barren roadside spaces, which are prime sources of dust generation, into functional ecological barriers that improve urban air quality, funded with a dedicated budget of ₹9.99 crore through the 15th Finance Commission.
- The project transformed exposed road shoulders, central medians and side verges across major corridors into dense green buffers, and expanded the city's green cover by converting reclaimed land and former dumping sites into afforested green spaces.

The Problem It Solves

- Barren central verges, exposed road shoulders and open roadsides were highly susceptible to generating dust through continuous vehicular movement and wind action.
- As a non-attainment city, this airborne dust contributed directly to high particulate-matter concentrations and degraded urban air quality.
- Loose, dry soil along major corridors lacked natural anchors and was easily transferred to roadways, where it continually resuspended, while extensive barren stretches, exposed earthen medians and former dumping sites created ecological dead zones lacking environmental resilience.

Who Is Involved

Implementing Agency	Ghaziabad Nagar Nigam (Ghaziabad Municipal Corporation)
Supporting Departments / Agencies	UPPCB, GDA, UPSIDA, UP PWD, UP Awas Vikas Parishad, Transport Department (RTO) and Traffic Police
Implementation Timeline	2025–26
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road and resuspension dust (Ghaziabad is a designated non-attainment city under NCAP)

Impact

- Stabilised loose topsoil on previously barren verges through layered vegetation and newly established root systems, significantly cutting traffic-induced dust resuspension.
- I medians and reclaimed dumping sites into functional green spaces across major transport corridors.
- Created dense green buffers that act as ecological filters, trapping airborne particulate matter and reducing localised air pollution in a non-attainment city.
- Enhanced urban aesthetics and livability, replacing degraded, dusty roadside stretches with green corridors and strengthening climate resilience.

Evidence:

The geo-tagged photographs below, from the city's submission, document the transformation of barren roadside verges into layered green dust buffers along Ghaziabad's transport corridors.



Barren roadside verges before greening, and the same corridors after layered plantation — geo-tagged, Ghaziabad

GREENED ROAD CORRIDORS ACROSS GHAZIABAD



Layered tree, shrub and ground-cover buffers along a road median

A greened central verge and roadside plantation on a major corridor



Geo-tagged roadside green buffers established along Ghaziabad corridors (Hapur Road and Kavi Nagar)

Recommendations for Other Cities

- Treat roadside greening as critical, sustainable infrastructure for road-dust management and air-quality control — not merely an aesthetic upgrade.
- Plant multi-tiered vegetation (a mix of trees, shrubs and ground cover) along medians, side verges and road shoulders to maximise dust interception and soil stabilisation.
- Integrate urban horticulture and land reclamation with clean-air goals to simultaneously curb particulate-matter pollution, boost biodiversity and improve climate resilience.

Contact:

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Organisation: Ghaziabad Nagar Nigam
Email: gzb.nagar.nigam@gmail.com

3 PRAYAGRAJ - UTTAR PRADESH

At a Glance

55,800 m²
Area Planted

~1.2 lakh
Trees (Naini)

51%
PM10 Reduction (base year)

XVFC
Source of Funds

Garbage Dumps Transformed into Lush Green Forests in Prayagraj Using the Miyawaki Technique

What Is It?

- The Corporation has planted trees at more than 10 locations in the city, covering an area of 55,800 square meters over the past two years.
- The largest plantation, with around 1.2 lakh trees of 63 species, has been done in the Naini industrial area, while 27,000 trees from 27 different species have been planted in Baswar after cleaning the city's largest garbage dumping yard.

The Problem It Solves

- This project is not only helping to get rid of industrial waste but is also reducing dust, dirt and bad odour, and improving the air quality of the city.

Who Is Involved

Implementing Agency	Prayagraj Nagar Nigam
Implementation Timeline	2023-2026
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road dust re-suspension, construction and demolition (C&D) activities, and vehicular emissions.

Impact

- PM10 for Allahabad city in FY 2025-2026 was reduced by 51% from the base year.

Evidence & Media Coverage

The photographs below document a garbage-dump site before the intervention and the dense Miyawaki forest established on it after implementation, along with media coverage of the initiative.

BEFORE



Before — garbage dumping yard under clearance and site preparation

AFTER



After — dense Miyawaki forest canopy established on the reclaimed site

MEDIA COVERAGE

18/08/2026, 13:43 Press Release Page | Press Information Bureau

Ministry of Culture



Around 56,000 sq. meters of Dense Forests created in Prayagraj in last two years using Miyawaki Technique

Garbage dumps transformed into lush green forests, aiding environmental conservation, as part of Mahakumbh 2025

संक्षेपित संस्करण: 08 JAN 2025 7:07PM by PIB Delhi

In preparation for Mahakumbh 2025, dense forests have been developed at various locations across Prayagraj, to ensure pure air and a healthy atmosphere for the millions of devotees expected to visit the city. The Prayagraj Municipal Corporation has utilized the Japanese Miyawaki technique over the past two years to establish multiple oxygen banks, which have now transformed into lush green forests. These efforts have not only enhanced the greenery but also contributed to improving air quality, playing a crucial role in environmental conservation.



Prayagraj Municipal Corporation Commissioner, Shri Chandra Mohan Garg said that they are creating dense forests in many parts of the city using the Miyawaki Technique. The Corporation has planted trees at more than 10 locations in the city, covering an area of 55,800 square meters over the past two years. The largest plantation, with around 1.2 lakh trees of 63 species, has been done in the Naini industrial area, while 27,000 trees from 27 different species have been planted in Baswar after cleaning the city's largest garbage dumping yard. This project is not only helping to get rid of

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2091250®=48&lang=2>

1/3

Press Information Bureau (Ministry of Culture) coverage of the Prayagraj Miyawaki forests, 8 January 2025

Contact:

Name: Mr. Seelam Sai Teja, IAS

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4 VARANASI - UTTAR PRADESH

At a Glance

~80 hectares
Land Greened

~2.51 lakh
Plants (GWR)

₹11 Cr
Project Cost

GWR
Guinness Recognition

Miyawaki Plantation Project

What Is It?

- The Varanasi Miyawaki Plantation Project covers approximately 80 hectares of land, at an approximate investment of ₹11 crore, implemented by Varanasi Nagar Nigam with support from the Smart City Mission and NGOs.
- A major achievement of the project is the plantation of approximately 2.51 lakh plants in a single plantation initiative, for which Varanasi received recognition in the Guinness World Records — creating an extensive green asset expected to deliver long-term benefits through carbon sequestration, improved local microclimate, dust interception, enhanced biodiversity and a better urban environment.

The Problem It Solves

- The project addresses the challenge of limited urban green cover and increasing air-pollution pressure in Varanasi.
- Developing dense forestation through Miyawaki helps create urban green buffers that intercept dust, support carbon sequestration and improve the local urban environment, complementing measures to address the city's dominant road-dust and vehicular-emission sources.

Who Is Involved

Implementing Agency	Varanasi Nagar Nigam
Supporting Departments / Agencies	Smart City Mission; Non-Governmental Organisations (NGOs)
Implementation Timeline	2025-26
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road dust (~84% of PM10, per IIT Kanpur source-apportionment study) and vehicular emissions (~9% of PM10; ~25% of PM2.5)

Evidence:

The photographs below, from the city's submission, show the mass plantation drive on the identified site and the dense Miyawaki forest cover subsequently established there.

BEFORE



Before — citizens and officials undertaking the mass plantation drive on the identified site

AFTER



After — dense, multi-layered Miyawaki forest cover established on the same site

GROWTH PROGRESS



A section of the maturing Miyawaki plantation, showing the multi-layered canopy developing over the reclaimed site

Recommendations

- Other cities can replicate Varanasi's Miyawaki Plantation Project by identifying vacant, degraded and underutilised urban land and converting it into dense green spaces using the Miyawaki technique.

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Prevention and Control of Open Burning

1 GOBINDGARH - PUNJAB

At a Glance

PNG

Cleaner Fuel Used

Scrubber + Stack

Emission Control

₹ 90 Lakh

Project Cost

129→123

PM10 ($\mu\text{g}/\text{m}^3$)

Establishment of Gas-Based Crematorium

What Is It?

- Municipal Council, Gobindgarh has established a gas-based crematorium as an initiative towards the use of cleaner fuel. PNG gas is being used in the crematorium, and the system is connected to a wet scrubber and a stack for emission control.

The Problem It Solves

- The intervention aims to reduce dependency on wood-based cremation and control fugitive emissions arising from wood-based cremation activities.

Who Is Involved

Implementing Agency	Municipal Council, Gobindgarh
Supporting Departments / Agencies	Ministry of Environment, Forest & Climate Change
Implementation Timeline	February to August 2024 (06 months)
Population Category	Under 3 Lakh population
Key Polluting Sources	Road dust, industrial and vehicular emissions.

Impact

- During January–December 2025, the total no. of 692 bodies were cremated, of which 659 (95%) were cremated using the conventional wood-based method, while 33 (5%) were cremated using the PNG gas-based cremation system.
- Considering an average wood consumption of 400 kg per conventional cremation, the 33 cremations carried out through the gas-based system resulted in an estimated wood saving of 13.2 tonnes per year. Reduced dependency on wood-based cremation.
- Reduction in air pollutant emissions associated with conventional wood-based cremation with PNG as a cleaner fuel and installation of a wet scrubber and stack.
- Improved local air quality in and around the cremation facility due to cleaner and more controlled combustion.
- Improved environmental sustainability by promoting the use of cleaner fuel in place of conventional wood-based cremation.

Evidence

The photographs showing the PNG-fired cremation chamber and the emission-control crematorium at Gobindgarh as below.

GAS-BASED CREMATORIUM & EMISSION CONTROL



Wet scrubber for flue-gas treatment



Exhaust stack for dispersion of treated gas



PNG-fired cremation chamber with control panel

PM₁₀ Reduction

- Average concentration of PM10 in 2025-26 reduced by 4.65% from 129 $\mu\text{g}/\text{m}^3$ in 2024-25 to 123 $\mu\text{g}/\text{m}^3$ in 2025-26.

Contact:

Sh. Chetan Sharma, Municipal Council, Gobindgarh

Email: mcgvg@ymail.com

2 PATIALA - PUNJAB

At a Glance

4

Pyres Fitted with Capture Hoods

2-Stage

Dry + Wet Scrubber System

₹ 19 Lakh

Total Project Cost

95 $\mu\text{g}/\text{m}^3$

Annual Avg. PM10 (2 Years)

Installation of Air Pollution Control Device (APCD) at Crematorium

What Is It?

- Municipal Corporation, Patiala, in coordination with PPCB and its Chartered Engineer, implemented a pilot APCD at Badungar Cremation Ground to control emissions from traditional wood-fired cremation. The system serves four open-pyre platforms and uses hood-based flue-gas capture, spark arrestors, dry and wet scrubbers, draught fans, and an exhaust stack to treat emissions before discharge. It reduces air pollution while preserving traditional cultural and religious cremation practices.

The Problem It Solves

- Patiala records an annual average PM10 level of 95 $\mu\text{g}/\text{m}^3$, while its seven open wood-fired pyres generate dense smoke and harmful pollutants. As full electrification or gasification faces cultural, infrastructure, and cost-related barriers, a technically feasible, economical, and culturally sensitive interim solution is needed.

Who Is Involved

Implementing Agency	Municipal Corporation, Patiala
Supporting Departments / Agencies	Ministry of Environment, Forest & Climate Change; Punjab Pollution Control Board (PPCB)
Mode of Implementation	Pilot project delivered with PPCB and its Chartered Engineer; ₹ 19 lakh project cost
Implementation Timeline	September 2025 to June 2026 (9 months)
Population Category	Above 3 to 10 Lakh population
Key Polluting Sources	Smoke and particulate emissions from open-pyre cremation activities.

Impact

- The technical assessment found an average 57% removal of particulate matter (PM) from the captured flue gas, demonstrating the potential of the system to reduce particulate emissions.
- Expected to significantly reduce visible smoke and emissions from cremation activities, along with a reduction in public complaints.
- Expected to reduce ambient air pollution, including SPM, SO₂ and NO_x concentrations, within and around the crematorium premises.
- Expected to improve health and safety for crematorium operators, visitors and nearby residents through reduced exposure to emissions.
- Expected to improve overall environmental conditions in and around the cremation ground.
- Provides a replicable, transitional model that retains traditional open-pyre cremation practice while mitigating its environmental impact.

Evidence: Before & After

The photographs showing the crematorium before hood installation, the completed hood and ducting network, and the Air Pollution Control Device at Badungar Cremation Ground are as below.

BEFORE



Before — open pyres at the crematorium, without emission capture

AFTER



After — completed smoke-capture hoods and ducting network



The dual-stage (dry + wet) Air Pollution Control Device

Contact:

Smt. Pooja Sayal Grewal, PCS, Municipal Corporation, Patiala

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3 GHAZIABAD - UTTAR PRADESH

At a Glance

₹3.25 Cr
Project Cost

CNG
Smoke-Free Furnaces

Cow-Dung Logs
Firewood Replacement

2025–26
Implementation

Establishment of a Green Crematorium (CNG and Cow-Dung Log)

What Is It?

- Ghaziabad Nagar Nigam established a Green Crematorium during 2025–26, with a dedicated allocation of ₹3.25 crore, to provide a sustainable alternative to traditional wood-based cremation. The facility combines CNG cremation furnaces for cleaner, low-emission cremation and cow-dung log cremation as a culturally acceptable alternative to firewood, reducing air pollution and natural-resource consumption while preserving the dignity of last rites.

The Problem It Solves

- Traditional wood-based cremation generates high smoke and particulate emissions, worsening air quality, while consuming significant firewood and contributing to resource depletion. The absence of cleaner, culturally acceptable cremation facilities also exposed nearby communities to localized air pollution and associated health risks, highlighting the need for a sustainable, low-emission alternative.

Who Is Involved

Implementing Agency	Ghaziabad Nagar Nigam (Ghaziabad Municipal Corporation)
Supporting Departments / Agencies	UPPCB, GDA, UPSIDA, UP PWD, UP Awas Vikas Parishad, Transport Department (RTO) and Traffic Police; local gaushalas (cow-dung log supply)
Implementation Timeline	2025–26
Population Category	Above 10 Lakh plus population
Key Polluting Sources	Road and resuspension dust (Ghaziabad is a designated non-attainment city under NCAP)

Impact

- Established state of art cremation is based on CNG furnaces along with cow-dung & 100% replaces used of fire wood.
- Integrated green infrastructure into essential municipal services, encouraging community-level adoption of eco-friendly practices.

Evidence

The photographs showing the Green Crematorium facility — with CNG furnaces and cow-dung log cremation are as below.

GREEN CREMATORIUM — CNG & COW-DUNG LOG SYSTEMS



The Green Crematorium (Swarg Dwar) with CNG furnaces and cow-dung log cremation, Ghaziabad Nagar Nigam



The Moksh Dham entrance at the eco-friendly crematorium complex

Contact:

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4 NALBARI - ASSAM

At a Glance

127→74

PM10 ($\mu\text{g}/\text{m}^3$)

₹20 Lakh

Project Cost (NCAP)

CCTV

Market Surveillance

2024

Onwards

CCTV Surveillance to Prevent Biomass Burning and Waste Dumping

What Is It?

- Nalbari Municipal Board introduced 20 CCTV-based surveillance from 2024 to strengthen environmental compliance and cleanliness in markets and vulnerable areas. This initiative prevents biomass burning, improper waste disposal, littering, and uncovered C&D material transport. Live and recorded footage supports quick identification of violations, offender tracing, and timely enforcement in coordination with city police.

The Problem It Solves

- Open burning, uncovered C&D material transport, and illegal dumping at GVPs were scattered and intermittent sources of air pollution, dust, and poor cleanliness. Periodic inspections were insufficient to identify offenders and ensure timely enforcement, resulting in recurring waste accumulation and environmental degradation in public and market areas.

Who Is Involved

Implementing Agency	Nalbari Municipal Board
Supporting Departments / Agencies	District Administration and City Police
Population Category	Under 3 Lakh population

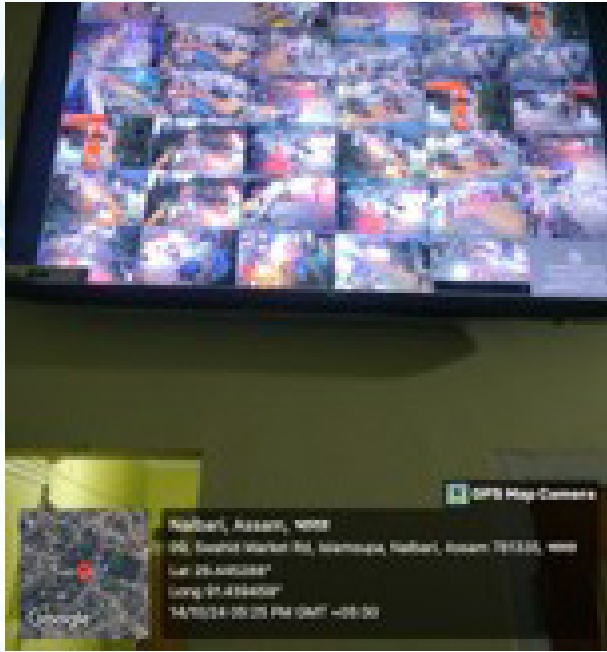
Impact

- Continuous CCTV surveillance to reduce illegal dumping of C&D waste, Garbage Vulnerable Points, open burning and material spillage on roads to improve cleanliness.
- Average concentration of PM10 in 2025-26 reduced by 41.73% from 127 $\mu\text{g}/\text{m}^3$ in 2023-24 to 74 $\mu\text{g}/\text{m}^3$ in 2025-26

Evidence

The photographs showing the CCTV surveillance network monitoring Nalbari's market areas and the transformation of a Garbage Vulnerable Point as below.

CCTV SURVEILLANCE NETWORK



The market-surveillance control room, showing live feeds from CCTV cameras across Nalbari



A pole-mounted CCTV camera and public-address unit at a Nalbari market junction

GARBAGE VULNERABLE POINT — BEFORE & AFTER



A Garbage Vulnerable Point before the intervention (open dumping), and after — cleared and secured under continuous surveillance

Contact:

Shri Ananya Dutta, Executive Officer, Nalbari Municipal Board

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**‘Use of Technology
in Public Grievance
Redressal, Implementation
and Monitoring**

1 BSPCB - BIHAR

At a Glance

1,71,867

Issues Raised

1,50,937

Resolved

88%

Overall Rate

3 Cities

Gaya · Muzaffarpur · Patna

A Technology-Enabled Platform for Managing Urban Air Pollution

What Is It?

Dispersed sources like road dust from unpaved roads, potholes, open burning of waste, and illegal dumping of Construction & Demolition (C&D) debris contribute 20–40% of particulate pollution (PM10/PM2.5) in most Indian cities. These sources are spread across multiple locations and involve multiple departments — making them hard to track and fix without a coordinated system.

- The Bihar Clean Air Dashboard is a web-based platform which enables city surveyors and officials to raise geo-tagged issue tickets with a photograph.

The Problem It Solves

The dashboard works across multiple agencies in each city and the implementation is supported by A-PAG team in coordination with ULBs.

Who Is Involved

City	Departments registered on Dashboard	Registered Users
Gaya	GMC, RCD, BUIDCO, IOAGPL	82
Muzaffarpur	MMC, RCD, BUIDCO, IOCL, Smart City	80
Patna	PMC, RCD, BUIDCO, GAIL, Patna Metro, 3 Municipal Councils (Danapur, Khagaul & Phulwari)	234

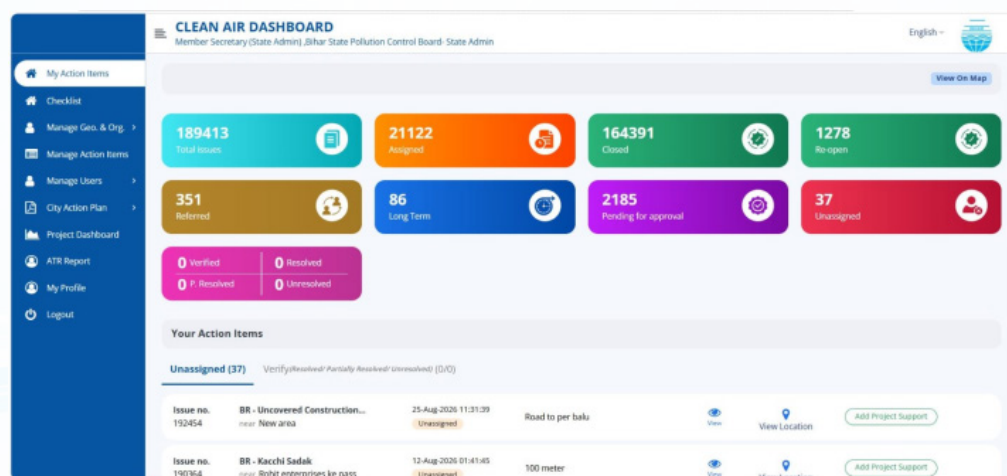
Abbreviations: GMC – Gaya Municipal Corporation | MMC – Muzaffarpur Municipal Corporation | PMC – Patna Municipal Corporation | RCD – Road Construction Department | BUIDCO – Bihar Urban Infrastructure Development Corporation | IOAGPL – Indian Oil Adani Gas Private Limited | IOCL- Indian Oil Corporation Limited | GAIL- Gas Authority of India Limited

Types of Issues Tracked/Resolve

The dashboard helps in track and manage the following five categories of dispersed air pollution sources:

- Solid waste and biomass burning on open land
- Road dust from unpaved or pothole-ridden roads
- Unpaved roads requiring black-topping
- Construction & Demolition (C&D) waste dumped on roads or open plots
- Active construction sites operating without mandatory dust suppression measures

City	Issues Raised	Issues Raised	Resolution Rate
Patna	98,965	82,104	83%
Gaya	36,308	34,067	94%
Muzaffarpur	36,594	34,766	95%
TOTAL	1,71,867	1,50,937	88%



Clear Air Dashboard BSPCB

Evidence: Before & After

1. Mud Road Converted to Metalled Road

BEFORE



AFTER



Fig. 1 — Mud road blacktopped after being reported on the dashboard (Gaya)

Contact:

Shri Neeraj Narayan, IFS, Member Secretary, BSPCB | Nodal Officer: Sri S.N. Jayaswal,
Bihar State Pollution Control Board (BSPCB)
Phone No. 9771423957 (Member Secretary) | 9431425750 (Nodal Officer)
Email msbspcb-bih@gov.in (Member Secretary) | bspcb@yahoo.com (Nodal Officer)
Implementation & Technical Support Air Pollution Action Group (A-PAG)

2 DPCC - DELHI

At a Glance

47

Total CAAQMS in Delhi
(up from 41)

+6

New Stations
Commissioned (Feb 2026)

30

Stations under DPCC
(up from 24)

₹12 Cr

Cost (Supply, Install
& 10-yr O&M)

Strengthening Ambient Air Quality Monitoring and Dissemination through Strategic Expansion of Delhi's CAAQMS Network

What Is It?

Delhi has established a multi-agency network of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) to provide continuous, time-resolved information on ambient air quality and to support scientific assessment, regulatory action and public dissemination.

In February 2026, six additional CAAQMS were commissioned at Jawaharlal Nehru University (JNU), Indira Gandhi National Open University (IGNOU), Talkatora Garden, Delhi Cantonment, Commonwealth Sports Complex and Netaji Subhash University of Technology (NSUT), West Campus. All six are under DPCC, taking the network from 41 to 47 CAAQMS and the DPCC component from 24 to 30 stations.

The expansion strengthens spatial coverage and the representativeness of ambient-air-quality monitoring across Delhi. Monitoring requirements are considered in relation to population distribution and land-use characteristics (residential, traffic, industrial and background areas), urban contiguity and the rapid expansion of peri-urban and suburban areas, while background and border locations are important for assessing regional transport of pollutants and baseline conditions.

The Problem It Solves

- A large metropolitan area contains varied population densities, land-use patterns and pollution environments, so monitoring at a limited number of locations may not adequately represent city-wide air-quality conditions.
- The strengthened network addresses geographical gaps by expanding monitoring coverage and improving representation of residential, traffic, industrial, background, peri-urban and suburban environments.
- Addresses the need for continuous, time-resolved information to assess pollution levels, variations and episodes.
- Addresses the need for background and border monitoring to understand regional transport and baseline conditions.
- Addresses the need for reliable data for scientific assessment, regulatory decision-making, pollution-control planning and public dissemination.

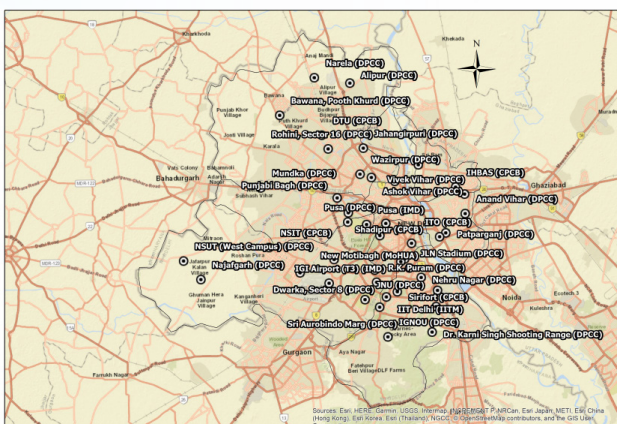
Who Is Involved

Implementing Agency	Delhi Pollution Control Committee (DPCC)
Supporting Departments / Agencies	DPCC, IMD, CPCB, IITM and MoHUA
Mode of Implementation	JNU, IGNOU, Talkatora Garden, Delhi Cantonment, Commonwealth Sports Complex and NSUT (West Campus) — all under DPCC
Implementation Timeline	2025–2026 (six stations commissioned in February 2026)
Population Category	₹12.00 crore (supply, installation and O&M for 10 years) for the six stations commissioned in February 2026
Key Polluting Sources	Included in the above
Source of Funds	Others

Impact

- Delhi's CAAQMS network increased from 41 to 47 stations with the commissioning of six additional stations in February 2026.
- The expansion improved spatial coverage and availability of continuous, time-resolved air-quality data across Delhi.
- Enhanced monitoring strengthens air-quality assessment, pollution-control planning, regulatory decision-making and real-time information dissemination.
- 13 additional CAAQMS are planned by DPCC, further strengthening the monitoring network.

Evidence



The Delhi CAAQMS network across operating agencies (DPCC, CPCB, IMD, IITM, MoHUA)



Inauguration of the six new CAAQMS stations, including NSUT (West Campus)



Media coverage — The Pioneer, 10 February 2026



A CAAQMS station with a public display board showing real-time PM10 and PM2.5 values

Delhi has 47 CAAQMS stations with the highest monitoring network density in the country.

PM₁₀ Reduction from 241 $\mu\text{g}/\text{m}^3$ in 2017-18 to 208 $\mu\text{g}/\text{m}^3$ in 2025-26

3 RAJKOT - GUJARAT

At a Glance

11,350

Hyperlocal Observations

15

Source Categories

18

Municipal Wards

281

C&D Sites Surveyed

Rajkot RECON: Hyperlocal Air-Pollution Source Mapping and Ward-Level Decision-Support Dashboard

What Is It?

Rajkot Municipal Corporation (RMC), with technical support from the Council on Energy, Environment and Water (CEEW), has initiated the beta version of the Rajkot RECON Survey Dashboard 2026. It converts extensive field observations into an interactive system for identifying, comparing and prioritising local air-pollution sources across all 18 municipal wards.

The survey provides “Hyperlocal information on Pollution sources, helping identify not only where pollution is occurring but also what is causing it”.

The beta platform consolidates 11,350 observations across 15 source categories.

Dashboard (beta): <http://34.93.176.219:8506/>

The Problem It Solves

Particulate matter, particularly PM10, remains Rajkot’s principal clean-air concern. Sustaining improvement requires action on dispersed sources that are not adequately represented by citywide averages alone. The dashboard identifies dumping of C&D waste as the most frequently observed category, followed by road- and waste-related sources.

Impact

- 11,350 hyperlocal observations consolidated.
- 15 pollution-source categories and all 18 wards covered.
- Citywide summary, source analysis, ward filtering, ward scorecards and methodology available through one interface.
- C&D waste dumping identified as a leading observed source, enabling focused investigation.
- The principal beta-stage impact has been improved institutional visibility, monitoring capacity and evidence-based prioritisation.
- Direct emission reductions are also to be assessed through repeated monitoring.

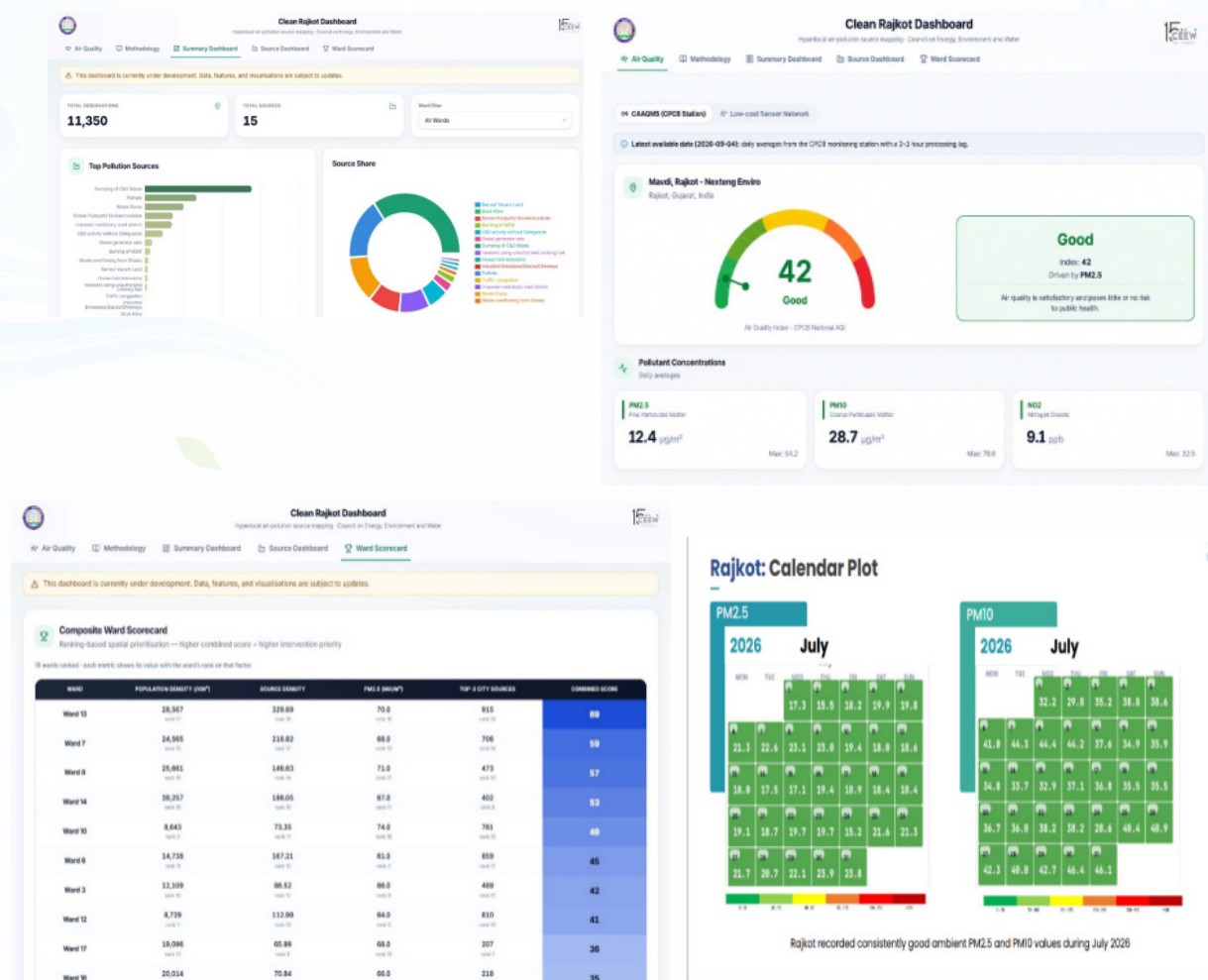
Evidence-to-Action: C&D Landscape Survey

The detailed C&D landscape survey demonstrates how a priority source identified through hyperlocal evidence can be examined more deeply. The survey covered 281 active sites across all 18 wards and assessed construction stage, waste generation, handling, transportation, disposal and clean-construction practices.

- 156 residential, 118 commercial and seven infrastructure sites.

- Approximately 75% were in excavation, foundation or structural stages — the most dust- and waste-intensive phases.
- 36 sites reported partial or complete dumping in open areas or landfills; only 20 reported consistent use of the authorised C&D facility.
- Approximately 76.5% transported waste manually or through open vehicles.
- 202 sites were 10–20 km and 37 sites were 20–50 km from the authorised plant; only 42 were within 10 km.

RECON BETA DASHBOARD



Summary Dashboard — 11,350 observations across 15 Pollution sources, with top sources and source share

Recommendations for Other Cities

- The model combines field intelligence, digital technology and municipal decision-making without requiring sophisticated monitoring equipment at every location.

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4 INDORE - MADHYA PRADESH

At a Glance

950,000+
Registered Users

1.92 M+
Complaints Handled

98.5%
Resolved in 24 hrs

8×
Cleanest City Award

Indore-311 Mobile Application & Public Grievance Redressal System

What Is It?

Launched on 2 October 2016, Indore-311 is an integrated, citizen-centric platform developed by Indore Municipal Corporation (IMC) for grievance redressal — including C&D waste and air-pollution reporting — public service delivery and real-time monitoring.

The Problem It Solves

The system addresses inefficient, non-transparent manual grievance logging via landlines; delays in reporting and clearing C&D debris, road dust and public-health hazards; and the lack of real-time monitoring, tracking and citizen-feedback mechanisms in municipal administration.

Who Is Involved

Implementing Agency	Indore Municipal Corporation (IMC)
Supporting Departments / Agencies	Indore Smart City
Mode of Implementation	Municipal internal revenues / NCAP and Smart City infrastructure funds
Implementation Timeline	Launched 2 October 2016 (ongoing)
Population Category	> 1 Million (Urban Agglomeration)

Impact

- Registered users grew from approximately 5,000 (December 2016) to over 950,000.
- Over 1,921,000 complaints** and queries registered, with a **98.5% resolution rate within 24 hours**.
- Enabled paperless, digital-first municipal interactions, reducing paper use and carbon footprint.
- Played a key role in Indore securing the Cleanest City award eight times consecutively.

Evidence

The images below are drawn from Indore Municipal Corporation's own submission: the Indore-311 mobile application, its citizen-outreach campaigns, and the public-feedback and SLA-escalation workflow.

APP & CITIZEN OUTREACH

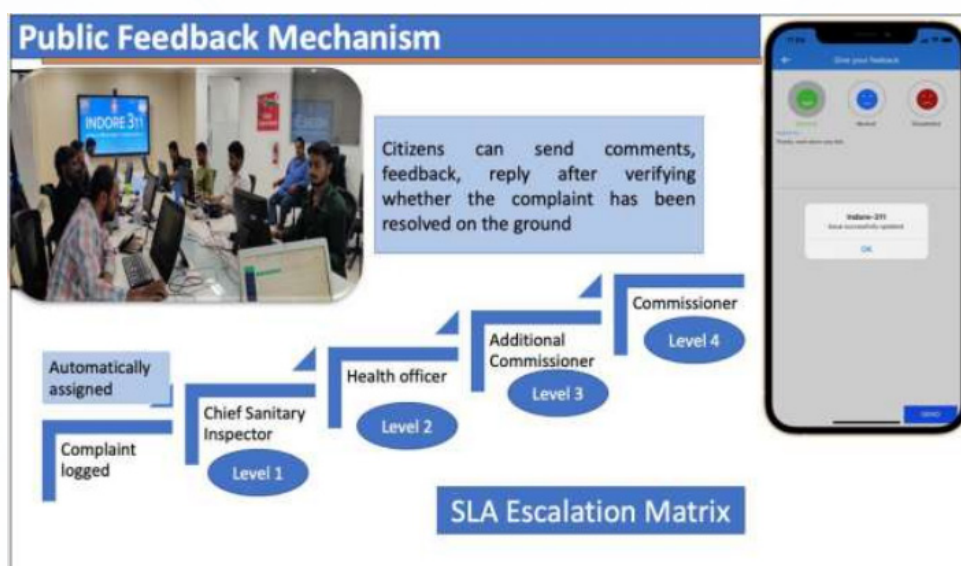


Indore-311 app home screen with live complaint status



Outreach campaigns promoting C&D-waste reporting via the app

PUBLIC FEEDBACK & SLA ESCALATION WORKFLOW



Public feedback mechanism and SLA escalation matrix (Complaint logged → Level 1 → Commissioner)

Standard Resolution SLA: 24 Hours for high-priority/sanitation complaints (e.g., garbage collection, dead animal pickup), (e.g., streetlights, minor drainage fixes), the window extends up to 48 hours (2 working days)

Contact:

Shri Kshitij Singhal, IAS | Indore Municipal Corporation

5

THANE - MAHARASHTRA

At a Glance

350+

Construction Sites
Monitored

25

City-Level LCS Sensors

6 Sep 2024

AQDSS Launch Date

Aug 2026

AI Chatbot Integrated

Air Quality Decision Support System of Thane

What Is It?

TMC, with CEEW support, developed AQDSS to enable data-driven air-quality management.

It integrates CAAQMS, manual monitoring, 25 city-level LCS and 350+ construction-site LCS, along with hyperlocal pollution-source data.

An AI-based chatbot, integrated in August 2026, enables natural-language access to AQDSS data.

- Multi-vendor data standardisation supports seamless integration and advanced analytics.

Platform Status: Live — AI chatbot integrated (as of August 2026)

The Problem It Solves

TMC had no centralised platform for air quality data management and analytics, and no system for continuous, city-wide monitoring. Real-time air quality monitoring of 350+ construction sites, and physically inspecting them to identify non-compliant sites, was difficult, and officials lacked tools to simplify air quality data analytics.

Who Is Involved

Implementing Agency	Thane Municipal Corporation (TMC)
Supporting Departments / Agencies	Council on Energy, Environment and Water (CEEW); Environment Department and Town Planning Department, TMC
Mode of Implementation	Developed pro bono with CEEW
Implementation Timeline	Ongoing since 2024 (AQDSS launched 6 September 2024; AI chatbot integrated August 2026)
Population Category	Above 10 Lakh plus population
Key Polluting Sources	PM10, PM2.5, SO2 and NOx from construction, biomass burning, road-dust resuspension and marine aerosols

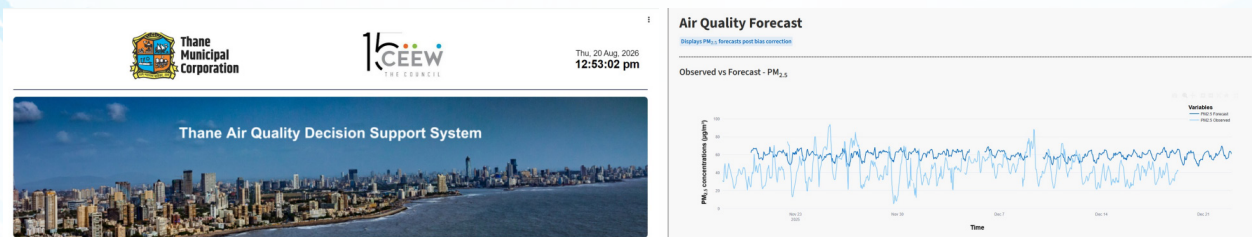
Impact

- Real-time monitoring of pollution levels at 350+ construction sites, allowing immediate implementation of control measures.
- Real-time monitoring of pollution levels across the city through 25 LCS, alongside CAAQMS and manual monitoring stations.
- Transition from a lack of dedicated construction-site air pollution oversight to a near real-time monitoring system.
- Established a centralised digital platform for air quality management that enables data-driven decision-making for TMC officials.

Evidence

The screenshots and modelled data below are from Thane Municipal Corporation's submission, showing the AQDSS dashboard, its forecasting and mapping outputs, and the live construction-site monitoring map.

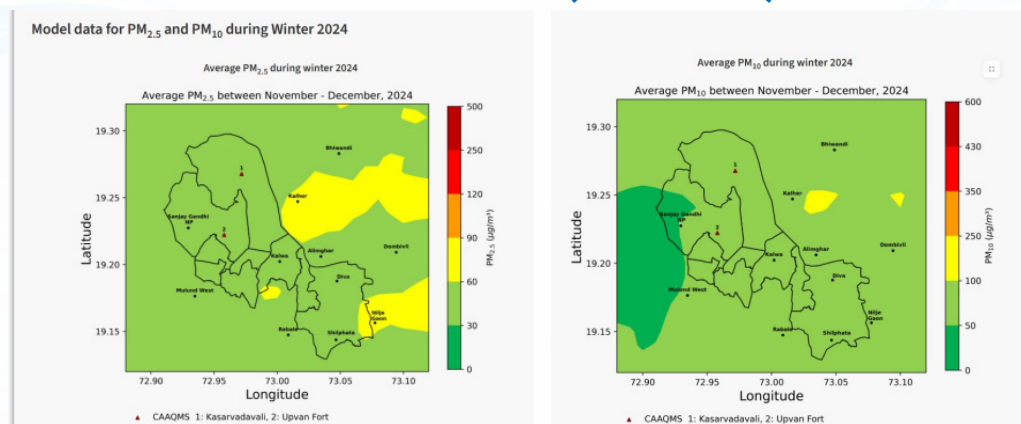
AQDSS DASHBOARD — LIVE PLATFORM & FORECAST



TMC and CEEW's Thane Air Quality Decision Support System dashboard

Observed vs. forecast PM_{2.5} concentrations, post bias-correction

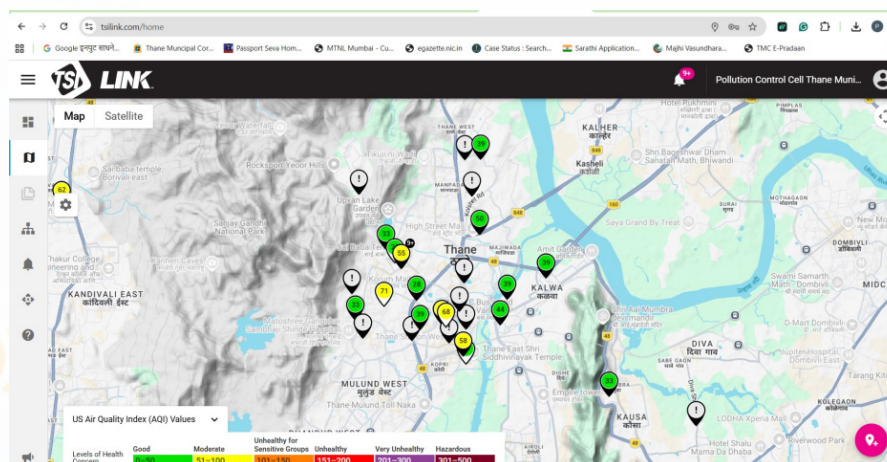
MODELLED PM_{2.5} & PM₁₀ CONCENTRATIONS WINTER 2024 (NOV–DEC)



Average PM_{2.5} concentrations, November–December 2024

Average PM₁₀ concentrations, November–December 2024

LIVE MONITORING MAP — CONSTRUCTION SITE AQI (TSI LINK)



Live construction-site AQI map on the TSI Link monitoring platform

6 MPCB - MAHARASHTRA

At a Glance

22

Mobile Monitoring Vans
(15 large + 7 small)

12

Regional Offices
Covered

₹31.25 Cr

Total Cost (Supply +
Install + 5-yr O&M)

5 Years

O&M Period (extend-
able up to 3 years)

Deployment of a Fleet of 22 Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV)

What Is It?

Maharashtra Pollution Control Board (MPCB) has built a state-wide fleet of 22 Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) — 15 large vans and 7 small vans — to supplement its fixed CAAQMS network with a rapidly deployable, self-contained monitoring capability, primarily for citizen-complaint investigation and hotspot identification.

The Problem It Solves

Regional Offices routinely receive citizen complaints on ambient air pollution (mostly particulate matter) via online channels and the SAMEER app, but many complaint locations lie outside the fixed CAAQMS network, making investigation impossible.

Who Is Involved

Implementing Agency	Maharashtra Pollution Control Board (MPCB)
Large-van deployment (12 Regional Offices)	Chandrapur, Nagpur, Amravati, Pune, Kolhapur, Raigad, Navi Mumbai, Mumbai, Thane, Kalyan, Chhatrapati Sambhaji Nagar (Aurangabad) and Nashik
Small-van deployment (5 Regional Offices)	Pune (2), Raigad (1), Navi Mumbai (1), Mumbai (3) and Thane (1)
Implementation Timeline	Commissioned in 2024–2025; O&M period of 5 years, extendable up to 3 more years by mutual agreement
Total Project Cost	~₹31.25 crore for the combined fleet of 22 vans (Supply + Installation + 5-year O&M)
Annual O&M Cost	~₹2.57 crore for the combined fleet

Impact

- Enables real-time, multi-parameter monitoring — PM₁₀, PM_{2.5}, SO₂, CO, O₃, NO, NO₂, NO_x, Benzene, Toluene, Ethylbenzene, m+p-Xylene, o-Xylene — plus meteorological parameters (temperature, relative humidity, solar radiation, wind speed/direction, rainfall) at any location within hours of deployment, versus no monitoring capability previously at such sites.

Evidence



A large Continuous Ambient Air Quality Monitoring Van deployed at Kesurdi, Maharashtra



A monitoring van deployed at Mahul, Chembur, Mumbai, with its telescoping meteorological mast



A large Continuous Ambient Air Quality Monitoring Van deployed at Kesurdi, Maharashtra



Contact:

Shri Satish Padwal, I/C Joint Director (Air Pollution Control) | Maharashtra Pollution Control Board
Phone 9422086243
Email jdair@mpcb.gov.in

Member Secretary
Shri Rahul Rekhawar
Phone : 8097188255
Email ms@mpcb.gov.in



LAUNCHING OF AWARENESS CAMPAIGN

Under

National Clean Air Programme (NCAP)

Organized by

District Administration

in collaboration with

Dimapur Green Committee

Date: 29th August, 2023

Time: 11:30 am | Venue: Seram

Government of Nagaland

DIPPR

DEPARTMENT OF INFORMATION & PUBLIC RELATIONS

A photograph of three people standing outdoors in front of a building with arched windows and large trees. A man in a white shirt and tie is on the left, holding a banner. Two women are in the center and right. The banner features a crest with a book and a tree, and a landscape illustration with a river and mountains. A blue circular graphic is overlaid on the bottom right of the image, containing the text 'Capacity Building & Public Outreach'.

Capacity Building & Public Outreach

Seminar Hall, DGC

1 NPCB (DIMAPUR) - NAGALAND

At a Glance

20,000 Kg

Road Dust Removed in a Day

230+

Volunteers Participated

**Community
Participation**

Jan Bhagidari

Economical

Low Cost- High Visibility

Action-Oriented Road Dust Cleaning Drive

What Is It?

- Nagaland Pollution Control Board partnered with Dimapur Municipal Council, Police Commissionerate, CSOs, volunteers and local shopkeepers to manually clear a heavily trafficked, dust-laden corridor and raise awareness on the road-dust–particulate pollution link. Aligned with Mission LiFE's clean-up-drive action point.

The Problem It Solves

- Heavy road dust accumulation along a busy, highly trafficked corridor, worsened by improper waste and de-bris disposal along the roadside, was resuspending into the air and degrading ambient air quality, a problem compounded by low public involvement, as shopkeepers and residents were not yet part of keeping the corridor clean, leaving upkeep entirely to civic agencies.

Who Is Involved

Implementing Agency	Nagaland Pollution Control Board (NPCB)
In Collaboration With	Dimapur Municipal Council (DMC), Police Commissionerate Dimapur, Civil Society Organisations, volunteers and local shopkeepers
Location / Stretch	Plaza Point to Nagarjan Police Point, Dimapur
Implementation Timeline	21 March 2026 (one-day drive)

Impact

- Convergence model: DMC + Police + CSOs + shopkeepers shared responsibility for one stretch.
- Manual cleaning as fallback: used where mechanised sweeping fails on heavy dust accumulation.
- Shopkeeper Sensitisation: extended upkeep responsibility to roadside businesses beyond the one-day drive.
- Built-in IEC: awareness messaging on particulate pollution ran alongside the physical clean-up.

Evidence:



Volunteers at the Road Dust Cleaning Drive, Dimapur

BEFORE



AFTER



Roadside dust and debris before the drive, and the cleared corridor after



Manual sweeping of the road corridor by volunteers



Sweeping the cleared stretch during the drive

2

NPCB (KOHIMA & DIMAPUR) - NAGALAND

At a Glance

2 Cities

Project Cost (15th FC)

Youth
Participation

Mera Yuva Bharat

Promote
Greenery

EK Ped Maa ke Naam

Mission LiFE

Lifestyle for Environment

The Air We Share: Bridging Policy & Public Action-
Interactive Multi-Stakeholder Talk Show on Clean

What Is It?

- Nagaland Pollution Control Board (NPCB) organised multi-stakeholder Talk Shows in Kohima and Dimapur to promote collaborative action for clean air. The programmes brought together government departments, ULBs, civil society, educational institutions, youth and citizens to discuss local air-pollution challenges and solutions. Youth representatives actively participated in panel discussions and directly engaged with officials, strengthening public–government dialogue. Participants were also encouraged to undertake tree plantation under “Ek Ped Maa Ke Naam” and promote the Mission LiFE message “Clean Air- My Responsibility.

The Problem It Solves

- The initiative addressed limited public awareness of air pollution and its sources, inadequate inter-departmental coordination, and limited public–government interaction, particularly with youth and citizens, while bridging the gap between policy, departmental action and public participation.

Who Is Involved

Implementing Agency	Nagaland Pollution Control Board (NPCB)
Stakeholders	District Commissioners (Kohima & Dimapur), Police, ULBs, Health Department, NPCB, civil society, educational institutions, students and the public
Cities & Venues	Kohima: Capital Convention Centre (29 August 2025); Dimapur: Town Hall (09 September 2025)

Impact

- Strengthened multi-stakeholder coordination and youth participation.
- Improved awareness, communication and community action for clean air.
- Demonstrated a replicable participatory IEC model under NCAP.

Evidence:

The multi-stakeholder Talk Shows in Kohima and Dimapur:



Talk Show panel, Kohima (Capital Convention Centre, 29 August 2025)



Participants at the Kohima Talk Show



Talk Show panel, Dimapur (Town Hall, 09 September 2025)



Participants at the Dimapur Talk Show

3 PATIALA - PUNJAB

At a Glance

30+

Institutions Engaged

30

Road Stretches Adopted

Eco Clubs

For Year-Round Upkeep

4 months

Campaign Duration

Mission Clean Patiala

What Is It?

- Mission Clean Patiala: “Saaddi Sadak, Saaddi Jimmevaari” is a community-driven initiative in which 30+ educational and government institutions adopt around 30 road stretches for regular cleanliness, waste management, plantation, greenery maintenance and low-cost beautification. Eco-Friendly Clubs support continued maintenance and community participation beyond the campaign period.

The Problem It Solves

- The initiative aims to foster civic responsibility and environmental awareness among students and professionals by encouraging schools, colleges and other institutions to adopt a nearby road and maintain its cleanliness, hygiene and aesthetic appeal through continuous engagement and community participation.

Who Is Involved

Implementing Agency	Punjab Pollution Control Board
Supporting Departments / Agencies	District Administration and Municipal Corporation Patiala
Implementation Timeline	May 2026 (04 months)
Population Category	Above 3 to 10 Lakh population

Impact

- Improved civic responsibility and ownership of public spaces.
- Promoted sustained environmental stewardship through continued institutional engagement.
- Enhanced cleanliness, greenery and aesthetic quality of the city environment.

Evidence:

The photographs below show participating institutions carrying out cleanliness, awareness and beautification activities under Mission Clean Patiala, along with the campaign’s citizen-outreach messaging.



Students clearing litter from an open ground,
Rajpura Colony



Punjabi University NSS volunteers collecting
waste



NCC cadets segregating and bagging litter



NCC cadets cleaning a roadside verge



"Mission Clean Patiala" citizen-outreach and
awareness drive in the market



Plantation Drive for a Greener Patiala

[illegible]

[illegible]



**Ministry of Environment,
Forest and Climate Change**