



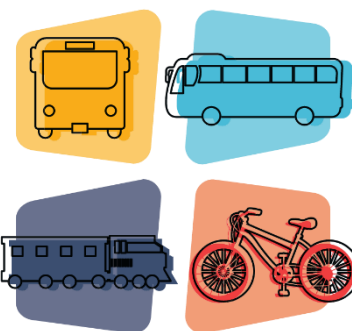
## DRIVING INDORE TOWARD CLEANER AIR

Exploring six solutions that Indore’s leaders can implement now to start curbing air pollution in the transportation sector.

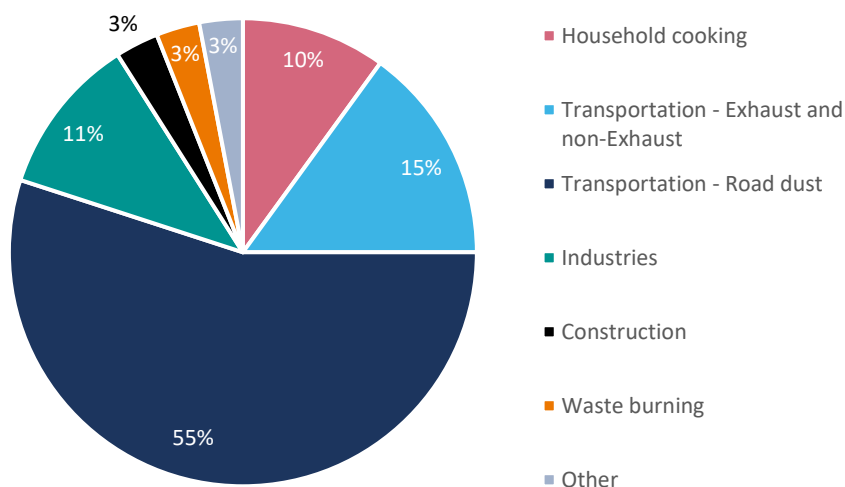
### Why should Indore residents be concerned about air pollution?

Air pollution is an increasingly urgent issue in Indore that directly threatens the health of residents. Satellite data indicate that air pollution in the city has been rising rapidly over the last 10 years.

According to a recent Clean Air Catalyst analysis, average monthly levels of fine particulate matter, also known as PM2.5, surpassed India’s national daily standard (60 micrograms/m<sup>3</sup>) for more than a third of 2023 and the World Health Organization’s 24-hour standard (15 micrograms/m<sup>3</sup>) for nearly all of 2023. In 2019 alone, 2,400 premature deaths and 620 new cases of childhood asthma in Indore were due to air pollution. Read more about the health impacts of air pollution in Indore in our health fact sheet, available at [globalcleanair.org](http://globalcleanair.org).



Graphic I - Local sources of air pollution in Indore, by sector



Source: Emissions Inventory Report, Clean Air Catalyst

### At a glance: Six ways to cut air pollution in transport

- 1) Expand access to public transportation options
- 2) Make eco-friendly vehicles more accessible
- 3) Restrict heavy-duty commercial vehicles in high traffic areas
- 4) Update parking regulations
- 5) Investigate road dust sources and reduction strategies
- 6) Enforce vehicle testing requirements

## Transportation is a priority sector for clean air and climate action

The Catalyst's 2024 Emissions Inventory estimates the transportation sector contributes more than any other to the PM2.5 breathed by residents every day, accounting for 70% of the total (See Graphic 1).

A 2013 study showed that vehicular congestion in just seven key intersections accounted for more than 2 million kg of CO<sub>2</sub> annually. Beyond PM2.5, the transportation sector contributes significantly to other health-harming pollutants in Indore, including 86% of nitrogen oxide (NO<sub>x</sub>), nearly half of carbon monoxide (CO), and 76% of black carbon emissions. The sector is also the main contributor to planet-warming greenhouse gas (GHG) emissions in Indore. A consultation with Indore residents organized by the Catalyst in 2022 also revealed the transport sector was an area of concern for scientists, key stakeholders, and the public.

### Six evidence-based transportation solutions

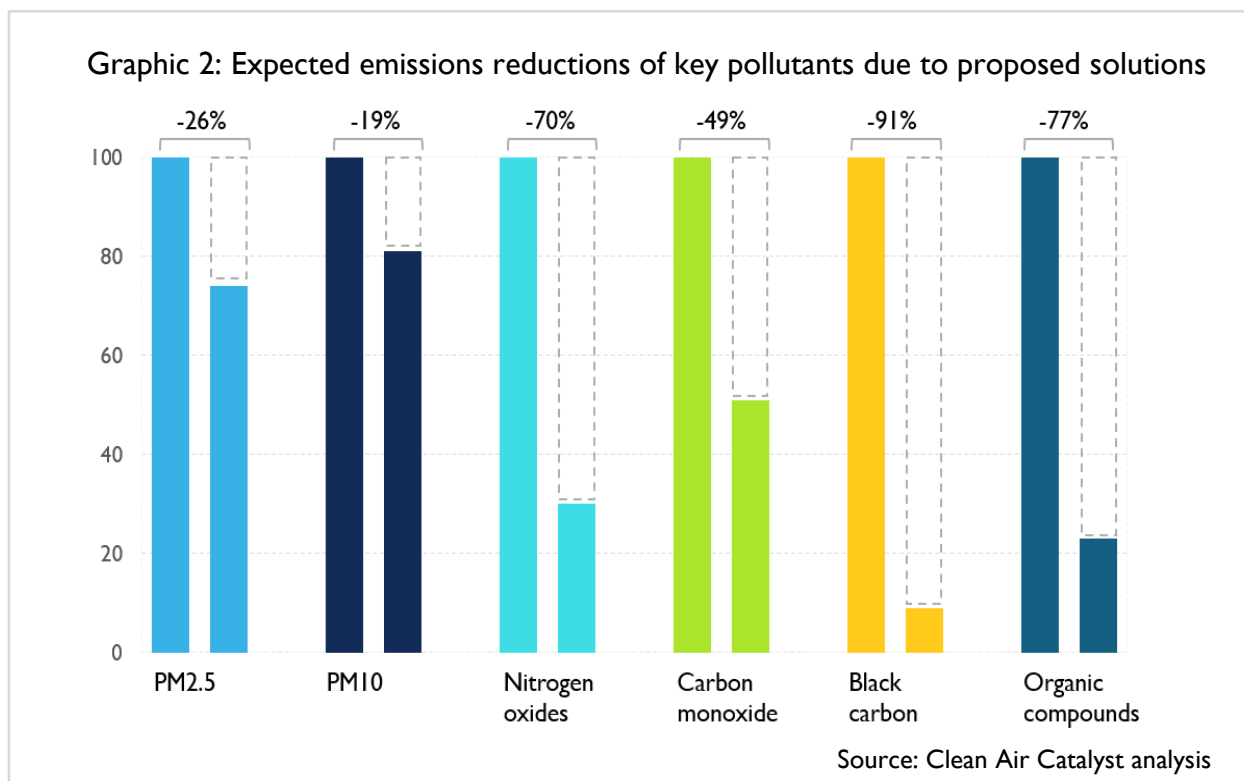
Based on a thorough analysis, the Catalyst selected the following six transportation policy solutions to deliver significant air pollution reductions per unit of cost (See Graphic 2) within a relatively brief time horizon. Once implemented, these solutions can help build momentum for additional actions that can drive down pollution even further. The twin aims of these six solutions are 1) to facilitate a mode shift from private to public transport and 2) to facilitate a transition to cleaner, more efficient modes of transport of all kinds. Let's explore each one:

#### 1) EXPAND ACCESS TO PUBLIC TRANSPORTATION OPTIONS

**What:** The goal of this action is to make public transportation an appealing alternative to personal vehicles by expanding access and making it safer, more efficient, and more reliable. Indore is already investing in public transportation such as the BRT (Bus Rapid Transport) and recently inaugurated metro rail systems. By continuing these investments and building upon them, the city can cut air pollution while improving mobility for residents.

#### What are the benefits?

- Lower emissions per rider compared to private vehicles
- Easier and more cost-effective to convert to low- and no-emission vehicles
- More affordable, which makes them more inclusive
- Expanded mobility for women and low-income commuters, boosting their role in economic development
- Improved access to education and employment opportunities



**Where:** Eco-friendly transportation options should be made available throughout the city, with priority given to major hubs. City leaders should also look to improve access to and electrify smaller-scale public transportation options such as buses and rickshaws, which play a crucial role in helping residents complete full door-to-door trips.

## 2) MAKE ECO-FRIENDLY VEHICLES MORE ACCESSIBLE THROUGH RETROFITTING AND INCENTIVES

**What:** Even with access to excellent public transportation, some residents will still need to drive. City and state leaders can enable drivers to reduce harmful pollution from internal combustion engine (ICE) vehicles by helping them switch to less-polluting alternatives. Strategies for doing this must reach all levels of the market and can include:

- **For new car buyers:** Incentives to choose an electric vehicle (EV), such as rebates or discounts
- **For existing car owners:** Promote use of retrofit kits that replace diesel engines with natural gas-powered ones that emit less pollution
- **For owners of older, high-polluting vehicles:** Incentives, such as government grants, to encourage vehicle retirement and replacement

**What are the benefits?**

- Reduced maintenance and energy costs
- Lower carbon emissions
- Extended life for retrofitted vehicles

**Where:** Implement these programs city-wide and across Madhya Pradesh, focusing on the oldest, most polluting vehicles. Build on the national FAME program and Madhya Pradesh's 2019 Electric Vehicle Policy, with additional incentives from local and regional governments.

## 3) RESTRICT HEAVY-DUTY COMMERCIAL VEHICLES IN HIGH-TRAFFIC AREAS

**What:** Heavy-duty vehicles, including lorries, trucks, and buses, are major emission sources in Indore, especially in congested areas. To reduce their emissions, city leaders should limit heavy vehicle movement in the city center and hotspots. This could be part of a low emission zone (LEZ) program, which may include:

- Tightening emission standards on heavy-duty vehicles, utilizing a phased implementation approach
- Permitting and licensing requirements for heavy vehicles entering designated areas
- Initiatives to divert heavy trucks from the city center or transfer their cargo to low-emission vehicles

**What are the benefits?**

- Reduced congestion and noise
- Safer conditions for pedestrians and drivers of smaller vehicles

**Where:** Restrictions on heavy-duty vehicles should be prioritized in the city center and other congested areas. Leaders can gradually expand them to other areas with community input.

## 4) UPDATE PARKING REGULATIONS

**What:** Innovative parking regulations play a pivotal role in shaping urban mobility and promoting sustainability. These include defining or modifying comprehensive parking policies, introducing designated spots for goods vehicles in market areas, and creating designated spots for electric vehicles.

**What are the benefits?**

- Less congestion and better space utilization
- A greener, more livable, and walkable urban environment
- Faster, more reliable public transportation



Public transportation investments and incentives for more eco-friendly private vehicles are two complimentary ways to reduce transport sector air pollution (Photo by Raju Pawar for Clean Air Catalyst).

**Where:** Implement parking regulations city-wide, starting with neighborhoods where parking is most scarce.

## 5) INVESTIGATE ROAD DUST SOURCES AND REDUCTION STRATEGIES

**What:** Road dust is a major contributor to PM2.5 pollution in Indore (see Graphic 1), though data on sources remains incomplete. We recommend the following actions to shed light on sources and inform solutions:

- Conduct source apportionment studies to identify key dust sources and target interventions effectively
- Add new street cleaning machines, expand coverage, and increase cleaning frequency
- Invest in infrastructure, like end-to-end paving and green buffer zones with trees and shrubs
- Strengthen regulations to minimize road dust from construction

**What are the benefits?**

- Potential significant reductions in PM2.5, PM10, and other pollutants
- More pleasant urban areas that promote walking and cycling
- Improved visibility for drivers and pedestrians

**Where:** Research should be a first step, to deepen understanding of road dust sources. It can then guide decisions on where, when, and how to deploy energy-intensive solutions like street cleaning and green infrastructure.

## 6) ENFORCE VEHICLE TESTING REQUIREMENTS

**What:** The purpose of this solution is to ensure greater compliance with mandated emission norms that already exist, such as the Pollution Under Control (PUC) certification. City and state agencies can tighten enforcement of such standards by:

- Investing in enforcement and inspection services
- Leveraging advanced pollution detection technologies
- Complementing enforcement with positive incentives (“carrots”) for compliance

**What are the benefits?**

- Increased consumer savings on repairs by catching vehicle problems early
- Improved safety and health by eliminating harmful pollution and detecting malfunctions

**Where:** This policy can be implemented city-wide but could be scaled up gradually as enforcement agencies receive the needed training and resources to enforce compliance.

## Getting there: The Indore Clean Air Coalition

These transportation solutions provide a clear path to cleaner air in Indore. Proven in other cities, they are achievable through strong collaboration.

City and state leaders can make faster progress with support from a diverse coalition that can raise awareness of the issue, advocate for solutions like these, provide additional funding, and offer research and feedback. The Indore Clean Air Coalition aims to provide a space where these activities can take place, organizing actions to advance solutions and inform their implementation.

# Indore Clean Air Coalition

**We invite leaders of all stripes to join the coalition and contribute to securing cleaner air and better health for all Indore residents. Learn more about the Indore Clean Air Coalition at [cleanaircatalyst.org](https://cleanaircatalyst.org).**

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