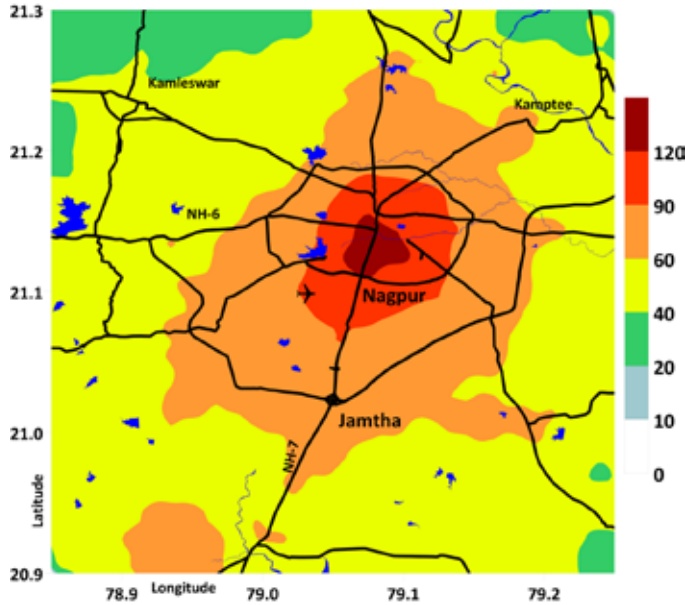


Modeled annual average PM_{2.5} concentration (2015) µg/m³



For urban Nagpur, average PM_{2.5} concentration was $84.9 \pm 19.1 \mu\text{g}/\text{m}^3$. This is twice the national standard (40) and more than 8 times the WHO guideline (10).

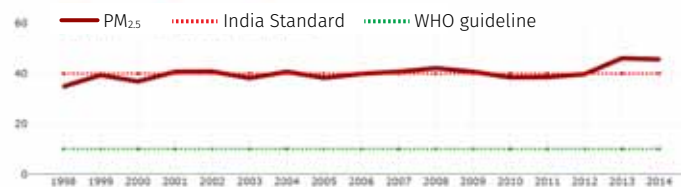
Air monitoring infrastructure

Nagpur has 1 Continuous Air Monitoring Station (CAMS) reporting data for all the criteria pollutants and 7 manual stations reporting data on PM₁₀, SO₂, and NO₂. There should be at least 22 CAMS in the city for efficient reporting.

Annual averages from the national ambient monitoring program (2011-2015) µg/m³

PM ₁₀	NO ₂	SO ₂
192.1 ± 112.5	64.7 ± 36.0	20.7 ± 18.8

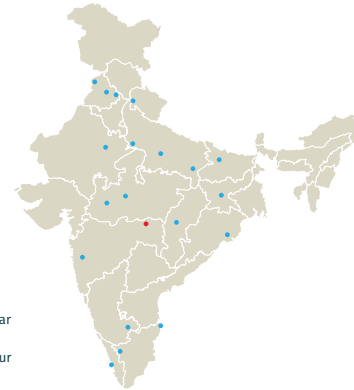
Trend in PM_{2.5} concentrations, based on satellite observations and global model simulations (1998-2014) µg/m³



The Air Pollution Knowledge Assessment (APnA) City Program

Clearing the air with data

- Agra • Amritsar • Bengaluru • Bhopal • Bhubaneswar
- Chandigarh • Chennai • Coimbatore • Dehradun
- Indore • Jaipur • Kanpur • Kochi • Ludhiana • Nagpur
- Patna • Pune • Raipur • Ranchi • Varanasi



Designing an effective Air Quality Management (AQM) plan for a city requires robust data on levels of pollution, affected areas, source contributors, peaking trends and possible control mechanisms.

The Air Pollution Knowledge Assessment (APnA) City Program seeks to make this database available and also serve as a starting point for understanding air pollution.

The program, implemented by Urban Emissions and facilitated by Shakti Sustainable Energy Foundation, seeks to create a comprehensive, city-specific information pool by pulling together data from disparate sources, surveys, mapping and atmospheric modeling.

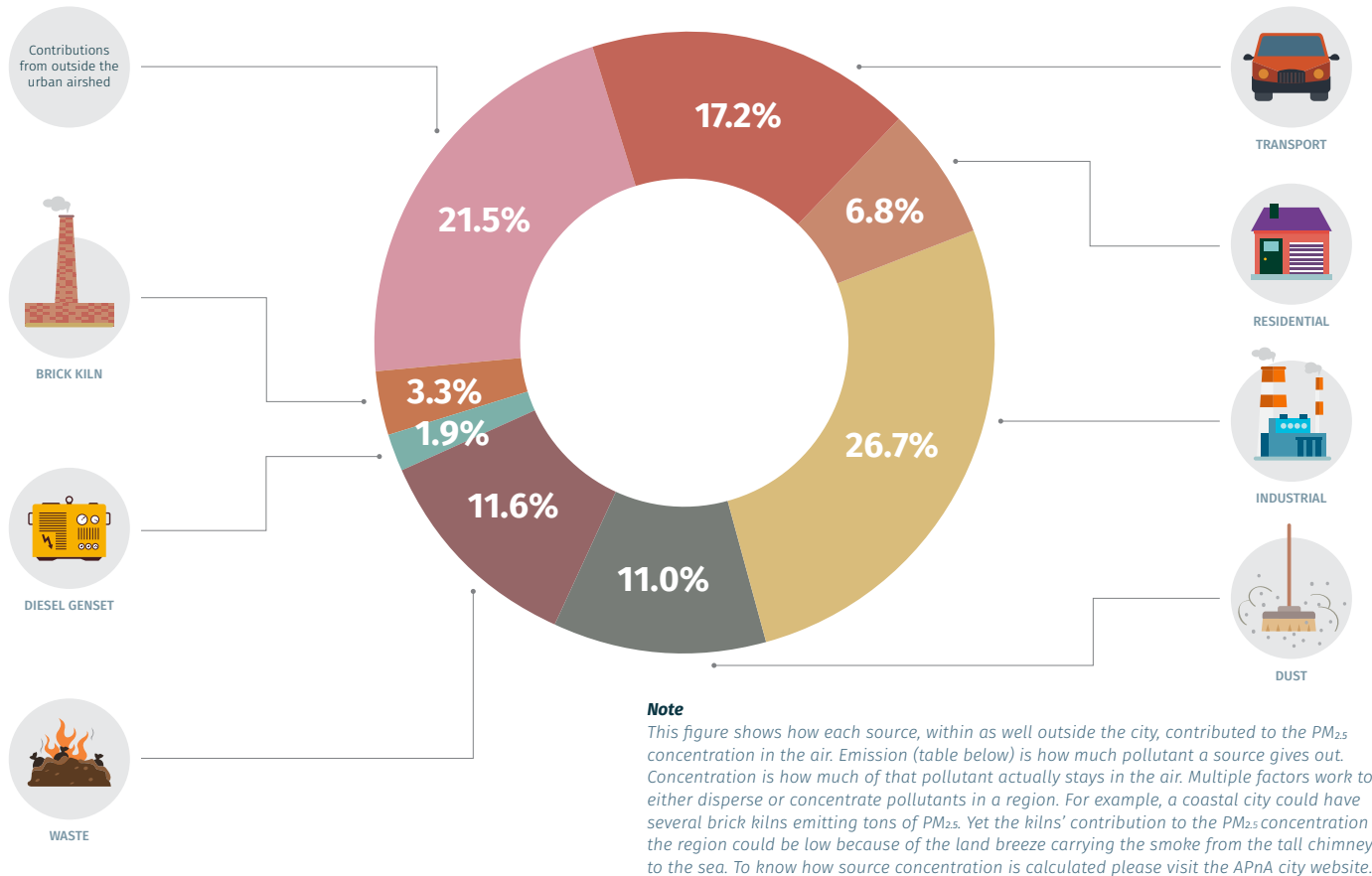
Policy options based on this information, and their implementation, would be the effective next steps in improving the air quality of our cities.

Nagpur

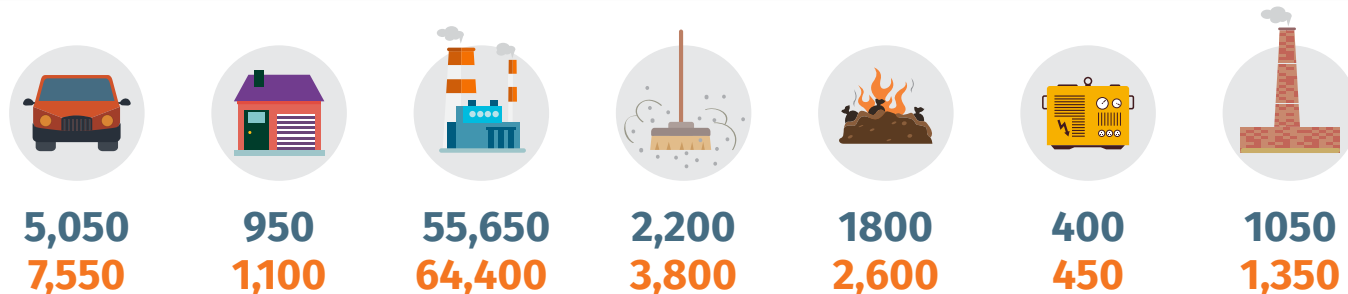
The air quality in this city of oranges is tending towards red. The PM_{2.5} level is twice the national standard.

For detailed information on Nagpur Air Quality, visit www.urbanemissions.info/india-apna

PM_{2.5} concentration : source-wise percentage share in 2015



PM_{2.5} emissions : source-wise share in tons in 2015 and 2030 (projected)



Total emissions in 2015 = 67,100 tons | Total emissions in 2030 = 81,250 tons

Findings & Recommendations

- The modeled source contributions present an even share of transport (including on-road dust), domestic cooking and heating, industries, open waste burning, and influence of outside sources as the key air pollution sources in the urban area.

- In 2015, an estimated 21% of the ambient annual PM_{2.5} pollution originated outside the urban airshed; some regional interventions could reduce the pollution loads. This contribution stemmed largely from coal-fired power plants, large (metal and non-metal processing) industries, and brick kilns located outside the urban airshed.

- The city needs to aggressively promote public and non-motorized transport and improve road infrastructure to reduce on-road dust re-suspension.

- By 2030, the vehicle exhaust emissions are expected to remain constant, if and only if, Bharat 6 fuel standards are introduced nationally in 2020, as recommended by the Auto Fuel Policy.

- By 2030, the share of emissions from residential cooking and lighting is expected to decrease with an increase in LPG consumption, residential electrification and urbanization. However, since biomass and coal is easily available, their use will continue unless there is an aggressive program for a 100% technology shift to cleaner options.

- The 120 brick kilns in the urban airshed (largely clamp style), are fueled mostly by coal and agri-waste. A technology upgrade to (for example) zig-zag and fixed-chimney kilns can make them more energy efficient. Coal-fired power plants need to enforce stricter environmental standards for all the criteria pollutants.

- Open waste burning is dispersed across the city and requires stricter regulations for addressing the issue.