Customised Interventions Needed for Air-Pollution Mitigation in Non-Attainment Cities

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In line with strong emerging evidence on how air pollution affects human health, the World Health Organisation (WHO), in its latest guidelines, has recommended more stringent limits for all key air pollutants to protect populations worldwide. It also says that almost 80% of deaths related to $PM_{2.5}$—the most hazardous pollutant for public health—could be prevented if the current air pollution levels were reduced to those proposed in the updated guidelines.

Though adhering to these WHO guidelines may not be feasible for a developing country like India, the government has been taking steps to combat the problem of air pollution. Recently, the Ministry of Environment, Forest and Climate Change (MoEFCC) launched a portal "PRANA" (Portal for Regulation of Air-pollution in Non-Attainment cities) under the National Clean Air Programme (NCAP), to provide real-time information on how specific cities are curbing their air pollution levels, as well as historical data on air pollution mitigation milestones achieved since 2018.

Non-attainment cities: Unique problems, generic solutions

NCAP, in 2019, identified 122 cities (now 132) that had persistently violated the national air quality standards for 3-5 years. These are called 'non-attainment' (NA) cities. The NA cities list is a heterogeneous mix of cities of all sizes, and types—from bustling metros like Delhi and Mumbai to Tier-II cities like Rishikesh and Gajaraula, and small towns like Parwanoo and Baddi.

Surprisingly, despite the stark differences in geography, demography, and socio-economic profiles of these cities and the variance in pollution-causing anthropogenic activities, the interventions for air-pollution control in all NA cities are largely similar. The city-level Clean

Air Plans (CAP) have failed to account for the challenges that are unique to a city and, therefore, require customised solutions to efficiently cut pollution.
Since vehicular emissions are a leading source of particulate matter (PM) generation in urban India, the bulk of action steps in all CAPs submitted under NCAP relate to transport and road dust, followed by interventions for the industrial sector. However, the plans have missed the obvious differences in the transport systems in these cities, resulting in significant weaknesses in the planned air-pollution-control measures.

Embracing the distinctness

Instead of copying generic initiatives for green urban transportation, specific interventions that are informed by the uniqueness of a city—transportation habits, available modes of transportation, feasibility of a particular cleaner option—should be formulated to combat the issue.

Let's take two NA cities, Patna and Bengaluru, which have markedly different transport systems to see how targeted strategies can be devised for better results.

Patna & Bengaluru

Patna, spread over 250 km2, is a Tier-II city, while Bengaluru is a metropolis spread over 800 km2.

Patna has only a skeletal bus transportation system (mostly privately-owned buses). Most of the transportation needs are met by diesel auto-rickshaws, which usually ply on fixed routes. People also use bikes and non-motorised transport (bicycle, cycle-rickshaw, walking) for commuting. The city gets most of its tail-pipe emissions from old buses, diesel auto-rickshaws, and private vehicles.
In comparison, Bengaluru has a well-established urban bus transport system, managed by Bengaluru Metropolitan Transport Corporation (BMTC), along with an operational metro rail network, and suburban railways lines. However, despite the many public transport options in the city, private ownership of vehicles (two-wheelers as well as cars) is high. This is because public buses and metro do not provide 'last-mile connectivity' (reaching the final destination)—a need that is fulfilled by private transport, on-demand auto-rickshaws and

taxi aggregators. Thus, on a typical day, around 9 lakh diesel cars (private and taxi aggregators) ply on Bengaluru roads, contributing heavily to air pollution.

What Patna can do

To reduce air pollution from the transportation sector, our research shows Patna needs to increase the percentage of people availing public transport (mode-share of buses). According to Patna Clean Air Action Plan, the city needs an additional 500 buses to increase the mode-share of public transport to 40% from the existing 20%. As Patna is a part of the Urja Ganga Gas Pipeline Project—a 2,655-km long natural gas pipeline infrastructure project—CNG can be easily supplied. Patna should, therefore, opt for CNG buses over electric buses (e-buses) to enable a faster transition to less-polluting transport. Moreover, given that most of the electricity generated in eastern India (including Bihar) comes from coal-based power plants, the use of electricity for e-buses—if Patna opts for them over CNG—would intensify pollution.

However, the trade-off is different for the already-operating diesel auto-rickshaws. The proposed incentive of INR 40,000 by the Bihar government to switch these auto-rickshaws to cleaner fuels should be expedited by making the conversion mandatory and setting a target timeline for it. Strict implementation of the ban on 15-year-old commercial vehicles will be another effective step. Finally, Patna should aim to maintain its already high share of non-motorised mode of transport.

Steps Bengaluru can take

In Bengaluru, studies by the Center for Study of Science, Technology and Policy estimate that the Bangalore Metropolitan Transport Corporation (BMTC) needs around 2,000 new buses to meet the city-commuter demand. It can buy 390 e-buses under the FAME-II scheme and Smart Cities Mission. Opting for a large number of e-buses, along with the speedy implementation of phases 2 and 3 of Namma Metro project, and a full-fledged suburban railway system can reduce PM2.5 emission from the transportation sector by 16% in the next four years.

To reduce air-pollution from private vehicles, it is critical to address the issue of last-mile connectivity. For this, inter-departmental cooperation for initiating last-mile connectivity

should be urgently considered. Bengaluru should adopt a strategy like Delhi's on banning old vehicles, along with prohibitory taxes on the purchase of diesel vehicles, to bring down the number of polluting vehicles on the road. Finally, encouraging people to use non-motorised transport by providing dedicated cycling corridors and safe pavements will also help reduce air pollution.

The bottom line

It is evident that air pollution issues across India are not comparable, since each region has its own set of complexities. India would do well to devise city-specific strategies to meet the NCAP targets and move closer to the revised WHO-recommended levels of air quality.

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