

## **Report No. 78**

**Supplementary Report on the Comprehensive Action Plan for Air Pollution Control with the objective to meet ambient air quality in the National Capital Territory of Delhi and National Capital Region, including states of Haryana, Rajasthan and Uttar Pradesh**

### **UPDATED PLAN WITH TIMELINES**

**Re-submitted November 16, 2017**

**The Hon'ble Court in the hearing dated November 13, 2017 had directed that the comprehensive action plan, as submitted by EPCA on April 5, 2017 should be suitably modified to include clear timelines for implementation. This supplementary report re-submits the same plan, but with schedules for directions from the Hon'ble Court.**

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## 1. Combating air pollution in Delhi and the National Capital Region

The Hon'ble Supreme Court, in its order dated 06.02.2017, has directed that:

*“In our opinion, it would be appropriate if all the concerned authorities namely the EPCA, the Government of Delhi as well as the Governments of NCR i.e. Governments of Haryana, Rajasthan and Uttar Pradesh along with CPCB hold a joint meeting within a period of two weeks from today and thereafter come up with one comprehensive plan merging all three plans. We direct accordingly.”*

In view of this, the Environment Pollution (Prevention and Control) Authority (EPCA) has drafted a comprehensive action plan for Delhi and the National Capital Region (NCR) in consultation with the Central Pollution Control Board (CPCB) and the Delhi Pollution Control Committee (DPCC) of the Delhi government. It has been agreed jointly that the Draft Action Plan, as prepared by EPCA, CPCB and DPCC would be sent to state governments of Haryana, Rajasthan and Uttar Pradesh for their review and adoption. This draft is based on the 2012-2013 action plan of the Delhi government, and has been updated based on the orders of the Hon'ble Supreme Court related to air pollution control in Delhi and NCR. It includes the 42 action point directions given by the Central Pollution Control Board in 2015 for Delhi and NCR; the Delhi Decongestion Plan drawn up by the Ministry of Urban Development; the revised Delhi Master Plan of 2021, and other relevant government plans and policies.

The overall objective is to present a pollution source-wise action plan to be implemented in a time-bound manner with adequate stringency, monitoring and compliance system to meet the clean air targets. This comprehensive plan identifies short-term priority action as well as those to be implemented in a medium to longer time frame. The new generation action is more complex in nature, but important for the desired stringency and effectiveness.

### 1.1. Guiding principles for the comprehensive action plan

**Meet clean air standards in a time-bound manner:** Air quality monitoring in Delhi and limited air quality monitoring in the NCR show the extent of non-compliance with the air quality standards. According to the 2009 National Ambient Air Quality Standards notified under the Air (Prevention and Control of Pollution) Act, 1981 the daily and hourly standards for pollutants must be met 98 per cent of the time in a year and they should not exceed the standards on two consecutive days. Delhi and NCR will have to strive towards meeting these standards over time. The global practice is to take the average concentration of a pollutant for three years to assess the percentage reduction needed to meet the clean air standards. This shows Delhi will have to reduce PM10 levels by 74 per cent, PM2.5 by 70 per cent, and nitrogen dioxide by 37.5 per cent to meet the standards. Similarly, key NCR cities and towns need significant reductions to meet the clean air standards (*see Table 1: Reduction needed in annual average concentration in selected NCR cities to meet the clean air standards*). This must be kept in view to decide on the stringency of action.

**Table 1: Reduction needed in annual average concentration in selected NCR cities to meet the clean air standards**

City	PM10 levels (in micro-gram per cubic metre cum)	Percentage reduction in PM10 required to meet the annual Average Standard (i.e. 60 micro- gram per cubic metre cum)	NO2 levels (i.e. 60 micro-gram per cubic metre cum)	Percentage reduction in NO2 required to meet the annual Average Standard (i.e. 40 micro- gram per cubic metre cum)	PM2.5 levels (in micro-gram per cubic metre cum)	Percentage reduction in PM2.5 required to meet the annual average standard (i.e. 40 microgram me per cum)
Delhi	232	74%	64	37.5%	132	69.7%
Faridabad	166	63.9%	41	2.5%	NA	NA
Ghaziabad	247	75.7%	35	Within standard	NA	NA
Noida	138	56.5%	31	Within standard	NA	NA
Meerut	149	59.7%	47	14.9%	NA	NA

Note: Annual data for consecutive years for Gurugram is not available NA: Not available;

Table to be updated as data for NCR towns are made available

Source: Based on data reported on CPCB website

**Take action on all sources of pollution to meet clean air targets:** Given the very high levels of pollution, it is important to take action on all sources to control particulate pollution as well as to prevent the trend in toxic gases from worsening. In 2015, a source inventory and source apportionment study was carried out by the Indian Institute of Technology (IIT), Kanpur under the aegis of the Delhi government. The study assessed 13 key pollution sources and their relative contributions to different pollutants (*see Annex 1: Relative contribution of pollution sources to pollution load in Delhi*). These include dust sources such as road dust and construction dust as well as a large number of combustion sources including vehicles, power plants, industries and waste burning. Such an assessment has not been done in the NCR

**Reduce integrated exposure to protect public health:** The Union Ministry of

Health and Family Welfare in its Report of Steering Committee on Air Pollution and Health-Related Issues in 2015 has stated that it is more important to know how close people are to pollution sources, what are they inhaling, and how much time they spend close to the pollution source than what occurs generally in the ambient air that is influenced by climate and weather. While ambient concentration of pollution helps measure the change in pollution trends over time and space, human exposures are heavily influenced by nearby sources (such as stoves, vehicles and neighbourhood trash burning) and less by general ambient concentrations. Take action to control pollution from all sources across micro-environments to protect public health.

**Public health risk from air pollution is grave and growing:** The Global Burden of Disease estimates for 2017 have shown that early deaths related to PM<sub>2.5</sub> in India are the second highest in the world and ozone-related deaths, though lower than PM<sub>2.5</sub>, are the highest in the world. Not only the tiny particulates, but also the toxic gases that come entirely from combustion sources pose a very serious health risk. The 2012 epidemiological study on children in Delhi (CPCB and the Chittaranjan National Cancer Institute of Kolkata) covered 11,628 school-going children from 36 schools. It showed that every third child has reduced lung function. Sputum of Delhi's children contains four times more iron-laden macrophages than those from cleaner environs, indicating pulmonary hemorrhage. The Health Effects Study of Boston in 2010 has shown that there are at least 3,000 early deaths in Delhi every year due to air pollution-related diseases that the Hon'ble Supreme Court has reinterpreted to be 8 deaths a day. Several other studies over time have established the serious health impacts and diverse health outcomes of air pollution in this region. This demands urgent and strong action.

**Address quantum vs toxicity:** Yet another principle that has been established is the setting of priorities according to what is more toxic and dangerous. Recent global studies have authoritatively assessed differentiated health risks according to the source of particulates. A study by the Health Effects Institute, published recently in *Environmental Health Perspectives*, has found that particles from coal and diesel are more harmful than wind-blown dust, as they can lead to an increase in ischemic heart disease-related deaths. Similarly, particles from diesel combustion are very toxic and have been classified by the WHO as a class I carcinogen for strong links with lung cancer, putting them in the same bracket as tobacco smoking and asbestos. This suggests that we must prioritise the more harmful particulates for action. Combustion sources -- vehicles, power plants and industry -- need more stringent and priority action.

**Adopt a regional approach for a common air-shed:** Local pollution control will have to be supported by regional action. Satellite imagery shows how the entire north Indian belt which is landlocked stays polluted during winter. Landlocked plains trap air and pollution from biomass *chulhas*, industries and power plants, traffic and open

fires. The seasonal incidents of farm fires in Punjab and Haryana have brought the matter of trans-boundary movement of pollution to the forefront, catalysing inter-state coordination. The farm fires greatly contribute to pollution in NCR towns during the season (roughly October 25-November 15). This pollution source has been taken up for action by the Hon'ble NGT as well as Hon'ble Delhi High Court and clear directions have been issued to the Punjab and Haryana state governments. This demands a regional action plan to address more dispersed pollution sources. Recognising this, the Hon'ble Supreme Court has provided that all actions to combat pollution must be applicable to the National Capital Region.

**Enforce emergency action to control and minimize exposure on a daily basis:** In 2016, the Hon'ble Supreme Court intervened to direct the Union government to frame and implement a graded response action plan, which lays out the measures and actions to be taken based on the levels of daily pollution to prevent peaking of pollution. This graded response action plan also, for the first time, provides for actions that need to be taken when pollution reaches a public health emergency level. This plan provides a model for other cities to emulate and should be enforced nationwide (see *Annex 2: Graded Response Action Plan*).

**Addressing both consistent and seasonal sources of pollution:** The pollution source assessment done by the Indian Institute of Technology, Kanpur in 2015 shows that combustion sources like vehicles, industry and power plants are the most consistent and dominant sources of pollution that emit throughout the year. Most other sources like waste and paddy burning and construction activities are variable and intermittent. Biomass and municipal solid waste burning are important sources, but they are variable. To get the average levels down, strong focus must remain on consistent sources such as vehicles, power plants and industry that also emit toxic gases, which are hazardous to health.

**Address secondary particulates that are formed in the air by gases:** The IIT Kanpur study of 2015 put the spotlight on the problem of secondary particulates that are formed in the air from gases that come from combustion sources. Nitrate particles formed from nitrogen oxides and sulphate particles formed from sulphur dioxides can be 25 per cent of the PM<sub>2.5</sub> load in the city. This means the relative contribution of power plants, traffic, industry and open burning to particulate levels becomes even bigger and needs stronger control. The study has also pointed to seasonal variations in the relative contributions to ambient pollution: winter experiences relatively higher contribution from combustion sources. During summer, the contribution of dust is higher.

## 2. Source-wise clean air action plan and compliance strategy for Delhi and NCR to meet clean air standards

### 2.1 Air quality monitoring

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.1.1	<p><b>DPCC to set up 20 more real time monitoring stations:</b> The grid plan should be representative of population distribution and land use including residential, commercial, industrial, roadside and sensitive areas. Delhi currently has 28 real time air quality monitoring stations that are operated by Central Pollution Control Board (CPCB), Delhi Pollution Control Committee (DPCC), and Ministry of Earth Sciences (MOES) with continuous relay of information. These include 10 manual stations and 18 real time stations.</p>	Department of Environment (DOE), Delhi Pollution Control Committee (DPCC)	Done
2.1.2	<p><b>NCR-wide air quality monitoring expansion:</b> The SC order of 2.12.2016 has directed CPCB to expand monitoring in the NCR. Accordingly, CPCB has submitted a plan to the Hon'ble Court. This includes –</p> <p>1. Uttar Pradesh has 10 manual and 1 real time monitoring stations with</p>	<p>Central Pollution Control Board (CPCB)</p> <p>State pollution control boards in NCR</p>	<p>Rajasthan: Done</p> <p>Uttar Pradesh: December 2017</p> <p>Haryana: January 2018</p>

	<p>one each in Ghaziabad and Noida. Real time stations will be set up by March 2017. The UP State Pollution Control Board will set up 6 manual and 8 real time stations.</p> <p>2. Haryana has 4 real time stations and will set up 13 more real time and 22 manual stations.</p> <p>3. Rajasthan has 9 manual stations; 2 real time stations are under installation, which will be completed by March 2017.</p> <p>The Hon'ble SC, vide its order dated 06.02.2017, has directed utilization of Rs 2.5 crore from the fund created from Environment Protection Charge on big diesel cars for installing monitoring stations and a Central Control Room for operational control and reporting in Delhi NCR. This is as per the plan submitted by CPCB.</p>		
2.1.3	<p><b>Enforce Graded Response Action Plan</b> as directed by the Hon'ble Supreme Court and notified by the Ministry of Environment, Forests and Climate Change (<i>Annexure 2</i>)</p>	EPCA, Task Force under CPCB	Ongoing. Has been enforced during 2017 and helped to bring down severe levels of pollution

2.1.4	Undertake satellite-based monitoring for tracking and enforcing agriculture waste burning	State governments , CPCB	Ongoing during crop burning season each year
2.1.5	<b>Research studies including air pollution inventory, source apportionment, health impact studies, exposure impacts and other relevant studies:</b> Govt. to support research works / scientific studies by academic / research institutions. Expertise will be sought from various institutions to develop protocols for assessment of the research proposals (CPCB Comment) <sup>1</sup> .	Environment departments and state boards in NCR	Ongoing (CPCB to give progress every 3 months)

<sup>1</sup> Item 2.1.5: "Expertise...research proposals" may be replaced with "Studies using EPC funds may be taken up as per the concept note prepared by CPCB to the Hon'ble Supreme Court"

## 2.2 Action to reduce vehicular emissions

S. No.	Action points	Agency responsible	Revised timeline for implementation
<b>EMISSION AND FUEL QUALITY FOR NEW VEHICLES</b>			
2.2.1	<p>Ensure on-schedule implementation of BS VI fuel and emission standards, including early delivery of BS VI fuel for vehicles to modify technologies. Ensure registration of only BS IV vehicles from April 1, 2017 and only BS VI-compliant vehicles from April 2020<sup>2</sup></p> <p>Supreme Court order of March 29, 2017 has directed that no vehicle that is not BSIV compliant can be registered from April 1, 2017. Any BSIII vehicle that comes for registration will have to provide the proof of sale before March 31,</p>	<p>State transport departments, Ministry of Road Transport and Highways (MORTH) and Ministry of Petroleum and Natural Gas (MOPNG)</p>	

<sup>2</sup> SIAM submission to EPCA: If the date of 1<sup>st</sup> April 2020 is changed to registration then industry has to stop manufacturing BSIV vehicles by April 2019. But BSVI fuels will come in September 2019. BSVI production can start only from that date.

	2017 ((CPCB Comment) <sup>3</sup> .		
2.2.2	<p><b>Action on dieselization:</b> The SC order dated 12.8.2016 has imposed an environment pollution charge of 1% on registration of diesel vehicles with 2,000 cc and above. A fund has been created from this revenue to fund pollution control efforts. Tax measures are needed to nullify incentives for diesel cars over petrol cars.<sup>4</sup></p>	CPCB	
2.2.3	<p><b>Expand CNG programme across NCR:</b> The SC orders dated 16.12.2015, 5.1.2016 and 10.5.2016 have directed CNG stations to be set up across NCR and taxis to convert to CNG<sup>5</sup>.</p>	MOPNG, GAIL / IGL	<p>Between December 2015 to current, the number of CNG stations has increased. Another 92 stations have been added across NCR.</p> <p>MoPNG to provide a plan for further expansion and for use in buses and public transport, including removal of fiscal distortions that are barriers to fast adoption of this fuel as against diesel.</p>

<sup>3</sup> CPCB in its submission to EPCA has stated that the notification regarding the implementation of BS-IV and BS-VI emission norms is applicable for vehicles manufactured on or after given dates, not registration of vehicles. The EPCA notes that the Hon'ble Supreme Court has already directed that it will only be registration of BSIV from April 1, 2017

<sup>4</sup> SIAM submission to EPCA: Equalise the price of petrol and diesel fuels as diesel cars are already have high tax burden compared to petrol cars. General recommendation is if any product is meeting environmental and emissions standards notified by the Government of India should not be termed as polluter or penalised in any way. If EPCA feels standards are not tight enough, EPCA could recommend tightening of the standards to the GOI. Carry out cost benefit analysis to prioritise different measures for reducing air pollution.

<sup>5</sup> SIAM submission to EPCA: Need expert view whether CNG should be expanded at the BSVI level as the PM emissions in CNG, petrol, and diesel is same. Marginal increase of 25% in NOx from diesel compared to CNG. CO benefit of diesel is substantial at 50% with added advantage of CO2. In future PM1 could become an issue which would be higher in CNG.

	NCR to expand CNG bus and auto fleets ( <i>see agenda on public transport</i> ).		
<b>2.2.4</b>	<p><b>Introduce battery-operated vehicles in targeted segments of two-wheelers, three-wheelers and buses.</b> Plan infrastructure for charging and battery disposal. <b>Identify and notify commercial areas in cities with high footfalls and good public transport and goods transport connectivity that can be pedestrianized, supported by zero emission battery-operated vehicles:</b> Priority may be accorded to battery-operated para-transit as feeders and for last mile connectivity in such areas. Ensure organized deployment to reduce congestion.<sup>6</sup></p>	DOE & DPCC, SPCBs, Transport Dept, municipal bodies, Discoms	<p><b>MoRTH to submit plan within 3 months with deliverables, focus on speedy implementation to target 3 wheelers and buses and feeder services like taxis, metro-feeder and to provide NCR-wide charging infrastructure.</b></p> <p><b>Plan by February 28, 2018</b></p>

<sup>6</sup> SIAM submission to EPCA: We agree with recommendations. There has to be sustained thrust to ensure penetration.

2.2.5	<p><b>Install vapour recovery systems in fuel refueling outlets to reduce benzene emissions in NCR. CPCB has issued direction for installation of stage I and Stage II vapor recovery system in all retail outlets with capacity 3000 klm and more in 46 million plus cities by December 2017. In Delhi and NCR all retail outlets should comply with this.</b></p>	MOPNG, Transport Dept., state boards, DOE	<b>May 2018</b> (6 months from approval of plan)
<b>ON-ROAD VEHICLES</b>			
2.2.6	<p><b>Auditing of Pollution under Control (PUC) certification centres</b> The SC orders dated 25.11.2016, 2.12.2016, 17.1.2017 and 06.02.2017 have directed the government and EPCA to audit stations in Delhi-NCR and suggest improvements.</p>	State departments of transport in Delhi and NCR	<p>In its order of August 10, 2017 Hon'ble Court has already given directions to MoRTH on this.</p> <p>MoRTH to provide compliance report to Hon'ble Court on implementation of its directions by December 10, 2018.</p>
2.2.7	<b>Tighten PUC</b>	Ministry of Road	<b>Hon'ble Court has in the October</b>

	<b>norms for post-2000 vehicles.<sup>7</sup> Upgrade in-use emissions testing for diesel vehicles.</b>	Transport and Highways	11, 2017 order directed ARAI (Automotive Research Association of India) to give report on this matter within 8 weeks to EPCA.
2.2.8	<b>Implement an on-board diagnostic system fitted in new vehicles for vehicle inspection. Improve facilities for its implementation</b>	Ministry of Road Transport and Highways Department of Transport, NCR	The Union has to revert back on the proposal for hand-held scanners to verify the functioning of OBD system and the plan proposed by the Hon'ble Court (vide its order dated October 11) to phase in the introduction, starting Grade A cities.
2.2.9	<b>Link PUC certificates with annual vehicle insurance to ensure 100 per cent compliance.</b>	MORTH, Transport Department, IRDA (Insurance Regulatory and Development Authority)	Done. In its order of August 10, 2017 Hon'ble Court has already given directions to MoRTH on this.  MoRTH to provide compliance report to Hon'ble Court on implementation of its directions by December 10, 2018.
2.2.10	<b>Enforcement of law against visibly polluting vehicles: impose penalty, launch extensive awareness drive against polluting vehicles.</b>	Department of Transport, GNCTD, Rajasthan, UP, Haryana	Ongoing
2.2.11	<b>Delhi to review and upgrade the Burari commercial vehicle testing centre.</b>	Transport Department, Delhi	February 28, 2018
2.2.12	<b>Ensure requisite</b>	State transport	February 28, 2018

<sup>7</sup> SIAM submission to EPCA: Indian PUC norms are in line with European regulations and would continue to evolve along EU norms. Analyse existing PUC data after the existing PUC regime is upgraded and data is available. Until the PUC system is made more robust, any further tightening would only result in more malpractices.

	<b>infrastructure for hydro testing of CNG cylinders in Delhi and NCR.</b> (CPCB Comment) <sup>8</sup>	departments, Ministry of Petroleum and Natural Gas	
<b>TRANSIT TRUCK TRAFFIC</b>			
<b>2.2.13</b>	<b>Divert truck traffic:</b> SC orders dated 9.10.2015, 16.12.2015 and 5.1.2016 directing diversion of non-destined trucks and imposition of ECC on incoming trucks. <b>SC order for installation of RFID system in Delhi:</b> As per the orders dated 9.10.2015, 5.1.2016 and 22.8.2016, the SDMC is tendering for RFID for 13 entry points, which account for 80% of commercial traffic into Delhi. The system will be commissioned before next winter.	Delhi Transport Department and Municipal Corporation of Delhi	Ongoing
<b>2.2.14</b>	<b>Check overloading:</b> The SC order dated 5.1.2016 directing for weigh-in-motion bridges /	NHAI to commission WIMS and enforce at all entry points	February 28, 2018

<sup>8</sup> Hydro testing of CNG cylinder maybe omitted as it is related to safety aspect.

	<p>machines (WIM) at entry points to Delhi. NHAI has commissioned 60 WIM at 6 toll plazas for entry into Delhi. However, implementation of its penalty, which is 10 times of applicable rate for over-loaded vehicles, is lagging.</p>		
<b>2.2.15</b>	<p><b>Fast track construction of Western and Eastern Peripheral Expressways:</b> Take steps to expedite early completion of the Expressways and submit a completion schedule. SC orders dated 11.2.2005, 11.3.2005, 1.8.2005 and 31.3.2016 on building / upgrading alternative bypass roads. The EPE is on schedule for completion in July 2018 and one stretch of WPE has been commissioned. The EPCA has given a report on</p>	<p>NHAI schedule for EPE is mid-2018</p> <p>Haryana government schedule for WPE is mid-2019</p>	<p>NHAI and Haryana government to come back to Hon'ble Court on expediting schedules in next hearing on December 6, 2017.</p>

	existing alternative routes that need upgradation. This is also being pursued with MoRTH and NHAI.		
<b>2.2.16</b>	<b>Inter-state freight transport plan:</b> Submit plan for inter- and intra-state transport sector for short term, mid-term and long term action points to improve rail-based freight traffic to reduce dependence on trucks.	Transport Department to coordinate with NCRPB and Railway Ministry	Submission of plan by February 28, 2018
<b>2.2.17</b>	<b>Fuel quality:</b> Prepare an action plan to check fuel adulteration and random monitoring of fuel quality data. The MoPNG has set up a fuel testing laboratory, based on previous SC directions. To review its operations and to ensure that fuel testing is done across NCR for all combustion fuels.	MOPNG	February 28, 2018

### 2.3 Strategies to reduce vehicle numbers on roads

S. No.	Action points	Agency responsible	Revised timeline for implementation
<b>PUBLIC TRANSPORT STRATEGIES</b>			
<b>2.3.1</b>	<b>Improvement in bus numbers and services.</b> SC orders dated 27.7.1998 and 5.1.2016 directing Delhi government to abide by SC direction to augment to 10,000 buses by 2000 and the Union to provide land for bus depots.	Delhi Transport Department, DTC, DIMTS, DDA	Delhi government must ensure total compliance with order of 1998 and 2016 by December 2018. This requires a total fleet of at least 10,000 buses
<b>2.3.2</b>	Implement the recommendations of Route Rationalization Report of GNCTD. Improve availability by rationalizing routes and fleet enhancement with requisite modification	Delhi Transport Department, DTC and DIMTS	Immediate
<b>2.3.3</b>	Reform of DTC and Cluster Bus Operations – modernize fleet and crew scheduling process of DTC, install GPS units on DTC buses and create a traffic control cell for monitoring bus movement, rationalize scheduling of buses under DTC and cluster scheme.	Delhi Transport Department, DTC and DIMTS	Immediate
<b>2.3.4</b>	IT system in buses, bus-stops and control centre and passenger information systems for reliability of bus services, and service monitoring.	Delhi Transport Department, DTC and DIMTS	Immediate
<b>2.3.5</b>	Bus parking should be made integral to urban planning. Multi-level bus parking to be provided in depots to more efficiently	Delhi Transport Department, DTC and DIMTS	Immediate. EPCA report on availability of bus depot land shows that land is available for additional 2000 buses and that Delhi

	use available land area. Multi-modal, multi-use bus depots to be developed to provide high-class bus services and terminal experience to passengers. Should include well equipped maintenance workshops.		government must use options for multi-level parking in rest. DDA has made the requisite changes in Master Plan to allow for multi-level parking
2.3.6	Need bus fare policy to ensure that it is affordable and remains competitive <i>vis-a-vis</i> the operational cost of two- wheelers.	Delhi Transport Department, DTC and DIMTS	Immediate
2.3.7	Enforce bus lanes and keep them free from obstruction and encroachment.	Delhi Transport Department, DTC, DIMTS	Immediate
2.3.8	<b>Augmenting the service of Metro for carrying more passengers:</b> SC order dated 5.1.2016 directing for augmentation of service / coaches. Metro has submitted to EPCA its plan for inducting 486 additional coaches by December 2017 for existing lines. Of this, 270 have been procured. In addition, Metro has submitted proposal for 602 coaches, which is being examined by the Delhi govt.	DMRC	December 2018
2.3.9	<b>Three-wheelers</b> Implement electro-mobility for three-wheelers to make them zero emission as efficient feeder system for last mile connectivity and integration with bigger public transport systems. Organise their services for	State transport departments	May 2018

	efficient deployment.		
<b>2.3.1 0</b>	BRTS / LRTS to be implemented in targeted high frequency routes and complemented with bus services with proper integration of routes, stations and terminals. Explore feasibility of BRT / LRTS connectivity between Delhi and other NCR cities ( <i>CPCB Comment</i> ) <sup>9</sup> .	Delhi Transport Department, DTC and DIMTS	Transport departments of Delhi, Haryana, UP and Rajasthan to provide action plan with schedules of key BRTS/LRTS corridors by February 28, 2018
<b>2.3.1 1</b>	Fare integration and common ticketing; bring ETVMs into all DTC buses. Common mobility cards to be the mandatory access card for buses.	Delhi Transport Department, DTC and DIMTS	Immediate
<b>2.3.1 2</b>	Implementation of multi-modal integration plan for bus-Metro IPT-NMT at key / all interchange points.	Delhi Transport Department, DTC and DIMTS	Immediate
<b>2.3.1 3</b>	Demarcation and development of Influence Zones around Metro stations as per MPD-2021 to improve access to the public transport system.	Transport Department, PWD, DDA /UTTIPEC, DMRC, DTC, DIMTS	Immediate
<b>2.3.1 4</b>	Proper regulations and organization including providing driver-training, certification, etc. for cab and auto-rickshaw drivers	DDA, MCD, PWD	Immediate
<b>2.3.1 5</b>	<b>NCR connectivity for public transport – need bus and Metro plans.</b> Rationalize routes and augment public transport in NCR on CNG mode.	Ministry of Urban Development, NCR Planning Board, state governments	MoUD to submit a comprehensive plan by February 28, 2018 with clear deliverables

<sup>9</sup> BRTS/LRTS in high frequency routes may be reconsidered.

2.3.1 6	<b>Rationalize entry taxes in NCR under the NCR reciprocal agreement to lower costs of travel by public transport.</b>	Ministry of Urban Development, NCR Planning Board, state governments	<b>Immediate</b>
2.3.1 7	Integrate ITS in bus systems in cities in NCR (automated vehicle location, passenger information system, fare collection system).	Ministry of Urban Development, NCR Planning Board, state governments	<b>Immediate</b>
2.3.1 8	Regional Rapid Transit System (RRTS) integrated with local transit systems should be implemented to provide seamless connectivity between regional and sub-regional centres of NCR.	Ministry of Railways and state governments	<b>National Capital Region Transport Corporation (NCRTC) to submit plan with schedules by December 2017.</b>
2.3.1 9	Integrated passenger terminals to be created with mixed use and multi-modal facilities for passenger comfort, integrating regional and local public transit systems.	Ministry of Railways and state governments	<b>Immediate</b>
2.3.2 0	Implement traffic impact assessment of infrastructure project for planning and management.	Ministry of Urban Development, Municipal governments, planning departments of cities, DDA in Delhi	<b>Immediate</b>

## 2.4 Non-motorized transport (NMT) network

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.4.1	<p><b>Prepare and implement zonal plans for developing an NMT network. This should include the following action points with appropriate timelines for implementation:</b></p> <ul style="list-style-type: none"> <li>• Implement network plan for footpaths on all roads, as per the IRC codes and Street Design Guidelines. Target specific kilometers of footpaths and cycle tracks to be completed in a phased manner and cover the entire city.</li> </ul> <p>Identify roads where dedicated and wide footpaths and cycle tracks (two-way) can be created on either side of the street, as per Street Design Guidelines.</p> <ul style="list-style-type: none"> <li>• Implement a network plan for more secondary street networks and ungated streets to provide direct</li> </ul>	PWD, MCD, NDMC, DDA, Traffic Police, UTTIPEC	All NCR states to provide plans with clear deliverables and schedule for last-mile connectivity by February 28, 2018

	<p>shortest routes for pedestrians and cyclists. Vehicular traffic can also be redistributed from major junctions through multiple routes to decongest. Signal-free corridors should be avoided as more road-space only attracts more traffic and impedes people's movement.</p> <ul style="list-style-type: none"> <li>• Plan and upgrade pedestrian / NMT crossings at least every 250 m, with pedestrian signals and signages. These should preferably be at-grade. Reduce block sizes to reduce walking and cycling distances.</li> <li>• Synchronization of signals should be implemented on a priority basis with an integrated IT-based traffic management system so that in spite of having frequent at-grade pedestrian crossings, traffic can move swiftly across signals.</li> <li>• Cycle sharing systems being introduced as</li> </ul>		
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	<p>feeders to public transport to be expanded to cover entire Delhi.</p> <ul style="list-style-type: none"><li>• Identify and notify key commercial areas with high footfalls and good public transport connectivity to create pedestrian plazas.</li><li>• Make safety and walkability audits of walking and cycling infrastructure mandatory.</li><li>• Encroachment of NMT lanes to be made punishable offence under the current provision of law.</li></ul>		
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## 2.5 Parking policy to reduce congestion and pollution

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.5.1	<p><b>Parking policy and enforcement measures to be prepared and finalized for implementation in Delhi and NCR. To include – i) Enforcement strategies ii) Parking pricing policy and iii) Parking management strategies. Delhi Master Plan 2021 has provided for a Parking District Management Plan.</b></p>	<p><b>Delhi:</b> DOE, UTTIPEC, all municipal agencies, traffic police, transport dept.  <b>NCR:</b> All state governments, transport departments urban development departments</p>	<p><b>Implement parking policy by February 28, 2018</b></p>
<b>ENFORCEMENT AND MANAGEMENT</b>			
2.5.2	<ul style="list-style-type: none"> <li>• Physically demarcate legal parking areas. Equip them with metering systems, proper signages, IT for information on parking availability to reduce cruising time and on-street management.</li> <li>• Existing / planned public parking facilities and on-street and off-street parking (including multi-level) facilities should be bundled for management</li> </ul>	<p>Municipal corporations in Delhi and NCR  Urban development department</p>	<p><b>February 28, 2018</b></p>

	<p>by a single agency/ operator. New stand-alone parking only sites are mostly not required since parking is permitted in all use zones.</p> <ul style="list-style-type: none"> <li>• Parking facilities within developments (e.g. commercial/ residential/ institutional) should be shared and priced for enabling use by different types of users during different times of the day, thus bringing down total parking space demand.</li> <li>• Plan and implement parking provision for buses, commercial vehicles and IPT-NMT modes, and for the differently-abled.</li> </ul>		
<b>PARKING PRICING AND PENALTY</b>			
2.5.3	<ul style="list-style-type: none"> <li>• Introduce and further upgrade variable time-based pricing, as per market demand. Coordinated off-street and on-street / surface pricing in commercial and</li> </ul>		February 28, 2018

	<p>residential areas, and parking permits in residential areas. Parking should be charged as per duration, location in city and size of the vehicle.</p> <ul style="list-style-type: none"><li>• Take steps to prevent parking of vehicles in the non-designated areas. Penalties related to parking should be charged 10 times the parking fee along with impounding of vehicles after a certain level of violation.</li><li>• Strict penalty for violation of parking regulations and walkway encroachment. Parking on footpaths should be made a cognizable offence under the Delhi Municipal Corporation Act and Police Act.</li><li>• Reform parking lease agreements to increase parking revenue for local area development and public transport improvement.</li></ul>		
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## 2.6 Traffic management

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.6.1	<ul style="list-style-type: none"> <li>Introduce early alarm system during traffic congestion for the benefit of commuters on major routes, to facilitate route diversion.</li> </ul>	PWD, MCD, NDMC, DDA, Traffic Police, UTTIPEC  <b>NCR:</b> All state governments, transport departments urban development departments	State traffic police departments of Delhi, UP, Haryana and Rajasthan to implement this plan on traffic management by May 2018
2.6.2	<ul style="list-style-type: none"> <li>Consider introducing plan for flexi / staggered timings to minimize peak movement of vehicles on roads.</li> </ul>		May 2018
2.6.3	<ul style="list-style-type: none"> <li>Synchronize traffic movements / introduce intelligent traffic systems for lane-driving.</li> </ul>		May 2018
2.6.4	<ul style="list-style-type: none"> <li>Formulate action plan for controlling decongestion of fuel stations including increasing the number of dispensing machines.</li> </ul>		May 2018
2.6.5	<ul style="list-style-type: none"> <li>Electronic monitoring of traffic violations.</li> </ul>		May 2018
2.6.6	<ul style="list-style-type: none"> <li>Examine existing framework for removing broken down buses / trucks from roads and create a system for speedy removal and ensuring minimal disruption to</li> </ul>		May 2018

	traffic from such buses / trucks.		
<b>2.6.7</b>	<ul style="list-style-type: none"> <li>Conduct audit of traffic intersections and install functional traffic signals at all major intersections in all NCR cities.</li> </ul>		May 2018
<b>2.6.8</b>	<ul style="list-style-type: none"> <li>Conduct review of traffic signaling system at all intersections in Delhi / Noida and Gurugram and other NCR towns that are traffic hotspots and bring requisite changes to reflect the traffic movement pattern at intersections.</li> </ul>		May 2018
<b>2.6.9</b>	<ul style="list-style-type: none"> <li>Enforce lane driving through heavy fining as in Mumbai.</li> </ul>		May 2018

## 2.7 Power plants and industries

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.7.1	Permanent closure of Badarpur Power Plant after commissioning of the Tughlakabad sub-station or move towards cleaner natural gas	NTPC and Power-grid corporation	Badarpur will be permanently by mid-2018
2.7.2	Closure of Badarpur during peak winter months when Graded Response Action Plan is in force	NTPC/DPCC	Done
2.7.3	Monitoring of flyash pond at Badarpur, particularly during summer months to control fugitive dust	DPCC	Done
2.7.4	Plan for site restoration of over 600 ha fly ash pond of Badarpur	NTPC	Done. NTPC has submitted to DPCC on-site remediation before permanent closure
2.7.5	Time-bound action based on plan for restoration of fly ash pond land area	NTPC	Site remediation by mid-July 2018
2.7.6	Move to full utilization of the cleaner natural gas-based Bawana station for power supply to Delhi	Department of Power, Delhi with GAIL	Immediate
2.7.7	Progressively close the older and more polluting thermal power plants in NCR and to move to cleaner natural gas. Change the merit order dispatch policy of the Union government so as to incentivize cleaner	Ministry of Power and state governments	MoP and MoPNG to provide plan with timelines by February 28, 2018

	plants to operate in the region.		
<b>INDUSTRIES</b>			
<b>2.7.8</b>	Urgent ban on furnace oil, pet coke, which are dirty industrial fuels with high Sulphur and heavy metals:	MoEF&CC and state governments	Done. State governments of Delhi, Haryana, UP and Rajasthan to comply with SC order of October 24, 2017
<b>2.7.9</b>	Strict enforcement against illegal use of such fuels, including fuels which do not have specifications laid down or are included in the acceptable fuels as mandated by state pollution control boards	DPCC and state pollution control boards	Immediate. State government of Delhi, Rajasthan, UP and Haryana to issue notification under Section 19.1 and 19.3 of Air Act, 1980 by December 31, 2017
<b>2.7.10</b>	Strict enforcement of air pollution control measures in all industries, includes those located in unauthorized areas.	DPCC and all state pollution boards	Immediate
<b>2.7.11</b>	Stop unrestricted import of such fuels, which are high in pollution because of high Sulphur or toxins	Ministry of Commerce	Immediate
<b>2.7.12</b>	Ensure that the sale, transportation and distribution of such fuels follows CMVR strictly for hazardous goods and ensure that there is no sale in restricted regions	Oil marketing companies	Immediate
<b>2.7.13</b>	Ensure calibration and working of Continuous Emission Monitoring System (CEMS) in all industries in NCR and provide information to monitoring agencies to begin and work out how this information can be provided to public as this will ensure that the system is operational	CPCB, DPCC and all state boards	Immediate
<b>BRICK-KILNS</b>			
<b>2.7.1</b>	Convert all brick kilns to	MOEFCC	Done as per following

4	zigzag technology – from natural draft kilns to induced--draft kilns (zigzag technology).	and state pollution control boards	<p>schedule.</p> <p>Only brick kilns which have converted to zig-zag technology and have been certified by the state pollution control board will be allowed to operate during winter 2017-2018.</p> <p>By July 1, 2018, only brick kilns with zig-zag technology will be allowed to operate in NCR</p>
<b>INCINERATORS</b>			
2.7.1 5	Implement emission norms for incinerators and examine the feasibility of less polluting alternatives.	Department of Environment, CPCB, DPCC, SPCBs	Immediate
2.7.1 6	Implement CEMS for incinerators and provide data on emissions on an open platform progressively.		Immediate
2.7.17	Develop a siting policy for biomedical incinerators.		February 28, 2018
<b>WASTE-TO-ENERGY PLANTS</b>			
2.7.18	Strict implementation of emission norms, use state of the art technology and provide emission data to State Pollution Control Boards.	State Pollution Control Boards	Immediate
2.7.19	Develop a siting policy for waste to energy plants	MOEFCC, CPCB, State Pollution Control Boards	December 31, 2017

## 2.8 Generator sets

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.8.1	Ensure that only those DG sets that meet the standards are allowed to operate.	CPCB, DPCC, SPCBs and Department of Environment	Immediate
2.8.2	Operating time of DG sets should be regulated according to graded action plan.	CPCB, DPCC, SPCBs and Department of Environment	Done
2.8.3	Only approved fuel should be allowed.	CPCB, DPCC, SPCBs and Department of Environment	Immediate
2.8.4	Non-usage of DG sets in social events as per graded action plan.	CPCB, DPCC, SPCBs and Department of Environment	Done
2.8.5	Alternate power systems should be promoted in cell towers, and use of DG sets discouraged.		Immediate

## 2.9 Open burning (including solid waste and agricultural residues)

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.9.1	SC order dated 16.12.2015 has directed a complete ban on garbage burning in the entire NCR region. This is being monitored by Delhi and NCR state governments. Take stringent action against open burning of biomass / leaves / tyres etc to control such activities	Department of Environment, SPCBs DPCC, municipal bodies, DPGS	Immediate
2.9.2	Ensure proper collection of horticulture waste (biomass) and composting-cum-gardening approach; municipal zonal offices should be responsible for controlling burning of leaves and garbage on roads / parks. All horticulture agencies should have compost pits in parks.	Municipal bodies and other park owning bodies like DDA in Delhi	Immediate
2.9.3	<b>Implement citizen reporting app</b> -- reporting of garbage / municipal solid waste burning through mobile-based applications and other social media platforms linked with Central and state-level control rooms for accountability. Build an awareness campaign through RWAs, Eco Clubs and municipal authorities.		Immediate
<b>REGIONAL PROBLEM AND BIOMASS BURNING</b>			

<b>2.9.4</b>	Ensure strict enforcement of ban on burning of agriculture waste and crop residues in Punjab and Haryana.	State governments in NCR and Punjab	Ongoing
<b>2.9.5</b>	To increase subsidy for purchase of equipment that eliminates the need for burning stubble and straw.	State governments in NCR and Punjab	Ongoing
<b>2.9.6</b>	Enforce the series of directives from the Hon'ble Supreme Court and NGT on ban on agricultural burning and recycling and reuse of this waste.	State governments in NCR and Punjab	Ongoing
<b>EPISODIC EVENTS</b>			
<b>2.9.7</b>	<b>Fire crackers --</b> Implement and monitor the SC order of September 12, 2017	<b>Department of Environment, SPCBs DPCC, DCP</b>	Immediate

## 2.10 Domestic chulha burning and open eateries

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.10.1	In slums and low-income neighbourhoods, as well as roadside eateries/dhabas/ restaurants etc promote and give access to LPG and electricity. Link commercial license to clean fuels.	Department of Environment, MoPNG	Immediate
2.10.2	Prohibit use of coal in hotels and restaurants, eliminate use of kerosene for cooking in NCR and incentivize move to LPG.	MoPNG and state governments	Immediate
2.10.3	A targeted programme can be developed with the Union Ministry of Petroleum and Natural Gas for wider distribution of LPG.	MoPNG and state governments	Immediate

## 2.11 Control measures for road dust

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.11.1	<p>SC direction dated December 16, 2016 has directed repair and building of pavements and vacuum cleaning of roads. This needs to be expedited and implemented across NCR. <b>Based on this, the following may be carried out:</b></p> <ul style="list-style-type: none"> <li>•Implement street design guidelines for footpaths and cycle tracks with adequate vegetative buffers and paving of roads. Take steps for blacktopping / pavement of road shoulders to avoid road dust.</li> <li>•Phase-in mechanical / vacuum-based street sweeping wherever feasible; introduce wet / mechanized vacuum sweeping of roads.</li> <li>•Implement truck loading guidelines; use of appropriate enclosures for haul trucks; gravel paving for all haul routes.</li> <li>•Sprinkling of recycled water (without compromising other uses); introduce water fountains at major traffic intersections, wherever feasible.</li> <li>•Maintain pot hole-free</li> </ul>	<p>Department of Environment, municipal bodies, DDA, PWD, CPWD, DSIIDC, DTTDC Road-owning agencies, Police Dept. Forest Dept.</p>	<p>Immediate and intensify during implementation of GRAP</p>

	<p>roads for free flow of traffic to reduce emissions and dust.</p> <ul style="list-style-type: none"> <li>•Increase green cover in Delhi. Undertake greening of open areas, gardens, community places, schools and housing societies.</li> </ul>		
<b>2.11.2</b>	<ul style="list-style-type: none"> <li>•Enforcement of air pollution control in concrete batching (use of water spray and wind breakers, bag filter at silos and enclosures, hoods, curtains etc)</li> </ul>		<b>Immediate</b>

## 2.12 Control measures for construction dust

S. No.	Action points	Agency responsible	Revised timeline for implementation
2.12.1	<p>SC order dated 16.12.2015 directed the Delhi govt to ensure measures are taken to mitigate dust pollution from construction. The EPCA has given a concise check list for inspection of construction sites. This should be implemented. Undertake control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and dust suppression units. Penalties have also been enhanced. Needs enforcement.</p>	<p>Municipal bodies, PWD, CPWD, DSIIDC, DTTDC, road owning agencies</p>	<p>Immediate</p>
2.12.2	<p>For material handling and construction demolition, it should be obligatory on part of the developers to provide evidence of debris disposal at designated sites. Promote recycling of construction material. Implement provision of Central regulations for construction and demolition waste</p>	<p>Municipal bodies, PWD, CPWD, DSIIDC, DTTDC, road owning agencies</p>	<p>Immediate</p>