

Comprehensive Clean-Air Action Plan (CAP)

Against the backdrop of the challenges outlined in each sector, this pollution source-wise comprehensive action plan has been developed for Barackpore. Keeping in view the air pollution reduction targets in the city detailed strategies have been identified to indicate the nature, scale, scope and depth of action needed for effective reduction to make an impact overtime. In view of this instead of listing only broad action points, detailed indicators and action points have been included for all sectors to guide implementation.

This plan has integrated and built on the on-going action and action plans of the state government in each sector that are already underway. Action plan has also been improved further based on emerging good practices. In several sectors good practices have emerged that need to be leveraged and aligned to meet the clean air objective. This creates a good template for upscaling and replication in other cities. This action plan has integrated all ongoing efforts to chart the roadmap. To maximize air quality gains take regional approach and integrate the solutions.

Special care has been taken to ensure that sufficient indicators are included in the plan itself to indicate the nature and scope of the strategies outlined for each sector that are needed for implementation to make an effective impact. For instance, often it is not clear how different aspects of transportation and urban planning are linked with air pollution control. It is important to ensure that clean air action plan ensures convergence of planning for road building, public transport infrastructure and non-motorized transport planning to guarantee that people-oriented design are integrated all across to prevent lock in of pollution in the infrastructure itself. Similarly, action in renewable energy sector, urban forestry and a plethora of clean energy and industrial emissions management strategies have been integrated.

Alignment of inter-sectoral action will be critical to leverage the available resources of funding for maximum impact. In all sectors—transport, industry, power plants, construction industry, municipal solid waste management, air quality monitoring, road building and traffic management—budgetary resources have been earmarked for investment, or, investments from other private or bilateral sources are coming in. If these investments are better informed and aligned with this clean air action planning process and objective, significant change at a scale is possible.

This plan also opens up the opportunity for developing fiscal strategies based on polluter pay principle to generate additional resources for funding of the plan. For instance, in other cities such as Delhi, fiscal measures such as environment compensation charge on trucks, big diesel cars and diesel fuel have helped to create dedicated funds that are now available for pollution control efforts. Such measures can be adopted to top up the resource needs in addition to the state and central government funding. In areas where the action depends on private sector participation and investments the detailed guidelines under this plan can guide such investment. This plan has identified the agencies responsible for implementation of each action point and has also indicated the timeline for implementation. This can be monitored for reporting and compliance.

Graded Response Action Plan (GRAP)

Based on the National Air Quality Index Graded Response Action Plan has been framed for daily response to air quality changes. This has predefined the set of measures to be taken for different air quality categories—satisfactory, moderate, poor, very poor, severe and emergency. Once notified these measures will come into force automatically. Available data shows that in most non-compliant cities, barring hotspot areas in industrial cities, the daily

levels vary between moderate to poor; sometime touching the very poor level. The GRAP measures will be implemented accordingly. GRAP also includes the advisory for people to take precaution for self-protection.

For proper implementation and oversight the high-powered committee will coordinate with the city level authorities in each six non-compliant city for direction, compliance monitoring and reporting. Each concerned department in a city will appoint a high level officer as a nodal official for coordination, implementation and periodic reporting.

COMPREHENSIVE CLEAN-AIR ACTION PLAN (CAP)

Source-wise clean air action plan and compliance strategy for Barrackpore to meet clean air standards. The following table indicates the short, medium and long term action along with agencies responsible.

(1) AIR QUALITY MONITORING AND ASSESSMENT

Sr. no.	Action points	Agency responsible	Timeline	Financial outlay
Short-term priority action				
1.1	Refer to IS:5182 (Part 14), 2000 on Recommended minimum number of stations, population-wise (Also mentioned in Guidelines for Ambient Air Quality Monitoring, CPCB, 2003); the population according to Census 2011 of Barrackpore is 1, 00,055 and the city has two manual monitoring stations. Based on the criteria, city requires one additional CAAQM station and one manual station. Among all twelve pollutants to be monitored, special focus is needed on PM2.5 and ozone monitoring. Use of air quality sensors at probable hotspots to complement air-quality monitoring (based on CPCB/ MoEF&CC guidelines) may be explored. The grid plan should be representative of population distribution and land use including residential, commercial, industrial, roadside and sensitive areas. This may include hot spots such as near traffic areas such as Chidiya Mor and landfill sites such as Muktapukur.	Nodal agency: West Bengal State Pollution Control Board (WBPCB), Supported by Central Pollution Control Board (CPCB)	6 months	1.8 crore
1.2	Use air quality information provided by satellite-based monitoring to complement ground-based air quality monitoring and also unmonitored areas. This is useful to identify agricultural burning/ forest fires, regional pollution etc that have impact on urban air quality. West Bengal has begun satellite based assessment. The program must be extended for Barrackpore	WBPCB, CPCB, IMD,	6 months	To be finalized
Medium-term action				
1.3	Develop capacity for pollution forecasting for implementation of graded response action plan. This will also require monitoring of weather data and support from IMD and IITM, Pune under MoES. For e.g., introduction of SAFAR to Barrackpore	MoES, Department of Environment WBPCB supported by CPCB, IMD	1 year	To be finalized
1.4	Set up daily air quality public information dissemination system based on National Air Quality Index and health advisory. Further develop online reporting of daily and annual data for all pollutants and pollution forecasting on SPCB website. Set up system for dissemination of information to public through website and local media.	WBPCB, CPCB, IMD,	1 year	Regular activity
1.5	Commission a source apportionment and pollution inventory study for the city, to capture source-wise contribution and seasonal variations in source contribution. Assessment of carrying capacity to be carried out as well. Additionally, the study must assess regional impacts by setting up a mechanism to assess trans-boundary emissions.	WBPCB	6 months	3 crore
1.6	Set up rural and peri-urban air quality monitoring to assess the airshed/ influence area. The National Clean Air Programme (NCAP) from the Union Ministry of Environment and Forest and Climate Change has recommended rural air quality monitoring.	WBPCB & CPCB	6 months	1.6 crore
1.7	Assess application of low-cost sensor-based monitors in areas that are not being monitored to create baseline local data to inform local area action	WBPCB & CPCB	6 months	To be finalized
1.8	Research studies including emission inventories and source apportionment, health impact studies, exposure impacts, carrying capacity assessment of air shed and regional impacts, hot spot assessments and other relevant studies may be undertaken to further refine and inform the action plan: Government 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.	WBPCB, DoE West Bengal State Council for Science and Technology,	2 years	1.5 crore

Sr. no.	Action points	Agency responsible	Timeline	Financial outlay
1.9	Database management for implementation of action plan: Data collection, sharing and analysis protocol must be set up for effective implementation of clean air action plan. Prepare detailed data protocol for systematic recording of emissions data from industries and other sources.	WBPCB, DoE in coordination with all relevant departments	1-2 years	Regular activity

(2) INDUSTRIES

Sr. no.	Action points	Agency responsible	Timeline
2.1	Implementation of SO _x and NO _x standards notified by MOEF&CC on January 29, 2018 for 35 categories of industries in and around the city. Ensure compliance through regular testing & CEMS enabled monitoring.	WBPCB	6 months
2.2	Implement existing standards for PM and ensure compliance through regular testing & CEMS enabled monitoring. (See action 2.4). Also take precautions for minimizing fugitive emissions through the preparation of a checklist for industrial zones and units, for each specific type of industry. Carry out regular inspection	WBPCB, Department of Commerce, Industries and Enterprise	3 months
2.3	Prepare a clean fuel policy and provide incentives for clean fuels for the state: Notify approved fuels. Promote relatively cleaner fuels like gas (Coal Bed Methane from Dankuni Coal Complex, natural gas) and electricity. Discourage fuels with very high sulphur and heavy metals like furnace oil, pet coke, tyre oil etc. (except where its used as feedstock like cement). Need for a favourable taxation and pricing policy to make cleaner fuels more competitive	WBPCB, Department of Commerce, Industries and Enterprise	6 months
2.4	Identify the units that need to install CEMS. Implement Continuous Emission Monitoring System (CEMS) across all targeted and applicable polluting industry. Ensure calibration and working of CEMS in all industries in the urban airshed or area of influence and provide information to monitoring agencies to take appropriate action. Specify the mechanism for quality control and quality assurance of CEMS data and ensure that data is available online as per a specific format and the reported data is compared with applicable prescribed limits and not the older standards. Compliance checking to be enforced routinely to prevent tampering with the CEMS. This needs to be done for industrial sectors including sponge iron and cement units, iron and steel industries and jute and rice mills	WBPCB, Department of Commerce, Industries and Enterprise, MSME	6 months
2.5	Identification of cumulative impact of industrial emissions and prescribe more stringent pollution control action for targeted industries. (To identify industries for time bound action to strengthen emissions control systems)	WBPCB, Department of Commerce, Industries and Enterprise MSME	6 months
2.6	Identification and implementation of fugitive emission control measures in ancillary units, material transfer and handling and emissions during industrial processes. Informal industrial units will require stringent monitoring.	WBPCB, Department of Commerce, Industries and Enterprise MSME	6 months
2.7	Enforce restrictions on operations of intensively polluting industries within urban airshed zones during high pollution periods.	WBPCB, Department of Commerce, Industries and Enterprise MSME	6 months
2.8	Strengthen the current siting policy for industries to be notified in future, in order to address Barrackpore-wide air quality issues	WBPCB, Department of Commerce, Industries and Enterprise	1 year
2.9	Prepare and implement local area action plan for pollution hotspots and strict enforcement of air pollution control measures in all industries, including those located in unauthorized areas. Build schedule for inspection of areas of concern and reporting.	WBPCB, Department of Commerce, Industries and Enterprise MSME	1 year
2.10	Training and Awareness Program for onsite emergency preparedness and environmental issues	WBPCB, Department Of Industries,	1 year

Sr. no.	Action points	Agency responsible	Timeline
		Commerce and Enterprises	
2.11	Construction of paved roads around all major industrial belts and estates. Installation of dust suppression system. Provision for water sprinkling and dust mitigation	WBPCB, Department Of Industries, Commerce and Enterprises, ADDA	1 year
2.12	Development of Adequate greenbelt around all major industrial estates by planting 1000 saplings	WBPCB, Department Of Industries, Commerce and Enterprises, ADDA	1 year

(3) BRICK KILNS, HOT MIX PLANTS & STONE CRUSHERS

Sr. no.	Action points	Agency responsible	Timeline
Short-term priority action			
3.1	There are brick kilns in close vicinity of the city. Enforce restrictions on operations of brick kilns within urban airshed zones during high pollution periods; allow only those Brick kilns that comply with rectangular zig-zag design with induced draft or those with improved technology. Initiate phasing out of traditional brick kilns.	L&LR Department WBPCB, Department of Commerce, Industries and Enterprise MSME	6 months
3.2	Relocate centralised Hot Mix Plants to areas outside Barrackpore boundaries, and ensure compliance with PM, NOx and SOx emission standards. Shut down small and mobile Hot Mix Plants	BARRACKPORE MUNICIPALITY, WB PWD, NHAI and other road operating agencies	Immediately
Medium-term action			
3.3	Convert all brick kilns to rectangular design zigzag technology—from FCBT natural draft kilns to induced draft kilns with rectangular zigzag design.	L&LR Department WBPCB, Department of Commerce, Industries and Enterprise, MSME	1 year
3.4	Prescribe design specifications for improved kilns and ensure compliance checking. Ensure conversion has actually taken place. Ensure provision of infrastructure in terms of viewing platform and chimney emission testing point for compliance.	CPCB, MoEF & CC WBPCB, Department of Commerce, Industries and Enterprise, MSME	1-2 years
3.5	Remove stone crushers that are close to the city; adopt stringent dust control measures and greening	District Administration, Commerce, Industries and Enterprise, MSME	1 year
3.6	Establish a protocol for using cleaner fuels & technology for asphalt mixing and minimizing the number of hot-mix plants	MoRTH, MoEF & CC Municipal corporation, WB PWD, NHAI and other road operating agencies	2 year

(4) POWER PLANTS

S No	Action points	Agency responsible		
	Titagarh Thermal power Station – 240 MW Retire all 4 units of 60 MW. The 37 year old	WBPCB, WBERC, WBSLDC, DISCOM	2020	Power Station under reserve shut down.

	station is run by CESC Limited. The power station committed to retiring its units in the Regional Phase-in plan meeting conducted by Central Electricity Authority in 2017-18.	CESC WBSLDC, CESC WBPCB, WBERC, DISCOM CESC		The management has decided to close these units.
	Step 1: Prepare phase-in plan in consultation with WBSLDC and DISCOM		By Feb 2020	
	Step 2: Collect phase-in plan with milestones		By June 2020	
	Step 3: Approval from Regulatory Agency		By June 2020	
	Step 4: Dismantling and Closure		By December 2020	
2	Bandel Thermal Power Station – 450 MW It has four units of 60 MW which are 55 years old and one 210 MW unit which is 38 year old.	WBPCB, WBERC, WBSLDC,DISCOM, WBPDCL WBSLDC,WBPDCL WBPCB WBERC, DISCOM WBPDCL	2020 By Feb 2020 By March 2020 By July 2020	Two old units were operating: Unit 1 was operating at 28 per cent and Unit 2 at 40 per cent plant load factor. Unit 3 and 4 were under reserve shut down. Unit 5 was operating at 51 per cent plant load factor.
	Step 1: Prepare phase-in plan in consultation with WBSLDC and DISCOM		2020	
	Step 2: Collect phase-in plan with milestones		By Feb 2020	
	Step 3: Approval from Regulatory Agency		By March 2020	
	Step 4: Dismantling and Closure		By July 2020	
3.	Southern Replacement Thermal Power Station – 136 MW Retire all 2 units of 68 MW. The 30 year old station is run by CESC Limited. The power station committed to retiring its units in the Regional Phase-in plan meeting conducted by Central Electricity Authority in 2017-18. However the company is exploring possibility to meet the new emission norms.	WBPCB	Unit 1: 2021 Unit 2: 2022	Power Station under reserve shut down. The management has decided to close these units. However feasibility study under way to meet the new norms.
	Step 1: Collect major milestone plan/Gantt chart for FGD installation, PM and NOx control and measures to meet water norms		By Feb 2020	
	Step 2: Prepare action plan for monitoring at relevant intervals, issue notice to collect a suitable bank guarantee amount – 1 per cent of the project cost		By June 2020	
	Step 3: Collect Bank guarantee, Engineering documents and Feasibility study – for FGD, NOx control and measures to meet water norms		By October 2020	
	Step 4: Ensure tenders are awarded		By January 2021	
	Step 5: Ensure civil works completed		By June 2021	
	Step 6: Ensure P&G test initiated for Unit 1		By December 2021	
	Step 7: Ensure P&G test initiated for Unit 2		By June 2022	
	Fugitive emissions			
1	Coal Handling: Issue modified consent condition and direct storage of coal in enclosed space. Collect Bank guarantee and timeline from power station to implement measures to enclose coal handling area	WBPCB	By March 2020 By June 20, 2020	
2	Fly ash management Form a committee and set terms of reference (ToRs) for inspection and improve fly ash management and utilisation in the thermal power stations. Allow only bulk container transport of fly ash – issue notice. Inspect fly ash pond and roads leading to the pond, audit the need for any improvement in the fly ash pond structure. Collect plans from power station to improve fly ash utilisation Collect Bank guarantee and timeline from power station to implement measures Form a committee and set terms of reference (ToRs) for inspection and improve fly ash management and utilisation in the thermal power stations. Allow only bulk container transport of fly ash – issue notice. Inspect fly ash pond and roads leading to the pond, audit the need for any improvement in the fly ash pond structure. Collect plans from		By March 2020 By June 2020 By March 2020 By June 2020 By October 2020	

power station to improve fly ash utilisation Collect Bank guarantee and timeline from power station to implement measures			
Fuel quality improvement			
Advice use of low sulphur coal (coal with sulphur content less than 0.2 per cent), co-firing of coal with biomass. On availability of natural gas switch-over coal-based power stations to natural gas-based power stations.			

(5) ACTION TO REDUCE VEHICULAR EMISSIONS

Sr. no.	Action points	Agency responsible	Timeline
Medium-term action			
4.1			
	Ensure on-schedule implementation of BS VI fuel and emission standards on April 1, 2020. Ensure that only BS VI compliant vehicles are registered from this date. Supreme Court order of October 24, 2018 has directed that no vehicle that is not BSVI compliant can be registered from April 1, 2020. The city is Fully prepared to comply the order of Hon'ble Apex Court.	Transport department	0 years
4.2			
Medium-term action			
4.2.1	Expand gaseous fuel programme: Enforce that all auto rickshaws and local taxis and buses to run on CNG/LPG (as case may be). Replace diesel three wheeler & taxi fleets with fleet on alternative fuels. Expand CNG/LPG refuelling infrastructure for delivery and use. GAIL is expected to expand natural gas grid to West Bengal. Prepare roadmap be linked to that. Around 5573 LPG driven Auto rickshaws operate at Barrackpore city. Depending on the availability of CNG, attempts will be taken to convert diesel operated taxi fleets either by replacement or by retro fitment.	Transport department, Department of Energy, MoPNG	2-3 years
4.2.2	<p>Expedite transition to electric mobility:</p> <ul style="list-style-type: none"> Target electrification of new vehicles fleet in specific segments using a mixture of mandates and subsidies as part of the state level EV policy. E.g. Make West Bengal a hub for electric mobility. Seek to drive rapid adoption of Battery Electric Vehicles (BEVs) in a manner where they contribute to 25% of all new vehicle registrations by 2023. Build on the policies of the central government - NEMMP & FAME Provision of additional state subsidy for procurement of commercial electric vehicles 100% Exemption of duty/tax on electricity tariff for an initial period of 5 years for EV manufacturers (vehicle and battery) Encourage retrofitting of auto-rickshaws / intermediate para transit vehicles (IPT) to EV Target provision of public and private EV charging stations as part of the state level EV policy. Eg. Design Special tariff at commercially viable rates for charging stations to encourage and enable government agencies and private players to set up charging stations at standardized rates Incentives by way of capital subsidy for the first lot of 100 fast charging stations to facilitate ease of adoption Integrating EV charging space in public areas, shared spaces, commercial buildings, institutions etc. Plan infrastructure and institutional framework for used battery processing, re-use, recycling and disposal. Include mandate based incentives in the form of lower road taxes, motor vehicle taxes and registration charges, preferential licensing and permit system, modification of building by-laws, creation of low emissions zones, special parking provision etc. Eg. Designated parking spaces for commercial electric vehicles with exempted parking fees for EVs Introduce provision for parking minimum in bylaws for new development to encourage EV adoption amongst user; in accordance with relevant government EV policy Provision of dedicated on-street parking spaces for commercial and personal electric vehicles; Exemption of parking fees for EV parked in those dedicated spaces Identify and notify commercial areas with high footfalls and good public transport and goods transport connectivity to pedestrianize supported by zero emission battery-operated vehicles: Priority may be accorded to battery-operated para-transit as feeders and for last mile connectivity. Ensure organized deployment to reduce congestion. Legalize domestic charging of e-rickshaws: to control power theft due to illegal 	Transport department, Department of Power &NES, DHI, NITI Aayog	1 year

Sr. no.	Action points	Agency responsible	Timeline
	charging and eradicate informal proliferation of units <ul style="list-style-type: none"> To facilitate rapid adoption of Battery Electric Vehicles in commercial segments, it is being contemplated to do away with Permit system and also exempting 100% of motor vehicles tax for initial 5 years. 		
4.2.3	Explore the feasibility of generating biogas from waste and sewage to run buses in cities	Transport Department, Department of Power & NES, oil marketing companies	1 year
4.2.4	Need favorable fiscal measures to promote clean fuels and vehicles and zero emissions vehicles. Tax relaxation in respect of Methanol/Ethanol fuelled motor vehicles is being contemplated.	Department of Transport, Power&NES and Finance	1 year
4.2.5	Introduce favourable fiscal measures to promote clean fuels and vehicles and zero emissions vehicle such as reduction in road tax Tax relaxation in respect of Methanol/Ethanol fuelled motor vehicles is being contemplated.	Department of	1 year
4.3			
4.3.1	Plan and implement adequate number of PUC centre for emissions testing of on-road vehicles. Strengthen periodic auditing and over- sight of PUC centres and calibration of equipment and third-party checks. There are 12 PUC centres which are operational and all are web linked to the Vahan Server. Periodic audit and calibration of machines are also done by officials. The machines have an updated AMC.	MoRTH, Transport Department	6 months to 1 year
4.3.2	Link PUC certificates with mandatory third-party insurance like in Delhi for vehicles to ensure 100 per cent compliance as per the Directives of the Hon'ble Supreme Court and the MoRTH notification. Ensure real-time updates for all WB registered vehicles with the VAHAN database for compliance. Develop a mechanism for ensuring that no vehicle is allowed to ply without valid PUC certificate. Any kind of transaction wrt to motor vehicles done in E-Vahan is only allowed if the third party insurance is complied with.	Transport Department, MoRTH	Immedia-tely
4.3.3	Improve and enforce PUC programme: Ensure universal linking of PUC centres with remote server and eliminate manual intervention in PUC testing. Implement testing of all notified emissions parameters including Lambda testing for petrol cars as notified by MORTH in 2004. This has been in effect since April 2019	Transport Department	0 year
4.3.4	Upgrade in-use emissions testing for petrol and diesel vehicles by using additional methods of screening such as remote sensing. Expand existing pilot on use of remote sensing for monitoring of emissions from in-use vehicles in Kolkata to upgrade inspection of on-road vehicles. Tender process has been initiated for purchase of 2 more RSD devices.	MoRTH, ARAI, Transport Department	1 year
4.3.5	Advancement of the system: Integrate on-board diagnostic (OBD) system fitted in new vehicles with vehicle inspection. As per the MORTH advisory PUC centres have to check malfunctioning indicator light on dash boards of vehicles. If the light is found on vehicles to be sent back for testing in authorized workshops; Additionally, PUC centres need to check if the OBD is functioning properly. Also keeping in view that BSVI vehicles will roll from April 2020, thereis need for system upgradation for more effective screening of on-road vehicles. It is recommended that remote sensing measurements of on-road emissions be introduced. Carry out training programs and auditing of PUC centres to check for preparedness for BSVI norms.	Transport Department	6 months to 1 year
4.3.6	Enforcement of law against visibly polluting vehicles: remove them from road, impose penalty, and launch extensive awareness drive against polluting vehicles.	Transport Department, Traffic Police	Ongoing
4.3.7	Set up modern centralized vehicle inspection centres for upgraded emissions, fitness and road worthiness tests for commercial vehicles and diesel vehicles. Such centres may be set up at a regional scale so that Barrackpore along with several municipalities and urban agglomeration in the region may leverage it. One pilot is under advanced stages of development at Behala, Kolkata. It is contemplated to develop another such automated vehicle testing centre at Nilgunge, Barrackpore	Transport Department, MoRTH	1 year
4.4	Scrappage Policy: Phase out old vehicles with the help of age cap and age-linked road tax policy. Set up scrapping infrastructure for scientific dismantling and disposal of old vehicles. Set up recycling units that are authorized with proper guidelines.17872 numbers of vehicles older than 15 years of age, have been removed from operations. At present 15 seized vehicles are awaiting scrapping on completion of statutory process.	Transport Department, MoRTH, CPCB	1 year

Sr. no.	Action points	Agency responsible	Timeline
4.6	Freight Transportation		
4.6.1	Use of off-peak passenger travel times to move freight and restrict the entry of heavy vehicles into cities during the day to continue. Adopt freight master plan to organize freight movement and logistics.	District and local administration, Municipal Corporation, Transport Department, Traffic Police	Within 6 months
4.6.2	Provide truck rest areas/parks along national and state highways to prevent entry of trucks into cities during peak hours. Use of off-peak passenger travel times to move freight and restrict the entry of heavy vehicles into cities during the day to continue	PWD, NHAI	Within 6 months
4.6.3	Introduce age and emission standards-based restrictions on the operations of commercial vehicles within the city. Install procedures and monitoring equipment to ensure better quality and more efficient vehicles operate on the roads.	NHAI, District and local administration	Within 6 months
4.6.4	Check overloading: Use weigh-in-motion bridges / machines (WIM) and Weigh bridges at entry points to the city to check the payload of commercial vehicles. As per the CMVR, a penalty of 10 times the applicable rate for overloaded vehicles is applicable. Two weigh in motion bridges have been made operational for the city of Kolkata and suburbs including Barrackpore.	District and local administration, Transport department, Traffic Police	Within 6 months
4.6.5	Create management systems for loading and unloading of goods in city areas.	District and local administration, Transport department	6 months
4.6.6	Develop a Safe-to-Load programme to ensure fitness and road worthiness of trucks and compliance to set standards would be adopted and enforced. Important for industrial cities. Central Motor Vehicle rules have specified Safe Axle Weight and Gross vehicle weight for different make and model of goods vehicles. Carriage of loads in excess of permissible ceiling comes under punishable offense.	Transport Department,	6 months
4.6.7	Rationalise share of high capacity trucks for long-distance freight transport of material instead of smaller trucks	NHAI, District and local administration	Within 6 months
4.6.8	Diversion of truck traffic: Check feasibility of diversion of non-destined trucks into the city. Alternate routes need to be identified and improved to ensure that non-destined commercial traffic does not enter the city. Pave all roads to control fugitive dust emissions	District and local administration, Transport department Traffic Police	Within 6 months
4.6.9	Radio frequency identification tag (RFID) based toll or entry tax collection: install RFID based toll collection system also link it with VAHAN database. This will enable lesser congestion on toll gates, also by using this technology vehicle identification by vintage, emission norm compliance etc. will be easier. KMDA can adopt such measures to make toll collection cashless and regulate entry based on age. This also allows scope of introducing environment pollution charge at the entry point. NHAI has implemented toll plazas in national highways.	District and local administration, Transport department, Traffic Police	1 year
4.6.10	Develop urban freight consolidation centres in relation to location of warehouses relative to suburban areas. Freight management should include freight logistics and freight master plan. This must align terminals, cold storage and freight corridors.	District and local administration, Transport department	1 year
4.6.11	Prepare a freight master plan: Prepare a detailed logistic plan which includes detailed assessment of freight connectivity, requirement of dedicated freight corridor and, allied freight infrastructure such as logistic park/ truck terminals, cold storage facilities, warehouses etc.	Transport Department, Railways	1-3 year

Sr. no.	Action points	Agency responsible	Timeline
4.7			
	Prepare an action plan to check fuel adulteration and random monitoring of fuel quality data. To ensure that periodic routine and surprise fuel testing is done for all transport and non-transport fuels. For this an action plan need to be prepared in consultation with oil companies and ministry of petroleum and natural gas.	WBPCB, MoPNG, Oil marketing companies	6 months
4.8	EMISSION CONTROL AT REFUELING STATIONS:		
	Install vapor recovery systems in fuel refuelling outlets to reduce benzene and VOC emissions in cities. CPCB has issued direction for installation of stage I and Stage II vapour recovery system in all retail outlets with capacity 3000 kilolitre and more in 46 million plus cities by December 2017. Retail outlets across the city should comply with this.	Transport department, State Oil Coordinator	1 year

(5) URBAN MOBILITY

Sr. no.	Action points	Agency responsible	Timeline
5.1	PUBLIC TRANSPORT SYSTEM		
Short-term action			
5.1.1	Improve the visibility of existing public transport system by installing Bus Post sign and Bus Queue Shelters in the city.	WBTC, Barrackpore Municipality	6 months
Medium-to long-term action			
5.1.2	Strengthen the city bus for connectivity to Barrackpore. Augmenting city bus services(frequency, routes, buses) through demand assessment and rationalisation	West Bengal Transport Corporation	18 months
5.1.3	Facilitating Multi-modal integration at major transit locations to ensure smoother transition between modes. At present Auto/E-rickshaws operate to provide last mile connectivity from nearest bus nodes, rail heads etc. However, there is a need to identify a few transit modes in the city and organise the existing informal services by infrastructure integration (i.e. provision of spaces/bays/exact location) for better movement	Barrackpore Municipality, WBTC, NBSTC, Eastern Railway, Kolkata Metro Rail Corporation Ltd., RTO(PVD), Traffic Police	18 months
5.1.4	To strengthen and prioritise movement of public transport over other modes, Bus priority measures should be taken on major intersections. Intersections should be identified and the ones on major arterials should be prioritised earlier. Moreover major arterials roads with adequate available width should have bus priority lanes too	Transport Department, WBTC, NBSTC, Traffic Police, Barrackpore Municipality	1 year
5.2	INTERMEDIATE PARA TRANSIT (IPT)		
Short-term action			
5.2.1	IPT in the region operates on route permit and fixed fares. There are earmarked parking arrangements at interchange points/major junctions. Additionally, there should be terminal points and pick up/drop off nodes identified for IPT services in around existing major public transport services (Bus/rail) such that it becomes an organised service and compliments major modes. IPT services is lower in the pyramid of mobility options and hence larger in volume and thus is the requirement of several smaller nodes in operation.	Transport Department, Traffic Police, Barrackpore Municipality, RTO (PVD)	6 months
5.2.2	Facilitate IPT driver training, standard licensing procedures and safety measures in operation At present, Driving license for e- rickshaw is allowed only after 10 days training.	RTO (PVD), Transport Department, Traffic Police	6 months
5.2.3	Enforce IPT service providers to abide by latest fuel economy standards (i.e. Bharat Stage IV and upcoming Stage VI). Auto registration is allowed on compliance of latest emission standards.	RTO (PVD), Transport Department, Traffic Police	

Sr. no.	Action points	Agency responsible	Timeline
	There should be training on importance of using unadulterated fuel, its effects and impacts on society as a part of registration and annual fitness checks.		
5.2.4	E-rickshaw plying in the city should also follow standard process of registering, followed by driving training and safety in operation 6000 auto are plying in this region.	RTO, Traffic Police	6 months
Medium term action			
5.2.5	Prepare a policy framework for future IPT development, with specific consideration on regulating numbers of IPT modes, restricting vehicles more than 15 years old from plying and laying down detailed steps for diesel to electric conversion.	KMDA, RTO(PVD)	1-3 years
5.3	ADOPTATION OF ELECTRIC MOBILITY		
Short term action			
5.3.1	Prepare an incentive based (financial) electric rickshaw scheme for the quicker adaptation of electric mobility in the city. - Incentive on de-registering ICE based IPT (Auto) and adopting E-rickshaw	KMDA, Transport Department, RTO(PVD)	6-12 months
5.3.2	Promote E-Rickshaws and electric auto-rickshaws as feeder services to the bus services to facilitate first and last mile connectivity by - Provision of parking/ terminal points etc. - Faster registration process at RTO - Conversion of existing ICE based IPT (Auto) to E-rickshaw	Transport Department, WBTC, Barrackpore Municipality, RTO(PVD)	6 months
5.3.3	Prepare regulatory mechanism for provision of dedicated parking space for electric rickshaws/vehicles.	KMDA, Transport Department, Barrackpore Municipality,	1 year
5.3.4	Take initiative to develop electric ecosystem such as charging infrastructure, better tariff regime etc.	KMDA/ Electricity department	1 year
5.4	ROAD DESIGN		
5.4.1	Non-motorized transport and safe access		
5.4.1.1	Prepare and implement plans for developing an NMT network. This should include following action: <ul style="list-style-type: none"> • Pedestrian infrastructure shall be designed based on the Indian Road Congress (IRC): 103-2012 • Target specific lengths of footpaths to be completed in a phased manner and cover the entire city. • Upgrade pedestrian crossing at least every 250 m, with pedestrian signals and signages. These should preferably be at grade. • Identify network to develop cycle tracks • Make safety audit of walking infrastructure mandatory. • Provide roadside public docking space for bicycles. • Make encroachment of NMT lanes punishable offence under the current provision of law. • Dedicated municipal budget shall be made for making streets safe. Reference: Indian Road Congress (IRC): 103-2012	KMDA, Barrackpore Municipality, PWD	1-3 years
5.5	MULTI-UTILITY ZONES (MUZ)		
5.5.1	Taking cognizance of the proposed land use map for Barrackpore Municipality, MUZ is recommended on existing as well as proposed major and minor arterial roads. It will help in organizing centralized development of activities along the G.T. road. All the stationary elements on the street shall be organized in a dedicated space which results in obstruction free streets. This should include the following elements. <ul style="list-style-type: none"> • It shall have dedicated space provision for bus stops, tree plantation, street furniture, auto Rickshaw stands, parking, hawkers, public toilets, information kiosks, underground and overhead utility services like electricity, water, telephone, gas etc. • Space provision for all the street elements shall have to be done by activity mapping, surveys and stake holder consultations. • A minimum width of 1.8 m shall be maintained for MUZ. Reference: Urban Street Design Guidelines Unified Traffic and	KMDA, Barrackpore Municipality, PWD	1-3 years

Sr. no.	Action points	Agency responsible	Timeline
	Transportation Infrastructure (Planning & Engineering) Centre prepared by Delhi Development Authority.		
5.6	COMPACT CITY DEVELOPMENT SHALL BE ADOPTED TO REDUCE DISTANCES AND IMPROVE ACCESS		
Medium- to long-term action			
5.6.1	Compact urban form to create higher density along major corridors to shorten travel distances, discourage usage of personal vehicles and hence reduce carbon footprints	KMDA, Barrackpore Municipality	12 months
5.6.2	In new development areas (low density or urban sprawl), facilitate adequate transport connectivity to enhance accessibility to major centres (jobs, education, commercial etc). Enhancing accessibility in compact development will reduce distance and in turn discourage adoption of cars and encourage usage of sustainable modes (Bus, Cycle, NMT, walk) to transit nodes	KMDA, Barrackpore Municipality	12 months
5.6.3	Ensure mixed landuse development along mobility corridors	KMDA, Barrackpore Municipality	12 months
5.6.4	Introduce Parking maximum to discourage usage of cars	KMDA, Barrackpore Municipality	
5.6.5	Ensure high-density street network and interconnected green spaces to encourage walkability in new development areas	KMDA, Barrackpore Municipality	
5.7	MAINTENANCE AND MANAGEMENT OF PARKING PLACES RULES		
	Implement Parking Area Management Plan (PAMP) as a demand management tool. PAMP will demarcate legal parking area(on-street and off-street), cap parking and also prevent illegal parking. PAMPs to be prepared in consultation with local stakeholders, planning bodies/departments. PAMP should include the following parameters among others:		
5.7.1	Demarcate the emergency vehicle route on all public roads within the neighborhood. Demarcate on ground wherever legal on-street parking is being provided for based on the local area plan.	KMDA, Barrackpore Municipality	6 months
5.7.2	Ensure no parks and green areas are converted to parking	KMDA, Barrackpore Municipality	6 months
5.7.3	Where shared Multilevel Parking facility is provided demarcate ingress-egress plan and ensure that no major disruption occurs on main thoroughfare traffic. Also indicate pedestrian circulation plan.	KMDA, Barrackpore Municipality	6 months
5.7.4	Eliminate free parking and introduce effective variable parking charges based on duration of parking and 'user pay' principle as per the National Urban Transport Policy. Kolkata has imposed differential parking charges at 11 locations. Similar measures can be undertaken in Barrackpore.	KMDA, Barrackpore Municipality	6 months
5.7.5	Do not allow gross-cost basis annual or monthly lump sum payment for parking in commercial areas. Annual passes allow unlimited use and do not reduce demand.	KMDA, Barrackpore Municipality	6 months
5.7.6	Physically demarcate legal parking areas. Equip them with metering systems, proper signage, IT for information on parking availability to reduce cruising time and on-street management.	KMDA, Barrackpore Municipality	6 months
5.7.7	Develop a methodology for parking pricing in residential areas and other major trip attracting areas (CBD, commercial, institutional etc.) in order to discourage misuse of urban land and reduce inflated parking demand <ul style="list-style-type: none"> - Pricing should encourage usage of designated parking spaces - Rationalise usage of on-street parking - Rationalise short term vs long term parking 	KMDA, Barrackpore Municipality	1-3 years
5.7.8	Penalty for illegal/wrong parking esp. parking within the emergency lanes and non-designated areas to be prohibitive.	KMDA, Barrackpore Municipality	1-3 years
5.7.9	Bundle existing / planned public parking facilities and on-street and off-street parking (including multi-level) facilities for management by a single agency/ operator. New stand-alone parking only sites are mostly not required since parking is permitted in all use zones.	KMDA, Barrackpore Municipality	1-3 years
5.7.10	Multilevel parking structure shall be equipped with smart technology such as real time information on vacant parking slots, smart meters etc. Various smart cities in India such as Jaipur and Bhopal are developing smart multilevel parking facilities.		
5.7.11	Earmark a part of parking revenue for local area improvement that includes footpaths, public amenities and parking facilities within the PAMP area.	KMDA, Barrackpore Municipality	1-3 years
5.7.12	Introduce residential parking permit for regular parkers for use of public parking space and these may be monitored.	KMDA, Barrackpore Municipality	1-3 years

Sr. no.	Action points	Agency responsible	Timeline
5.7.13	In order to optimize utilization of land, ensure that in all new projects (e.g. commercial, institutional, housing, etc.), at least 50% of the available parking spaces is made available for shared parking facility.	KMDA, Barrackpore Municipality	1-3 years
5.7.14	Ensure in the parking contractual agreement that the revenue sharing model is dynamic and flexible, allowing for flexibility in charging and varied usage and rates of the parking spaces; specify the investment that Contractor will have to make for up gradation of the PAMP area including metering, ITS application for commuter information, signage	KMDA, Barrackpore Municipality	1-3 years
5.7.15	Plan and implement parking provision for buses, commercial vehicles and IPT-NMT modes, and for the differently abled.	KMDA, Barrackpore Municipality	1-3 years
5.8	TRAFFIC MANAGEMENT		
Short-term action			
5.8.1	Conduct a third party/ independent audit of geometry of all city roads and intersections and provide specific solutions.	Traffic Police	6 months
5.8.2	Conduct audit of all intersections and install functional traffic signals at all major intersections.	Traffic Police	6 months
5.8.3	Enforce lane driving through heavy fining	Traffic Police	6 months
Medium-to long-term action plan			
5.8.4	Prepare Traffic Impact Assessment (TIA) guidelines and permit new developments based on the formulated TIA guidelines.	Traffic Police/ KMDA	1 year
5.8.5	Prepare traffic management plan for special days, i.e. during Durga Puja festival/ during urban flood situation.	Traffic Police, KMDA, Barrackpore Municipality	1 year
5.9	TRAFFIC IMPACT ASSESSMENT		
Medium-to long-term action plan			
5.9.1	Permit new developments based on the impact of traffic on the surrounding transport infrastructure and neighborhoods.	Barrackpore Municipality/ SEIAA	1-3 years
5.9.2	Make necessary infrastructure augmentations based on traffic impact assessments and levy costs to the developer, if needed and possible.	Barrackpore Municipality, Traffic police	1-3 years
5.10	FINANCING OF URBAN TRANSPORT		
Medium-to long-term action plan			
5.10.1	Create dedicated and ring-fenced urban transport fund for meeting Urban Transport needs by adopting innovative financial instruments to mobilize local resources including land value capture and polluter pay principle and resources from private participation	Transport Department, Barrackpore Municipality	1-3 years
5.10.2	Rationalization and reallocation of funds from road capacity augmentation projects towards public transit systems and complete streets	Transport Department	1-2 years
5.10.3	Encourage involvement of the private sector in activities such as operation and maintenance of road infrastructure, parking facilities, vehicle testing and certification facilities, repair facilities, construction and management of terminal facilities among others. Regulatory monitoring will be required for quality control, quality assurance and performance guarantee. The private sector will be involved in providing public transport services, but under well-structured procurement contracts along with strong supervision of their service level and compliance strategy.	Transport Department, Barrackpore Municipality	1-3 years
5.11	DATA ON URBAN COMMUTE		
Medium-to long-term action plan			
5.11.1	Regular update of the database and information would be one of the important tasks. This will require standardization of database for recording of travel and transport related activities to be able to assess travel activities -- generation of daily number of trips, nature of travel demand, and share of different travel modes, average trip distance, and changes in modal share.	Transport Department, Barrackpore Municipality	1-3 years

(7) GENERATOR SETS

Sr. no.	Action points	Agency responsible	Timeline
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Sr. no.	Action points	Agency responsible	Timeline
6.1	Ensure that only those DG sets that meet the standards in terms of emission or design of chimneys/ exhaust and acoustic enclosures also verify and check whether design specifications are followed or not thereafter the genset to be allowed to operate.	Police WBPCB Municipal Corporation	6 months
6.2	Curtail use of DG sets in social events by providing temporary electric connections. Also restrict use of DG sets during high pollution episodes.	WBPCB, and Municipal Corporation	6 months
6.4	Alternate power systems should be promoted in cell towers, and use of DG sets discouraged	Department of Power & NES, Distribution Companies	1 year
6.5	Leverage roof top solar programme to reduce dependence on DG sets		1 year
6.6	Ensure access to quality electricity supply		1-2 year

(8) OPEN BURNING (INCLUDING SOLID WASTE AND AGRICULTURAL RESIDUES)

Sr. no.	Action points	Agency responsible	Timeline
7.1	Enforce a complete ban on garbage burning in the entire region. Evolve a monitoring mechanism for this. Take stringent action against open burning of biomass, leaves, tyres etc. to control such activities	Municipal Corporation, Development Authority, Resident Welfare Associations, WBPCB,	6 months
7.2	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. Implement strong public outreach programme to promote household and community-based composting systems (composting pits, shredders etc). There are large open grounds, and houses with compounds in the city with considerable tree cover that cause extensive leaf litter. Open burning of leaves must stop.		6 months
7.3	Decentralized waste management for hotels, apartments, institutions as per Solid Waste Management Rules, 2016. Implement provisions of Solid Waste Management Rules 2016 to implement penal provisions to spot fine on waste burning. Strictly ban open burning of hazardous industrial waste		6 months
7.4	Use of satellite-based monitoring as well as mobile spot check squads for enforcement by locating the position of the fires on the fields.	Municipal Corporation, Metropolitan Development Authority, RWAs, State Police Department, WBPCB GIS cell	6 months
7.5	Proper management of landfill sites at Muktapurkurto prevents spontaneous fire. Further dumping of waste at open landfill sites should be restricted.		
7.6	Adopt roadmap for zero landfill policy to promote decentralized waste segregation, reuse and recycling		
7.7	With good decentralised and segregated waste management system in place to waste-to-energy plants will not be needed in the city. In case any location requires such plant - strong siting policy should be adopted to keep it away from habitation including neighbourhoods of low-income groups. Strict implementation of emissions norms; use of state-of-the-art technology and provide real time emissions data to SPCB.	Municipal Corporation, Metropolitan Development Authority, RWAs, State Police Department, WBPCB GIS cell	6 months

(9) COMMON BIOMEDICAL TREATMENT FACILITY

Sr. no.	Action points	Agency responsible	Timeline
8.1	Implement emission norms for incinerators if any and examine the feasibility of less polluting alternatives in compliance to Biomedical waste treatment rules.	WBPCB, Municipal Corporation; incinerator facility operators	6 months
8.2	Implement CEMS for incinerators and provide data on emissions on an open platform progressively.		6 months

8.3	Develop a siting policy for biomedical incinerators.	WBPCB Supported by Municipal Corporation	6 months
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(9) COOKING FUELS AND OPEN EAT(10) HOUSEHOLD POLLUTION AND OPEN EATERIES

Sr. no.	Action points	Agency responsible	Timeline
9.1	A targeted programme to be implemented for 100 per cent coverage of households by distribution of LPG/PNG in all non-compliant cities. Most of the eateries run on LPG. Unauthorised eateries have to be considered for conversion.	District and local administration	1-2 years
9.2	In low-income neighborhoods, as well as roadside eateries/dhabas/ restaurants etc. promote and give access to LPG and electricity. Mandate and link commercial license to clean fuels.	, Dept. power and NES, municipal corporation, urban local bodies	1-2 years

(11) ROAD DUST

Sr. no.	Action points	Agency responsible	Timeline
Short-term action			
10.1	Sprinkling of recycled water (without compromising other uses); introduce water fountains at major traffic intersections, wherever feasible. Adopt dust control measures for dug up areas. .	District and local administration , PWD, Road owning agencies	6 months
10.2	Phase-in mechanical / vacuum-based street sweeping wherever feasible; introduce wet / mechanized vacuum sweeping of roads		6 months
Medium- to long-term actions			
10.3	Implement truck loading guidelines; use of appropriate enclosures for haul trucks; gravel paving for all haul routes.	Department of Transport, Traffic Police	1-2 years
10.4	Maintain pothole-free roads for free flow of traffic to reduce emissions and dust.	Municipal corporation, District and local administration	1-2 years
10.5	Increase green cover in the region. Undertake greening of open areas, gardens, community places, schools and housing societies.	, Barrackpore Municipality, local bodies, RWAs	1-2 years
10.6	Enforcement of air pollution control in concrete batching (use of water spray and wind breakers, bag filter at silos and enclosures, hoods, curtains etc.) or use clean alternative technologies		1-2 years
10.7	Adopt street design guidelines for paving of roads and footpaths (hard and soft paving) with vegetative barriers. Mandate restoration according to the guidelines after the completion of all infrastructure projects.	WBPCB, Road Owning Agencies, Department of industries	1-2 years

(12) CONSTRUCTION DUST

Sr. no.	Action points	Agency responsible	Timeline
Short-term action			
11.1	Adopt and implement dust control measures for all types of construction - buildings and infrastructure. The preventive measures as mentioned in CPCB guidelines ³ . Construction agencies to be made liable. Impose penalty for non-compliance.	Municipal corporation	6 months
11.2	Undertake control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and dust suppression units. Introduce steeper penalties for non-compliance. Needs enforcement.	Municipal corporations/ Urban Local Bodies	6 months
11.3	Enforce restrictions on construction activities within urban airshed zones during high pollution period	Municipal corporation WBPCB	6 months
11.4	Notify rules to segregate construction and demolition waste. Provide a network of decentralized C&D waste segregation and collection sites across the city.	Municipal corporation	1-2 years
11.5	For material handling, construction and demolition, it should be obligatory on part of the developers to provide evidence of debris on-site recycling and/or disposal at designated sites.	Municipal corporation	1-2 years
11.6	Set up facilities to recycle construction and demolition waste. Mandate certain percentage of the material for new construction to be recycled construction waste. Implement provision of Central regulations for construction and demolition waste management rules 2016. Set up facilities for recycling of C&D waste	District and local administration , Municipal corporation	1-2 years

(13) EPISODIC EVENTS

Sr. no.	Action points	Agency responsible	Timeline
12.1	Measures to control forest fires/biomass/crop residue burning: Use satellite based monitoring and on-ground enforcement to control such burning episodes. So, an assessment needs to be carried out to identify the reasons and kind of technological and fiscal measures needed to curtail the fires. This is part of regional action.	WBPCB, Agriculture, and allied department , District and local administration	Ongoing
12.2	Firecrackers: regulate and control its usage including restrictions on timing as per the Supreme Court and CPCB and PESO guidelines.	District and local administration , Police Department, WBPCB, RWAs, Supported by Chief Controller of Explosives, Petroleum and Explosive Safety Organization (PESO)	Ongoing

(14) RENEWABLE ENERGY

Sr. no.	Action points	Agency responsible	Timeline
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Sr. no.	Action points	Agency responsible	Timeline
13.1	West Bengal has solar energy policy. As per the policy, it is mandatory for all housing societies having a total contract demand of 500 KW to install solar rooftop systems to meet at least 1.5 percent of their total electrical load. This should be further strengthened and implemented. This should be linked with transition from diesel genset to solar power, also the electric public transport can be linked with solar power plans to shift to zero emission target. Identify and target institutional/ industrial and residential consumers for faster adoption. Identify open areas in the city where solar power generation is possible.	WBREDA, Department of Power and NES, District and local administration	1-2 years
13.2	WB RE policy requires commercial and industrial establishments with more than 1.5 MW of contract demand, to install solar rooftop systems to meet at least 2 per cent of their total electrical load. This should be further strengthened and implemented. This should be linked with transition from diesel genset to solar power. Identification of the mandated entities to encourage adoption through awareness camps and introduce relevant penalties in case of non-compliance.	WBREDA, Department of Power and NES, District and local administration	1-2 years
13.3	Introduce a stand-alone scheme for state run institutions - schools, colleges, hospitals etc. that meet the criteria and facilitate their adoption through a state tender; the tenders must be based on the aggregated demand and must occur at defined intervals to ensure developer participation.	WBREDA, Department of Power and NES, District and local administration	1-2 years
13.4	Facilitate uptake of solar PV on existing residential households and commercial establishments (for example - where there is a lack of rooftop space or single grid-connection for multiple houses) by introducing encouraging regulatory measures such as virtual and group metering	WBREDA, Department of Power and NES, District and local administration	1-2 years
13.5	Introduce an online portal, where prosumers can apply for solar rooftop, interact with installers and track the installation process [to check delays at discom and SNA's end] - inspections, grid connection and subsidy disbursal.	WBREDA, Department of Power and NES, District and local administration	1-2 years
13.6	Setup a Solar Command Centre (CCC) within the WBREDA that provides guidance, facilitate redressals and acts as a watchdog for solar rooftop adoption, especially tracking progress under schemes and mandates (including Renewable purchase obligation).	WBREDA, Department of Power and NES, District and local administration	1-2 years

(15) URBAN GREENS AND FORESTS

Sr. no.	Action points	Agency responsible	Timeline
14.1	Avenue plantation along roads with more traffic. Urban planning to integrate urban greens (parks, district forests etc.) and urban forests in the Master Plans of the cities and all infrastructure development and urban redevelopment projects. At least 15-20 percent of the new urban redevelopment projects should be set aside for urban green and tree cover. Urban planning to provide for green roofs and vertical greens linked to infrastructure development. Green walling with plantations around dust generators and also to be dust barriers to be integrated with the urban forestry and forest policy.	Forest, Municipality, PWD, NHAI	1 year

(16) IMPROVE TRAINING AND CAPACITY

Sr. no.	Action points	Agency responsible	Timeline
15.1	Training and skill development will be required of public officials and other public functionaries for planning and management and execution of the plan. This will also require extensive capacity building in all sectors and infrastructure planning.	West Bengal State Council for Science and Technology, Department of Personnel and Training, District and local administration,	Ongoing

(17) NEED FOR PUBLIC AWARENESS AND COOPERATION

Sr. no.	Action points	Agency responsible	Timeline
16.1	Organizing deeper public engagement and forums for public consultation for public understanding of the nature of solutions needed to address the complex problem of sustainable industrial development and urban mobility. Formation of a public grievance redressal portal for redressal of public complaints on air pollution along with a supervisory mechanism for its disposal at time bound manner	West Bengal State Council for Science and Technology, WBPCB, District and local administration	Ongoing

A draft graded response action plan has also been prepared which shall be finalized as and when the air quality forecasting is available and the emission sources are ranked on basis of SA study. In addition, the finalization of GRAP also requires the reconciliation with IMD forecasted data on air quality. It is already noted that the observed air quality is grossly different from the IMD forecasts. This draft plan is attached only as a specimen, which may also need further refining based on SA study and current year's experiences on air quality management:

GRADED RESPONSE ACTION PLAN (GRAP) FOR REDUCING AIR POLLUTION IN NON-ATTAINMENT CITIES OF WEST BENGAL

The proposed graded measure approach for each pollution source according to the Air Quality Index (AQI) categories includes appropriate measures for each level of pollution (PM10 / PM2.5). While the comprehensive clean air action plan must be implemented round the year, the GRAP measures are meant to be temporary measures for duration of smog episodes and are implemented according to the severity of the air pollution levels. Once the levels come down and stabilize, measures are withdrawn. The objective of the GRAP is to prevent pollution from getting worse when adverse weather conditions trap and spike pollution. A GRAP has been prepared, which may be implemented as and when required and when severe conditions are forecasted.

The proposed GRAP includes set of measures to be implemented with greater vigour and stringency to prevent and avoid high level of air pollution in cities. This is linked to the national air quality index that categorises daily air quality as good, satisfactory, moderate, poor, very poor, severe, and emergency. All actions suggested for each category are cumulative and add up to the level of emergency as air quality worsens. For implementation of GRAP, the scientific Task Force under WBPCB will advise the District Level monitoring committee on the daily pollution levels and forecasting based on real time monitoring. Accordingly the Committee may issue notices to the city authorities to implement the pre-defined action. Each implementing department will appoint a nodal officer to facilitate implementation. The action notified for moderate and poor categories that are largely about stringent enforcement in different sectors can become default action for continuous implementation throughout the year. Additional measures meant for very poor and severe may be notified which such situation develops especially during calm and inversion conditions.

Moderate to poor	
Poor - When PM2.5 levels are between 91-120 microgramme per cum or PM10 levels are between 251-350 microgramme per cum; Moderate - When PM2.5 is between 61-90 microgramme per cum or PM10 is between 101-250 microgramme per cum	
Action to be taken	Agency responsible
Stringently enforce/stop garbage burning in landfills and other places and impose heavy fines on person responsible	Municipal Corporations
Close/stringently enforce all pollution control regulations in brick kilns and industries	State Pollution Control Board
Stringently enforce pollution control in thermal power plants through Pollution Control Board monitoring	State Pollution Control Board
Do periodic mechanized sweeping on roads particularly in roads with heavy traffic and water sprinkling every two days	Municipal Corporations Traffic Police PWD
Strict vigilance and no tolerance for visible emissions – stop plying of visibly polluting vehicles by impounding or heavy fine	Department of Transport Traffic Police
Stringently enforce rules for dust control in construction activities and close non-compliant sites	District Administration, Police
Deploy traffic police for smooth traffic flow at identified vulnerable areas	Traffic Police

Divert non-destined truck traffic	Municipal Corporations Traffic Police
Strictly enforce Supreme Court orders on firecrackers	SPCB, District Administration in consultation with Chief Controller of Explosives, Petroleum and Explosive Safety Organization (PESO); Police
Ensure fly ash ponds are watered every alternate day during summer months (March-May)	Plant in charge of Power Plants
Information dissemination, social media, mobile Apps should be used to inform people about the pollution levels, contact details of control room, enable them to report polluting activities/sources to the concerned authorities, and actions that will be taken by government based on the level of pollution.	State Pollution Control Board District Administration

Very Poor When PM2.5 levels are between 121-250 microgramme per cum or PM10 levels are between 351-430 microgramme per cum	
Action to be taken	Agency responsible
Stop use of diesel generator sets	State Pollution Control Boards
Enhance parking fee by 3-4 times	Municipal Corporations
Augment public transport services by increasing frequency	Department of Transport State Transport Corporation
Stop use of coal/firewood in hotels and open eateries	Municipal Corporations
Residential societies and individual house owners to provide electric heaters during winter to security staff to avoid open burning	Municipal Corporations Resident Welfare Associations
Alert in newspapers/TV to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement.	State Pollution Control Board

Severe When PM2.5 levels are above 250 microgramme per cum or PM10 levels are above 430 microgramme per cum	
Action to be taken	Agency responsible
Close brick kilns, Hot Mix plants, Stone Crushers and other highly polluting units or as applicable locally	State Pollution Control Board District Administration Police
Shut down / minimize operation of polluting coal based power plant if the plant is not complying with emission standards.	State Pollution Control Boards
Intensify public transport services. Introduce differential rates to encourage off-peak travel.	Transport Department State Transport Corporations
Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.	All road owning agencies including Municipal Corporations, Public Works Department and National Highway Authority of India
Restrict movement of trucks inside the coal field mine areas	State pollution control board, Department of Steel and mine

Severe + or Emergency When PM2.5 levels cross 300 microgramme per cum or PM10 levels cross 500 microgramme per cum (or 5 times above the standard) or persist for 48 hrs or more.	
Action to be taken	Agency responsible
Stop entry of diesel truck traffic into city (except essential commodities)	Traffic Police Municipal Corporations
Stop construction activities	Pollution Control Board Municipal Corporations
Introduce some form of vehicle restraint measures for private vehicles based on license plate numbers, or introduce low emissions zones in the city to stop entry of polluting vehicles (old and ageing and polluting diesel vehicles etc). For this purpose introduce sticker system as per MORTH guidelines to indicate fuel and date of manufacture of vehicles.	Transport Department Traffic Police

State Pollution Control Board Task Force to take decision on any additional steps including shutting of schools	
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Action to be taken by public

While the National Air Quality Index (AQI) and health advisory will inform people about the dangers of exposure, people are also expected to take precautionary measures to protect themselves. Suggested actions by public are listed below:

Level according to AQI	Action
Very poor, severe and emergency	Those suffering from heart diseases, asthma, and other respiratory disease may consider avoiding undue and prolonged exposure
	Schools to suspend all outdoor activities and sport events
	Report visible emissions from vehicles, industries, power plants, garbage burning, and other non compliances to the respective control rooms
	Do not use diesel and kerosene generators
	Maintain vehicles properly (PUC certificate, replace car air filter, maintain right tyre pressure)
	Minimize unnecessary travel, use public transport & avoid using private vehicles

INSTITUTIONAL MECHANISM FOR IMPLEMENTATION OF GRAP

In order to implement and monitor progress of the proposed actions, a district level monitoring committee is proposed, which will also provide for the institutional mechanism for implementation. The committee may co opt members if situation demands.

Proposed Composition of District Level Monitoring Committee for GRAP Implementation:

District Collector/ District Magistrate	Chairman
Sub-divisional Magistrate of District Head Quarter	Member Secretary
Superintendent of Police	Member
Regional officer of WB-PCB	Member
Representative of leading NGOs working on environment related issues (nominated by Chairman)	Member
Regional officer from Transport Department	Member
Representative from KMDA	Member
One academicians from the field of environment (nominated by Chairman)	Member
Regional Officer from WB Industrial Development Corporation	Member
Nominated Official from WBREDA	Member
All RTOs of the district	Member(s)
Nominated Official from Forest Department	Member

Air Quality Monitoring network design criteria

Population (Census 2011)	Minimum No. of manual station under NAMP	Minimum no of proposed CAAQMS	Total
1,00,000- < 5,00,000	1-Background 2-Residential/ Commercial	1-Residential	4
5,00,000- <10,00,000	1-Background 2-Residential/ Commercial	1-Residential 1-Traffic dominant area 1- Commercial	6
10,00,000- <50,00,000	1-Background 2-Residential/ Commercial	2-Residential 1-Traffic dominant area 1- Commercial 1-Industrial area	8
≥50,00,000	1-Background in upwind direction 1-Background in down wind direction 2-Residential/ Commercial	4-Residential 3-Traffic dominant area 3- Commercial 2-Industrial area	16