

Revised Actions for Howrah

Comprehensive Action Plan (CAP)

Against the backdrop of the challenges outlined in each sector, this pollution source-wise comprehensive action plan has been developed for industrial town of Howrah. 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.

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. 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 is 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 Action Plan (CAP): Short-, medium- and long-term measures Source-wise clean air action plan and compliance strategy for Howrah 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

| S. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|----------------------------|---|---|--------------|----------------------------|
| Short-term priority action | | | | |
| 1.1 | <p>As per the IS:5182 (Part 14), 2000 on Recommended minimum number of stations, population-wise (Also mentioned in Guidelines for Ambient Air Quality Monitoring, CPCB, 200329) Howrah fulfills the criteria of minimum number of stations. Howrah has a population of 10,77,075 and based on the CPCB criteria, it has three CAAQMS and four manual stations.</p> <p>Among all twelve pollutants to be monitored, special focus is needed on PM2.5 and ozone monitoring. Use air quality sensors at probable hotspots to complement air-quality monitoring (based on CPCB/MoEF&CC guidelines) may be tried.</p> | WBPCB Supported by Central Pollution Control Board (CPCB) | Action taken | Regular monitoring cost |
| 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. | WBPCB, CPCB, IMD, IITM, Pune, MoES | 6 months | To be finalised |
| 1.3 | Develop capacity for pollution forecasting for implementation of graded response action plan. This will also require monitoring of weather data. Extending programs like SAFAR for Howrah | MoES, IMD, IITM, Pune, Department of Environment, WBPCB supported by CPCB | 1 year | To be finalised |
| 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 | To conduct a source apportionment and emission inventory study, to capture source-wise contribution and seasonal variations in source contribution, also to assess regional impacts by setting up a mechanism to assess trans-boundary emissions. The carrying capacity measurements are to be carried out as well. The WBPCB is to select a relevant institution to commission the study. | WBPCB, Department of Environment | 1 year | 3 crore |

| S. no. | Action points | Agency responsible | Timeline | Financial outlay |
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| 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 | 1-2years | 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 | 1 year | To be finalized |
| Long-term action | | | | |
| 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 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, CPCB, West Bengal State Council for Science and Technology, | 2 years | 1.5 crore |
| 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

| S. no. | Action points | Agency responsible | Timeline |
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| Short-term priority action | | | |
| 2.1 | Implement of SOx and NOx standards notified by MOEF&CC on January 29, 2018 for 35 categories of industries in and around the city. Strengthen and implement strategies needed for critically polluted industrial areas. Strengthen the current siting policy for industries to be notified in future, in order to address Howrah-wide air quality issues. | WBPCB | 6 months |
| 2.2 | Implement existing standards for PM and ensure compliance through regular testing & CEMS enabled monitoring (See action 2.4) . Also takeprecautions for minimizing fugitive emissions through the preparation of a checklist for industrial zones and units, specific to each type of industry. Carry out regular inspection | WBPCB, Department of ICE and MSMA | 3 months |
| 2.3 | Prepare a clean fuel policy and provide incentives for clean fuelsfor the state: for this identify approved and non-approved fuels.For this notify a list of approved fuels.Promote relatively cleaner fuels like gas (Coal Bed Methane,natural gasetc) and electricity. Discourage fuels with very highsulphur and heavy metals like furnace oil, pet coke, tyre oil etc.(except where it is used as feedstock like cement).Need for afavourable taxation and pricing policy to make cleaner fuels morecompetitive. Incentivise replacement of boilers to switch to cleaner fuels. Clean fuel strategy needed for small and medium scale units with nominal or no emission control system | WBPCB, Department of ICE and MSME | 6 months |

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| 2.4 | Identify the units that need to install 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 actions. Specify the mechanism for quality control and quality assurance of CEMS data and ensure that data is available online 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 all sectors including sponge iron units, cement units, iron and steel industries, rice mills and jute mills. | WBPCB, Department of ICE and MSME | 6 months |
| 2.5 | Identification of cumulative impact of industrial emissions such as total load from a specified area. Prescribe more stringent pollution control action for each type of industry. For instance, different actions for sponge iron units and rice mills. | WBPCB, Department of ICE and 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. Hold quarterly inspections | WBPCB, Department of ICE and MSME | 6 months |
| 2.7 | Enforce restrictions on operations of intensively polluting industries within urban airshed zones during high pollution periods. Upgrade all existing Air pollution Control devices. | WBPCB, Department Of ICE and MSME | 6 months |

| Medium-term action | | | |
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| 2.8 | Prepare and implement action plan specific for small and medium scale industrial units. | WBPCB, Department of ICE and MSME | 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 ICE and MSME | 1 year |
| 2.10 | Strengthen the current siting policy for industries to address Howrah wise air quality problems. Restrict expansion and diversification of old polluting units that are near residential areas until robust pollution control devices have been installed and are routinely inspected. | WBPCB, Department of ICE and MSME | 1 year |
| 2.11 | Training and awareness program for onsite emergency preparedness and environmental issues for industrial workers. | WBPCB, Department of ICE and MSME | 1 year |
| 2.12 | Construction of paved roads around all major industrial estates. Installation of dust suppression system. Provision for water sprinkling and dust mitigation. | WBPCB, Department of ICE and MSME, ADDA | 1 year |
| 2.13 | Development of adequate green belt around all major industrial estates by planting at least 1000 saplings | WBPCB, Department of ICE and MSME, ADDA | 1 year |
| 2.14 | Inspection of bag filters wherever installed, replacement of older bag filters and overhauling of ESPs and water scrubber system where applicable. | WBPCB, Department of ICE and MSME, KMDA | 1 year |

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

| S. no. | Action points | Agency responsible | Timeline |
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| 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 | Dept of land and Land Reform WBPCB, KMDA, HMC, Department of MSME | 6 months |
| 3.2 | Relocate centralised Hot Mix Plants to areas outside Howrah boundaries, and ensure compliance with PM, NOx and Sox emission standards. Shut down small and mobile Hot Mix Plants | HMC, 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. | Department of Land and Land Reform, WBPCB, CPCB, ICE and 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, WBPCB, Department of ICE, MSME | 1 year |
| 3.5 | Remove stone crushers that are close to the city; adopt stringent dust control measures and greening | WBPCB, West Bengal Department of Industries, Commerce and Enterprises, MSME, HMC | 1 year |
| 3.6 | Establish a protocol for using cleaner fuels & technology for asphalt mixing and minimizing the number of hot-mix plants | MoRTH, HMC, WB PWD, NHAI and other road operating agencies | 2 year |

(4) ACTION TO REDUCE VEHICULAR EMISSIONS

| S. no. | Action points | Agency Responsible | Timeline |
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| 4.1 | Emission And Fuel Quality For New Vehicles: 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. Fully prepared to comply the order of Hon'ble Apex Court. | Transport Department | 1 year |
| 4.2 | | | |
| 4.2.1 | Expand gaseous fuel programme for vehicles: Move auto rickshaws and local taxis and buses to run on CNG. Replace diesel three wheeler & taxi fleets with CNG fleet. Expand CNG refuelling infrastructure for delivery and use. GAIL is expected to expand natural gas to West Bengal, prepare roadmap for Howrah for the same. Around 133 LPG driven Auto rickshaws operate at Howrah City. Depending on the availability of CNG, attempts will be taken to convert diesel operated taxi fleets | Transport Department, Department of ICE, MoPNG | 1-2 years |

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| | either by replacement or by retro fitment | | |
| 4.2.2 | <p>Target Medium and short term goals for electrification of new vehicles fleet in specific segments using a mixture of mandates and subsidies. Eg.</p> <ul style="list-style-type: none"> 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 to EV IPT Seek to drive rapid adoption of battery electric vehicles in a manner that they contribute to 25% of all new vehicle registration by 2023. Build on policies of the central govt to make West Bengal a hub of electric mobility. Currently about 2500 E-Rickshaws/ToTos are operating within the city limits. Electric Buses are to be introduced in the city within the next one year. 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 | Transport Department, Department of ICE, MoPNG, Department of Power and NES, Central Policy guidance from DHI and Niti Ayog | 1 year |
| 4.2.3 | <p>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.</p> <p>Designated parking spaces for commercial electric vehicles with exempted parking fees for EVs</p> <p>Legalise domestic charging of e-rickshaws: to control power theft due to illegal charging and eradicate informal proliferation of units</p> | Transport Department, Department of ICE, MoPNG, Department of Power and NES, Central Policy guidance from DHI and Niti Ayog | 1 year |
| 4.2.4 | Feasibility of the potential of generating biogas from waste and sewage to run buses in cities to be explored. | Transport Department, Department of Energy, Oil marketing companies | 1 year |
| 4.2.5 | Introduce favourable fiscal measures to promote clean fuels and zero emission vehicles such as reduction in road tax. Tax relaxation in respect of Methanol/Ethanol fuelled motor vehicles is being contemplated. | Transport Department, Department of Power and NES and Finance | 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 oversight of PUC centres and calibration of equipment and third-party checks. At present there are 51 PUCs are operational in Howrah City | Transport Department | Ongoing |
| 4.3.2 | Link PUC certificates with mandatory third party insurance 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 with respect to the motor vehicle done in e- Vahan is allowed only if the third party insurance is complied with. | Transport Department, MoRTH | Immediately |
| 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. Effective since 1 st 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. Currently being done for Kolkata and its suburb. Tender process has been initiated for purchase of 2 more RSD devices.. | Transport Department, MoRTH, ARAI | 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 | Transport Department | 6 months-1 year |

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| | <p>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.</p> <p>Also keeping in view that BS VI vehicles will roll from April 2020, there is 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 programmes, and auditing of PUC centres to check for preparedness of BS VI norms</p> | | |
| 4.3.6 | <p>Enforcement of law against visibly polluting vehicles: remove them from road, impose penalty, and launch extensive awareness drive against polluting vehicles.</p> | <p>Transport Department, Traffic Police</p> | <p>6 months-1 year</p> |
| 4.3.7 | <p>Set up modern centralized vehicle inspection centres for upgraded emissions, fitness and road worthiness tests for commercial vehicles and diesel vehicles. One pilot project is under advanced stages of development at Behala, Kolkata. It is contemplated to develop another such automated vehicle testing centre at Nilgunge, Barrackpore and in Durgapur SBSTC premises and in Howrah as well.</p> | <p>Transport Department, MoRTH</p> | <p>1 year</p> |
| 4.4 | <p>Phase out old vehicles and develop a state vehicle scrapping 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 and integrate the current informal scrapping units</p> <p>18332 Nos. of 15 year + commercial vehicles are seized/ scrapped/ physically thrown out of operation of the city limits of Howrah. The Process of scrapping the vehicles are followed as defined in the MV Act and after scrapping, the registration number of the vehicle is cancelled in the system</p> | <p>Transport Department, MoRTH, CPCB</p> | <p>1 year</p> |

| 4.5 Freight Transportation | | | |
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| Short-term action | | | |
| S. No | Action points | Agency Responsible | Timeline |
| 4.5.1 | Adopt freight master plan to organize freight movement and logistics. | District and local administration, Howrah Municipal Corporation (HMC) | Within 6 month |
| 4.5.2 | 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. Pave all roads to control fugitive dust | PWD, NHAI | |
| 4.5.3 | 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 |
| 4.5.4 | 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 its suburbs including Howrah City outskirts | District and local administration, Transport department, Traffic Police | Within 6 months |
| 4.5.5 | Create management systems for loading and unloading of goods in city areas. Major loading and unloading places in the city. | District and local administration, Transport department | 6 months |
| 4.5.6 | 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 Vehicles 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 an enforceable offence. | Transport Department, | 6 months |
| Medium to long term action | | | |
| 4.5.7 | Promote high capacity trucks for long-distance freight transport of mining material instead of smaller trucks | NHAI, District and local administration | Within 6 months |
| 4.5.8 | 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. | District and local administration, Transport department Traffic Police | Within 6 months |
| 4.5.9 | 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. Kolkata-Metropolitan Development Authority can adopt such measures to make toll collection cashless | District and local administration, Transport department, Traffic Police | 1 year |

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| | and regulate entry based on age. This also allows scope of introducing environment pollution charge at the entry point. | | |
| 4.5.10 | Develop urban freight consolidation centers in relation to location of warehouses relative to suburban areas. | District and local administration, Transport department | 1 year |

| S. No | Action points | Responsible Agency | Timeline |
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| 4.6 | 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 |
| 4.7 | Install vapor recovery systems in fuel refueling outlets to reduce benzene and VOC emissions in cities. CPCB has issued direction for installation of stage I and Stage II vapor recovery system in all retail outlets with capacity 3000 kiloliter and more in 46 million plus cities by December 2017. Retail outlets across the city should comply with this. | Transport department, State Oil Coordinator | 6 months |

(5) URBAN MOBILITY

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|-----------------------------------|--|--|-----------|---|
| 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, Howrah Municipal Corporation (HMC) | 6 months | No separate budget done from routine activity |
| Medium-to long-term action | | | | |
| 5.1.2 | Strengthen the bus service for Howrah-Kolkata city bus | WBTC, Howrah Municipal Corporation (HMC) | 18 months | To be finalized |

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|--------------------------|---|---|-----------|------------------|
| | <p>Augment complete city bus fleet with Global Positioning Device (GPS) and passenger Information System (PIS).</p> <p>At present city bus system operated by WBTC are equipped with IT based infrastructure. It is however very crucial to maintain the IT based systems in buses for improved services and operational efficiency</p> | WBTC, Howrah Municipal Corporation (HMC) | | Not available |
| 5.1.3 | <p>Facilitating Multi-modal integration at major transit locations to ensure smoother transition between modes.</p> <p>At present, auto rickshaws/e-rickshaws operate basically to provide last mile connectivity from nearest bus nodes, rail heads etc. and infrastructure integration for multi-modes exists at Howrah Railway station.</p> <p>Similarly there is need for infrastructure integration for seamless movement at other secondary transit locations. There is a need to identify a few other 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</p> | Howrah Municipal Corporation (HMC), WBTC, Eastern Railway, Kolkata Metro Rail Corporation Ltd., RTO(PVD), Traffic Police Howrah | 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, Traffic Police, Howrah Municipal Corporation (HMC) | 0year | |
| 5.2 | INTERMEDIATE PARA TRANSIT (IPT) | | | |
| Short-term action | | | | |
| 5.2.1 | <p>IPT in the region operates on route permit and fixed fares. There are earmarked parking arrangements at interchange points/major junctions.</p> <p>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.</p> | KMDA, HMC, Traffic Police, RTO-Transport Department | 6 months | |
| 5.2.2 | <p>Facilitate IPT driver training, standard licensing procedures and safety measures in operation</p> <p>At present, MTS are situated within the city limits which train IPT drivers. And driving license for e- rickshaw is allowed only after 10 days training.</p> | RTO, Transport Department | 6 months | |
| 5.2.3 | <p>Enforce IPT service providers to abide by latest fuel economy standards (i.e. Bharat Stage IV and upcoming Stage VI).</p> <p>Auto registration is allowed on compliance of latest emission standards.</p> <p>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.</p> | RTO, Transport Department, Traffic Police, HMC | 6 months | |
| 5.2.4 | <p>E-rickshaw plying in the city should also follow standard process of registering, followed by driving training and safety in operation.</p> <p>There are approximately 2500 E-rickshaws and Totos within the city limits of Howrah.</p> | RTO, Traffic Police, KMDA and HMC | 6 months | |
| 5.2.5 | Encourage cycling – Remove NMT movement restriction. | KMDA, HMC | 1 year | |
| 5.2.6 | Introduce campaigns to create user awareness and adoption. | HMC, Traffic Police | 6 months | |

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|----------------------------|--|--------------------------------------|---|------------------|
| Medium term action | | | | |
| 5.2.7 | 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. Currently the auto policy is being implemented within the city regulating the number and direction and terminus of the IPT. Efforts are being taken to convert the Totos into e-rickshaw. | KMDA | 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. At present, the State Tax Act promotes e- mobility by way of reduced taxation. - Additionally, there should also be Incentive on de-registering ICE based IPT (Auto) and adopting E-rickshaw to encourage clean fuel adoption | HMC/ Regional Transport Authority | 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 | Bus SPV/ KMDA | 6 months | |
| Medium to long term | | | | |
| 5.3.3 | Prepare regulatory mechanism for provision of dedicated parking space for electric rickshaws/vehicles. Currently there are parking arrangement at interchange points/major junctions. But prioritizing space / parking arrangement for E-mobility will encourage its usage and conversion from ICE based Auto to E-rickshaw | HMC, Transport department, RTO(PVD) | 1 year | |
| 5.3.4 | Take initiative to develop electric ecosystem such as charging infrastructure, better tariff regime etc. | HMC/ Electricity Department | 1 year | |
| 5.4 | ROAD DESIGN | | | |
| 5.4.1 | Non-motorized transport and safe access | KMDA, HMC, Traffic police | 1 year subject to completion of m work of metro railways | |
| 5.4.2 | 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, HMC, PWD | 1-3 years year subject to completion of m work of metro railways | |

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|---------|---|---------------------------|-----------|------------------|
| 5.5 | MULTI-UTILITY ZONES (MUZ) | | | |
| 5.5.1 | <p>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.</p> <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. <p>Reference: Urban Street Design Guidelines Unified Traffic and Transportation Infrastructure (Planning & Engineering) Centre prepared by Delhi Development Authority.</p> | KMDA, HMC, PWD | 1-3 years | |
| 5.6 | 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: | | | |
| | Short-term action | | | |
| 5.6.1 | 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, HMC, Traffic Police | 6 months | |
| 5.6.2 | Ensure no parks and green areas are converted to parking | KMDA, HMC, Traffic Police | 6 months | |
| 5.6.3 | 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, HMC, Traffic Police | 6 months | |
| 5.6.4 | 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 Howrah. | KMDA, HMC, Traffic Police | 6 months | |
| 5.6.5 | 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, HMC, Traffic Police | 6 months | |
| | Medium- to long-term action | | | |
| 5.6.6 | 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, HMC, Traffic Police | 6 months | |
| 5.6.7 | <p>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</p> <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, HMC, Traffic Police | 1-3 years | |
| 5.6.8 | Penalty for illegal/wrong parking esp. parking within the emergency lanes and non-designated areas to be prohibitive. | KMDA, HMC, Traffic Police | 1-3 years | |
| 5.6.9 | 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 | KMDA, HMC, Traffic Police | 1-3 years | |

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|--|---|--|-----------|------------------|
| | parking is permitted in all use zones. | | | |
| 5.6.10 | Multilevel parking structure shall be equipped with smart technology such as real time information on vacant parking slots, smart meters etc. | KMDA, HMC, Traffic Police | 1-3 years | |
| 5.6.11 | Earmark a part of parking revenue for local area improvement that includes footpaths, public amenities and parking facilities within the PAMP area. | | | |
| 5.6.12 | Introduce residential parking permit for regular parkers for use of public parking space and these may be monitored. | KMDA, HMC, Traffic Police | 1-3 years | |
| 5.6.13 | 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, HMC, Traffic Police | 1-3 years | |
| 5.6.14 | 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, HMC, Traffic Police | 1-3 years | |
| 5.6.15 | Plan and implement parking provision for buses, commercial vehicles and IPT-NMT modes, and for the differently abled. | KMDA, HMC, Traffic Police | 1-3 years | |
| 5.7 | TRAFFIC MANAGEMENT | | | |
| Short-term action | | | | |
| 5.7.1 | Conduct a third party/ independent audit of geometry of all city roads and intersections and provide specific design based solutions. | Traffic Police, Howrah Municipal Corporation (HMC), Transport Department | 6 months | |
| 5.7.2 | Conduct periodical audit of all intersections, IT infrastructure and signals at all major intersections. | Traffic Police, Transport Department | 6 months | |
| 5.7.3 | Enforce lane driving through heavy fining in major arterial roads | Traffic Police, Transport Department | 6 months | |
| Medium-to long-term action plan | | | | |
| 5.7.4 | Prepare Traffic Impact Assessment (TIA) guidelines and permit new developments based on the formulated TIA guidelines. | Traffic Police/ KMDA | 1 year | |
| 5.7.5 | Prepare traffic management plan for special days, i.e. during Durga Puja festival/ during urban flood situation. | Traffic Police, KMDA, HMC | 1 year | |
| 5.8.6 | Install IT infrastructure for traffic management at major locations | Howrah Municipal Corporation, Traffic police | | |
| 5.8.7 | Financial model to support existing IT infrastructure in traffic management should be adaptive, self-sustaining and innovative | Howrah Municipal Corporation, Traffic police | | |
| 5.8 | TRAFFIC IMPACT ASSESSMENT | | | |
| Medium-to long-term action plan | | | | |
| 5.8.1 | Any new development that has to come in the area should procure adequate clearance from traffic police along with development authorities. Clearance by traffic police will be based on assessment of impact on traffic that will be induced by the upcoming development in the area. | Howrah Municipal Corporation (HMC), KMDA, Traffic Police | 1-3 years | |

| Sr. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|--|---|---|-----------|------------------|
| 5.8.2 | Make necessary infrastructure augmentations based on traffic impact assessments and costs should trickle down to the developer/real estate, if required and possible. | Howrah Municipal Corporation (HMC), KMDA, Traffic Police | 1-3 years | |
| 5.9 | FINANCING OF URBAN TRANSPORT | | | |
| Medium-to long-term action plan | | | | |
| 5.9.1 | 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, KMDA, Howrah Municipal Corporation (HMC), | 1-3 years | |
| 5.9.2 | Rationalization and reallocation of funds from road capacity augmentation projects towards public transit systems and complete streets | Transport Department, KMDA, Howrah Municipal Corporation (HMC), | 1-2 years | |
| 5.9.3 | 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, KMDA, Howrah Municipal Corporation (HMC), | 1-3 years | |
| 5.10 | DATA ON URBAN COMMUTE | | | |
| Medium-to long-term action plan | | | | |
| 5.10.1 | Regular update of urban mobility database and information is one of the crucial aspect of assessing travel demand in a city and its related tasks. A city should maintain and update few basic database as : <ul style="list-style-type: none"> - No of trips per day - PCTR - Modal Split - Average Trip distance by modes - Average trip cost | Transport Department, Howrah Municipal Corporation (HMC), KMDA | 1-3 years | |

(6) GENERATOR SETS

| S. 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. | Howrah Municipal Corporation, Police | 6 months |
| 6.2 | Curtail use of DG sets in social events by providing temporary electric connections. Restrict use of DG sets during high pollution episodes. | WBPCB, and Howrah Municipal Corporation, Police | 6 months |
| 6.3 | Alternate power systems should be promoted in cell towers, and use of DG sets be discouraged | Department of Energy, Distribution Companies, | 1 year |
| 6.4 | Leverage roof top solar programme to reduce dependence on DG sets | Department of | 1 year |

| | | | |
|-----|---|---------------|------|
| 6.5 | Ensure access to quality electricity supply | Power and NES | year |
|-----|---|---------------|------|

(7) OPEN BURNING (INCLUDING SOLID WASTE AND AGRICULTURE RESIDUES)

| S. no. | Action points | Agency responsible | Timeline |
|----------------------------|--|--|----------|
| Short-term priority action | | | |
| 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 | HowrahMunicipal Corporation, | 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 thecity with considerable tree cover that cause extensive leaf litter. Open burning of leaves must stop. | Kolkata Metropolitan Development Authority, Resident Welfare Associations, WBPCB | 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 | HMC, KMDA | 6 months |
| 7.4 | Use of satellite-based monitoring as well as mobile spot check squads for enforcement | HowrahMunicipal Corporation, KMDA, RWAs | 6 months |
| 7.5 | Proper management of landfill sites to prevent spontaneous fire. Further dumping of waste at open landfill sites should be restricted. | HowrahMunicipal Corporation, KMDA, RWAs | 6 months |
| 7.6 | Adopt roadmap for zero landfill policy to promote decentralized waste segregation, reuse and recycling | Police Department, WBPCB GIS cell Howrah Municipal Corporation, | 6 months |
| 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. | KMDA, RWAs, StatePolice Department, WBPCB GIS cell | 6 months |

(8) COMMON BIOMEDICAL AND TREATMENT FACILITY

| S. no. | Action points | Agency responsible | Timeline |
|--------|---|--|----------|
| 8.1 | Implement emission norms for incinerators 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 anopen platform progressively. | | 6 months |

| | | | |
|-----|--|---|----------|
| 8.3 | Develop a siting policy for biomedical incinerators. | WBPCB Supported by Municipal Corporation | 6 months |
|-----|--|---|----------|

(9) COOKING FUELS AND OPEN EATERIES

| S. no. | Action points | Agency responsible | Timeline |
|-----------------------------------|--|--|-----------|
| Medium to long term action | | | |
| 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. | Department of Power & NES, 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. of Power & NES, Natural gas, municipal corporation, urban local bodies | 1-2 years |

(10) ROAD DUST

| S. no. | Action points | Agency responsible | Timeline | Financial Outlay |
|-------------------------------------|---|---|-----------|-------------------|
| 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. At present 6 tankers are plying @ 20 km per day for 25 days in a month | District and local administration, PWD, Road owning agencies | 6 months | 6 lakhs per month |
| 10.2 | Phase-in mechanical / vacuum-based street sweeping wherever feasible; introduce wet / mechanized vacuum sweeping of roads | | 6 months | |
| 10.3 | Construction of 8 km pavements | HMC | 4 months | 6.08 Crore |
| 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. | Howrah 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. | West Bengal State Council for Science and Technology, HMC, 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 | WBPCB, | 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. | Road Owning Agencies, Department of industries | 1-2years | |
|------|--|--|----------|--|

(11) RENEWABLE ENERGY

| S. no. | Action points | Agency responsible | Timeline |
|------------------------------------|--|--|-----------|
| Medium- to long-term action | | | |
| 11.1 | 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 plansto shift to zero emission target. Identify and target institutional/industrial and residential consumers for faster adoption. Identify openareas in the city where solar power generation is possible. | WBREDA, Department of Power & NES, District and local administration | 1-2 years |
| 11.2 | 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 & NES, District and local administration | 1-2 years |
| 11.3 | 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 & NES, District and local administration | 1-2 years |
| 11.4 | 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) byintroducing encouraging regulatory measures such as virtual and groupmetering | WBREDA, Department of Power & NES, District and local administration | 1-2 years |
| 11.5 | 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 & NES, District and local administration | 1-2 years |
| 11.6 | 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 & NES, District and local administration | 1-2 years |

(12) EPISODIC EVENTS

| S. no. | Action points | Agency responsible | Timeline |
|--------|--|---|----------|
| 12.1 | Measures to control forest fires/biomass/crop residue burning: Use satellitebased monitoring and on-ground enforcement to control such burningepisodes. So an assessment needs to be carried out to identify the reasonsand kind of technological and fiscal measures needed to curtail the fires.This is part of regional action. | WBPCB, Agriculture and allied Industries , District andlocal 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 |
|------|--|--|---------|

(13) URBAN GREENS AND FORESTS

| S. no. | Action points | Agency responsible | Timeline |
|--------------------|--|---|----------|
| Medium-term action | | | |
| 13.1 | 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. 250 trees have been planted in 20 parks | Forest Department, HMC, KMDA, PWD, NHAI | 1 year |

(14) IMPROVE TRAINING AND CAPACITY

| S. no. | Action points | Agency responsible | Timeline |
|--------|--|---|----------|
| 14.1 | 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 |

(15) NEED FOR PUBLIC AWARENESS AND COOPERATION

| S. no. | Action points | Agency responsible | Timeline |
|--------|--|--|----------|
| 15.1 | 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. | West Bengal State Council for Science and Technology, WBPCB, | Ongoing |
| 15.2 | 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 | District and local administration | |

(16) ACTION PLAN FOR POWER PLANTS IN THE REGION

There is no Power Plant in HMC.

(17) ACTIONS FOR MANAGEMENT OF CONSTRUCTION DUST

| S. 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 ¹ . Construction agencies to be made liable. Impose penalty for non-compliance. | Howrah Municipal Corporation | 6 months |
| 11.2 | Undertake control measures for fugitive emissions from material handling, conveying and screening operations through watersprinkling, curtains, barriers and dust suppression units. Introduce steeper penalties for non-compliance. Needs enforcement. | Howrah Municipal Corporations | 6 months |
| 11.3 | Enforce restrictions on construction activities within urban airshed zones during high pollution period | Howrah Municipal Corporation/ WBPCB | 6 months |
| Medium- to long-term action | | | |
| 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. | Howrah 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. | Howrah 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, Howrah Municipal Corporation, WBPCB | 1-2 years |
| 11.7 | Notify the requirement for a comprehensive waste management plan (WMP) from bulk waste generators mentioning the estimated amount of generation, provision of dust control measures, details of the transporting entities, information about the location of waste disposal etc. The WMP should be combined with building permits and made compulsory before any construction/demolition/remodeling activity. | Howrah Municipal Corporation | 1-2 years |

¹<http://jkspcb.nic.in/WriteReadData/userfiles/file/cand%20D%20guidelines/CPCB%20guidelines%20for%20dust%20control.pdf>

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. This draft plan is attached only as a specimen, which may 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 |
| Control use of diesel generator sets by improving electricity supply | State Pollution Control Boards |
| Restrict parking and enhance parking fee by 3-4 times in commercial areas to reduce usage of personal vehicles | Municipal Corporations |
| Augment public transport services by increasing frequency and ensure adequate para transit services | Department of Transport State Transport Corporation |
| Stop use of coal/firewood in hotels and open eateries | Municipal Corporations |
| 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 coal based polluting industrial units and plants if the emission are found to be beyond permissible limit; Allow plants on cleaner fuels like natural gas, electricity etc. | 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). | Transport Department Traffic Police |
| State Pollution Control Board Task Force to take decision on any additional steps including shutting of schools | |

Actions 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

The committee may co-opt members as demands. Proposed Composition of District Level Monitoring Committee for GRAP:

| District Collector/ District Magistrate | Chairman |
|--|------------------|
| Sub-divisional Magistrate of District Head Quarter | Member Secretary |
| Chairman of Howrah Municipal Corporation | Member |
| Superintendent of Police | Member |
| Regional officer of WBPCB | Member |
| Representative of leading NGOs working on environment related issues (nominated by Chairman) | Member |
| Regional officer from Transport Department | Member |
| Representative of CEO, Kolkata Metropolitan Development Authority (KMDA) | Member |
| One academician 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 State 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 |