Revised Action plan for Thane City under NCAP

Thane Clean Air Action Plan
2020 - 21

Thane Municipal Corporation, Thane

Pollution Control Cell

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LIST OF ABBREVIATIONS

CIDCO	:	City and Industrial Development Corporation of Maharashtra
CPCB	:	Central Pollution Control Board
IHME	:	Institute for Health Metrics and Evaluation
IIT	:	Indian Institute of Technology
IITM	:	Indian Institute of Tropical Meteorology
MIDC	:	Maharashtra Industrial Development Corporation
MPCB	:	Maharashtra Pollution Control Board
MSRDC	:	Maharashtra State Road Development Corporation
MSRTC	:	Maharashtra State Road Transport Corporation
MMR	:	Mumbai Metropolitan Region
MMRDA	:	Mumbai Metropolitan Region Development Authority
NEERI	:	National Environmental Engineering Research Institute
WHO	:	World Health Organization

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INTRODUCTION :

With almost 3.7 million global deaths in 2012 attributed to outdoor air pollution (WHO, 2014), it has emerged as one of the gravest threats to public health. 98% of cities in low- and middle-income countries do not meet World Health Organization (WHO) air quality guidelines (WHO, 2016).

Data from the country's major regulator the Central Pollution Control Board (CPCB), showed that 77% of Indian urban clusters clearly exceeded the National Ambient Air Quality Standard (NAAQS) for respirable suspended particulate matter (RSPM or PM10) in 2010 (CPCB, 2012). Another key estimate from WHO pointed that out of 20 world's worst particulate air polluted cities around 13 were in India including the capital Delhi, which has been the worst ranked city in terms of air pollution (WHO, 2014). It is quite alarming to note that the satellite measures of fine particulates created for the entire India reveal that our population living both in urban and rural areas is exposed to hazardously high levels of particulates. Almost 670 million people comprising 54.5% of the population reside in regions that do not meet the Indian NAAQS for fine particulate matter (Green Stone et al, 2015; Dey, 2012). Numerous studies have revealed a consistent correlation for particulate matter concentration with health than any other air pollutant. Studies show a statistically significant correlation between mortality and ambient particulate matter concentration (Lee et al, 2006).

The exposure to hazardous particulate matter pollution (PM2.5 and PM10) is alarmingly high in most Indian cities, with levels exceeding the National Ambient Air Quality Standards for most parts of the year. Several Indian cities such as Delhi, Gwalior, Raipur, Patna, Varanasi, Agra, and Kanpur exceed the PM2.5 levels by several times than the air quality guidelines recommended by the WHO. Health implications of air pollution are the driving forces that necessitate the management of air quality in urban spaces. Control measures and standards are primarily developed with the concerns regarding health of the citizens by creating sustainable and livable urban spaces. The World Bank Report (2016) highlighted that diseases associated with outdoor and household air pollution may have costed India as much as 8.5 per cent of its GDP in 2013. As per WHO, direct health risks associated with exposure to the pollutants vary with pollutant type, concentration and time of exposure. Healthy people commonly experience breathing difficulties or respiratory irritation if exposed to the pollutants. However, adverse effects may result in individuals suffering from heart or respiratory ailments. Immediate health problems are caused with high levels of pollutants in the atmosphere even for relatively shorter duration which could include:

respiratory illness such as asthma or bronchitis, aggravated cardiovascular ailments like heart attack or congestive heart failure, increase in probability of cancer.

Permanent health effects that may be caused with long-term exposure to polluted air including: accelerated aging of the lungs, loss of lung capacity and decreased lung function, development of diseases such as asthma, bronchitis, emphysema, and possibly cancer shortened life span. Health impacts associated with exposure to gaseous pollutants and toxic pollutants include significant damage to the lungs, heart and the nervous system. Exposure to ozone gas leads to irritation in lungs, decline in lung functioning and increased disability-adjusted life year (DALYs). Fine particulate matter (particulate matter less than 2.5 microns in diameter) is of significant concern to human health, since it can penetrate deep into the lungs.

Other pollutants such as Volatile Organic Compounds (benzene, butadiene, and aldehydes) or asbestos, and metals (such as mercury, lead, manganese, chromium) are potentially toxic if upon recurrent exposure. A number of them are reported to be known as human carcinogens (e.g. benzene, butadiene, formaldehyde, asbestos), some are known to cause significant respiratory irritation (benzene, butadiene, formaldehyde, asbestos) and a few impact the nervous system and the brain (e.g. the metals mercury) (HEI, 2007).

Air pollution has huge economic consequences for agriculture, ecosystem, and buildings it also has adverse impacts on the local weather. As per the study conducted by IITM, gases like NOx, CO & VOCs cause an increase in surface ozone and long-term exposure to high concentration of surface ozone damages vegetation with substantial reduction in crop yields and crop quality. The worst affected crop in India in terms of yield losses is wheat followed by rice (Beig, 2014).

AIR QUALITY TRENDS :

The analysis of annual average ambient concentration of PM2.5 and PM10 across the country reveals that the annual concentration for PM2.5 ranged from 44.61 - 239.59 μg/m3 with an average concentration 188.35 μg/m3 for the past 20 years (1995-2015). It has consistently been over the prescribed limit of 40μg/m3 (annual average) for PM2.5 levels in ambient air. Similarly, the PM 10 concentrations over the country have also been ranging above the NAAQS limit of 60 μg/m3 (annual average) consistently since the data has been gathered.

Analysis of the publicly available monitoring data for the top 10 cities on the WHO list of highly polluted cities reveals that since the past 10 years there has not been a single day when the PM 10 concentration levels in these cities complied with the NAAQ standard. It is evident that (Fig.1) from 2011 to 2015 almost all the cities had PM10 concentrations above the NAAQ standards.

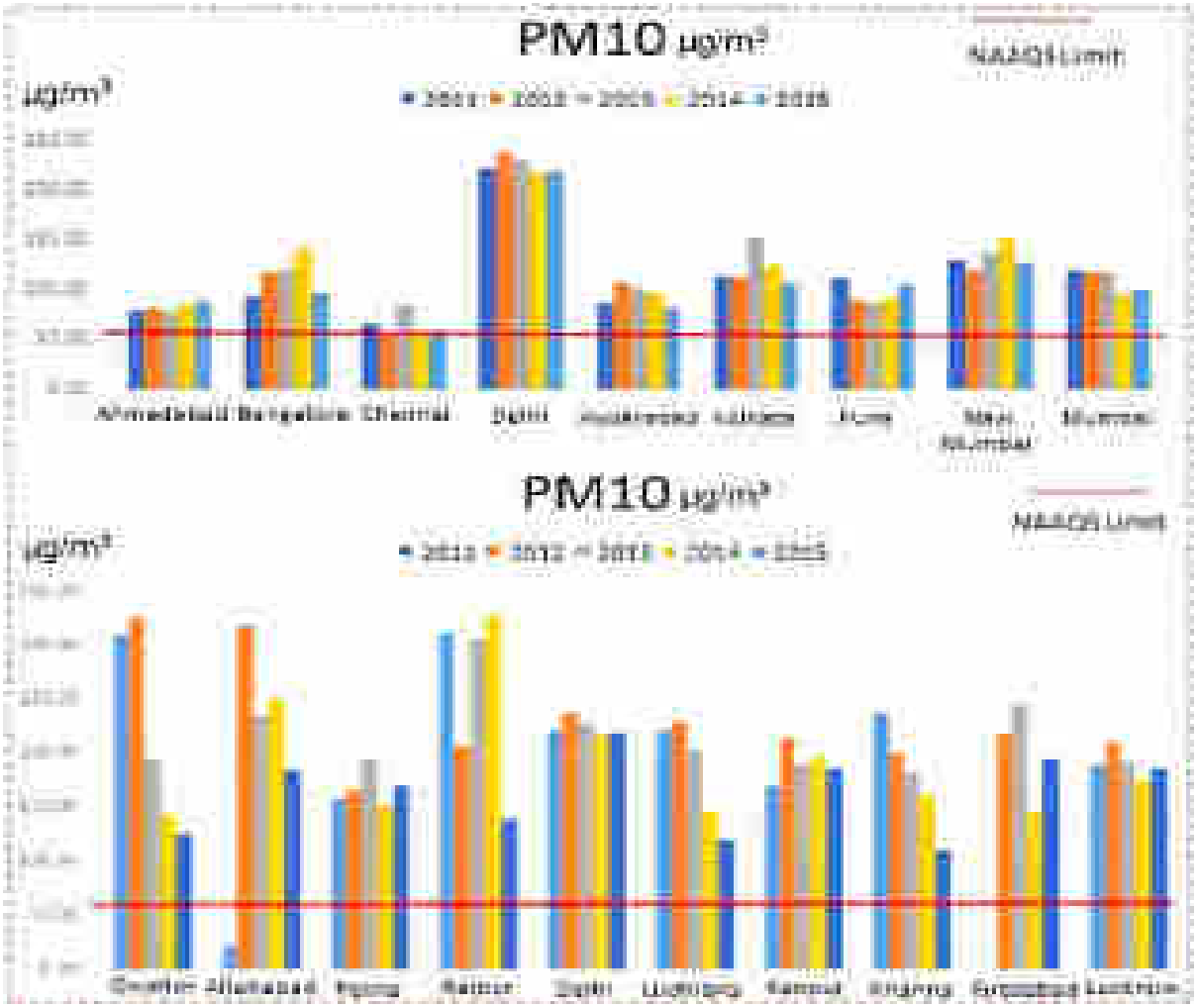

Figure 1: Trends in PM 10 concentrations (µg/m^3) in Indian cities 2011-2015

AIR QUALITY IN MAHARASHTRA:

Poor air quality in a major concern in Maharashtra cities. Ambient air quality is monitored under NAMP (National Ambient Air Quality Monitoring Programme) as per the monitoring protocol prescribed by the CPCB at selected locations. CPCB identified **17 non-attainment cities in Maharashtra** based on the observation of exceedance with respect to National Ambient Air Quality Standards 2009 consecutively during 2011 to 2015 namely Akola, Amravati, Aurangabad, Badlapur, Chandrapur, Jalgaon, Jalna, Kolhapur, Latur, Mumbai, Nagpur, Nasik, Navi Mumbai, Pune, Sangli, Solapurand Ulhasnagar. Recently **Thane city has been added to** the list based on exceedance with respect to National Ambient Air Quality Standards 2009 consecutively during 2015-17.

Air pollution has been viewed seriously by Supreme Court and the National Green Tribunal which have issued specific directions from time to time for improving the ambient air quality where the level of pollutants exceeded the stipulated standards. Various studies conducted in past have identified as the major air pollution sources in urban areas as suspension of road dust, vehicular emissions, biomass burning, crop residues, municipal solid wastage, construction and demolition activity emission from industrial units, DG sets, fuel uses for domestic and commercial activities.

MANAGING AIR QUALITY -INITIATIVES UNDERTAKEN :

National Ambient Air Monitoring Program (NAMP) with 631 stations in 262 cities across India to determine the status and trends of ambient air quality and ensure effective regulatory compliance. The NAMP stations are equipped to continuously monitor the concentration of four pollutants (Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2) and Particulate Matter size equal to or less than 10 micron (PM_{10}) and 2.5 micron ($PM_{2.5}$) in the ambient air on a 24-hour basis (envfor.nic.in/division/air-pollution). Additionally, the autonomous institutions (e.g. Indian Institute of tropical Meteorology (IITM), Pune) have also established monitoring stations in major cities to estimate the air quality. Mega cities like Delhi and Mumbai are equipped with a strong monitoring network with 28 monitoring stations each. Also, a major low cost monitoring network is also being assessed and established as potential to measure few criteria pollutants in the country (India Spend 2015).

Subsequently, in 2015 the Government launched the National Air Quality Index (NAQI) that aimed at providing effective protection to citizens against health risks from the air pollution. AQI categorizes associated health impacts on a scale of 0-500 and

communicates air pollution levels to citizens. There are eight sub-indices that monitor level of a specific pollutant: PM_{10}, $PM_{2.5}$, Nitrogen Dioxide (NO_2), Sulphur Dioxide, Ozone, Carbon Monoxide (CO), Ammonia (NH3) and Lead (Pb). Based on the concentration of each pollutant, a sub-index is calculated for each and worst sub-index determines overall AQI value for that particular day. Currently, the AQI display is in 24 cities and is also accessible through app download on social media.

In the absence of any concrete and robust action plan the number of cities classified as non-attainment under the NAAQS has continuously been on a rise in the country. There are approximately 94 cities in India which are under the non-attainment list of NAAQS from the past five years. As per the Section 18 (1) of the Air Act the CBCP has directed the SPCB's of the respective states to prepare the action plan and implement it to comply with the NAAQS. Yet, no such action plans are formulated and put into force. However, only recently the Delhi Pollution Control Committee (DPCC) and CPCB developed the Graded Responsive Action Plan (GRAP) which is applicable only during exigency period for the city and actions described in GRAP can come into force as and when directed by the authority. In Aug, 2017 MPCB proposed Clean Air Mission- Maharashtra 2022 for undertaking Air Quality Monitoring, Emission Source Apportionment and Air Quality Improvement Plans for 17 cities in the State of Maharashtra and Surat City, Gujarat.

Recently, the Maharashtra Pollution Control Board (MPCB) developed first of its kind five-star rating system in India to measure pollution for industries in collaboration with MIT's Jameel Poverty Action Lab (J-PAL). The objective is to collect data (particulate matter) from approximately 20,000 stacks and make the data publicly available and increase transparency. The industries will be rated between one and five stars depending upon their performance on the pollution front and aid in pollution abetment strategies and plans for non-performing units. Furthermore, the city of Ahmedabad in support with local Government developed first Indian monitoring and early warning system for air pollution in May 2017 with a purpose to minimize health impacts and deaths from air pollution. As a part of what is called the Air Information and Response (AIR) plan, daily AQI will be accessible to citizens through 11 LED screens across the city. Under this plan, medical professionals will be trained to respond during air pollution episodes and the warning system will notify people of excessive pollution days.

High pollution levels combined with dense population in urban areas results into high mortality and health costs. Conditions in developing Asian cities such as low average

incomes, poor health facilities along with inadequate awareness about the sources and treatment of health problems, further contributes to the loss of many lives every year. The Global Burden of Disease recognized that in 2013 approximately 660,000 deaths in India were on account of outdoor air pollution (IHME, 2015). Addressing India's air pollution and ensuring the right to clean air for all requires a comprehensive national action plan with targets and timelines, along with strict measures and monitoring plans for reducing air pollution emissions from major polluting sectors such as power generation, industry, transport and agriculture. However, our cities constantly face the problem of insufficient information on air quality management as data on air pollution is not easily available. This has resulted in poor public awareness and insufficient measures to reduce air pollution (Apte et al, 2011; Kaushik and Borah, 2016).

In order to manage air quality better, there is a need to have a comprehensive understanding of the status and gaps in the air quality management of a city. Unfortunately, air quality information is often limited, fragmented between different organizations and not easily understood by the public. In addition, India's fast growing economy is confronted with many development challenges, like energy security, economy and traffic congestion, which are further compounded by climate change. As the global climate change agreements and national policies and targets trickle down to the cities, there will be a tremendous capacity gap to deal with climate change while continuing to address air pollution and other development issues.

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DEVELOPMENT OF A CLEAN AIR ACTION PLAN :

A Clean Air Action Plan is a collection of regulations, policies and programs that intend to improve air quality and public health by identifying cost-effective measures to reduce emissions from various sectors. The action plan approaches vary depending on the context of cities and countries, as well as their needs and capacities to develop and implement the measures. In general, the main process of developing a clean air action plan can be summarized into four simple steps with stakeholder participation and communication being part of the whole process (Fig. 2). This clean air action plan process involves following key aspects.

Assessment:

This includes review and analysis of the status and trends of air quality, impacts on public health and the environment, information on key pollutants and sources of emissions, indicators of growth and their projections in future years, baseline emissions inventory for targeted pollutants, and projected levels of emissions

Action Plan Development:

This step encompasses identification of different types of control measures on pollutant emission reduction, cost-effectiveness of the control measures, and co-benefits. This is a way to address the existing situation as well as future scenarios, with due consideration of projected population growth, demand and management of services, sector specific plans from municipal corporation and urban and industrial development agencies, and expected technological advancements.

Implementation:

This is a key step that requires a clear institutional framework and responsibilities, stakeholder coordination and communication, political support, allocation of financial resources and technical capabilities.

Review:

This refers to the tracking and reporting of the implementation of measures and overall changes in emissions. It is important to identify monitoring mechanisms to enable review of the effectiveness of available control measures, and to determine if changes are needed to achieve greater reductions, address excessive costs or amend measures, as appropriate (Clean Air Asia, 2016).

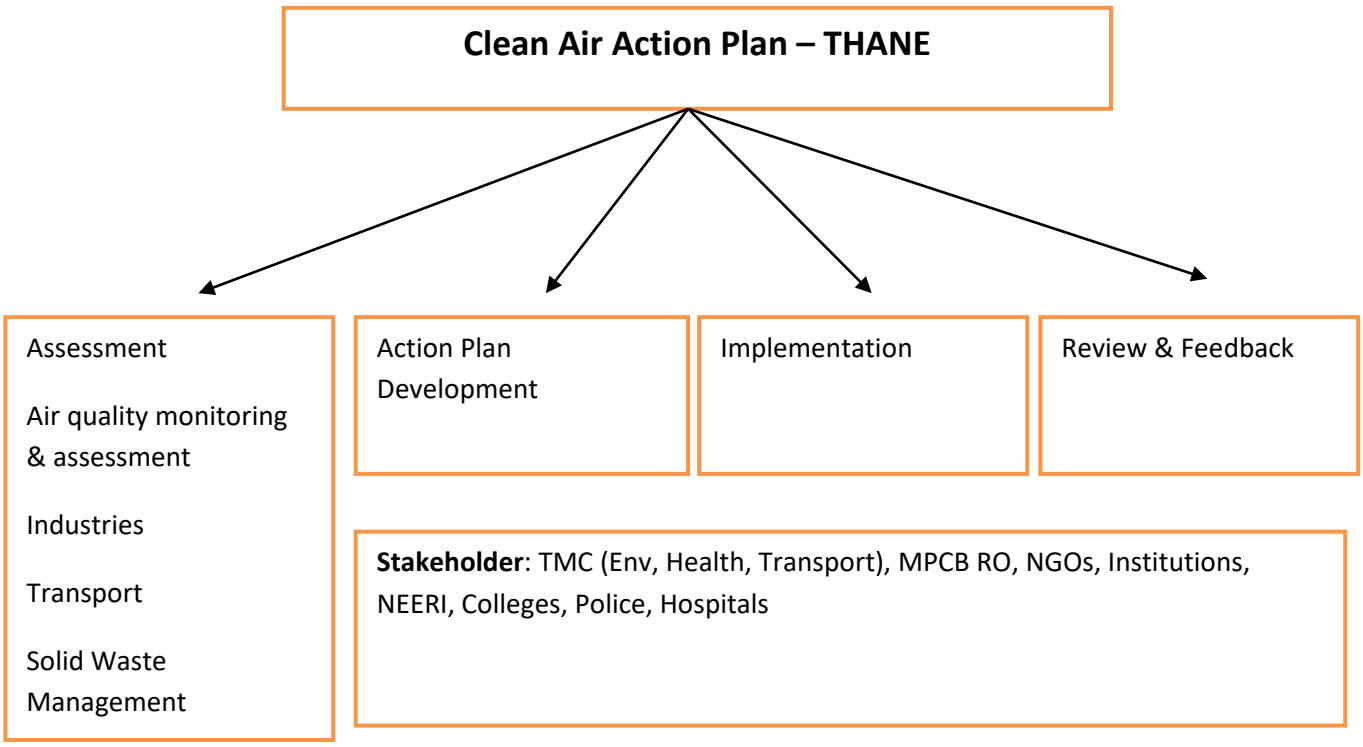

Figure 2: Developing a Clean Air Action Plan for Thane.

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INTRODUCTION TO THANE CITY :

Thane District is the largest District in Maharashtra State.Thane is the third most industrialized district in the State. The city ranks No. 16 in the country. The city is spread around 147 sq. km (50 sq. miles). Thane is adjacent to Mumbai and 2 National highways NH3 - Mumbai - Agra & NH4 - Mumbai -Bangalore pass through it.

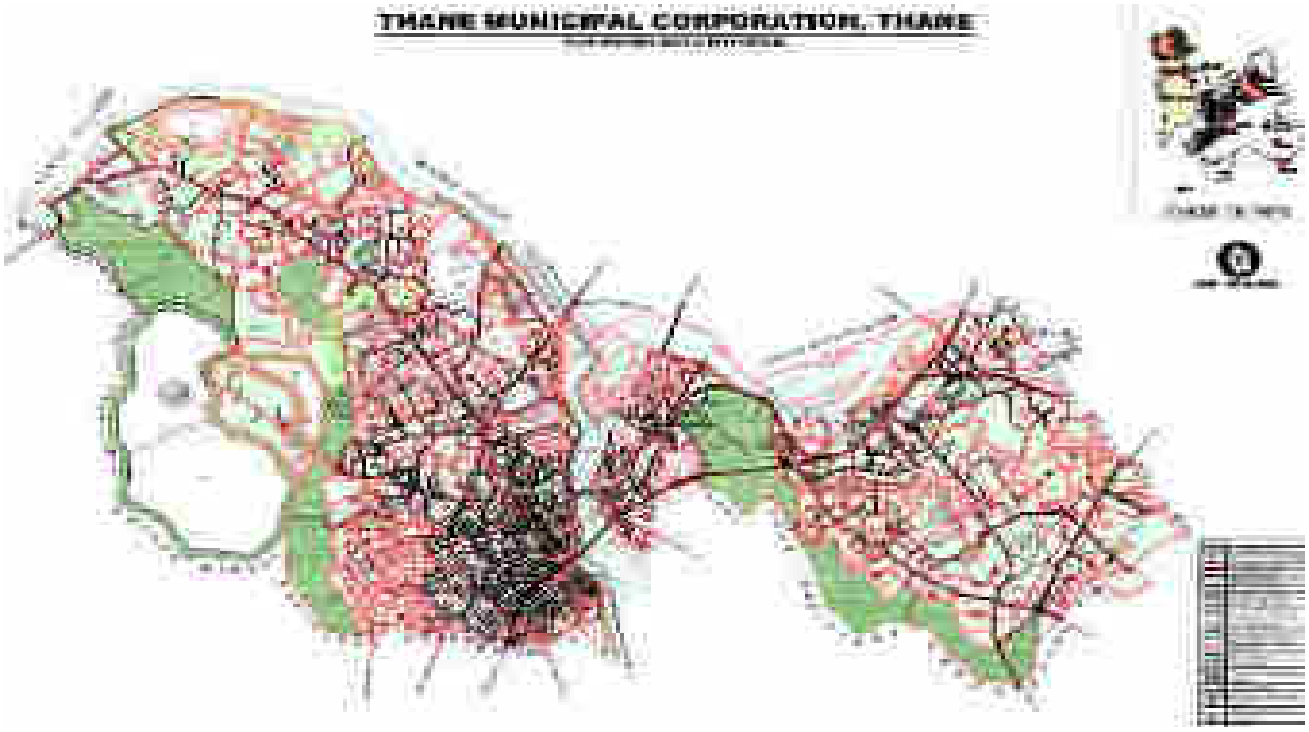

Figure 3: Location of Thane

TMC Population (2020)	Approx. 23 lakh
Vehicular Population (2020)	2217699
TMC Area	12823 H
Forest Area	H
Green Area	3211.77 H
Developable Area	50%
Weather	Hot & Humid
Humidity	14% to 95%
Wind speed	0.5 Km/hr. To 2 km/hr.
Rainfall	3793.07 mm (Year 2020)
See level	7.0 m.s.l.

LOCATION :

Thane, the second northern-most districts of Konkan, lies adjoining the Arabian Sea in the north-west Part of Maharashtra State. It extends between 18’420 and 20’200 north latitude and 72’450 and 73’480 east longitude. Its northern limits adjoin the Palghar District carved out of Thane in 2014 while the district of Nasik and Ahmednagar to its East, Pune to the South–East, Raigad to the south and Mumbai Metropolitan to the South – West.

TOPOGRAPHY :

Topographically, district can be divided into 2 parts:-

(1) In the north and Eastern Part of the district, Sahyadri ranges are spread and its north side the thick forest area is situated.

(2) The Central Region of the district is mostly flat area and Rice farming is done in this area. It’s heavily urbanized area.

WEATHER :

Weather at Thane city has been noted as hot and humid. The maximum temperatures range between 35 - 40ºC and minimum between 25 -35ºC. The maximum humidity is registered as 95% and minimum humidity at 14%. The rainfall average is also good. The city has around 2,500 to 3,000 mm of average annual rainfall. The winds at the city blow from North to South and South west at an average of around 0.5 to 5 km per hour.

Table 1: Thane basic features

S. No.	Parameter	Value
1.	Average Temp	33^0C
2.	Humidity	14% - 95%
3.	Wind speed	0.5 - 2 km/hr
4.	Rainfall	2,500 to 3,000 mm
5.	Sea level	7.0 M.S.L

DEMOGRAPHICS: Population of Thane its Growth and density

The resident population at Thane according to the 2011 census was18,18,872, with 9,66,293 males and 8,52,579 females. The population of Thane city is increasing atthe annual growth rate of 6.5% since 1951. Considering the 2001 Census the population was just12,60,000. After this the development of the city was very fast under Municipaladministration. The population has seen increase of around 44.35% today.

By 2020, the population of Thane city reached around 23 Lakhs. Withproximity to Mumbai the Thane city has attained an immense importance. Interms of development Thane city has also earned a name as an industrial city. The number of ITParks and malls is increasing. With this numerous employment opportunities are available. With addition and availability of affordable housing as well as facilities and amenities, thepopulation of the city is increasing speedily. The increase has been at the rate of 8 to 10% per year. Theaverage density of the city population has beenregistered as 14,177 per sq. km.

LAND USE, LAND USE CHANGE & FORESTRY :

Environmental quality of any urban area is affected by two main factors. One of them is the prevalent use for land for different purposes and the other, the physical infrastructure. Different land uses generate different activities resulting into mixed uses and hence chaotic situations. Land use planning has to be deliberated by the public authority for better quality of environment in terms of public health and hygiene. It is also necessary to avoid health hazards caused by mixing of contradictory land uses like residential and industrial. A careful study of the existing land use pattern is required for making any proposal in this direction.
Land use refers to man's activities on land, utilitarian in nature whereas land cover denotes the vegetation cover, water body cover and artificial constructions etc.

- Total area -12,893 H
- Developed area - 5930.23 H (46%)
- Undeveloped area - 3682 H (28.5%)
- Green zone area - 3211.77 H(25%)

Trend of land use in TMC Area

Year	No. of Projects	Plot Area (Sq.m)
2016-17	384	3377118.70
2017-18	345	3646906.53
2018-19	401	3672737.00
2019-20	366	3092649.00

TREE PLANTATION :

Out of the total area under Thane Municipal Corporation 25 % is occupied by green zone. Under Government of Maharashtra initiative of 13 Cr. tree plantation during the period from 1st July 2018 and 31st July2018, a total of 1.19 Lakh trees were planted and during2017-18, around 50,000 mangroves were planted.

Under Amrut Mission TMC has made Three Green areas

6 Lakh trees planted 2015-2018 under Van Mahotsav. Since 2019 TMC has planted 8018 trees at 87 road patches. TMC has erected 11 green canopies at Ghodbunder road. TMC is proposed erection of 13 more canopies on Main traffic corridor .TMC has created 1294 Sq.m vertical green wall at Majiwada golden dyes junction and Cadbury junction. For 2021-22 Rs. 2 Cr. Provision is made for plantation. Under Amrut mission at 3 green areas TMC has made Urban Forest by planting 31500 trees on total area 52 Acre. TMC has 106 garden which are maintain by PPP and by TMC workers. TMC has made 3 biodiversity park at Mulla baug, Dattaji Salvi Udyan & Kasarwadvli Udyan. TMC has proposed Biodiversity park (6000 Sq.m) at Kolshet and 1.5 Cr. Provision is made for 2021 - 22.

Considering the importance of environmental conservation, an ambitious program for plantation of 5Lakhs trees has been implemented by Thane Municipal Corporation. Under this scheme, local species of trees have been planted at open spaces in the city, grounds, borders of the plots, both sides of the roads, road dividers, public gardens, developers areas, private housing complexes and others. Under this and through a Tripartite agreement Mouje Shil, Mumbra and Mouje Parsik, the target of 5 lakh tree plantation was carried out successfully at Forest Department lands through Forest Development Corporation part of Forest Department with 15,000members of 35 Volunteer organizations as well as 5,000 students from schools, colleges and Scout and Guide.

TMC has 132 gardens which are maintain by PPP mode, and through TMC staff. TMC has 3 biodiversity park like Butterfly garden Mullabuag, Dattaji Salve Udyan, Kasarwadvli Udyan.

TMC has purchased tree transplantaion machine and maximum efforts are made to replant the trees instead of tree cutting.

Tree Trasnplantaion Machine of TMC

<u>GREEN CANOPIES PROJECT</u> - On demo basis TMC has made 11 tree canopies on Ghodbunder road to increase pedestrian movement to reduce air pollution.

WATER FRONT DEVELOPMENT- TMC has initiated water front development at 7 location along creek side. To improve creek ecosystem, protect mangroves, creating recreation facilities- gardens, public spaces, cycle track etc.

SOLID WASTE MANAGEMENT

Solid Waste Generation and its management :

The city generates around 950 Metric Tons of solid waste through various mediums. Around7,03,556 Kg of bio medical wastes is also generated every year.

With the increase in residential areas, businesses, marketing complexes, Malls, Hotels, Cinema theaters, Multiplexes, Private hospitals and dispensaries as well as increased construction and demolition activities, the solid waste generation within the city is also increasing in the same proportion. To undertake solid waste management of TMC for administrative purpose it has been divided city into 9 administrative wards. To undertake SWM 212 permanent workers and around 441 contract workers carry out collection of solid waste in Ghanta gadis. For collection of waste from house to house and its transportation TMC has taken 109 large and 106 small Ghanta gadis on rent basis from private contractors.

Cleaning of roads and lifting of waste on contract basis :

As the cleaning of roads at the city is a huge work and as the TMC staff is inadequate, 20 private contractors have been appointed. These contractors placed 1,645 workers on contract for this work. Out of these 1,204 workers carry out the work of cleaning 236 km of roads and 441 workers collect waste from various parts of the city on Ghanta gadis.

Waste dumping ground :

TMC does not have its own dumping ground at present. The solid waste collected from Thane city is presently being dumped at 15 Hectares of private land at Khardi. Thisis located at Khardi in Mumbra Ward with Survey Nos. 38/1, 38/2, 38/3, 38/4, 38/5, 38/6 and 38/7.

In order to store solid waste from areas other than Kalwa and Mumbra, space from C. P. Tank areais also being used. As Khardi location is far away from the city and the approach road is very narrow, the solid waste is temporarily placed at C. P. Tank area. This stored solid waste is then carried by 10 wheel dumpers to Khardi dumping ground. The quantum of solid waste carried every day from C. P. Tank to Khardi is around 700 to 750 Tons. In order to speed up the transportation process, the work on erection of a modern transfer terminal is in progress.

Solid waste processing center :

According to the Thane City Development plan three plots of land have been reserved by TMC for solid waste disposal and processing. These three plots of land are namely Mauje Bhayandarpada (Sector 6 total 8 Hectares), Mauje Shil (Sector 11 total 14.3 Hectares) and Mauje Dighar(Sector 11 total 18.89 Hectares).

In 2004, the proposal from Thane Municipal Corporation to erect Solid Waste processing Center at 18.89 Hectares of land at Survey No. 15, 16, 17 and 18 at Mauje Dighar was approved.

However the proposed project could not be erected as the local residents totally opposed the same. The work of disposal of Solid waste has been lingering since 2006. In order to bring the same on track, 'Waste to energy' project based on modern technology has been started through M/s. Thane Clean Environment Pvt. Limited.

Forest land for processing of Solid waste :

A proposal to make forest lands available for solid waste management has been submitted to Principal Secretary, Ministry of Revenue Forests, Mumbai. The proposal is for using open spaces on these lands for wastes and stone brick wastes and tree plantation thereinafter. Thane Municipal Corporation will bear all expenditure on this account and once the trees are full grown and the forestlands are developed, these will be returned to the Forest Department. Accordingly a tripartite agreement was sent to the Forest Department for final approval on the 1st June 2011. According to the same the Forest Department had asked us to receive No Objection Certificate from the Environment Department. The No Objection Certificate has since been obtained and has been submitted to the Forest Department. Once Thane Municipal Corporation is in occupation of the said land, the same is proposed to be used for disposal of solid waste.

Various processing projects according to the type of solid waste generated at the City :

Considering the delay in erection of a project for disposal of solid waste, Thane Municipal Corporation has started erection of Bio/ Vermi /Mechanical composting and bio-mechanization projects from 1 to 5 M Tons capacity in a decentralized manner. Once the processing on 100 tons of solid wastes is started during the first phase, the next project for 100 tons will be started in the second phase. Tenders have been invited for the same. The Tender process for 3 decentralized project shas also started based on Plasma technology for erection of 100 Metric Ton capacity each.

In TMC area total waste generated is 963 MTD out of which wet waste is 515 MTD and Dry waste is 423 MTD.

- There is 100% collection of waste. Segregation level is 75% and processing is 75%.
- TMC has 6 plants of composting. 70 MTD capacity
- TMC has 4 Windrow composting projects. capacity 100 MTD.
- TMC has wood waste to briquette plant of capacity 10 TPD.
- TMC has Flower waste to manure plant of capacity 3 TPD.
- TMC has 10 MRF facility and Thermocol processing plant.
- WASTE TO ENERGY PLANT at Daighar, Thane capacity – 1000 TPD will be started in 2022.
- At present TMC has made contract with agency for awareness program at school, colleges, residential areas

Proper Collection of Horticulture Waste and its disposal following composting-cum-gardening approach.

<u>Wood Waste Collection :</u>

Thane Municipal Corporation started Wood Waste to Fuel Briquettes project in Thane City. This project is basically taking care of all the Horticulture Waste, Leafy litter in the city.

Garden Department of Thane Municipal Corporation has deployed separate vehicles for collection of Garden Waste from whole city. This collected waste disposed off at the plant site for the treatment.

In the plant, collected garden waste dried, Shredded and then pressed to compact to form briquettes using compression machines. Capacity of the project is 10 TPD.

Plastic Management:

Plastic ban

Thane Municipal Corporation is organizing environmentally oriented activities in Thane city regularly and through such awareness programs, citizens are guided and informed about environmentally oriented concepts. Citizens also participate spontaneously in these activities. A plastic ban has been imposed in the state of Maharashtra by the state government. For this information to citizens about alternatives to Plastics must be provided in detail. For this many activities were planned by TMC such as Short Film Festival based on Environment message, organizing Street plays, Survey of housing societies and distribution of awards to those who did excellent work in Solid Waste Management Project, distribution of paper and cloth bags, various optional three-day workshop and exhibition on plastic alternatives to citizens, etc. All these events and awareness programs arranged by TMC has received positive response by all Thane citizens.

Single Use Plastic Free Thane Action Plan Features:

In Thane Municipal Corporation area about 963 metric tons of solid waste is generated every day through various means. About 60% of the total urban solid waste collected in the municipal area is wet waste and 40% is dry waste. Accordingly, 398 metric tons of dry waste is being generated per day in Thane Municipal Corporation area. The components of this dry waste are generally found as follows:

Plastics and Thermocol :	27. 50%
Possible recyclable components (paper, cardboard, glass, metal, e-waste, etc.):	35. 00%
Fences, wood, clothes, furniture, rubber and tires, etc.:	35. 00%
Non-Biodegradable (Inert):	2. 50%

Various projects have been started by Thane Municipal Corporation for component wise management.

As per the instructions of Hon. Commissioner, Thane Municipal Corporation, a total of 12 Material Recovery Facilities have been set up by Thane Municipal Corporation at Ward Committee level.

The Government of Maharashtra has started the implementation of single use plastic ban in the state by publishing a notification on 23rd March 2018. Accordingly, all government

agencies are informed about the effective implementation of the ban on plastics in their jurisdiction. Accordingly, vigilance teams have been set up and fines have been collected from many establishments through them.

The plastics are being collected by the Stree Mukti Sanghatana, Samarth Bharat Vyaspeeth, Bisleri Foundation for Change, Premises Bhagini Vikas Sangh and the Citizens' Association Anti-Plastic Brigade.

According to the letter received from Maharashtra Pollution Control Board for the implementation of banned plastics in Thane Municipal Corporation area by Thane Municipal Corporation, 10 action points have been mentioned. Accordingly, action plan for release of Thane Municipal Area SINGLE USE PLASTIC has been submitted with budgetary provision.

A Nuisance Detection Team has been set up under this. In this, action regarding ban on Single Use Plastic is taken with the help of tax inspectors, sub-inspectors of sanitation, health inspectors, licensing inspectors as well as pollution control inspectors is taken by Additional Commissioner, Deputy Commissioner will take weekly and necessary review of the action taken by the Nuisance detection team for continuous elimination of plastics.

Also, in order to discourage the use of plastic, a street play was organized at 60 places in Thane Municipal Corporation area regarding ban on plastic. An exhibition was held at Kala Bhavan to inform the citizens about the use and scientific disposal of plastics, and a workshop was organized for the scavengers. The public awareness program includes a number of activities such as erecting hoardings at the local level, Government Circulars, Information Sheets, informing the public about the news as well as local cable TV. Provide up-to-date information through scroll lines, create awareness based on themes based on raps, songs, slogans, etc., raise awareness about plastic ban on festivals through NGOs like Eco Club, Rotary Club, Lions Club, Inner Wheel Club, etc. Residential complexes about punitive action to be taken, distribution of leaflets in residential complexes, commercial establishments, school establishments, hospitals and health centers and hospitals etc. on which plastics citizens should not use and punitive action to be taken. Check the use of single use plastic from class monitors etc.

This will include Information Public Relations Department, Educational Institutions, and Pollution Control Room.

Also, for the disposal of plastics, Thane Municipal Corporation has set up Material Recovery facility centers at 12 places in Thane city. At the same time, awareness will be created among the citizens, various establishments and waste pickers about the disposal of plastics using the

Give your dry waste app on DG Thane. The use of recycled plastic for road construction will be indicated.

On the occasion of the anniversary on 1st October, in collaboration with the Rotary Club and Aniruddha Academy, all the lakes in the TMC area as well as the plastics in the creeks and ghats were picked up. On the same lines, in collaboration with all these social organizations (NGOs), plastics will be collected from rivers and streams in Thane Municipal Corporation area and disposed of as per ward committee rules.


लोकमत

१०० सोसायट्यांमधून केले कचऱ्याचे संकलन

Manure From Nirmalya :

Thane Municipal Corporation has been successfully conducting the project of making manure from Nirmalya (flowers used as offerings) continuously for last 3 years during Ganesh festival. The 120 ton Nirmalya collected last year was made into manure by means of scientific process. However, Nirmalya is collected at temples, cemeteries etc. in Thane city throughout the year. There are more than 100 big temples and 37 cemeteries in Thane city. All the Nirmalya from these places is carried to dumping ground by Ghantagadi or flows into creek, wells, lakes causing water pollution and disfiguring their beauty.

This year, during Ganpati Festival, Samarth Bharat Vyaspeeth, the Pollution control Cell of TMC and The Solid Waste Department with the workforce of 38 cleaning workers and 7 supervisors collected 150 ton of Nirmalya from 18 immersion ghats through 25 dumpers; and 70 ton non-degradable factors were segregated.

Nirmalya from 20 big temples and 17 cemeteries in Thane city will be collected and carried to the project site at Kopri STP. Also, 200 ton Nirmalya collected during Ganesh festival will be carried to this project site. This Nirmalya will be reduced to small pieces by shredding machine. At the same time, bio-culture will be mixed into that, which will speed up the degradation process and 3 ton Nirmalya will be converted into manure in 15 days.

Tenders will be solicited for this project. The tenure of the tender will be 5 years. It is expected that if the work of this project is allotted to a social organization it can raise awareness so as to gather at the temples the Nirmalya collected in the residential complexes in the surrounding area of the temples and this will help control the pollution of lakes to some extent.

Fuel Briquettes From Wood Waste :

Thane city is a green city. The green area of the city is around 33%. There are 4 lakh trees in the city. Wood waste is generated in large quantity in thane city. The wood waste includes the garden waste of housing societies, the uprooted trees, branches, wood, dried leaves and twigs etc. At present, this wood waste is disposed by way of land-fill. Fuel Briquette is obtained from such wood waste by scientific method. Samarth Bharat Vyaspeeth has presented a proposal to the Municipality for conducting a project for converting the wood waste into Fuel Briquette on PPP basis.

Manure is made from Nirmalya collected from temples, cemeteries, flower markets in the project erected at Kopri by Samarth Bharat Vyaspith. As an expansion of this already running project the institute has started a project for obtaining Fuel Briquette from the wood waste by scientific method.

The capacity of this project will be 10 ton per day and the tenure for the appointed institute for conducting this project will be 10 years. Thane Municipality has provided a plot of about 20,000 sq.ft. to the said institute free of cost and will take to the project site 10 tone wood waste that is required every day to obtain Fuel Briquette. Similarly, TMC will have to provide for sewerage connection, toilet facility, electricity, water connection and the payment of their bills.

This institute will give the municipality 1 ton Fuel Briquette every day free of cost after the plant has been fully operative. TMC can use this Fuel Briquette for anything. The capital and revenue costs (excluding electricity and water bills) will be borne by the said institute. By this the wood waste will be disposed scientifically. This project was made operative in March 2016.

Scientific Disposal of E-waste :

E-waste means electrical and electronic waste. With the increasing urbanization the e-waste is also increasing. It includes computer, printer, C.D., television set, washing machine, mobile, A.C., typewriter, Zerox machine, telephone etc. Normally, computers and mobiles are used for 3 to 5 years and after that they are thrown into waste. These electrical and electronic articles have good quantity of valuable metals such as lead, cadmium, copper, zinc etc. Hence, the informal sector disposes these articles in large quantity. This disposal includes melting the articles in acid, burning them etc. These processes not only cause pollution in great degree, but also harm human health.

Under this project the e-waste generated in the TMC area will be scientifically disposed by M/s Ecorecycling Pvt. Ltd., on PPP basis. For this project TMC will make available to the said institute its own plots of 10 sq.ft. each at 100 places, free of cost for 5 years, to put up a certain type of container. For this, the institute, will give profit share to TMC by scientifically disposing the e-waste.

The e-waste collection centres will be made available at the following places.

- TMC headquarter, Panchpakhadi, Thane.
- Naupada Ward Committee, Naupada, Thane.
- Uthalsar Ward Committee, Uthalsar, Thane.
- Rayaladevi/Wagle Ward Committee,
- Wagle Estate, Thane.
- Lokmanya Nagar/ Vartak Nagar Ward Committee, Vartak Nagar, Thane.
- Majivada Ward Committee, Majivada, Thane.
- Kopri Ward Committee, Kopri, Thane.
- Kalwa Ward Committee, Kalwa, Thane.
- KalwaChhatrapatiShivajiMaharaj Hospital, Thane.
- Mumbra Ward Committee, Mumbra, Thane.

Collection, Transport and Recycling of Construction and Demolition Waste Material Generated in Thane City :

Construction and demolition waste material mainly include debris and broken pieces of stones and bricks. All this waste is thrown into river and water bodies, on roadsides and in the bushes and thickets. This affects the natural resources, acqatic life and biodiversity. In Thane city such waste is often dumped on the shore of the creek, in public places and on roadsides. This affects the environment of the city and its cleanliness. At present, contractors are appointed by builders to dispose such waste. These contractors separate the material that has saleable value and throw away the remaining waste, such as broken bricks, RCC chamber cement after removing iron/steel rods from it and lime etc. About 100 tons of such waste is generated every day in Thane city.

A project for the collection, transport and reuse of the construction and demolition waste material generated in Thane city has been proposed to be undertaken on PPP basis through tender system. This project will be of the capacity of 300 ton per day. A 5 acre

plot will be provided for this project by TMC free of cost. The tenure of this project will be 20 years.

Useful by-products can be produced by collecting, transporting and recycling the construction and demolition waste, e.g. paver blocks, concrete blocks, RMC tiles etc. The PPP partner will earn income through the sale of such products.

Dry Waste Collection Centre :

700 metric ton urban solid waste is generated every day in TMC. As the city is developing rapidly, the number of residential complexes, commercial complexes, malls, hotels, multiplexes etc. is also increasing. Generally, the urban solid waste includes 40% of wet waste and 60% of dry waste, which contain paper, plastic, glass, metal pieces, wood etc. As per the Urban Solid Waste Rule 2016, it is mandatory to segregate wet and dry waste and the dry waste should be disposed in a scientific manner for the conservation of environment. Therefore, TMC has started the work of segregation of wet and dry waste. The work of collection of dry waste from societies has been started on experimental basis in three ward committees i.e. Vartak Nagar, Majiwada and Uthalsar. Similarly, TMC has also taken steps towards raising public awareness and setting up Dry Waste Collection Centre on PPP basis.

Under this project a place of 10,000 to 15,000 sq.ft. will be provided and a shed will be put up. The appointed organization will raise public awareness in the societies. With the help of rag-picker women it will collect dry waste, segregate it and sell it to other organization. This will reduce TMC’s burden of transport of waste and will help the waste pickers.

Thermocol Recycling:

TMC has taken action to set up a project of recycling of thermocol by using scientific method for its reuse. The project will be of the annual average capacity of 1 ton/per day and will be run on PPP basis. This will reduce pollution caused by thermocol thrown on dumping ground. This project is running at TMC's Waste Segregation Centre, CP Talao.

Bio-Methanisation Plantat Chhatrapati Shivaji Hospital, Kalwa:

A project of capacity of 25 ton/per day for Bio-CNG generation from hotel waste has been set up in the premises of Chhatrapati Shivaji Maharaj Hospital by TMC in association with Prerana Bahuddeshiya Sanstha. Prerana Sanstha is a registered social

organization. 3 sub-institutes of this organization have obtained international patent in this field.

The Solid Waste Management Department of TMC collect the wet waste generated in hotels, restaurants, ceremony halls, inns, hostels messes and fruit and vegetable markets; and make that available at the project plant for processing. The fuel generated from this project will be supplied to Chhatrapati Shivaji Maharaj Hospital and Thane Municipal Transport service. 1500 m^3 biogas, 650 kilo Bio-CNG and manure will be produced every day. The project tenure will be 20 years.

A concession of 5% has been announced in Property tax for housing societies and establishments implementing the concepts of separation of wastes to reduce waste as well as reuse and recycle the waste (3R).

Biomedical waste:

On behalf of Thane Municipal Corporation, around 1,982 medical establishments have been registered charging a fee. Each of these medical establishments has been provided an independent Bar Code. the vehicles that carry the bio medical waste have been fitted with GPS Vehicle Tracking System. The biomedical waste generated at these establishments was around7,03,556 Kg during January 2019 to December2019.

Scientific disposal process for Bio-medical waste:

1. Infectious waste (human body organs)materials coming in contact with internal liquids(such as bandage, cotton, plaster etc), animals used in experiments are completely burnt in an incinerator machine at a temperature of 850^{o}C resulting in ash.

2. Plastic (Saline bottles, tubes, syringesetc) waste is processed in Autoclave and disinfected through vapor. After this the material is broken into pieces. Further the same is processed to produce plastic granules.

3. The waste apart from this such as glass and needles are processed chemically and then the waste is sent for further reprocessing. The entire waste is scientifically disposed off at this center. Around 2 acres of land has been offered for setting up this center at Dighar. From the next financial year the center will start functioning at this new location with higher capacity machines and in accordance with the newly promulgated 2016provisions under Bio medical solid waste regulations.

Capital expenditure on Solid waste Management:

Thane Municipal Corporation is striving on all counts for scientific management of sewerage water and urban wastes. In Thane Municipal Corporation Budget 2016-17, there was a provision of 19.70% of the total capital expenditure for sewerage water and solid waste management. Compared to previous year budget, provision of 21% for the year 2017-18 of the total capital expenditure has been reserved for sewerage water and solid waste management.

Fine for dumping waste at public places:

Thane Municipal Corporation has decided the list of fines for dumping wastes at public places and making the area dirty and unclean. The concerned Byelaws have been submitted to the Government for approval. The list is as given in table 3.

Table 3: Penalties for public for littering and waste dumping

Details	Fine (In Rupees)
Spitting	250
Public spit	100
Bathing in public spaces	100
Immerse urine in public places	150
Feeding animals and animals in public places	500
To sit in the front of the road	150
Commercial vehicles wash along the road	1000
Wash clothes and pots along the road	100
Unhygienic premises and residence	10,000
Fix buildings drinking water pipeline Leakage and therefore trouble notice to others if not repaired within 10 days	10,000

Source : Solid Waste Management Department, TMC

MRF Center, TMC

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Composting Unit, TMC

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ROADS, VEHICLES& TANSPORT

Roads

Considering the increasing development and population, the stress on the roads is increasing. The stress is causing potholes and sinking of the roads. There is a possibility of accidents due to bad roads. In order to reduce the expenditure on repairs of the roads TMC has started construction of concrete roads.

The city has 14 main roads with a total road length of 370 km out of which Concrete /UTWT road length is 160 km. Area of the roads is 30.76Hectares which has increased to 58.3 Hectares after road widening.

Total road length 370 km

Concrete /UTWT road 160 km

To maintain pothole free roads for free flow of traffic from June- September (Cold mix pot prêt /Jet patching, Paver block, Rich concrete M60 are utilized. Scrapping and leveling of roads is a continuous process. During summers WBM is made use of off.

Road Widening

TMC has implemented >70% of Mobility plan under IMP and balance work will be completed up to 2022. According to **Thane Integrated Mobility Plan** in the Short term missing links and widening of 93 roads, vehicular subways on 2 roads, Railway over bridges on 4 roads would be taken up

Medium term would include missing links and widening of 21 roads, vehicular grade separators on 4 roads, vehicular subways on 1 road and Railway over bridges on 1 road.

City Engineer in July highlighted that more than 50% of the work has been completed with funds from Thane Smart City Corporation Ltd. (details of completed work in the annexure)

- TMC has made multi level car parking facility at GaondeviMaidan (Under ground) , Jupiter Hospital, Ashar Complex and Kacharali lake of capacity 910/4W, 170/2W and 150 3W.
- TMC has given 200 jammer to police to prohibit illegal parking. Penalty of Rs. 200/- for wrong parking and tow away charges collected by police.
- TMC has planned on Street parking policy for which TMC has indentified 177 roads in 9 wards.
- TMC has planned on Street parking policy as under.

- TMC in co – ordination with RTO managing parking plots for luxury buses, School buses
- At present there are 756729 diesel, 1418107 petrol, 5682 LPG, 96195 CGN, 685 battery operated vehicles.
- TMC has 200 Buses and 100 office vehicles which run on diesel.
- TMC has initiated pedestrian pathway project. The total length is 12 km and cost 21.59 Cr. The work will be completed December 2021. Balance 40 km pedestrian pathway proposal is in process.
- TMC has initiated Station Area Traffic Improvement Project 2 (SATIS) to decongest east side of Thane railway station by 2021.
    - Thane railway station suffer from acute congestion as 6.5 lakh commuters daily use it. TMC has initiated new station in between Thane and Mulund, (Mental hospital) for which MOU is made and compound wall panel construction is in progress.
    - Metro work is initiated in Thane city of total length 29 Km of cost 7215 Cr. The project is jointly implementing by State Government and Central Government. Solar panels will be installed on roof which will provide electricity to project.
    - TMC has initiated in 2018 Coo Rides public cycle sharing project under which 52 stops each with 15 bicycle which operated. on mobile app. Up till now 1.5 lakh rides made.

ANNEXURE -

Traffic Congestion Points and Plan for Decongestion

(City Engineer – Mobility Projects)

Sr.No	Component	Details	Completed	In Process	Planned
1	Intersection Geometric Improvements	Khopat Jn.,	Y		
2		Sathe Chowk,		Y	
3		Kalwa Jn.,	Y		
4		Wagle Industrial Estate		Y	
5	Flyovers/Interchanges	SL to SL Flyovers on EEH,		Y	
6		Tembhi Naka,		Y	
7		Mumbra,	-		
8		Bypass junction	Y		
9	Flyovers/Interchanges by other Dept. organisations	Golden Dyes,	Y		
10		Majiwada,	Y		
11		Kapurbawdi,	Y		
12		Tulsidham,	N		
13		Waghbil Naka,	—		
14		Manpada,	Y		
15		Patlipada,	Y		
16		[illegible] Chowk,	Y		
17		[illegible]			
18		Teen Petrol Pump,	Y		
19		[illegible] Thackeray Chowk	Y		
20	Pedestrian Subways at Intersections	Majiwada, [illegible]		Y	
21	Pedestrian FOBs	1.Shivaji Hospital Junction,	Y		
22	Skywalks	Thane West,	Y		
23	Skywalks	Thane East	Y		
24	Removal of Footpath Encroachments/Repairs		Y	Y	Y

25	Construction of Footpath (avg. 2m wide)		Y	Y	Y
26	Bus Fleet Procurement				
27	Multi-storeyed Parking Structures	Near Gadkari,	Y		
28		Near Upvan Lake,	N		
29		Thane East	N		
30	Widening and Concretisation of Existing Roads				
31	Metro/Mono Rail Corridor	Thane-Bhiwandi-KlayanDombivali (M11/M12)	Y	Y	Y
32	Truck Terminal	Near Boundary of TMC,	Y		
33		Near Thane-Ghodbunder Road			
34	ROB/RUB	ROB near Thane Rly. Station,		Y	
35		ROB Near Diva		Y	
36	Construction of Missing Links/Bridges (Priority II)			Y	Y
37	Enhancement of Sub-Urban Services on Diva-Vasai Suburban line			Y	
38	Flyovers/Interchanges	Shil Phata Junction,		Y	
39		KlayanPhata Junction		Y	
40					
41	Widening and Concretisation of Existing Roads		Y	Y	Y
42	Metro/Mono Rail Corridor	Ghatkopar-Mulund-Thane(M5)		Y	
43		Thane-Ghodbunder-Dahisar(M13)		Y	Y
44	SATIS for Mumbra, Diva and Kalwa Stations				Y
45	Bus Fleet Procurement		Y		
46	[illegible]	Near Dativali			
47	Widening and Concretisation of Existing Roads (Intermittent)			Y	Y

It is a part of TMC initiative. Under Smart City project TMC has planned.

Intelligent Transport System: KPMG

Key Features/Components:

- **Establish a Central Control Centre (CCC)** – for monitoring the fleet and carrying out reporting and other operational activities. To include full hardware and networking supply and setup and manpower supply for operations.
- **Setup a Cloud Based DC** – the entire solution would be cloud based
- **Automatic Vehicle Locator System (AVLS)** – at any point the bus location will be traceable on a GIS map
- **Passenger Information System (PIS)** – Passengers at bus-stops will be able to see in display boards ETA of different buses. In bus passenger will be able to see next bus stop, ETA. In exceptional scenario, emergency messages can be broadcast in bus.
- **Vehicle Health Monitoring (VHMD)** – Vehicle health in terms of various parameters such as fuel level, ignition on/off, rpm, coolant level etc. will be tracked real time and any exceptional condition will trigger alerts to the control room.
- **Fleet Management** – Route assignment to buses, driver assignments to buses, schedule etc. will be managed through the fleet management module of the web application.
- **Mobile App** – The "Where is my TMT bus now" mobile app will enable passengers to track his/her expected bus real time on maps, plan trips between two locations and share feedback with TMT.
- **Alerts** – Any exceptional condition in AVLS, PIS, VHMD will trigger alerts to relevant stakeholders. Panic button press will send alert to command center.
- **Reporting & MIS** – Various reports will enable monitoring of fleet and operational matters and also enable future decision making. Examples – driver scorecard, trip report, bus fault summary, fuel consumption report etc.

This project is implemented at a cost of Rs 4 crores for a period of 3 years project completion due by 2020.

Overall Progress:

- Detailed physical mapping is done for all routes and bus stops, ensuring precise recording of GPS coordinates to ensure aspects like tracking, geo-fencing etc.
- Complete master data entry is carried out, including fleet, human resource, routes and schedule data.
- Web and mobile applications are developed
- GPS devices are installed on all JNNURM 1 buses
- Special mounts are designed for installing the TV screens at bus stops. These included a provision for securing with a padlock.
- Central control centre is setup using modern equipment and connectivity.
- A special mobile app is created for TMTU controllers, to enable them to input any route change information via mobile devices connected to the CCC.
- Pilot is carried out on select buses and routes
- ITS solution is rolled out across the fleet and the citizen facing app is launched on the Google Play Store
- Buses are being monitored on a real time basis by CCC operators post go-live
- IOS app id developed and under testing
- LED Display PIS boards are installed at three bus depots

Parking Policy :

TMC has made multi level car parking facility at GaondeviMaidan (Under ground) , Jupiter Hospital, Ashar Complex and Kacharali lake of capacity 910/4W, 170/2W and 150 3W.

Table 4 :Parking policy of TMC

Sr. No	Name of Word	Total no. Of Roads	Total no. Of Vehicles
1	Kalwa ward office	10	764
2	Kopri Ward Office	20	674
3	MajiwadaManpada Ward Office	13	376
4	Mumbra Wad Office	19	1347
5	Naupada Ward Office	24	1805
6	Railadevi Ward Office	34	2081
7	Uthalser Ward Office	26	1298
8	Vartak Nagar Ward Office	26	1127
9	Wagle Ward Office	5	383
	Total	**177**	**9855**

Underground Parking at GaondeviMaidan

Salient features

- Total construction area of parking is 4220 square meters.
- Parking for 120 No. 4 wheelers
- Parking for 130 No. 2 wheelers

Thane railway station is the most congested area in thane and having hardly any space for parking. It was necessary to have a car park in the vicinity of the railway station therefore it is proposed to construct the parking plaza for Two wheeler and four wheeler at Gaondevimaidan.The provision for parking would be underground.

Status:GAD has been approved Fire NOC has been obtained. Soil Investigation has been completed. Third party Design Proof checking is in progress.

VEHICLES

At present there are 756729 diesel, 1418107 petrol, 5682 LPG, 96195 CGN, 685 battery operated vehicles.

• TMC has 200 Buses which run on diesel for which Retrofitting of Particulate filter is proposed. (Rs. 75,000/-@1V)

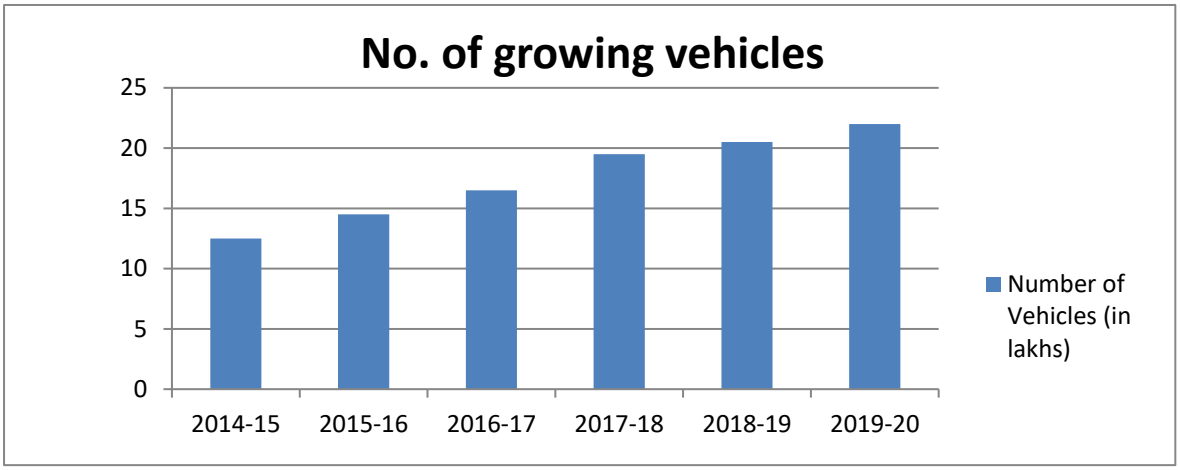

Figure 4: Growth of Vehicles in Thane city

Table 6 : Regional vehicle number in Thane city 31 March 2018

Regional Vehicle No. 2019-2020 in Thane City

Sr. no.	Category	M.V. Population as on 31.03.2019 vehicles	No. of Vehicles New Registration & RMS (1.4.2019 to 31.3.2020)			Incoming Vehicles (1.4.2019 to 31.3.2020)			Outgoing Vehicles (1.4.2019 to 31.3.2020)				Cancellation Registration Scraped, etc. (1.4.2019 to 31.3.2020)	Motor No. Population as 31.3.2020(3+6+9-13-14)
			New Vehicle	RMI Other State Vehicles	Total (4+5)	Within Region	Other Region	Total (7+8)	Within Region	Other Region	Other State	Total (10+11+12)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Motor Cycles	945717	72901	20	72921	1746	2323	4069	5454	4952	296	10702	125	1011880
2	Scooters	258226	13		13	15	25	40	848	125	1	974	20	257285
3	Moped	13240	419	1	420	12	2	14	15	10	115	140	0	13534
	Total of 2 Wheelers	**1217183**	**73333**	**21**	**73354**	**1773**	**2350**	**4123**	**6317**	**5087**	**412**	**118116**	**145**	**1282699**
4	Motor Cars	450255	14250	15	14265	109	144	253	1295	13263	498	15056	10	449707
5	Jeeps	45512	0	0	0	0	0	0	0	0	0	0	0	45512
6	Station Wagons	5469	0	0	0	0	0	0	0	0	0	0	0	5469
	Taxi Cabs	0	0	0	0	0	0	0	0	0	0	0	0	0
7 (a)	Meter fitted	2389	12	0	12	0	0	0	0	0	0	0	0	2401

Sr. no.	Category	M.V. Population as on 31.03.2019 vehicles	No. of Vehicles New Registration & RMS (1.4.2019 to 31.3.2020)			Incoming Vehicles (1.4.2019 to 31.3.2020)			Outgoing Vehicles (1.4.2019 to 31.3.2020)				Cancellation Registration Scraped, etc. (1.4.2019 to 31.3.2020)	Motor No. Population as 31.3.2020(3+6+9-13-14)
			New Vehicle	RMI Other State Vehicles	Total (4+5)	Within Region	Other Region	Total (7+8)	Within Region	Other Region	Other State	Total (10+11+12)		
7 (b)	Tourist cabs	34460	1162	0	1162	8	5	13	343	362	370	1075	2	34558
8	Auto Rickshaws	118419	6622	0	6622	0	0	0	0	0	0	0	2	125039
9	Stage Carriages	1042	48	0	48	0	0	0	0	0	0	0	0	1088
10	Cont. Carri. Minibus	12571	511	0	511	5	5	10	391	405	68	864	0	12228
11	School Buses	1332	199	0	199	0	0	0	0	0	0	0	0	1531
12	Pvt. Service Vehicles	1878	11	0	11	0	0	0	0	0	0	0	0	1889
13	Ambulance	1795	91	0	91	0	0	0	22	14	8	44	0	1842
14	Arti. & Multi. Veh.	10684	49	1	50	0	0	0	0	0	0	0	0	10734
15	Trucks & Lorries	77696	4213	23	4236	595	489	1084	428	587	679	1694	10	81312
16	Tankers	11309	139	0	139	0	0	0	0	0	0	0	0	11448
17	Delivery Van (4. Whl.)	72249	2829	3	2832	0	0	0	0	0	0	0	0	75081
18	Delivery Van (3. Whl.)	59358	1213	0	1213	17	12	29	0	0	0	0	0	60600
19	Tractors	1800	136	0	136	0	0	0	0	0	0	0	0	1936
20	Trailors	8879	93	0	93	0	0	0	0	0	0	0	0	8972
21	Others	3787	299	14	313	74	56	130	425	135	12	572	5	3653
	Total	**2138067**	**105208**	**77**	**105285**	**2581**	**3061**	**5642**	**9221**	**19853**	**2047**	**31121**	**174**	**2217699**

(Source: RTO, TMC)

With the urbanization of Thane city, the increasing use of vehicles can be seen. Thane Municipal Corporation is making efforts to use maximum public services. Innovative initiatives like Green Energy Vehicles, Intelligent Transport System, Sustainable Electric Mobility Ecosystem, and Coo Rides are also being implemented in Thane. This will help reduce the use of petrol and diesel vehicles and improve the environment.

TMC has initiated in 2018 **Coo Rides** public cycle sharing project under which 52 stops each with 15 bicycle which operated. on mobile app. Up till now 1.5 lakh rides made.

Present Status of Transport at Thane city

The citizens from Thane city utilize public transport facilities such as TMT Buses and Rickshaws. Private vehicles are also used for travel. As the State Transport Service is regularly available from the city to far off cities in the State such as Khed, Ratnagiri, Sindhudurg, Pune, Nashik, Aurangabad, Jalgaonand others as well as nearer locations such as Bhayandar, Vasai, Nalasopara, Virar, Bhiwandi, Kalyan, Panvel and others, the citizens accrue the benefits of these services.

Thane Municipal Transport (TMT)

Thane Municipal Transport (TMT) service, fully owned by Thane Municipal Corporation started

on the 9th February 1989. Presently the TMT Service has a fleet of 472 Buses, with 369 Diesel and 103 CNG buses. There are 96 routes for TMT buses leading to locations within the city and outside the city such as Dombivali, Vashi, Panvel, Bhayander, Mira Road and others. The total length of TMT bus routes is around 300 Km. Around 2,37,324 commuters use the services from TMT. TMT service is provided through 2,077 employees. There are four TMT Bus Depots at Kalwa, Wagle Estate, Anandnagar and Mullabaug.

There are **13 CNG filling (vehicle) Stations** in Thane city

Table7: Information about TMT service

Information about Thane Municipal Corporation bus service

No.	Details	Year2017-2018	Year2018-2019	Year 2019-2020
1	Bus number	472	467	517
2	Number of bus depots	4	4	4
3	Bus route	96	102	102
4	Number of passengers per day	2,37,324	1,76,683	2,08,637
5	Per bus per day	199	202	191
6	Total daily diesel (liters)	6429	6083	6773
7	Number of buses running on diesel	369	364	414
8	CNG Number of buses running on top	103	103	103
9	Total staff	2077	1998	1922
10	Accidents throughout the year	21	58	65
11	Total death due to accident	-	1	3

Source: Thane Municipal Transportation Service

- At present TMC has 1 electric bus, 2 electric cars and 2 electric scooter. 2 Charging station facility are available is HQ.
- For Charging stations TMC has made MoU with Mahindra & Mahindra for 4 wheeler.
- For Charging stations TMC has made MoU with Kinetic for 2&3 wheeler.
- TMC has proposed vehicle charging station at Anand Nagar depot .
- TMC has submitted proposal to MMRDA for 100 Electric Buses on PPP basis. Follow up is in progress.
- Separate budgetary Head is made for next financial year.
- TMC has made solar city activity center at School for awareness in Energy Efficiency using various models.
- TMC has submitted proposal to MOHOA for 200 buses on sharing buses in Dec 2020.

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TMC INITIATIVE

New suburban railway station

About 90% of the city has evolved around the four key railway stations (Thane, Kalwa, Mumbra and Diva) of Thane city. About 65% of the city's population is served by Thane railway station. However, the railway station suffers from acute congestion, being the busiest railway station in region with over 6.5 lakh commuters daily. Thane Municipal Corporation has proposed an additional railway station between thane and Mulund keeping in view the ever increasing passenger traffic at thane Railway Station.

Project features

- This Station will be constructed between Mulund and Thane.
- 14.73 acre of land is allocated for the new station situated at the Mental Hospital premises
- All facilities for passengers including parking and bus terminus will be available
- Will reduce passenger load on Thane and Mulund by 31% and 24% respectively.

The construction has been divided in to two components:

- 'Operating Area' will be constructed by Central Railways
- 'Circulating Area' will be constructed by Thane Smart City Limited
- For **Operating area,** an amount of Rs. 120 crores will be deposited in regular installments to Central Railways

The components of 'Circulating Area' are:

- Elevated structure for connectivity to the service road
- Development & strengthening of DP roads, circulation roads etc. (except area for proposed Metro)
- Shifting of HT cables and electrification of circulating area.
- Provision for water supply and drainage.
- Maintenance for one year after completion of work, security and cleaning.

Status:MOU shared with central railways and Soil Testing –Bore Log data collection has been completed. Compound wall panel construction is in progress.

Multi – modal Transit Hub at existing railway station

90% of the urban sprawl has evolved around the four key railway stations (Thane, Kalwa, Mumbra and Diva) of thane city. About 65% of the city's population is served by Thane railway station however, the railway station suffers from acute congestion, being the busiest railway station in region with over 6.5 lakh commuters daily. Thane Municipal Corporation had earlier developed a solution for the dispersal of traffic on the western side of Thane railway station. This project was undertaken under the station area traffic improvement scheme (SATIS) and it won an award by MOUDfor the same. The project involved an elevated deck and flyovers which would separate the city buses from remaining traffic and thereby improve traffic conditions. This also included design for an IPT (Intermediate Public transport) Stand beneath the deck. However, the increasing traffic has outstripped this facility. To improve mobility around the station area, Thane Smart City is working with the Traffic police and Indian railways to ensure the successful implementation of a multimodal facility on the eastern exit of thane Station.

- Creation of deck area of about 10,000 sq. m. outside the railway station
- The deck area for interchange of public transport and other commuter facilities Viz. Food Courts, Commodity vendors, parking facility etc.
- Construction of circular elevated road link of 3 kms between Eastern Express Highway and Thane Railway Station (East)
- Potential Sources of Revenue can be ticket sales, commercial lease rent and advertising
- Funding: Cost Sharing is being explored between Central Railways and TMC

Status:GAD for the Phase-1 has been approved .IRSDC has in-principally approved for the construction of deck area. MOU has been shared with IRSDC and Soil Testing –Bore Log data collection has been completed.

Proposed Metro Plan of Thane City

Metro Rail Standard Gauge: 1435 mm

Table 8: Metro Line length

Ringroute Track	Advanced Km	Underground Km	Total length Km
Proposed Thane to New Thane (Circular Route)	26	3	29

Table 9: Estimated number of passengers using the metro

Year	Passenger traffic per hour during peak rush hour	Number of commuters using metro per day (in Lakh)
2025	23320	5.76
2035	29489	7.61
2045	31393	8.72

Integrated traffic planning

PRTS, Feeder bus services, Public bicycle sharing, Parking and pedestrian facilities etc.

Table 10: Metro Navigation Planning

Ringroute Track	Matters	2025	2035	2045	2050
Proposed new Thane to New Thane (Circular Route) Dongripada to Thane via Junction	Car / Train	3.6	3.6	3.6	6
	Trains / Hour	16 (12,4)	16 (5,11)	18 (3,15)	18
	Capacity of 6 passengers / Per Sq/m	15464	21134	25902	28332
	Capacity of 8 passengers / Per Sq/m	19684	26887	32949	36036
	The highest passenger traffic expected per hour is planned.	15000	21000	26000	28000

Speed according to metro rail planning :

Table 11: Other technical information

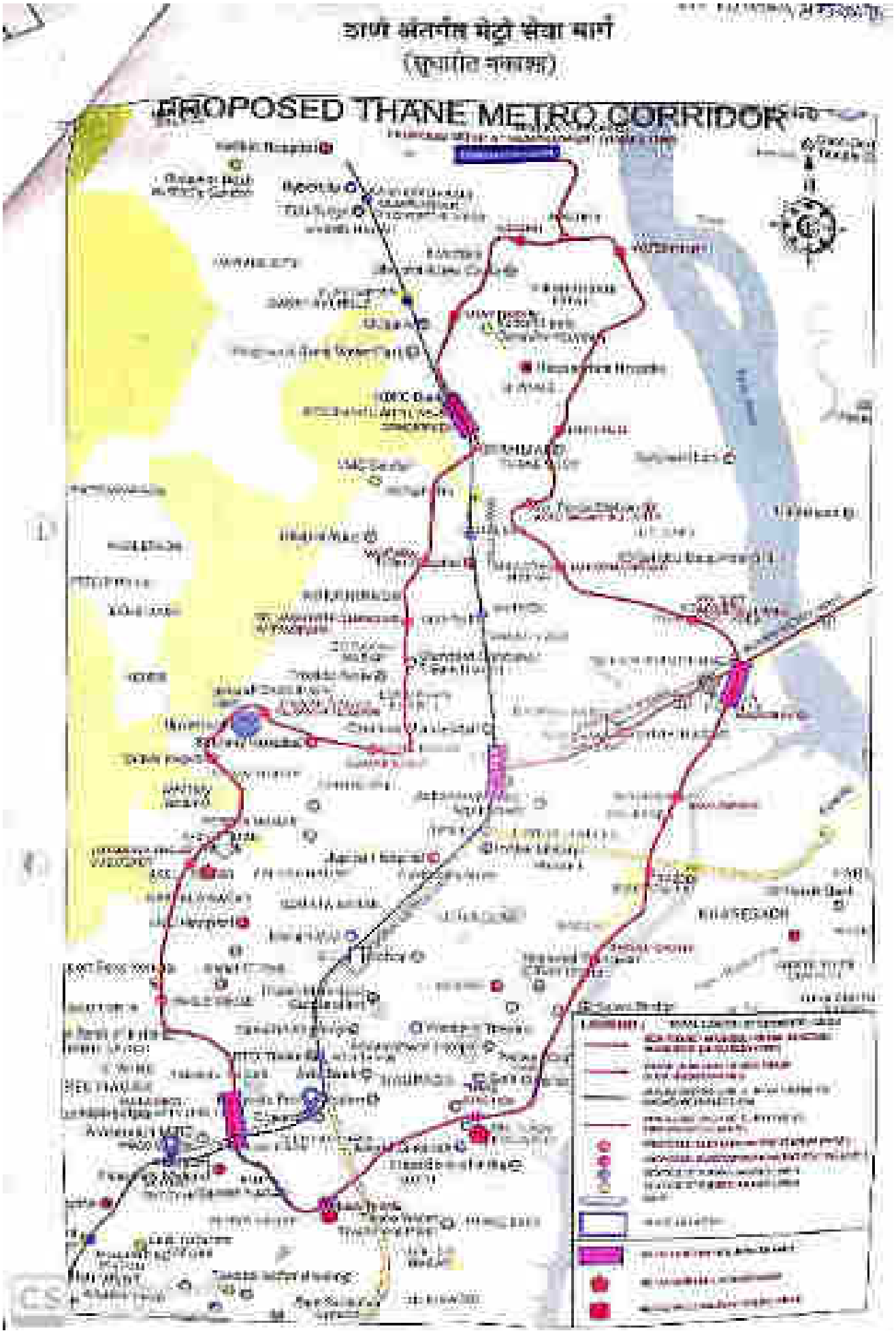
Sr.No		Dimension
1.	Gauge	1435 MM
2.	Speed as planned	80km/per hour
3.	Maximum axle load	16 M.ton

Carshed (Depot)

18 Hectare space for maintenance facility at Kasarvadavali depot.

Security Measures:

An effective system will be created under the provisions of the Disaster Management act. Security measures like CCTV cameras, luggage scanners, metal detectors, bomb detection devices, wireless sets, etc. will be in the metro station.


ठाणे अंतर्गत मेट्रो सेवा मार्ग
PROPOSED THANE METRO CORRIDOR

AIR QUALITY

Air Quality of Thane City

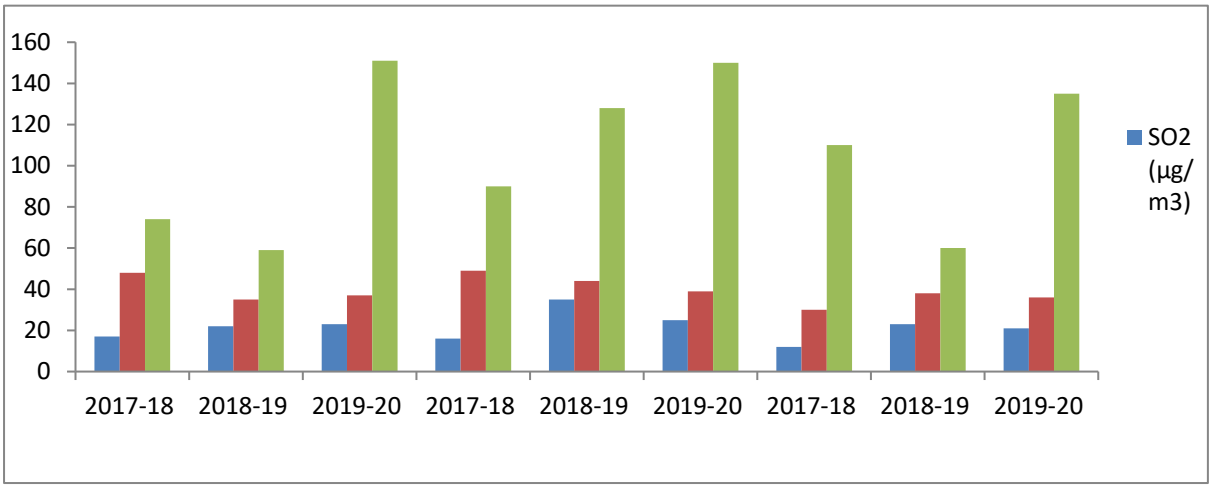
Air quality in Thane is monitored at 3 locations namely Kopari (residential), Shahu (residential) and Raptakos (Industrial) twice in a week.

Table 12: Air Quality Monitoring in Thane

Stations > Information⇓	Kopari	Shahu	Raptakos
Station Code	303	304	305
Locations	19°10'59.03" N, 72°58'33.24" E	19°11'17.67" N, 72°58'03.80" E	19°12'42.08" N, 72°57'32.80" E
Category	Residential area.	Residential area.	Industrial & some residential construction
Pollution Source	Vehicular pollution.	Vehicular & commercial emission.	Vehicular & Industrial emission.
Parameters Monitored	SO2, NOx & RSPM (PM10).	SO2, NOx & RSPM (PM10).	SO2, NOx & RSPM (PM10).
Sampling Days	52 Samples/6 months, 104 Sample/year	52 Samples/6 months, 104 Sample/year	52 Samples/6 months, 104 Sample/year
Frequency	Twice a week (Fri & Sat)	Twice a week. (Mon & Tue)	Twice a week. (Wed & Thu)

Table 13: Results of Air Quality Monitoring in Thane

Place	Kopri			Shahu Market			Reptakos Brett & Co.			Limits ($\mu g/m^3$)
Year / Pollutant	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20	
SO_2 ($\mu g/m^3$)	17	22	23	16	35	25	12	23	21	**50**
NO_X ($\mu g/m^3$)	48	35	37	49	44	39	30	38	36	**40**
RSPM($\mu g/m^3$)	74	59	151	90	128	150	110	60	135	**60**
AQI	74	59	**134**	90	119	133	107	60	123	



Conclusion:

The RSPM component has been temporarily increased due to various constructions such as construction of Thane Municipal Corporation bridges, foot over bridge, metro work, laying of sewerage in various chowks.

Air pollution is increasing due to increasing urbanization and the number of vehicles. Measures such as road widening, construction of flyovers and tree planting are being implemented by the municipality to reduce air pollution, as well as regular vehicle PUC checks, use of clean fuel in vehicles, awareness to prevent the engine of the vehicle does not run on the signal. Thane Municipal Corporation has developed app with the help of DRP Global Technology to check air quality. The Municipal Corporation monitors the air quality in various residential, commercial, industrial zones and various junctions in the city.

TMC has also observed the air quality in Thane at different places and in different climatic conditions. The results of the current air quality have also been compared with the results of the previous air pollution index. Air quality is also checked during the festival to understand the sudden temporary effect of such activities on air quality. E.g. Diwali. Also air quality is checked near the source of pollution. E.g. Dumping ground site.

The rapid development of Thane city is one of the reasons why the level of air quality in Thane is leaning towards pollution. Air quality has come under strain in Thane city due to ongoing development works like Metro work, development of infrastructure, increasing load of vehicle pollution. However, efforts like tree planting, green canopy development, awareness and development of many infrastructure projects in a timely manner have resulted in some control over air pollution in Thane city. But there is still an opportunity to improve the air quality of Thane city. For this, Thane Municipal Corporation has developed a grievance redressal mechanism.

Toll Free Number: 1800-222-108

Email :rdmce@thanecity.gov.in

WhatsApp / SMS: 7506946155

Telephone number: 022-5392323

CONTINUOUS AIR QUALITY MONITORING STATION WITH DISPLAY BOARDS

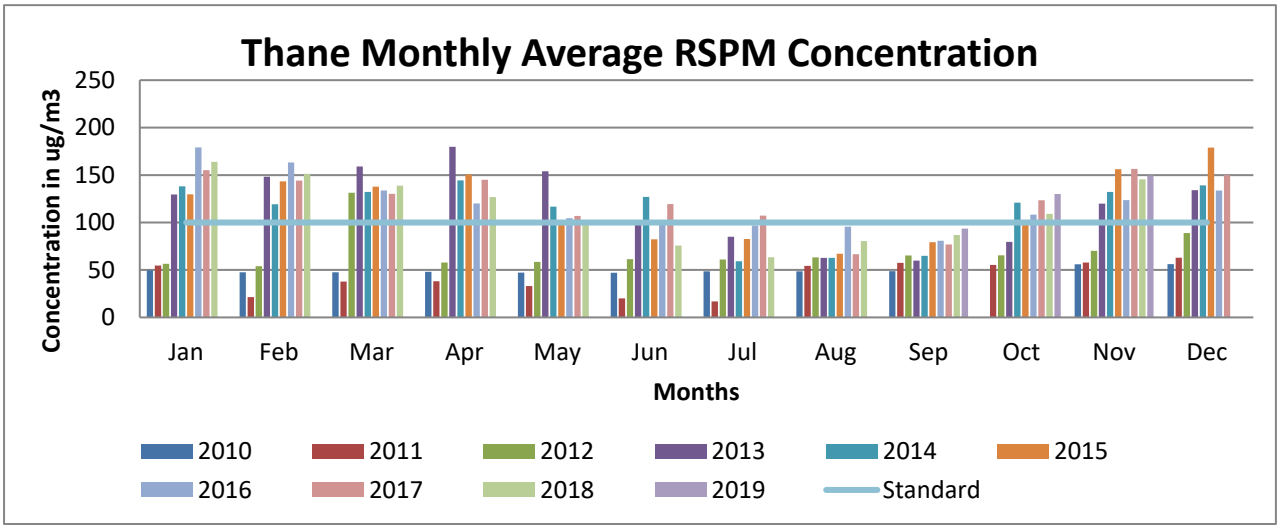
CAAQM :

Thane Municipal Corporation has installed a CAAQM Station in Thane at Teen Hath Naka.

The instrument is of OPSIS make which is by a Swedish company complying the desired standards prescribed by the authorities in India. This station is a sensor based Air Quality Monitoring system operative 24 X 7 with the emitter – receptor mechanism. The instrument is procured by TMC on its own funds.

This instrument is equipped with the sensors which are continuously monitoring the SO_2, NOx, RSPM & O_3 levels along with the weather parameters. All the data is stored on the server which is connected to CPCB data centre. From this station, we are able to track the air quality levels of Teen Hath Naka at a frequency of 15 seconds. The data gets stored in the local computer which is connected to Pollution Control Departments website & CPCB Data Centre. Also TMC has developed a Mobile application from which the citizens can easily access the air quality data of this station.

Thane Monthly Average RSPM Concentration (3 Station)



Maharashtra Pollution Control Board recently sanctioned 3 more CAAQM Station for Thane City. These stations will be provided to TMC for operation & maintenance. TMC alongwith MPCB officials has jointly surveyed & finalized the locations for installation of these stations in Thane City & the stations will be operative soon.

Sr.No.	City	CAAQM Stations			Manual Stations			Remarks
		As per CPCB's criteria	Existing	Requirement	As per CPCB's criteria	Existing	Requirement	
01.	Thane (18,41,488)	05	03 (under procurement)	02	03	03	00	As per the CPCB's criteria, 5 nos. of CAAQM stations are required in Thane city, of which 03 nos. of CAAQM stations are at procurement stage. Additional 02 nos. are required for which site identification is under process.

Further TMC also has proposed to prepare a distributed network of Real-Time Air Quality Monitoring systems equipped of around 15 sensor based monitoring machines. These machines will be directly connected to the centralized computer of Pollution Control Department which is interconnected to the TMC website. So, this air quality data can be easily accessible to citizens & all the concerned authorities.

LED Display Boards:

As a part of mitigation measure to cure Air Pollution Levels in Thane city **Thane Municipal Corporation has installed 5 electronic information display boards at various locations in Thane City** which are monitored from TMC control room. Basically these boards are installed for the information purpose from which the citizens can easily get the information of Air Pollution Levels of the city. The information displayed will direct public response and help the administration in localizing the impact on air quality.

In the normal times, the same display boards can be used for awareness w.r.t. Air Pollution, Environment, community education, etc.

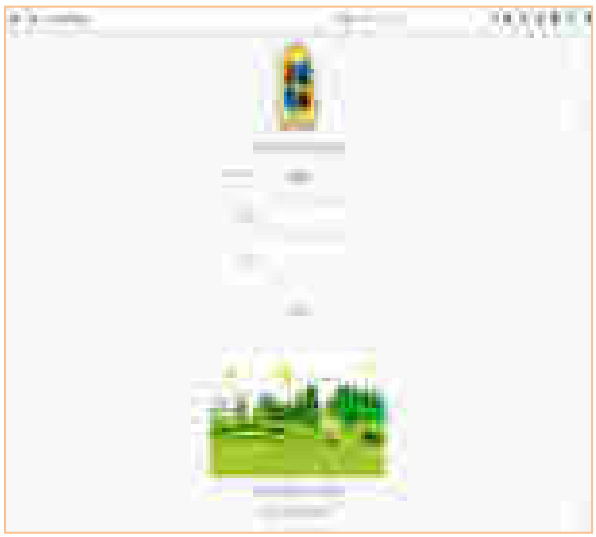
The Traffic Police and TMC have jointly identified locations where these display boards are to be erected. The critical locations are all rail terminus, MSRTC depots, BEST bus, TMT depots and important junctions (Road Cross-sections).

TMC has proposed to install 30 more electronic information display boards at all the major road cross-sections in Thane through which citizens can easily get the air quality information.

Figure 6: Air Quality LED Display Boards

AIR POLLUTION & WEATHER MONITORING MOBILE APPLICATION

In order to enhance public awareness about air quality showcasing the results of air quality and weather, TMC decided to develop a mobile application which will be easily accessible to common citizens and all the authorities.



AIR QUALITY AWARENESS INITIATIVES OF TMC

MoU to be signed between Thane city & CII Blue Sky Cities Project on Air Pollution & Waste Reduction till 2024 for once in a month workshop on Air Quality Awareness by experts.

Plays to be conducted by Shetay Vision on Air Pollution & Plastic awareness. In PHASE I (16th Sep-15th Nov, 2019) 67 street plays to be conducted in housing societies, schools, colleges, gardens and lakes.

INDUSTRIES

Thane is the third most industrialized district in the State. The Thane-Belapur-Kalyan industrial belt is the Centre of highly sophisticated modern industries. The industrial growth in the district, however, is concentrated in this industrial belt. The district can be divided into three district parts. The first is the area under direct influence of Mumbai metropolis. This area is more or less suburban to the metropolis and includes Thane, Kalyan and Ulhasnagar talukas where a number of organized modern industries are concentrated. The second zone comprises the industrially developing areas of Bhiwandi tehsils of Thane District. The third part includes the rest of the area of the district having conventional village industries, age-old cottage industries and primary processing agro-industries.

Table 14: Categories of Industries in Thane

Category	Red	Orange	Green	Total
Large	14	3	1	18
Medium	1	1	--	2
Small	154	95	664	913
Total	169	99	665	**933**

Presently 933 industries are operating out of which 169 industries are in Red category, 99 industries are in Orange category and 665 industries are in Green category.

The chemical factories located earlier in Thane Municipal Corporation area are either shifted to other notified industrial areas or are closed. Majority of the industries are located in Wagle Estate, MIDC. Engineering, service industries, job work type industries of non polluting nature are presently operating in this MIDC.

WATER FOUNTAIN AT MAJOR TRAFFIC INTERSECTION

Mist Spray:

To reduce the dust pollution and to comply the NCAP guidelines, Thane Municipal Corporation is in process to **install a Mist Spray (Water Sprinkling system) mechanism at Teen Hath Naka junction.** This is the most traffic congested junction in the city where TMC is continuously monitoring the air quality level. At this junction TMC found the RSPM levels well above the prescribed limits. Also as Thane is a developing city, construction activities are at a higher side in the city. This also causes the increase in RSPM level in the city.

To tackle this condition a Mist Spray mechanism is proposed & at the finalization level of installation at Teen Hath Naka. As per this mechanism the system will spray micron size water droplets in the environment which helps to dust suppression.

TMC has proposed for installation of 4 more Mist Spray mechanisms in the city.

CONTROL MEASURES FOR FUGITIVE EMISSION FROM MATERIAL HANDLING,

conveying and screening operation through water sprinkling, curtains, barriers and supression units.

In Thane Municipal Corporation area there are more than 15 active RMC units which are as follows,

Pollution Control Cell of Thane Municipal Corporation has regular check on all these RMC units at a regular interval. These RMC's are equipped with the required systems to control the air pollution levels. Routine Air Quality monitoring is done by MPCB and Pollution Control Cell of TMC at all these RMCs.

PENALTIES FOR CONTROL OF DUST

1. Transporting sand, cement, aggregates in developer box type dumper with coverto arrest dust pollution- fine Rs 25,000
2. Any developer while constructing any building has to put barricades - 20ft high and Green Nylon net.
3. Onsite water sprinklers to arrest dust pollution from storage of sand fine Rs 15,000.
4. All govt. agencies Telephone, Gas, MSCB also have to follow the rules.
5. In city area RMC unit developer have to use sprinklers/plantation, plastic curtain to arrest dust pollution.

TMC HAS A GRIEVANCE REDRESSAL SYSTEM IN PLACE

Twitter account TMC a Tweet Away,

1800222108 (toll free for noise and air complaints)

ALTERNATE FUEL POLICY FOR CREMETORIUMS

In Thane Municipal Corporation area there are 37 crematoriums operative by TMC where main source of fuel for cremation is wood. TMC have installed advanced 6 cremation machines at 5 crematoriums which can be run on LPG.

Table 15: Advanced Crematoriums in Thane

JawaharBaug	2
Wagle Estate	1
Balkum	1
Rambaug, Upvan	1
Manisha Nagar	1

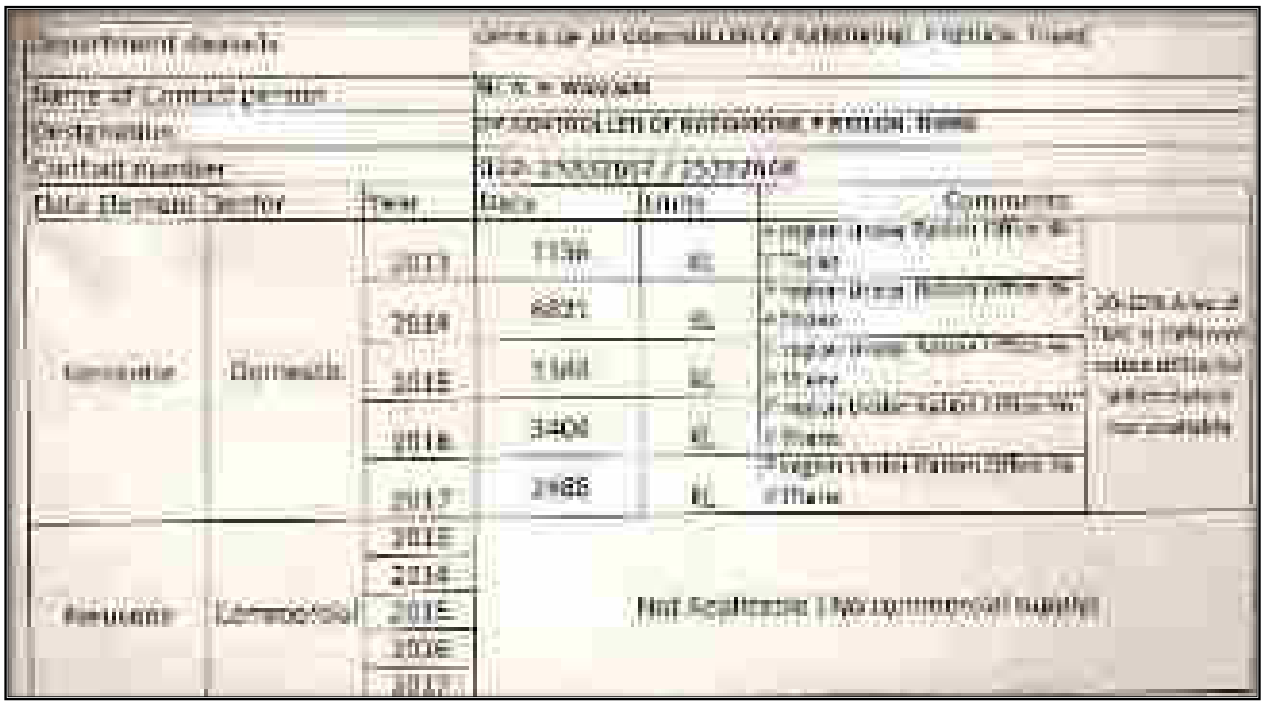
Also have proposed two more crematoriums which can be ran on LPG.

Kasarwadavali	1
Kharegaon	1

Nowadays at Jawaharbaug Crematorium which is main crematorium and situated at the centre of Thane City, TMC have started to erect 4 more advanced cremation machine which can operate on PNG. These are the multi-fuel (dual) type cremation machines where little amount of wood is included (as Religious feelings of citizens are more towards wood) with maximum part of PNG.

Approx. 400 to 450 Kg of Wood is required to burn a body.Approx. 1 Commercial LPG Cylinder is required to burn a body.

KEROSENE CONSUMPTION IN THANE



Data Element	Sector	Year	Data	Units	Comments
Consume	Domestic	2013	7136	KL	
		2014	6821	KL	
		2015	5161	KL	
		2016	3404	KL	
		2017	2685	KL	
Consume	Commercial	2013			Not Applicable (Non-commercial supply)
		2014			
		2015			
		2016			
		2017			

Figure 7: Domestic Kerosene consumption in Thane

It is clear from the above figure that the consumption of Kerosene in Thane as has been on the decline. In 2013 from consumption of 7136 KL it has come down to 2685 KL in 2017.Total Number of household PNG connections in Thane city is 122722.

POWER SUPPLY –

Maharashtra State Electricity Distribution Company (Limited) (MSEDCL) and Tata Power are the main sources of electricity for Thane. They supply electricity to the city.

- **Lamp arrangement**

A total of 42,200 street lights and park lights have been installed in the city by the corporation. Last year, the number was 40,200. This includes 45 high mast lamps. Of the city's lights, 28,500 are LED lights. Similarly, the 26 number of traffic signalsin the city last year has increased to 30 this year.

4.5.1. Energy efficiency and renewable energy projects

Thane Municipal Corporation has used energy efficiency and renewable energy in its services and facilities. In honour of this work, the Central Government has declared Thane Municipal Corporation as a 'Pilot Solar City'. The renewable energy projects in Thane Municipal Corporation area are as follows.

Renewable energy projects in Thane Municipal Corporation area

No.	Project	Capacity/ No.
		2019-2020
1	A system that generates electricity on solar energy	218kW
2	Solar powered traffic signals	6No
3	Solar Blinkers	45 No
4	Biomethanization	15tons per day
5	Solar Power Generating System at TMC Primary Schools (Net Metering)	234KW
6	LEDLights	42,200

(Source: Power Supply Department, TMC)


Solar energy project undertaken by Thane Municipal Corporation

4.5.2. Thane Municipal Corporation's activities for energy efficiency

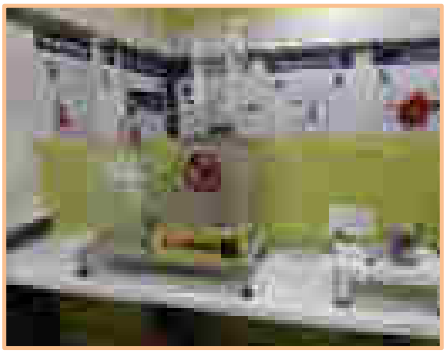
Solar powered water heaters have been installed at various hospitals and administrative buildings. They heat about 10,500 liters of water per day. Also, 120 solar powered street lights and 6 traffic signals have been installed at major places in the city. KashinathGhanekarNatyagriha and Ram Ganesh GadkariRangayatan near MasundaTalao, built in Hiranandani Meadows area on Ghodbunder Road, are implementing energy efficiency projects.

Energy efficient LED lamps are being widely used for street lighting systems. Under the B.S.U.P. housing project, 18 buildings were constructed in which, solar power water heaters have been installed for low and very low income groups. The system heats 76,500 liters of water per day for 1315 families. The star labelling program of BEE (Bureau of Energy Efficiency) of the Central Government has been implemented. Five-star air conditioning system, T5 tube light and power saving BLDC fans approved by the Bureau of Energy Efficiency have been installed in the premises of the municipal buildings. In the budget for solar energy project, a provision of Rs. 50.0 lakhs have been made. Sodium vapour lamps are currently being replaced by energy efficient LED lamps through ESCO. Buildings of Thane Municipal Corporation and electricity generation on solar power mechanism of 10 MW capacity has been undertaken on PPP basis.

Conclusion: Increasing use of electricity leads to pollution. The increase in electricity consumption is in line with the development of the city. But existing schemes and unconventional energy awards are trying to curb this growing use. This will enable large scale pollution control.

SOLAR TECHNOLOGY INITIATIVES OF TMC -

TMC has erected solar city activity center 1.01.2020 at school for energy awareness.



267 KW School rooftop solar project -

With the aim of reducing dependency on conventional energy sources, Government of Maharashtra and government of India are working in tandem to promote use of new and renewable resources under the solar city initiatives. Considering the 'Vision of City', present national and state level policies and incentives to support for establishment of new and renewable energy generation power plants, Thane Municipal Corporation has taken initiative to start with 'Grid connected Solar PV Power Projects under net metering scheme on the available roofs at various locations of Thane Municipal Corporation School Buildings'.

Objectives:

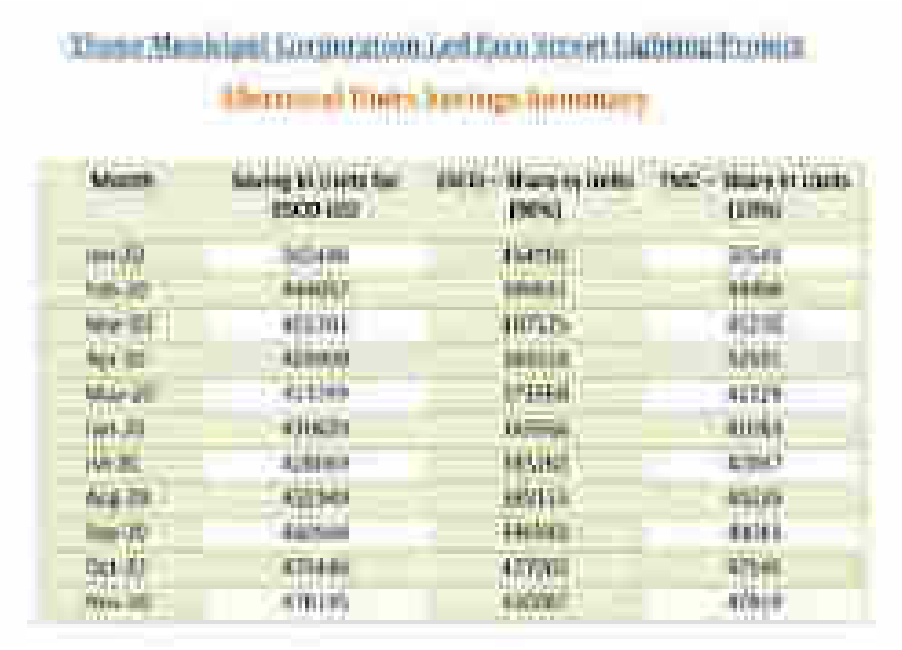
- To optimize the capacity of the solar PV system
- To circumvent technical losses in the solar PV system arising out of DC/AC conversion (No batteries)
- To supply electricity generated out of solar PV systems at a cheaper cost per unit
- To reduce the overall carbon footprint by promoting green cost- effective solutions
- To encourage solar energy use and energy independence among the public by setting a precedent
- To promote the use of solar energy applications.
- To overcome the national barrier prevalent amongst the public that solar energy is expensive
- To promote the concept of "net zero building" Where all the energy requirements are internally generated by the system to revolutionalize the solar energy sector
- Reduction in carbon foot prints

Status: **Installation work at the school buildings has been completed**

LED Streetlights under ESCO Model

A total of 7500 number of Street lights have been replaced with LED light fixtures and its success and acceptance by the local people is well proven. Based on this work and positive results, Thane Municipal Corporation has now decided to up-scale Energy Efficiency implementation is Street lighting sector. Better and efficient street lighting system in city will beautify the city and ensure safety of the local people. This scale up project will also test innovative approach towards improved service delivery and promotion of clean and more efficient urban services, facilitate private sector engagement and lead the city towards better social, environmental and economic outcomes.

Thane Municipal Corporation is assisted by ICLEI- Local Governments for Sustainability – South Asia, in its transition towards low emission development through project "Developing Urban Low Emission Development Strategies in Emerging Economies (Urban LEDS)" funded by European Union and is supported by UN-Habitat. As a part of Urban LEDs, a pilot project was identified by Thane Municipal Corporation for replacement of high energy consuming lighting fixtures with low energy consuming LED fixtures through ESCO model. The project envisages reducing energy consumption and thereby reducing greenhouse gas emissions through municipal services.

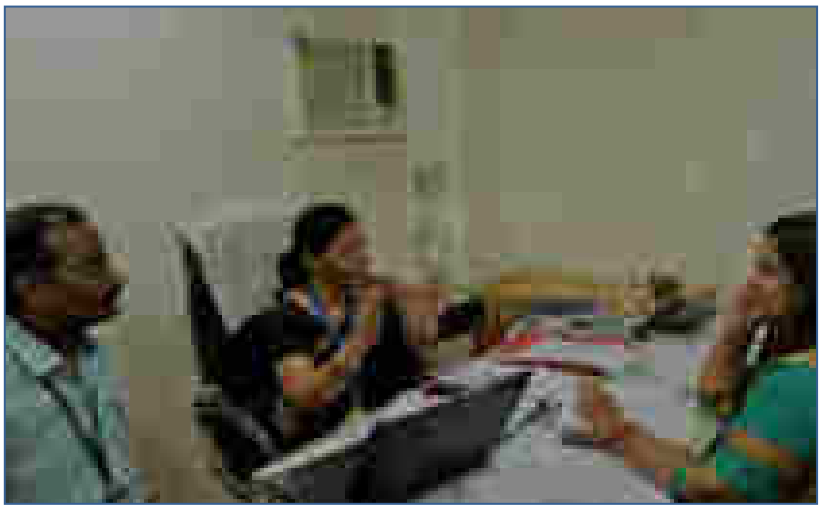


Objectives:

- To provide better and efficient street light facility to the citizen of Thane as per commonly accepted standards for street lighting.
- Reduction of energy consumption and greenhouse gas emissions through energy efficient retrofits;
- Modernization/augmentation of metering, monitoring and control system to ensure successful design and implementation of large scale energy efficient municipal street lighting and,
- Ensure efficient operation and maintenance of street lighting services.
- Reduction in carbon foot prints

Status: 7500 Street lights have been replaced with LED light fixtures.

Meeting and Discussion with Thane Municipal Corporation Commissioner Shri. Jaiswal and other staff members on 13th Sep, 2019



Discussion on Various Initiatives planned by TMC with TMC's PCC (Pollution Control Cell) Incharge Ms. ManishaPradhan and other staff members

Electric Vehicle Policy for Thane city.

Thane 2025 - An EV Roadmap


THANE MUNICIPAL CORPORATION, THANE

Introduction

Air pollution is a growing concern across the globe. Rising particulate matter concentration in air is causing detrimental effects on health of population. The Central Government launched National Clean Air Programme (NCAP) as a long-term, time-bound, national level strategy to tackle the air pollution problem across the country in a comprehensive manner with targets to achieve 20% to 30% reduction in Particulate Matter concentrations by 2024. Thane has been identified as one of the the Smart Cities Mission (SCM) that are non-attainment cities under the National Clean Air Program (NCAP).

To ensure sustainable transportation ecosystem and keeping a tab on rising pollution due to ICEs, Thane city plans to adopt vehicle electrification. This comes in the backdrop of Central Government's announcement of FAME II policy and Maharashtra State releasing its EV policy. Thane city has designed a road map with defined strategies aligned with the Central and State Government EV policies to imbibe sustainable, clean and clean transportation ecosystem for other cities to replicate.

Adoption of electric vehicles is necessaryfrom the perspective of urban air pollution and environmental sustainability. A gradual shift from the ICEs to EVs will help build a cleaner and greener city and ensure significant reduction in Air pollution within the city limits. Developing the ecosystem for personal, commercial and public transport system will be crucial to achieve this goal for the benefit of the society. Coupling electric vehicles with renewable energy (solar, wind etc.) deployment will transform the transportation sector into a zero-emission sector.

Thane is well positioned and equipped to make an impact and act as a role model for other cities to follow. Ithas nearly 22 Lakh vehicles (as on 31.03.2020), mostly ICEs, on road dominated largely by 2 Wheelers (~58%) and 4 wheelers (~24.2%).Also, the city has around ~12%of Auto Rickshaws and delivery vans plying on its roads.The vehicular presence has seen an increase of ~4% with 21,38,067 vehicles plying on-road in 2019. With the increasing focus on safety concerns due to pandemic the use of personal vehicles is expected to increase significantly, exacerbating the air pollution in the cities. Hence, TMC plans to undertake this roadmap to facilitate the transition of vehicles within city from fossil fuels to electricity as a fuel.

Objective

To make Thane a model EV city through accelerated adoption of electric vehicles in existing mode of transportation, develop enough charging infrastructure and develop awareness of EV adoption in masses for other cities to replicate.

Challenges to the uptake

A) The current ICEs are at a highly developed state with people acclimatized with the existing network of highly accessible fuel recharge stations. This provides reluctance on part of commuters to shift to a new model where refueling(recharging) is constrained by the infrastructure availability.

B) Highercapex and cost of capital from lenders for EV purchases from lenders vis-à-vis those available for ICEs has kept the customers at bay. Though the high capex gets offset by the lower operational costs however the uncertainty in how they will perform creates doubts in consumers' minds about the risk of investing in high capital costs.

C) Public awareness about EVs in the normal customers about the benefits of adopting EVs is still low making transition to cleaner modes of transport low. Also, normal public are less aware about the different models of EVs available in the market.

D) Lack of charging infrastructure and range anxiety: The charging infrastructure is at a nascent stage compared to the existing fuel stations. This provided limited options for the EV users to recharge the vehicles. Also, the time taken for refueling (3 to 5 mins) vis-à-vis that for recharging (30-60 mins for fast charging) presents itself as a barrier. This coupled with a lower battery capacity leads to range anxiety among the customers about driving longer distances within the cities.

E) Residual value of the vehicle is an important aspect during vehicular purchase for the customer. The novelty and non-maturity of the technology has inhibition in the minds of customers regarding the resale value making investment a risky business.

Roadmap Targets

Given the challenges highlighted earlier, bringing a mass change in a short time will be difficult. Hence, this roadmap has outlined phased targets to be achieved.The roadmap is targeted towards the development of EV ecosystem withdefined short term, medium term and long-termtargets as elucidated inTable 1. Each term will achieve specific goals as defined below

- Immediate goals are set to identify, define and set a few realistic achievable goals for the city to set the tone for EV uptake.
- Short term goals will seek to create a demonstration of the feasibility of EVs through direct action by the Government and Government agencies.
- Medium term goals: To streamline and mainstream the benefits of the bouquet of incentives offered by the central and state EV policy and couple them with the TMC efforts to create an EV ecosystem
- Long term goals: To ensure electric vehicle technologies enter the main stream commutation; Focus on sustaining growth and bringing in the most up to date but context-driven technologies.

Table 1Targets

Vehicle type	Immediate (<1 year)	Short Term (1 to 3 years)	Medium Term (4 to 6 years)	Long Term (7 to 10 years)
Government vehicles purchases	20%	50%	100%	100%
Buses in Gross Contract mode	50 buses	250 buses	350 buses	500 buses
Charging infrastructure – PCS	~ 30 PCS with provision of charging two 4 wheelers per charging station	~ 100 PCS with provision of charging two 4 wheelers per charging station	Self-Sustaining	Self-Sustaining
Charging infrastructure – Total parking allocation- IT hubs and Commercial complexes (CC)	IT - min. 20%. CC- min. 10%.	IT- min. 30%. CC- min. 15%.	IT- min. 40%. CC- min. 20%.	Self-moderated
LEZ		Define, identify and plan 1 LEZ at public transportation hubs	1. Execute the identified LEZ. 2. Define, identify and plan 5 new LEZ at public transportation hubs	Execute the 5 identified LEZs at public transportation hubs identified earlier

EV Working Group

An EV working Group will be instituted by the TMC as the core working committee through representation of relevant departments within TMC. It will be the sole authority and decide the framework for the implementation, operationalization and monitoring of all the EV related work within TMC.

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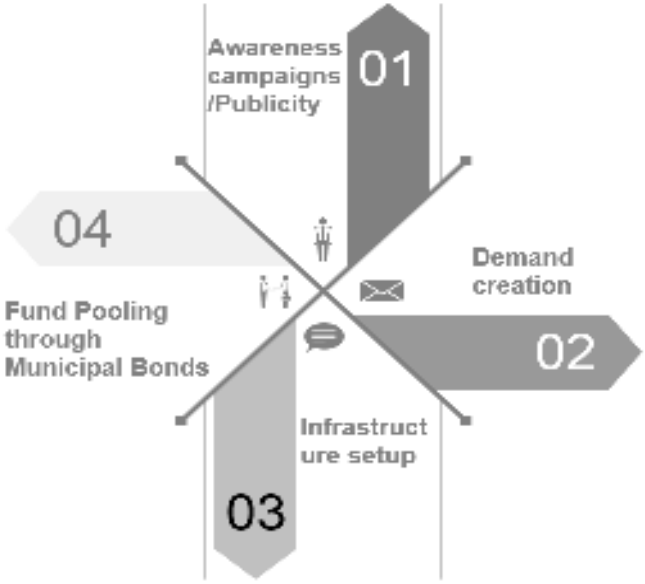
- The EV working group should appoint consultants for driving the efforts and Govt should authorize the consultant for EV roadmap implementation for Thane city as it is the first city of implementation of state EV policy.
- Thane Municipal Commissioner should be made a member of State EV policy steering committee to drive the EV adoption as planned in the roadmap in tandem with State EV policy.
- The EV working group should consist of the members with positions as outlined below:

SR. No.	Representative	Position
1	TMC Commissioner	Chairman
2	RTO representative	Convener
3	Pollution Control Cell representative	Member
4	TMT representative	Member
5	MSEDCL representative	Member
6	UDD representative	Member
7	Industry stakeholders' representatives	Member

EV Roadmap Strategies:

To meet the targets and overcome the challenges a structured approach is proposed focused on ensuring better customer experience while increasing the uptake.

A four-pronged strategy is designed for improving the uptake and driving the EV adoption to achieve these goals:



- **Awareness campaigns**

  Lack of awareness is a big challenge. The high capital costs and uncertain benefits of lower operating costs coupled with the concern relating to the range need to be overcome. TMC will conduct targeted campaigns highlighting monetary benefits to inform the consumers about the savings in operating costsfrom electric vehicles. The campaigns will eb aided by the information on available models, access to charging infrastructure, and educating the customers about the policy initiatives.

Activity	Immediate &Short Term (Immediate- <3 years)	Medium Term (4 to 6 years)	Long term (7 to 10 years)
Commuter Choice Programme	A detailed study on commutation choice within Thane city with survey on preference and perceived challenges for EV adoption by key stakeholders	NA	
Newspaper advertisement	Once per week in 5 local language news papers		NA

Activity	Immediate &Short Term (Immediate- <3 years)	Medium Term (4 to 6 years)	Long term (7 to 10 years)
Publicity on Radio	1. 30 second radio clip on 3 most prominent radio channels. 2. 1 interview aired monthly on the radio highlighting EV benefits from key stakeholders		NA
Awareness Campaign	Quarterly for identified groups such as Auto rickshaw unions, Educational institutes, IT parks	NA	NA
Billboard	Setup Billboards	NA	NA
Local Trains and buses	Setup posters on 10 Local trains		NA
Buses and Government vehicles	Setup posters on 50% of Government facility vehicles		NA
Social Media	Setup dedicated TMC operated and monitored social media accounts on Facebook, Twitter etc.	Drive the awareness through social media reachout through analysis of data collected from social media'	Setup data analytics centre to track the progress and bring improvements

1. TMC will conduct a detailed study to assess the commutation pattern of traffic within the city which will identify the most crowded areas to decide on targeted EV adoption. The study will also elaborate on staggered working hours for the office complexes to reduce the traffic congestion while increasing reliance on electrification of vehicles.

- **Infrastructure development**

  Striving to give best consumer experience and address the issue of range anxiety in the minds of consumers through structured and targeted deployment of charging infrastructure in Thane Municipal area will provide the impetus for uptake of EVs in TMC.

2. To develop deeper understanding and structured reforms, a study will be conducted to decide on the deployment of charging stations within Thane which will include detailed consultation with key stakeholders.

Activity	Immediate	Short Term	Medium Term	Long term
Study on deployment of chargers within Thane city	Identify and finalize the location, types and quantum of EV chargers in TMC	Market driven		
Float tender for setting up Public Charging Stations within TMC premises	TMC, post the study on PCS, will provide the list of available spaces within the tender on nominal lease rate.		Market driven	
Finalize successful bidders for setting up Public Charging stations	30	100	Self-sustaining	
Issue direction to IT Hubs, Commercial places for conversion of parking spaces to be EV ready	Immediate basis			

- **Demand Creation:**

Thane Municipal Corporation (TMC) will float tenders for procuring the Electric vehicles by the Government officials for all the future 4-wheeler requirements. The tenders will be open to all the models as stated in the Central / Maharashtra policy.

To give a boost to STU buses, TMC will develop a composite fleet of mini buses (<30 passenger capacity), standard buses and articulated buses (120-150 passenger capacity) based on proposed route map study.

Activity	Immediate	Short Term	Medium Term	Long term
Identification	Identify the need of Government facility vehicles and official vehicle for TMC			
Demand aggregation- Government vehicles (Float tenders and finalize successful bidders)	All new vehicles henceforth will be EV and may be on dry lease from EESL			
Demand aggregation- Buses (Float tenders and finalize successful bidders)	50 Numbers- Opex	250 Numbers- Opex	350 Numbers- Opex	500 Numbers- Opex
Monitoring	Decide on the mode of monitoring and mapping the EV ecosystem	Develop centralized monitoring mapping app and dedicated EV ecosystem portal for one-stop-EV solution for citizens.		

- **Dedicated fund pool:**

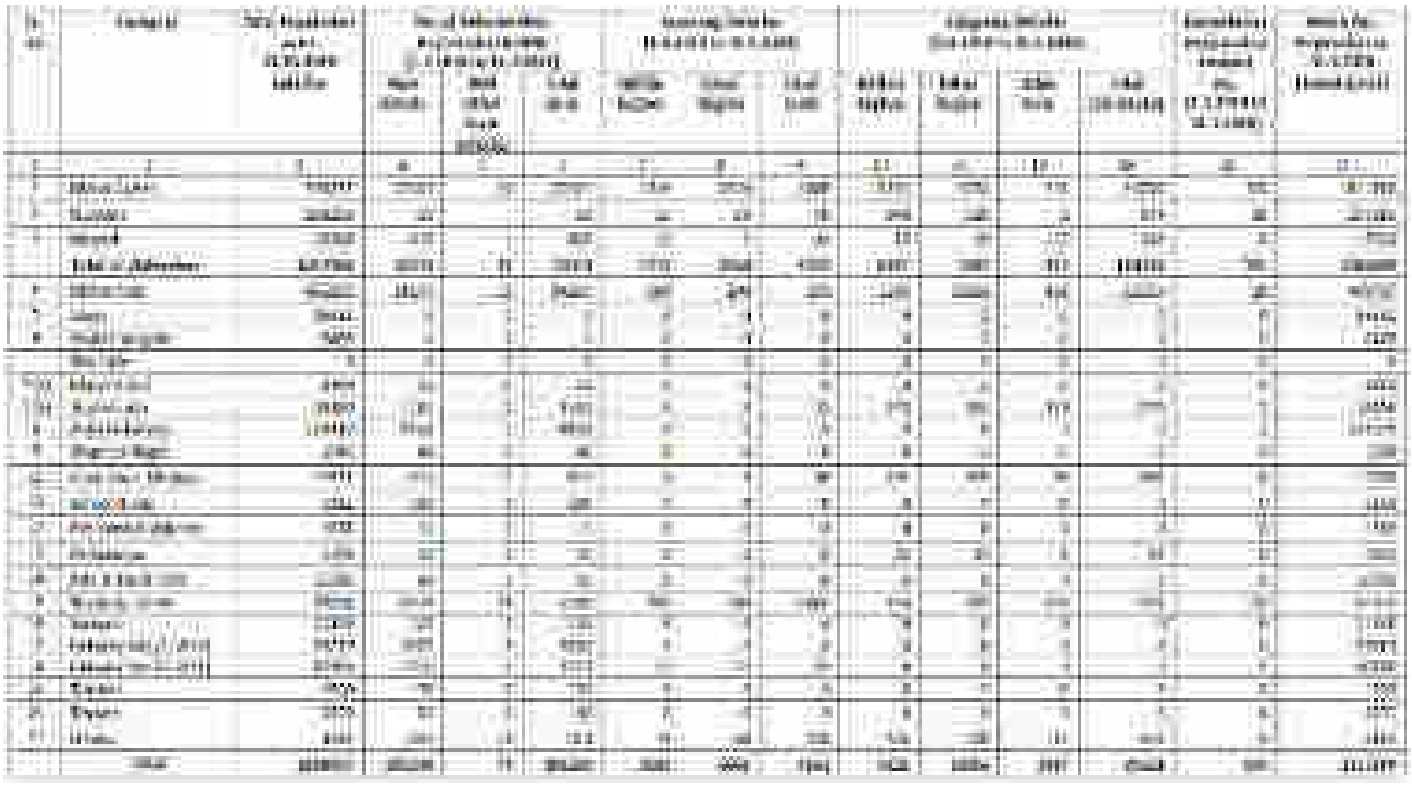
  To ensure that long term sustenance and success of the efforts for electrification of the vehicles to drive the green change in the city, TMC will raise the funds through dedicated 'Sustainable fund for Thane City. Thane is a CRISIL 'AA' rated ULB organization which reflects to a 'stable' financial situation.Funding the projects through development banks facilities such as World Bank ADB etc.The funding should be explored in medium term(3 to 6 years).Background exercise for fund requirement and modalities can be outlined and explored.

TMC Incentives:

To drive the adoption of EVs in the city, TMC will nudge the people towards more usage of EVs in the city. This will be done by incentivizing owners of EVs. Following incentives are envisaged by TMC:

1. All EV related work will be streamlined through single Window clearance dedicated for EV vehicles.
2. A property tax rebate of 10% will be given for residential property owners for 3 years.
3. No Parking fees will be levied for owners of EVs
4. All the Government offices and buildings will have dedicated parking spaces allocated for EVs and will have preferential parking arrangements
5. For making the parking garages "EV ready" by including proper wiring and power capacity within walls/floors/ceilings to eventually install EV charging stations- Municipal corporation will provide single window clearance for all such applications.
6. The available spaces for public charging infrastructure for leasing will be offered at a nominal rate of 1 Rs / year / sq.ft.
7. All government official vehicles will be on lease mode from EESL (Central Government Organization)

Annexure 1–Vehicular details for Thane



Annexure 2 – Definition / Explanation

Abbreviation	Detail
EV	Electric Vehicle
ICE	Internal Combustion Engine
R&D	Research and Development
TMC	Thane Municipal Corporation
PCS	Public Charging Station
e2W	Electric 2 wheeler
e3W	Electric 3 wheeler
e4W	Electric 4 wheeler / Passenger cars
GoM	Government of Maharashtra
MSRDC	Maharashtra State Road Development Corporation
ULB	Urban Local Bodies
MPCB	Maharashtra Pollution Control Board
CC	Commercial Complexes
NA	Not applicable
INR	Indian National Rupee
Cr	Crore

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
		Monitoring Mechanism							Thane MunicipalCorporation has a Pollution Control Cell (details attached) the cell will meet and examine the implementation of action plan. Commissioner- Head MPCB RO- Meeting Convener
SOURCE GROUP - VEHICULAR EMISSIONS									
1	(i)	Launch extensive drives against polluting vehicles for ensuring strict compliance	Moderate	Feasible	--	Short Term(Regular)	2021	Traffic Police,	1. Conducted by Traffic Police under Motor Vehicles Amended Act (2019) 2. fine charges for not carrying PUC. 3. Awareness With involvement of Schools, Colleges & Local NGOs.
	(ii)	Launch public awareness campaigns for air pollution control, vehicle maintenance, minimizing use of personal vehicles, lane discipline etc.	Moderate	Feasible	Yes(50 lakh)	Short Term (regular & Extensive campaigns during Festive season)	2021	Traffic Police, NGO, RTO, TMC, Media, College	4. At present TMC has made contract with agency for awareness program at school, colleges, residential areas, etc. Since 2019, 67 awareness program street plays done. 5. TMC is in process of making MOU with CII (Confederation of Indian Industry) under Blue Sky Project for Awareness among citizen.

<table>
<tr><th>Sl. No</th><th>Source Group</th><th>Control option</th><th>Expected reduction and impacts</th><th>Technical feasibility</th><th>Requirement of financial resources</th><th>Implementation period (short/mid/long-term)</th><th>Time target for implementation</th><th>Responsible agency(ies)</th><th>Any other information</th></tr>
<tr><td></td><td>(iii)</td><td>Prevent parking of Vehicles at Non designated areas</td><td>Moderate (city congested area)</td><td>Feasible</td><td>4 Cr.
(Line marking, Zebra Crossing , Spot light, Sign board, etc.)</td><td>Mid Term</td><td>2023</td><td>TMC, RTO</td><td>1. TMC has made multi level car parking facility at GaondeviMaidan (Under ground) , Jupiter Hospital, Ashar Complex and Kacharali lake of capacity 910/4W, 170/2W and 150 3W.
2. TMC has given 200 jammer to police to prohibit illegal parking. Penalty of Rs. 200/- for wrong parking and tow away charges collected by police.
3. TMC has planned on Street parking policy for which TMC has indentified 177 roads in 9 wards.
4. TMC has planned on Street parking policy as under
<table>
<tr><th>Ward Office</th><th>No. of Roads</th><th>No. of Vehicles</th></tr>
<tr><td>Kalwa</td><td>10</td><td>764</td></tr>
<tr><td>Kopri</td><td>20</td><td>674</td></tr>
<tr><td>Majiwada Manpada</td><td>13</td><td>376</td></tr>
<tr><td>Mumbra</td><td>19</td><td>1347</td></tr>
<tr><td>Naupada</td><td>24</td><td>1805</td></tr>
<tr><td>Railadevi</td><td>34</td><td>2081</td></tr>
<tr><td>Uthalsar</td><td>26</td><td>1298</td></tr>
<tr><td>Vartak Nagar</td><td>26</td><td>1127</td></tr>
<tr><td>Wagle Estate</td><td>05</td><td>383</td></tr>
<tr><td>Total</td><td>177</td><td>9855</td></tr>
</table>
5. TMC in co – ordination with RTO managing parking plots for luxury buses, School buses</td></tr>
</table>

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(iv)	Initiate steps for retrofitting of particulate filters in Diesel vehicles, when BS-VI fuels are available	Moderate (will reduce the overall Air Pollution Load)	Feasible	**Rs 75 Lakh (For 100 TMC diesel vehicles) @ Rs. 75000/- per vehicle.**	Mid term	2023	RTO TMC	• At present there are 756729 diesel, 1418107 petrol, 5682 LPG, 96195 CGN, 685 battery operated vehicles. • TMC has 100 **diesel vehicles** which run on diesel for which Retrofitting of Particulate filter is proposed. (Rs. 75,000/-@1V)
	(v)	Prepare action plan to check fuel adulteration and random monitoring of fuel quality data	Moderate	Feasible	Survey and random checking work	Mid-term but a continuous process	2021	Resident Deputy Collector (RDC), Anti-adulteration cell, RTO	Checking fuel adulteration with coordination of anti-adulteration cell which is a continuous process.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(vi)	Prepare action plan for widening of road and improvement of Infrastructure for decongestion of Roads.	High	Feasible	**- Rs. 100 crores** 50 Km smart roads **(@ Rs. 20 crores for 10 km)**	MidTerm(in progress) as per **Thane Integrated Mobility Plan**	Short term - July, 2019 Mid-term- 2023	MMRDA, PWD, Thane Smart City Corporation Ltd.	• TMC has implemented >70% of Mobility plan under IMP and balance work will be completed up to 2022. • Short term - Missing links and widening of 93 roads, vehicular grade separators on 11 roads, vehicular subways on 2 roads, Railway over bridges on 4 roads. Medium term - Missing links and widening of 21 roads, vehicular grade separators on 4 roads, vehicular subways on 1 road, Railway over bridges on 1 road. Total road length 370 km Concrete /UTWT road 160 km. • TMC has initiated pedestrian pathway project. The total length is 12 km and cost 21.59 Cr. The work will be completed December 2021. Balance 40 km pedestrian pathway proposal is in process.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(vii)	Prepare Plan for the construction of expressways/bypass to avoid congestion	Moderate	Feasible	--	Mid Term	2023	MMRDA, PWD TMC	• TMC has initiated Station Area Traffic Improvement Project 2 (SATIS) to decongest east side of Thane railway station by 2021. • Thane railway station suffer from acute congestion as 6.5 lakh commuters daily use it. TMC has initiated new station in between Thane and Mulund, (Mental hospital) for which MOU is made and compound wall panel construction is in progress. • Metro work is initiated in Thane city of total length 29 Km of cost 7215 Cr. The project is jointly implementing by State Government and Central Government. Solar panels will be installed on roof which will provide electricity to project. • TMC has initiated in 2018 Coo Rides public cycle sharing project under which 52 stops each with 15 bicycle which operated. on mobile app. Up till now 1.5 lakh rides made.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(viii)	Steps for Promoting Battery operated vehicles	Moderate	Feasible	Yes, 2 Crores for infrastructure and charging station for battery operated vehicles	Mid-Long Term	2022	TMC, Traffic	• At present TMC has 1 electric bus, 2 electric cars and 2 electric scooter. 2 Charging station facility are available is HQ. • For Charging stations TMC has made MoUwith Mahindra& Mahindra for 4 wheeler. • For Charging stations TMC has made MoU with Kinetic for 2&3 wheeler. • TMC has proposed vehicle charging station at Anand Nagar depot . • TMC has submitted proposal to MMRDA for 100 Electric Buses on PPP basis. Follow up is in progress. • Separate budgetary Head is made for next financial year. • TMC has made solar city activity center at school for awareness in energy efficiency using various models. • EV Policy for Thane City is prepared.
	(ix)	Install weigh in motion bridges at the borders of the cities / Towns and States to prevent overloading of vehicles.	--	--	--	--	--	RTO	Overloading of vehicles is checked on stationery weigh bridges. Penalty is recovered as per provision of M.V. Act and rules.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(x)	Intelligent Traffic System	Moderate	Feasible	--	Mid-Long term	2022	RTO, TMC	TMC has erected command and control room around 1500 cameras are installed in the city, which linked to traffic police and police.
	(xi)	Installation of Remote Sensor based PUC systems	Moderate		--	Mid- Long term	2020	RTO	Upgradation of **124 PUC** centres across Thane
	SCS-1	Sulphur reduction in diesel	Moderate	Feasible	--	Mid Term	2021	Ministry of Road Transport & Highway	BS VI fuel availability from 2020 onwards
	SCS-2	Introduction of new technology vehicles	High	Feasible	--	Mid Term	2021	Ministry of Road Transport & Highway	--
	SCS-3	Provide good public transport system	High	Feasible	Yes, 30 Crores for Electric buses	Short-Mid	2022	TMC,TMT, MMRDA, Metro	• TMC has fleet of 517 buses out of which 414 are diesel 103 CNG and 1 electric bus. • TMC has submitted proposal to Ministry of State for Housing and Urban Affaire GOI for purchase of 200 buses, development of Bus depot and basic infrastructure of total cost 160 Cr. Central Gov. Share is 104 Cr. and State and ULB share is 56Cr. (GB resolution No. 253 dated 23.12.2020). • TMC has initiated work for Intelligent Transport System

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
									(ITS), Central Control Centre, MULTI- MODAL TRANSIT HUB @ existing station (SATIS1 and 2). • New Suburban Railway Station between Thane &Mulund. • Metro work initiated.
	SCS-4	Standards for new and In-use vehicles	High	Feasible	--	Mid term	2021	Ministry of Road Transport & Highway	In progress
	SCS-5	Alternative fuels	High	Feasible	--	Mid term	2021	Mahanagar Gas Ltd	Total No of **household PNG connections in Thane city - 122722**
	SCS-6	Implementation of BS – VI norms	High	Feasible	--	Mid term	In progress - since 2019	Ministry of Road Transport	In progress
	SCS-7	Electric / Hybrid Vehicles	High	Feasible	--	Mid term	2023	Automobile Firms	• At present TMC has 1 electric bus, 2 electric cars and 2 electric scooter. 2 Charging station facility are available is HQ. • TMC has proposed vehicle charging station at Anand Nagar depot . • TMC has submitted proposal to MMRDA for 100 Electric Buses on PPP basis. Follow up is in progress. • Separate budgetary Head is made for next financial year.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	SCS-8	OE-CNG for new public transport buses	High	Feasible	Already have 13 CNG filling (vehicle) Stations in Thane city	Mid term	2020	TMC, Mahanagar gas Ltd., TMT	103 CNG buses already running
	SCS-9	Ethanol blending (E10 – 10% blend)	High	Feasible	--	Mid term	2022 (10% blend)	Govt., OMCs (Oil Marketing companies), Sugar Mill manufacturers	7.2% ethanol blend 2018-2019
	SCS-10	Bio-diesel (B5/B10: 5 – 10% blend)	High	Feasible	--	Mid term	2023	Min O & NG, Fuel firm	
	SCS-11	Retro-fitment of Diesel Oxidation Catalyst (DOC) in 4-wheeler public transport (BS–II and BS-III)	High	Feasible	--	Mid term	2023	RTO	Continual Improvement Process
	SCS-12	Retro-fitment of Diesel Particulate Filter in 4-wheeler public transport(BS – III city buses)	High	Feasible	**Rs 1.5 crores** 200 Diesel buses retrofitment @ Rs 75000 = Rs 1.5 crores	Mid term	2021	RTO, TMT	Continual Improvement Process. TMC has 200 Buses which run on diesel for which Retrofitting of Particulate filter is proposed. (Rs. 75,000/-@1V) In progress,

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	SCS-13	Banning of 10 year old commercial vehicles	High	Feasible	--	Mid term	2021	RTO	TMT not operating vehicles more than 10 year old
	SCS-14	Inspection/ maintenance to all BSII & BSIII commercial vehicles	High	Feasible	--	Mid term	2021	RTO	In progress
	SCS-15	Restrict commercial vehicles entering city by having ring roads	Moderate	Feasible	Yes, under city development plan	Mid term	2023	TMC, MMRDA	TMC has initiated construction of new Kalwa bridge to improve mobility and decongestion on two major junctions. Total length is 2.3 Km and Cost is 183 Crores.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
SOURCE GROUP - RESUSPENSION OF DUST									
2	I	Prepare plan for creation of green buffers along the Traffic corridors	High	Feasible	**Rs 1 crore** for green buffers along the traffic corridors. (Green Canopies & Garden under fly overs))	Mid	2022	TMC, Garden Dept., Tree authority, NGO	**Main traffic corridor have been identified in TMC area** • 6 Lakh trees planted 2015-2018 under Van Mahotsav. Since 2019 TMC has planted 8018 trees at 87 road patches. • TMC has erected 11 green canopies at Ghodbunder road. TMC is proposed erection of 13 more canopies on Main traffic corridor . • TMC has created 1294 Sq.m vertical green wall at Majiwada golden dyes junction and Cadbury junction. • For 2021-22 Rs. 2 Cr. Provision is made for plantation
	II	Maintain Pothole Free Roads for Free Flow Traffic	High	Feasible	--)	Regular	Continuous Process	TMC PWD	TMC regularly maintain pothole free roads for free flow traffic by *using Cold mix pot pret/Jet patching (June- Sep) Paver block, Rich concrete M60*
	III	Introduce water fountains at Major Traffic intersection, wherever feasible	Moderate	Feasible	**Rs 5 crores** For 5 major polluted chowks	Mid term	2022	TMC	**Teen Hath naka and 4 other locations** (proposed) For that purpose treated STP water will be used.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	IV	Greening of open areas, garden, community places, schools and housing societies	Moderate	Feasible	--	Short Term. In progress	Annual Continuous Process	TMC, Garden Dept., Tree authority, NGOs	• Under Amrut mission at 3 green areas TMC has made Urban Forest by planting 31500 trees on total area 52 Acre. • TMC has 106 garden which are maintain by PPP and by TMC workers. • TMC has made 3 biodiversity park at Mullabaug, DattajiSalviUdyan&KasarwadvliUdyan. • TMC has proposed Biodiversity park (6000 Sq.m) at Kolshet and 1.5 Cr. Provision is made for 2021 – 22
	V	Blacktopping of metaled Roads including pavement of Road shoulders		Feasible		Short term	Continuous Process 2020	PWD	• Phase wise blacktopping of WBM road is in process. Scrapping and leveling of roads is a continuous process during summers WBM
	SCS-1	Wall to wall paving (brick)		Feasible		Short term	Continuous Process 2021	PWD	Between Monsson season from June- Sep Paver block
	SCS-2	Road design improvement /Dust Sweeping Machines		Feasible	**7 Cr** 7Dust sweeping machines **(@ 1 cr). Total cost 7 Cr**	Mid term	2023	PWD	• In TMC out of total 10 wards 3 dust sweeping machines exist in 3 wards. 7 more machines are proposed.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
SOURCE GROUP - BIOMASS/TRASH BURNING, LANDFILL WASTE BURNING									
3	(i)	Launch extensive drive against open burning of biomass, crop residue, garbage, leaves etc.	High	Feasible	**Rs 50 Lakhs**	Short Term	Regular basis Phase I - March 2020 Phase II- Dec, 2021	TMC, NGOs, College	• In TMC area total waste generated is 963 MTD out of which wet waste is 515 MTD and Dry waste is 423 MTD. • There is 100% collection of waste. Segregation level is 75% and processing is 75%. • TMC has 6 plants of composting. 70 MTD capacity. • TMC has 4 Windrow composting projects. capacity 100 MTD. • TMC has wood waste to briquette plant of capacity 10 TPD. • TMC has Flower waste to manure plant of capacity 3 TPD. • TMC has 10 MRF facility and Thermocol processing plant. • WASTE TO ENERGY PLANT at Daighar, Thane capacity – 1000 TPD will be started in 2022.

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	(ii)	Regular check and control, of burning of Municipal Solid waste	High	Feasible	--	Short Term In progress	2020	TMC/MPCB	• Heavy penalty mechanism for open burning of garbage. • A special squad has been formed for identification of open burning of garbage or waste. • For complaint redressal mechanism twitter handle is established. • 245 Cleanliness Marshalls are deployed for checking waste dumping, burning on streets and maintaining cleanliness.
	(iii)	Proper collection of Horticulture waste and its disposal following composting – cum –gardening approach	High	Feasible	4 Cr decentralized composting plants at 4 locations (1 cr. 1 plant) 4 Cr. Along with separate vehicle for collectionYes	Midt Term In progress	2022	TMC	In TMC area there is 50 TPD Horticulture waste generating. Thane Municipal Corporation started 10 Ton Horticulture Waste to Fuel Briquettes project in Thane City which takes care of all the Horticulture Waste, Leafy litter in the city.
	(iv)	Ensure ban on burning of agricultural waste and crop residues and its implementation	--						
	SCS-1	Strict compliance of ban on open burning	High	Feasible		Short Term In progress	2019	TMC	Already discussed

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
SOURCE GROUP - INDUSTRY									
4	(i)	Identification of Brick Klin and their regular monitoring including use of designated fuel and closure of unauthorized units.	---	---	---	---	---	---	At present there are no Brick klin in TMC area..
	(ii)	Action against non-complying industrial units	moderate	feasible	NA	Short Term In process	2021	MPCB	34 polluting industries closed
	SCS-5	Location specific Emission reduction	high	feasible		Short Term In progress	2020	MPCB	Most of chemical industries closed/ shifted
	SCS-6	Fugitive emission control	High	feasible		Short Term In progress	2021	MPCB/TMC	Presently only Services industry in operation in Thane municipal limits. Closure direction- 2 RMC plants. Conditional direction- 2 RMC plants
	SCS-7	Banning of new industries in existing city limit		Feasible		Short Term In progress	2020	MPCB	Closure issued to 2 RMC plants and 32 Jean wash industries

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	SCS-8	Installation/ upgradation of air pollution control systems	High	feasible	Not required	Short Term In progress	By 2021 All will upgrade to APC	MPCB	Interim direction – 5 industries 4 industries upgraded APC, 1 common Biomedical Treatment and Disposal facility upgrade of Incinerator 6-12 months
	SCS-10	Regular audit of stack emissions for QA/QC	High	feasible	Not required	Short Term In progress	Continuous Process	MPCB	Regularly done
		Set up and publicize helpline in each city/towns as well as SPCB/PCC HQ for complaints against reported non compliance	Moderate	Feasible	Not required	Short Term	In progress	TMC	TMC has a grievance redressal system in place Twitter account TMCa Tweet Away, 1800222108 (toll free for noise and air complaints)

<table>
<tr><th>Sl. No</th><th>Source Group</th><th>Control option</th><th>Expected reduction and impacts</th><th>Technical feasibility</th><th>Requirement of financial resources</th><th>Implementation period (short/mid/long-term)</th><th>Time target for implementation</th><th>Responsible agency(ies)</th><th>Any other information</th></tr>
<tr><td colspan="10">SOURCE GROUP - CONSTRUCTION & DEMOLITION</td></tr>
<tr><td>5</td><td>(i)</td><td>Enforcement of construction & demolition rules</td><td>Moderate</td><td>feasible</td><td>--</td><td>C&D Policy in place</td><td>started 2019</td><td>TMC MPCB, RDC</td><td>• C&D Waste Management Plant (capacity 300 TPD) erected & Policy is Published. Total 15 bins are placed in city to Collect C&D waste.
• In 2019 49504.7 tons C&D waste is generated which is collected and send for processing (136 TPD).
<table>
<tr><th>Year</th><th>No. of Projects</th><th>Plot Area (Sq.m)</th></tr>
<tr><td>2016-17</td><td>384</td><td>3377118.70</td></tr>
<tr><td>2017-18</td><td>345</td><td>3646906.53</td></tr>
<tr><td>2018-19</td><td>401</td><td>3672737.00</td></tr>
<tr><td>2019-20</td><td>366</td><td>3092649.00</td></tr>
</table></td></tr>
<tr><td></td><td>(ii)</td><td>Control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and suppression units</td><td>High</td><td>feasible</td><td></td><td>Short term</td><td>2021</td><td>TMC,MPCB</td><td>• 15 active RMC units in city. PCC TMC keeps a regular check.
Any developer while constructing any building has to put barricades - 20ft high and Green Nylon net. 2. Onsite water sprinklers to arrest dust pollution from storage of sand fine Rs 15,000. 3. All govt. agencies Telephone, Gas, MSCB also have to follow the rules. 4. In city area RMC unit developer have to use sprinklers/plantation, plastic curtain to arrest dust pollution</td></tr>
</table>

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	SCS-1	Better construction practices with PM reduction of 50%	Moderate	feasible		Short Term In Progress	2022 In Progress	TMC	As per notification GSR 94 (E) dated 25.01.2018 of MoEF and CC regarding mandatory implementation of Dust mitigation measures for Construction and Demolition activity, TMC will insert following notified clauses in construction permissions, ➢ No building or infrastructure requiring EC shall be implemented without approved environmental management plan inclusive of dust mitigation measures. ➢ Road leading to or at construction site must be paved and blacktopped. (i.e. metallic roads). ➢ No excavation of soil shall be carried out without adequate dust mitigation measures in place. ➢ Water sprinkling system shall be put in place. ➢ No loose soil or sand or C&D waste or any other construction material that causes dust shall be left uncovered. ➢ Dust mitigation measures shall be displayed prominently at the construction site for easy public viewing. ➢ No uncovered vehicles carrying construction material and waste shall be permitted

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
	SCS-3	Ensure carriage of construction material in closed /covered Vessels	Moderate	feasible		Short Term In Progress	In Progress	TMC	Transporting sand, cement, aggregatesin developer box type dumper with cover to arrest dust pollution- fine Rs 25,000
		Establishment of a continuous Air Quality Monitoring station within the city with display Board	High	feasible	--	Mid term	Dec 2019-June 2020	MPCB	As per CPCB criteria 5 CAAQMS needed in Thane-3 stations at procurement stage CAQMS Traffic Park (Ghordbunder road) Jai BhavaniUdhyan, Upvan. For 2 more CAAQMS site identification in progress.
SOURCE GROUP - DOMESTIC FUEL BURNING									
6	*SCS-1*	Shift to LPG from solid fuel &kerosene for domestic applications	High	feasible		Mid term	2021	TMC	Domestic consumption of Kerosene in Thane on the decline in 2013 from consumption of 7136 KL to 2685 KL in 2017
	SCS-2	Better cook-stove designs	High	feasible		Short Term In progress	2021	TMC	In urban areas residents using LPG/ PNG with modern cook stoves

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
SOURCE GROUP - MINING									
7	*SCS-1*	Effort for good mining practices	Moderate	Feasible		Short Term In progress		MPCB, District Collector	In TMC area at present only one mine is in operation. For its crushing unit MPCB Consent is already given.
	SCS-2	Greenbelt for activity zone and the buffer zone for each mining area	---	---	---	---	---	---	---
	SCS-3	Maintenance of mine area roads	---	---	---	---	---	---	---
SOURCE GROUP - DG SETS									
8	(i)	Monitoring of DG sets and action against violations	Medium	feasible		Short term	In progress complete by 2021	Based on CPCB Guidelines, MPCB has issued directive	All construction projects with built up area > 20,000 sq m necessary to install DG sets with acoustic enclosure only
	SCS-1	Reduction in DG set operation/Un-interrupted power supply				Short term	2021	MPCB, TMC, MSEB	

Sl. No	Source Group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
SOURCE GROUP - BAKERIES/CREMATORIA									
9	*SCS-1*	Use of LPG in Hotels and "dhabas"	Medium	feasible		Short term	2021	TMC	In progress
	SCS-2	CREMATORIUMS	Medium	Feasible	6.25 Cr. (for conversion of 5crematoriums)	Short term	2021		• Most of the bakeries, hotels are using LPG as fuel. • However, TMC will ban on the use of wood / coal as a fuel. In the bakeries dhabas and hotels after policy decision by General body. • At present in TMC area 5 crematoriums run on LPG. 5 mores crematoriums on Electric are Proposed.
Sl. No	**Source Group**	**Control option**	**Expected reduction and impacts**	**Technical feasibility**	**Requirement of financial resources**	**Implementation period (short/mid/long-term)**	**Time target for implementation**	**Responsible agency(ies)**	**Any other information**
SOURCE GROUP - OTHERS									
10		Source Apportionment (SA) and Emission Inventory (EI)		Feasible		Short term	To be started in December, 2020	NEERI/IIT Bombay	NEERI/EPTRI

ANNEXURES

ठाणे महानगरपालिका

[illegible]

THE MUNICIPAL CORPORATION OF THE CITY OF THANE

[illegible]

AIR POLLUTION AWARENESS

[illegible]

[illegible]

STATUS : INTEGRATED MOBILI[illegible]
PLAN, THA[illegible]

[illegible]: TMC/CE/ 55[illegible]

Date: 30/3/[illegible]

To,
Chief Executive Officer,
Thane Smart City Ltd.,
[illegible] Municipal Corporation, Thane.

Subject: Regarding establishing implementation & monitoring framework for mobility

Respected Sir,

This is with reference to above mentioned subject. Thane Municipal Corporation [illegible] is implementing projects as mentioned in Integrated Mobility Plan (IMP).

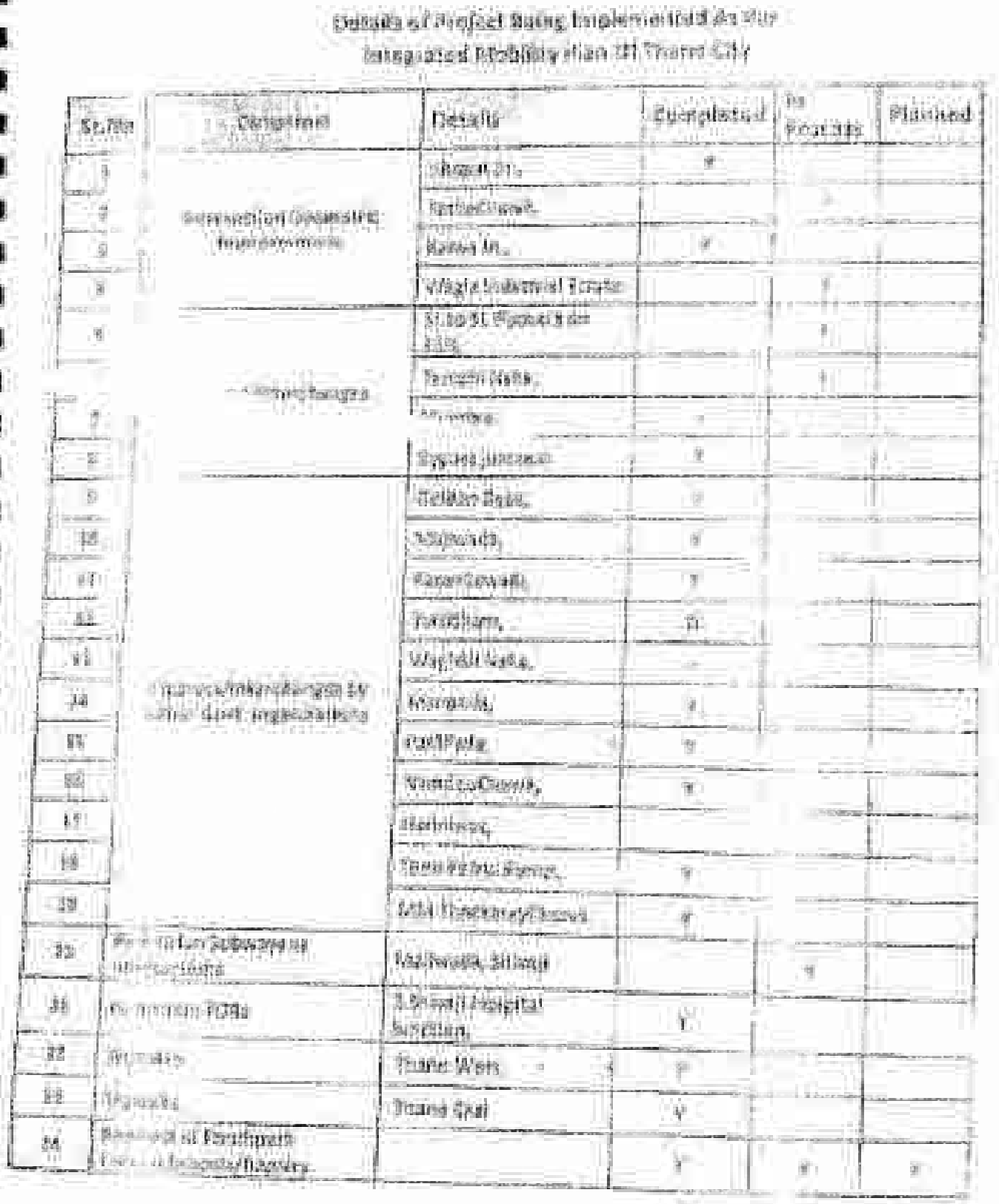
Implementation [illegible] of mobility related projects is monitored through [illegible] Special Project Cell. Similarly, the projects implemented under Smart City projects [illegible] monitored through Thane Smart City Corporation Ltd.

Thane Municipal Corporation has implemented more than 50% of mobility [illegible] projects under IMP for betterment of Thane city, the status of which is mentioned in the [illegible] sheet.

Regards,

City Engineer,
Thane Municipal Corporation

Annex: List of Projects implemented as per Integrated Mobility Plan, 2008 and it[illegible] status.



Details of Project being implemented as per
Integrated Mobility Plan of Thane City

Sr.No.	Component	Details	Completed	In Process	Planned
1					
2					
3					
4					
5					
6					
7					
8					
9					
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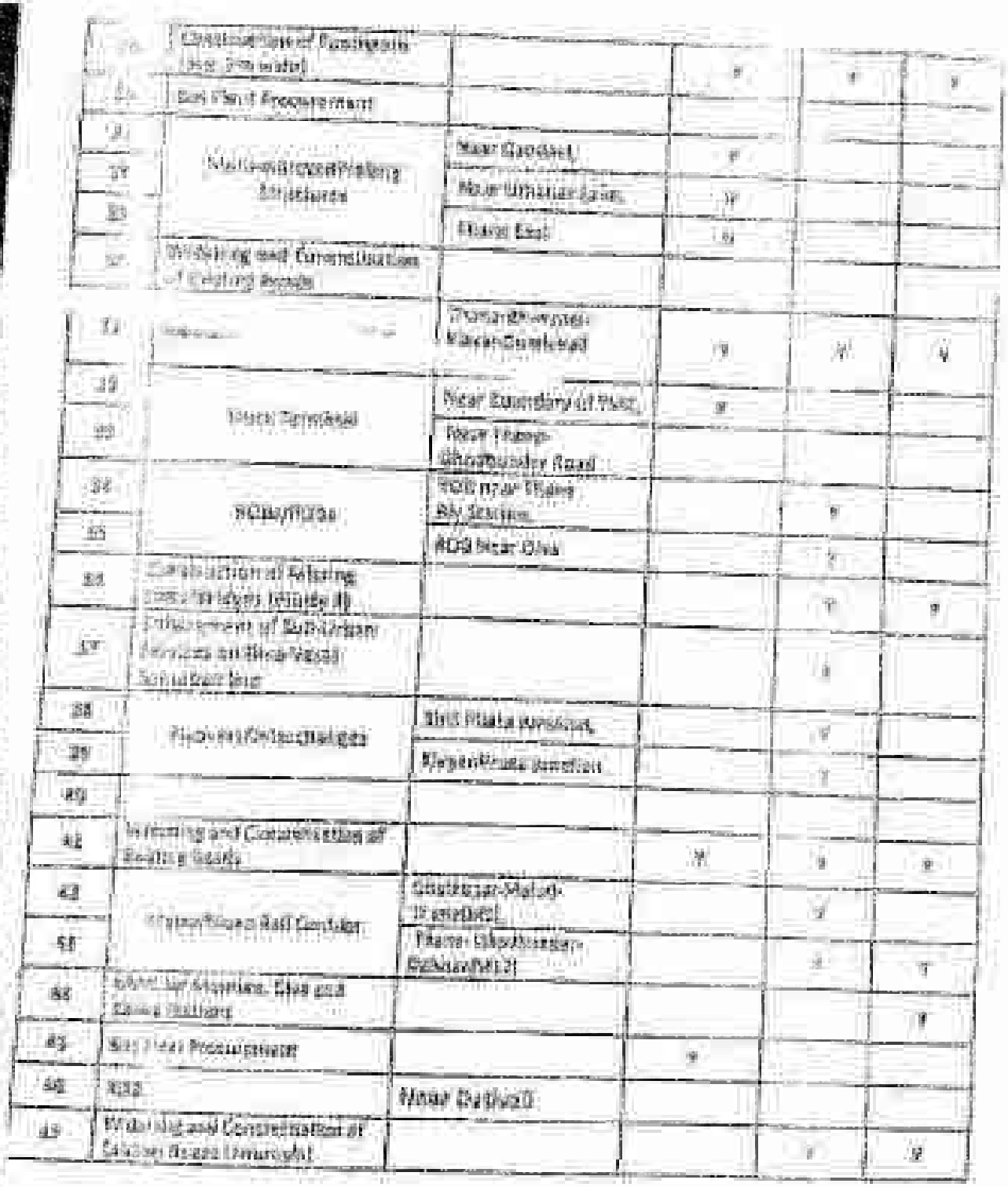

[illegible]	Additional suburban Railway Station between Mulund and Thane (Waghle Station), Kalwa [illegible] Station			Y		
[illegible]	[illegible] Proposal as per CMP [illegible] Study	Thane Dombivali Line		Y		
[illegible]	Bus Fleet Procurement			Y		

Regards,

City Engineer,

Thane Municipal Corporation

4WHEELER & CHARGING STATION
M&M V/S THAN MC

Memorandum of Understanding

This Memorandum of Understanding (here in after referred to as the ("MOU") dated 21st Nov. 2018 is entered into by and between:

Thane Municipal Corporation, governing body of the city of Thane, having its registered office at New Administrative Building, Mahapalika Bhavan, Almeda Road, Chandan Wadi, Panchpakhadi, Thane (West) Thane, Maharashtra 400602, represented by Shri Rajendra Ahivar, Additional Municipal Commissioner (1), Thane Municipal Corporation, Thane which expression shall wherever the context permits, admits or requires be deemed to mean and include its affiliates, successors in interest and permitted assigns ("TMC");

and

Mahindra & Mahindra Limited, a company incorporated under the Indian Companies Act, 1913, having its registered office at Gateway Building, Apollo Bunder, Mumbai 400001, hereinafter referred to as M&M and is represented by Mr. [illegible] Chakravarthy, Head, Future Sustainable Mobility Solutions, Mahindra and Mahindra Ltd. which expression shall wherever the context permits, admits or requires be deemed to mean and include its affiliates, successors-in-interest and permitted assigns.

TMC and M&M, here in after are referred to individually as 'Party A' and 'Party B' respectively and collectively as the "Parties".

Whereas:

a. Party A has a vision of making the city of Thane ("the City") a sustainable city through promoting electric mobility solutions and maximizing adoption of electric vehicles in the City, in line with its vision of being a Smart City. Accordingly, Party A has been proactive in leveraging best practices and latest global technologies to achieve its goal of building a low carbon transport system. In this endeavor, the International Finance Corporation (IFC), private sector arm of World Bank Group, through its [illegible], has been providing technical assistance to Party A to build a sustainable electric mobility program/ecosystem in Thane.

b. M&M or Party B is inter alia engaged in the business of manufacturing vehicles and through its various group companies provide vehicles, vehicle financing, insurance, vehicle servicing, after sales among other products and services. M&M is also in the business of providing sustainable mobility solutions, which could bring a paradigm shift in passenger commuting and continuously mitigate air pollution and congestion. In this direction, M&M has introduced a range of electric vehicles like e2o plus, e-Verito, e-Supro, e-bus, e-rickshaw and e-auto and is planning to launch further in the EV space, in alignment with M&M's vision of the "*Future of Mobility*". M&M has worked closely with [illegible]

1

across the EV value chain such as Magenta Power and Fortum for charging infrastructure, [illegible] Finance and Three Wheels United for financing, and various technology players such as [illegible] and others for creating value in the EV industry.

e. The Parties wish to explore the feasibility of a joint strategic alliance to realize Party B's [illegible] end-to-end mobility solution for the city, enabled through deployment of electric vehicles by [illegible] limited to vehicles alone, while enabling better and smart connectivity across various parts of the City (collectively known as "Joint Objective").

NOW, THEREFORE, in consideration of the above, the Parties agree as follows:

1. Scope of the Joint Objective

(i) The Parties shall, during the term of the MOU, have various rounds of discussions and negotiations to collaborate and use best efforts to provide end to end mobility solutions in the City, enabled by electric vehicles.

(ii) During the term of the MOU, the Parties shall jointly discuss on operating and business model to be adopted during initial phase of operations as well as for eventually scaling of sustainable mobility solutions for commuters in the City.

(iii) Party B shall facilitate the Joint Objective [illegible], including [illegible] for [illegible] first and last mile connectivity, [illegible] and [illegible] management services either directly or through [illegible], subsidiaries or any other sister companies. The Parties shall, during the tenure of the MOU, negotiate for the purpose of finalizing commercial aspects and business model of the Joint Objective.

(iv) The Parties would also work together and engage with other relevant stakeholders jointly to build awareness and momentum around using EVs for addressing urban mobility challenges in Thane City.

(v) Neither Party will divulge learnings achieved during the term of the MOU to a third party without prior written consent of the other Party. All developments on the platform and vehicles achieved from discussions & learnings from pilot during the period of this MOU shall be owned solely by PARTY B.

(vi) For the purposes outlined in the scope of the Joint Objective, the Parties agree that they may execute necessary Agreements between them or with any other party as may be required from time to time, for the purpose of achieving the Joint Objective.

4.1 Rights of Party A

(vii) Party A shall provide the required land on as is where is basis for installation of charging stations at mutually agreed terms and conditions (including land size, area, charges and location, etc.).

(viii) Based on the progress of the pilot under growth of EV's in the City, Party A can consider connecting outside routes as electric vehicle zones.

(ix) Party A will provide subsidies on electricity costs for charging and other potential costs from time to time in line with its policies to promote electric mobility.

(x) Party A shall also provide parking space closest to the location in agreement with Party B for electric vehicles at mutually agreed terms and conditions (including number of parking slots, vehicle type to be parked in the assigned space, charge terms whether parking preferred in one month, etc.).

(xi) Further, Party A shall coordinate with Distribution Utilities operating in Thane as well as Maharashtra Electricity Regulatory Commission (MERC), and any other regulations to stimulate electricity tariff at a competitive rate for electric vehicle charging.

(xii) Party A shall maintain a single point contact for various approvals, clearance, permissions, permits / incentives applicable to deployment of electric vehicles.

(xiii) Party A shall also provide all necessary assistance for enabling easy development of electric vehicles including permits as spaces as shared vehicles, coordination with Regional Transport Officials (RTOs) and issue of green number plates etc., as well as joint efforts with concerned in Thane.

(xiv) At mutually agreed terms of conditions, Party A shall facilitate sharing of APIs from other players in the ecosystem as well as details of public transport routes, timings, etc., so that Party B can provide integrated smart mobility platform going forward.

(xv) For the purpose of the above, the Parties agree that they may execute necessary Agreements between them or with any other party as may be required from time to time, for the purpose of achieving the aforesaid Joint Objective.

4.2 Rights of Party B

(xvi) It will be the responsibility of Party B to provide end-to-end mobility solutions for the city on mutually agreed modes through deployment of electric vehicles (including electric three wheelers and four wheelers, both cars and LCV's, but not limited to these).

(xvii) It will be the responsibility of Party B to facilitate availability of charging stations through its partners, subject to support provided by Party A as described in clause (viii), (ix), (x) under Section 4.1. Party B shall also coordinate with Distribution Utilities (DISCOMs) to secure power connection in their own name with required support from Party A. Party A

would provide necessary assistance as outlined in clause (xi) under Section 1.1 to [illegible] ensure grid connectivity for charging stations.

(xviii) In line with the growth of electric vehicles in the City, Party B will explore setting up adequate number of charging stations in discussions with Party A. A phased approach [illegible] be taken in terms of vehicle deployment and setting up of charging infrastructure as may be mutually agreed between both the Parties.

(xix) Party B would ensure that the charging stations have the requisite optimal software through mobile applications/ technology to provide seamless billing and other connectivity services for Thane citizens as well as be able to provide necessary records to Party A.

(xx) Party B will take necessary consent of Party A for changing the associated partners for [illegible] delivering the services effectively under MoU.

(xxi) During the pilot phase Party B would put best efforts to deploy 100 electric vehicles on [illegible] platform. Basis the pilot, both Parties shall discuss further scale up of these solutions.

(xxii) Party B will explore partnerships to offer financing, and any other support to enable [illegible] success of the pilot, after discussion with Party A.

2. Expenditure and Sharing

Unless otherwise agreed upon in writing by the Parties, each Party shall bear its own cost in connection with negotiation pursuant to signing of this MOU, the due diligence and all other activities related to their respective obligations for the Joint Objective under this MOU.

3. Term, Effect and Nature of this MOU

(i) This MOU shall come in to effect from the Effective Date and shall be valid for a period of 5 (Five) Years. The term of this MOU may further be extended for such period and on such terms as the Parties may mutually decide. This MOU shall cease to an end upon the expiry of its Term and/or the renewal period there of. This MOU may be terminated by any Party upon providing 3 month prior written notice to the other Party without liability of any kind to the other Party.

(ii) Subject to the sub clause (iii) below, this MOU shall be non-binding in nature, and the Parties agree that the execution of this MOU shall not constitute any undertaking by any Party on the transactions contemplated herein. The Parties recognize that the signing of this MOU does not constitute any legal obligation or commitment by any Party to enter in to a Definitive Agreement or any other agreement.

(iii) It is expressly understood and agreed that, except with regard to clause 4 (Amendment to this MOU), clause 6 (Confidentiality), clause 7 (Limitation of Liability), clause 8 [illegible]

Resolution) and clause 9 (Governing Law and Jurisdiction) of this MOU, this MOU (i) shall not be binding on the Parties, (ii) no liability or binding obligation is intended to be created between the Parties pursuant to the execution of this MOU, and (iii) any legal rights and obligations between the Parties shall come into existence only upon the execution of the Definitive Agreement, in accordance with the terms and conditions contained in such agreement, which shall be binding as provided therein.

4. <u>Amendment to this MOU</u>

Any amendment to this MOU shall be made in writing and shall only become effective after the authorized representatives of the Parties execute such amendment.

5. <u>Assignment of this MOU</u>

No Party may assign in whole or in part any of its rights and/or obligations under this MOU (except to its subsidiaries and associates previously identified and where they will work closely in spirit of this MOU) without the prior written consent of the other Party, which consent shall not be unreasonably withheld.

6. <u>Confidentiality</u>

No Party shall (and each of them shall procure its management staff, directors and employees not to) make any announcement or disclosure concerning this MOU or the arrangement contemplated in this MOU without the other Party's prior written consent, except (i) as may be required by applicable law or by competent regulatory authorities, (ii) for complying with applicable stock exchange rules/requirements globally, and (iii) to its affiliates and advisors/consultants as necessary to support the matters described in this MOU and provided they are subject to a duty to keep the terms confidential.

7. <u>Limitation of Liability</u>

Neither Party shall be liable for any punitive, consequential, indirect damages or loss of profit, business, revenues or goodwill for any matter arising from this MOU unless such breach is due to misrepresentation, fraud, gross negligence or wilful misconduct.

8. <u>Dispute Resolution</u>

(i) In the event of any dispute between the Parties, in the first instance, it shall be resolved mutually by a discussion between the Parties.

(ii) In the event of non-resolution, the matter shall be referred to and finally resolved by arbitration in accordance with the Arbitration Rules of the Mumbai Centre for International Arbitration ("MCIA Rules"), which rules are deemed to be incorporated by reference in this clause. The seat of the

The provisions of RTI ACT 2005 shall be applicable to all the concerned.

IN WITNESS WHEREOF, each Party has caused its authorized representative to execute this MoU as of the date first above written.

AGREED AND ACCEPTED:

Office of the Thane Municipal Commissioner	M/s. Kinetic Green Mobility Solutions Pvt Ltd
Name : Shri Rajendra Ahivar	Name : Ms. Sulajja Firodia Motwani
Designation: Additional Municipal Commissioner (1)	Designation: Executive Director
Thane Municipal Corporation, Thane	

Additional Commissioner (1)
Thane Municipal Corporation, Thane

TMC & ~~[illegible]~~ KINETIC

2 & 3 WHEELER ELECTRI[C] VEHICLES CHARGING STATIO[N]

Memorandum of Understanding 2018 – 2023

This Memorandum of Understanding (hereinafter referred to as the "MOU") dated 21st Nov, 2018 is entered into by and between:

Thane Municipal Corporation, governing body of the city of Thane, having its registered office at new Administrative Building, Maharashtra Bhavan, Almeida Road, Chandan Wadi, Pachpakhadi, Thane (West) Thane, Maharashtra 400602, represented by Shri Rajendra Ahivar, Assistant Municipal Commissioner (I), Thane Municipal Corporation, Thane, which expression shall wherever the context permits, admits or requires be deemed to mean and include its affiliates, successors-in-interest and permitted assigns ("TMC");

and

Kinetic Green Mobility Solutions Pvt. Ltd. The Company, bearing CIN [illegible] under the Indian Companies Act 2013 and having its registered office at D-1 Block, Plot No 18/2, Chinchwad, Pune, Maharashtra 411019, India hereinafter referred to as Kinetic and represented by Mr. [illegible], Executive Director of the Company.

TMC and Kinetic hereinafter are referred to individually as Party A and Party B respectively and collectively as the "Parties".

Whereas

a. TMC has a vision of making the city of Thane ("the City") a sustainable city through promoting electric mobility solutions and accelerate adoption of electric vehicles in the City, in line with its vision of being a Smart City. Accordingly, TMC has been proactive in leveraging best practices and latest global technologies to achieve its goal of building a low carbon transport system. In this endeavour, the International Finance Corporation (IFC), private sector arm of World Bank Group, through its Eco Cities Program, has been providing technical assistance to TMC to build a sustainable electric mobility ecosystem in Thane.

b. Kinetic is one of the pioneering automobile groups in India and is a part of Rs. [illegible] cr. Firodia Family company. Over last [illegible] years, Party B has proved its excellence with its engineering and design capability. Kinetic is a brand synonymous with innovation, and excellence with the first motorized two wheeler "Kinetic Luna" and perhaps also the first un-geared scooter "Kinetic Honda" which redefined mobility in India.

c. In the past Kinetic alone and in Union with its strategic partners have provided comprehensive successful and smart solutions to State Governments and Smart Cities for adoption of Electric Vehicles for a broader

ecosystem. [illegible] with TMC for the project and [illegible] shall [illegible] all the partners, technology partners, financial partners, operating partners for successful implementation of the project.

4. The Parties wish to explore the feasibility of a joint strategic alliance to enable [illegible] end-to-end mobility solution for the city, enabled through deployment of electric vehicles, [illegible] limited to vehicles alone, while enabling better and smart connectivity across various parts of [illegible] City (collectively known as "Joint Objective").

NOW, THEREFORE, in consideration of the above, the Parties agree as follows:

1. Scope of the Joint Objective

(i) The Parties shall, during the term of the MOU, have various rounds of discussions and negotiations to collaborate and use best efforts to provide end to end mobility solutions for first and last mile services in the City, enabled by electric vehicles.

(ii) During the term of the MOU, the Parties shall jointly discuss an operating and business model to be adopted during initial phase of operations as well as for eventually scaling up the mobility solutions for commuters in the City.

(iii) Party B shall facilitate the Joint Objective (which, inter alia, includes demand generation using first and last mile connectivity, vehicle and driver management services [illegible] directly or through its affiliates, subsidiaries or any other group companies. The Parties [illegible] during the tenure of the MOU, negotiate for the purpose of finalizing commercial [illegible] and business model of the Joint Objective.

(iv) The Parties would also work together and engage with other relevant stakeholders [illegible] build awareness and consensus around using EVs for addressing urban mobility challenges in Thane City.

(v) For the purposes outlined in the scope of the Joint Objective, the Parties agree that they [illegible] execute necessary Agreements between them or with any other party as may be [illegible] from time to time, for the purpose of achieving the Joint Objective.

Role of Party A

(vi) TMC shall provide the requisite land on as is where is basis, for installation of charging stations on mutually agreed terms and conditions (including land size, area, charges and location, etc.).

(vii) At a later stage, based on the growth of EVs in the City, PARTY A can consider [illegible] [illegible] routes as electric vehicle zones.

(viii) PARTY A will provide subsidies on electricity costs for charging and other [illegible] from time to time in line with its policies to promote electric mobility.

(ix) PARTY A shall also provide parking space [illegible] the electric vehicles at mutually agreed terms and conditions [illegible] in agreement with Party B [illegible], [illegible] to be parked in the [illegible] including number of parking [illegible].

(x) Further, Party A shall coordinate with Distribution Utilities operating in Thane, as well as Maharashtra Electricity Regulatory Commission (MERC), and any other regulators to [illegible] electricity tariff in [illegible] for electric vehicle charging.

(xi) PARTY A shall nominate a single point contact for various approvals, [illegible] benefits / incentives applicable in deployment of electric vehicles.

(xii) PARTY A shall also provide all necessary assistance for enabling easy deployment of electric vehicles including permits [illegible] electric vehicles, registration with Regional Transport Office(s) (RTO) and issue of green number plates etc. Any related incidental expenses will be borne by PARTY B.

(…) For the purpose of the above, the Parties agree that they may execute necessary Agreements between them or with any other party as may be required from time to time, for the purpose of achieving the aforesaid [illegible] Objective.

Role of Party B

(…) It will be responsibility of Party B to provide [illegible] mobility solution for the city in mutually agreed manner through deployment of electric 3 Wheeler, 2 Wheeler vehicles.

(…) It will be the responsibility of Party B to set up, operate and maintain the charging stations. The party will also coordinate with Distribution Utilities (MSEDCL) to secure power connection in their own name or in the name of their strategic partner or in the name of the alliance in the form of partnership, SPV or JV. PARTY A would provide necessary assistance while engaging with MSEDCL so as to secure grid connectivity for charging stations.

(xv) In line with the growth of electric vehicles in the City, Party B will set up adequate number of charging stations in discussion with PARTY A. A phased approach may be taken in terms of vehicle deployment and setting up of charging infrastructure in agreement with both Parties.

(xvi) Party B would ensure that the charging stations have the requisite [illegible] software to provide customer billing and other connectivity services for Thane citizens as well as [illegible] to provide necessary [illegible] to PARTY A.

(xvii) Party B will take necessary consent of Party A for changing the [illegible] for delivering the services effectively under MoU.

2. Expenditure and Sharing

Unless otherwise agreed upon in writing by the Parties, each Party shall bear its own costs in connection with negotiation pursuant to signing of this MOU, the due diligence and all the activities carried in the form of mission.

3. Term, Effect and Nature of this MOU

(i) This MOU shall come into effect from the Effective Date and shall be valid for a period of (Five) Years. The term of this MOU may further be extended for such period and on such terms as the Parties may mutually decide. This MOU shall come to an end upon the expiry of its Term and/or the renewal period (as the case may be). This MOU may be terminated by any Party upon providing 3 month prior written notice to the other Party without liability of any kind to the other Party.

(ii) This MOU is non-binding in nature and the Parties agree that the execution of this MOU shall not constitute any undertaking by any Party on the commercial understanding between the Parties. The Parties recognize that the signing of this MOU does not constitute any legal obligation or commitment by any Party in order for the Definitive Agreement or any other agreement.

(iii) It is expressly understood and agreed that, except with regard to clause 4 (Amendment of this MOU), clause 6 (Confidentiality), clause 7 (Limitation of Liability), clause 8 (Dispute Resolution) and clause 9 (Governing Law and Jurisdiction) of this MOU, this MOU shall not be binding on the Parties, (i) no liability or binding obligation is intended to be created between the Parties pursuant to the execution of this MOU, and (ii) any legal rights and obligations between the Parties shall arise into existence only upon the execution of the Definitive Agreement, in accordance with the terms and conditions contained in such agreement, which shall be binding as provided therein.

4. Amendment to this MOU

Any amendment to this MOU shall be made in writing and shall only become effective after the authorised representatives of the Parties execute such amendment.

5. Assignment of this MOU

No Party may assign its rights or part any of its rights under obligations under this MOU save to its subsidiaries and associates mutually identified and whom they will work closely in the term of this MOU) without the prior written consent of the other Party, which consent shall not be unreasonably withheld.

6. Confidentiality

the Party shall (and each of them shall procure its management staff, directors and employees not to) make any announcement or disclosure concerning this MOU or the arrangement contemplated in this MOU without the other Party's prior written consent, except (i) as may be required by applicable law or by competent regulatory authorities, (ii) for complying with applicable stock exchange requirements globally, and (iii) to its affiliates and advisors/consultants as necessary to support the matters described in this MOU and provided they are subject to a duty to keep the same confidential.

7. <u>Limitation of Liability</u>

Neither Party shall be liable for any punitive, consequential, indirect damages or loss of profit, business, revenues or goodwill for any matter arising from this MOU unless such breach is due to misrepresentation, fraud, gross negligence or wilful misconduct.

8. <u>Dispute Resolution</u>

(i) In the event of any dispute between the Parties, in the first instance, it shall be resolved mutually by a discussion between the Parties.

(ii) In the event of no resolution, the matter shall be referred to and finally resolved by arbitration in accordance with the Arbitration Rules of the Mumbai Centre for International Arbitration ("MCIA Rules"), which rules are deemed to be incorporated by reference in this clause. The seat of the arbitration shall be Mumbai. The tribunal shall consist of one arbitrator, mutually agreed upon by the Parties. The language of the arbitration shall be English.

9. <u>Governing Law and Jurisdiction</u>

This MOU, including non-contractual rights and obligations arising out of or in connection with this MOU, shall be governed by the laws of India, without recourse to conflict of laws, rules, and shall be subject to exclusive jurisdiction of the courts at Mumbai.

10. <u>Counterparts</u>

This MOU may be signed in two counterparts and each counterpart shall be deemed to be an original and shall constitute the one and same agreement.

11. <u>Entire Arrangement</u>

This MOU constitutes the entire arrangement between the Parties relating to the subject matter hereof and supersedes any and all prior discussions and agreements, either oral or in writing, between the Parties with respect to the subject matter herein, including in relation to any Confidential Information shared between the Parties.

arbitrator shall be binding. The tribunal shall consist of one arbitrator, mutually agreed upon by the Parties. The language of the arbitration shall be English.

8. Governing Law and Jurisdiction

This MOU, including non-contractual rights and obligations arising out of or in connection with this MOU, shall be governed by the laws of India, without regards to conflict of laws rules, and shall be subject to exclusive jurisdiction of the courts at Mumbai.

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The provisions of RTI ACT 2005 shall be applicable to all the concerned.

IN WITNESS WHEREOF, each Party has caused its authorized representatives to execute this MOU on the date/day shown within.

AGREED AND ACCEPTED:

Office of the Thane Municipal Commissioner

Name: Shri Rajendra Ahirao

Designation: Additional Municipal Commissioner (1)

Thane Municipal Corporation, Thane

Additional Commissioner (1)
Thane Municipal Corporation, Thane

M/s. Mahindra and Mahindra Limited

Name: Mr. Mamun Chakravarthy

Designation: Head,

Smart Sustainable Mobility Solutions

Mahindra and Mahindra Ltd.

2. Overall Scope of Intelligent Transport System (ITS) Central Control Centre (CCC)

The overall scope of the implementation will consist of supply, development/customization, testing, installation and commissioning. The project is planned to cover about 420 buses, the details of which are given hereunder:

- 220 buses as per JNNURM-2 already fitted with UBS-II compliant ITS kit
- 200 JNNURM-1 buses to be fitted with GPS tracking device as part of the project

All these 420 buses shall be integrated with Central Control Centre (CCC).

The scope of work mentioned below is indicative but not exhaustive.

The overall scope of ITS solution is:

- Supply, installation, testing and commissioning of on-bus GPS tracking system with all fittings & fixtures specified in Annexure-B in 200 JNNURM-1 buses.
- Supply, installation, testing and commissioning of on-bus LED monitor for 10 Air-conditioned buses along with hardware to drive the content on these monitors. The specifications are mentioned in Annexure-B.
- Supply, installation, testing and commissioning of ITS Central Control Centre (CCC) infrastructure. Details are provided in Annexure-B.
- Integration of 420 buses (200 JNNURM-1 and 220 JNNURM-2) in to single Central Control Centre (CCC).
- Supply, installation, customization and commissioning of Bus tracking application for 420 buses. Detailed requirement is mentioned in Annexure-B.
- Supply, installation and commissioning of LED boards or Television screens for buses, bus stops and terminals as specified in Annexure-B.
- Supply of "Where is my bus" android based mobile app for real time ETA (Expected Time of Arrival) details. Details are provided in Annexure-B.
- Set up cloud based data center and provide cloud based data service to fulfil TSR's ITS requirement for [illegible] years. Details are provided in Annexure-B.
- Providing High Speed Internet connectivity of the required bandwidth to the Central Control Centre (CCC) and payment of all relevant charges for the entire contract period of 3 years. The bandwidth requirement & backup connectivity requirement has to be worked out by the vendor to meet the SLA and for providing the required services.
- Vendor needs to provide the required communication sub system including procurement & installation of SIM cards in 420 on-bus ITS. Payment of monthly charges for the required GPRS/GSM communication, for the entire contract period of three years. Details provided in Annexure-B.

- Comprehensive warranty of Central Control Centre (CCC) application and Android application for 3 years. Details are mentioned in Annexure-B

- Comprehensive warranty of All the command center hardware and software 3 years.

- Complete implementation and making the project successful by running it for warranty, support and maintenance period of 3 years details are in Annexure-H.

4. New suburban railway station

Project brief

About 50% of the city has evolved around the four key railway stations (Thane, Kalwa, Mumbra and Diva) of thane city . About 50% of the city's population is served by thane railway station. However, the railway station suffers from acute congestion, being the busiest railway station in region with over 6.5 lakh commuters daily. Thane Municipal Corporation has proposed an additional railway station between thane and Mulund keeping in view the ever increasing passenger traffic at thane Railway Station.

Project features

- Thane Station will be constructed between Mulund and Thane
- 14.72 acre of land is allocated for the new station situated at the Mental Hospital premises
- All facilities for passengers including parking and bus terminus will be available
- Will reduce passenger load on Thane and Mulund by 31% and 24% respectively

The construction has been divided in to two components:

- 'Operating Area' will be constructed by Central Railways
- 'Circulating Area' will be constructed by Thane Smart City Limited
- For Operating area, an amount of Rs. 128 crores will be deposited in regular installments to Central Railways

The components of 'Circulating Area' are:

- Elevated structure for connectivity to the station road
- Development & strengthening of DP roads, circulation roads etc. (except area for proposed depot)
- Shifting of HT cables and electrification of circulating area
- Provision for water supply and drainage
- Maintenance for one year after completion of work, security and cleaning.

Status MOU signed with central railways and Soil Testing –Bore log data collection has been completed. Compound wall canal construction is in progress

5. Multi – modal Transit Hub at existing railway station

- Project brief

80% of the urban sprawl has evolved around the four new railway stations (Thane, Kalwa, mumbra and Diva) of thane city. About 55% of the city's populations is served by these railway station however, the railway station suffers from acute congestion, being the busiest railway station in region with over 8.5 lakh commuters daily. Thane Municipal Corporation had earlier developed a solution for the dispersal of traffic on the western side of Thane railway station. This project was undertaken under the station area traffic improvement scheme (SATIS) and it won an award by MOUD for the same. The project involved an elevated deck and flyover which would separate the city buses from remaining traffic and thereby improve traffic corridors. This also included design for an IPT (Intermediate Public transport) Stand beneath the deck. However, the increasing traffic has outstripped this facility. To improve mobility around the station area, Thane Smart City is working with the Traffic police and Indian railways to ensure the successful implementation of a multimodal facility on the eastern side of thane Station.

Project features

- Creation of deck area of about 10,000 sq. m. outside the railway station
- The deck area for interchange of public transport and other commuter facilities Viz. Food Courts, Community services, parking facility etc.
- Construction of circular elevated road link of 3 kms between Eastern Express Highway and Thane Railway Station (East)
- Potential Sources of Revenue can be ticket sales, commercial lease rent and advertising
- Funding: Cost Sharing is being explored between Central Railways and TMC

Status: DPR for the Phase-1 has been approved. IRSDC has in-principally approved for the amalgamation of deck area. MOU has been shared with IRSDC and Soil Testing –Bore Log data collection has been completed

Mahanagar Gas Ltd.
Thane, Maharashtra

Total Number of Household Connections in Thane City :	122722
MP Network (Kms) :	1557.70
Steel Network (Kms) :	1535.85
Total Service Regulators :	2388
Total Commercial Customers in Thane City :	220
MRS :	8
GBS :	3
Total Number of CNG Filling (Vehicle) stations in Thane City :	13

WATER FRONT ACTIVITY

32 km creek area — Total Area 57 H ... 2291

Work completion 3 years

4. The petitioners submit that it has proposed to undertake work of conservation, preservation of the eco system along creek area besides activities which are necessary for protection of area from encroachment/ reclamation/ dredging. The Corporation has engaged International consultant M/s Ney Paullisen Architect and Engineers, Belgium for preparation of Waterfront Development master plan of the City for 32km creek stretch. Accordingly in December 2012 the consultant submitted Waterfront Development Master Plan of the City consisting of 13 Zones. The waterfront project is considered as a makeover project for neglected and polluted creek area which has always been under the threat of encroachment. The development of waterfront will be one of the main sustainable urban environment projects to conserve, preserve and improve the ecosystem with a view to harness eco awareness amongst the citizens and to provide them recreational facilities in Thane with following-

i. Necessity:

- Improve the creek's ecosystem.
- Improve the environment health of the city.
- Protecting mangroves & safe guarding encroachment along the creek sides.

- Creating recreational facilities.-Mangroves trails, promenades, Gardens, Public spaces, seating arrangement Cycle track.

ii. Objectives:

- To contribute to the aesthetic and physical quality of the neighborhood without affecting nature and environment.
- To achieve larger policy objectives such as public health, youth development, livelihood opportunities, social and cultural exchange.
- To improve the overall quality of life of the residents and the visitors.

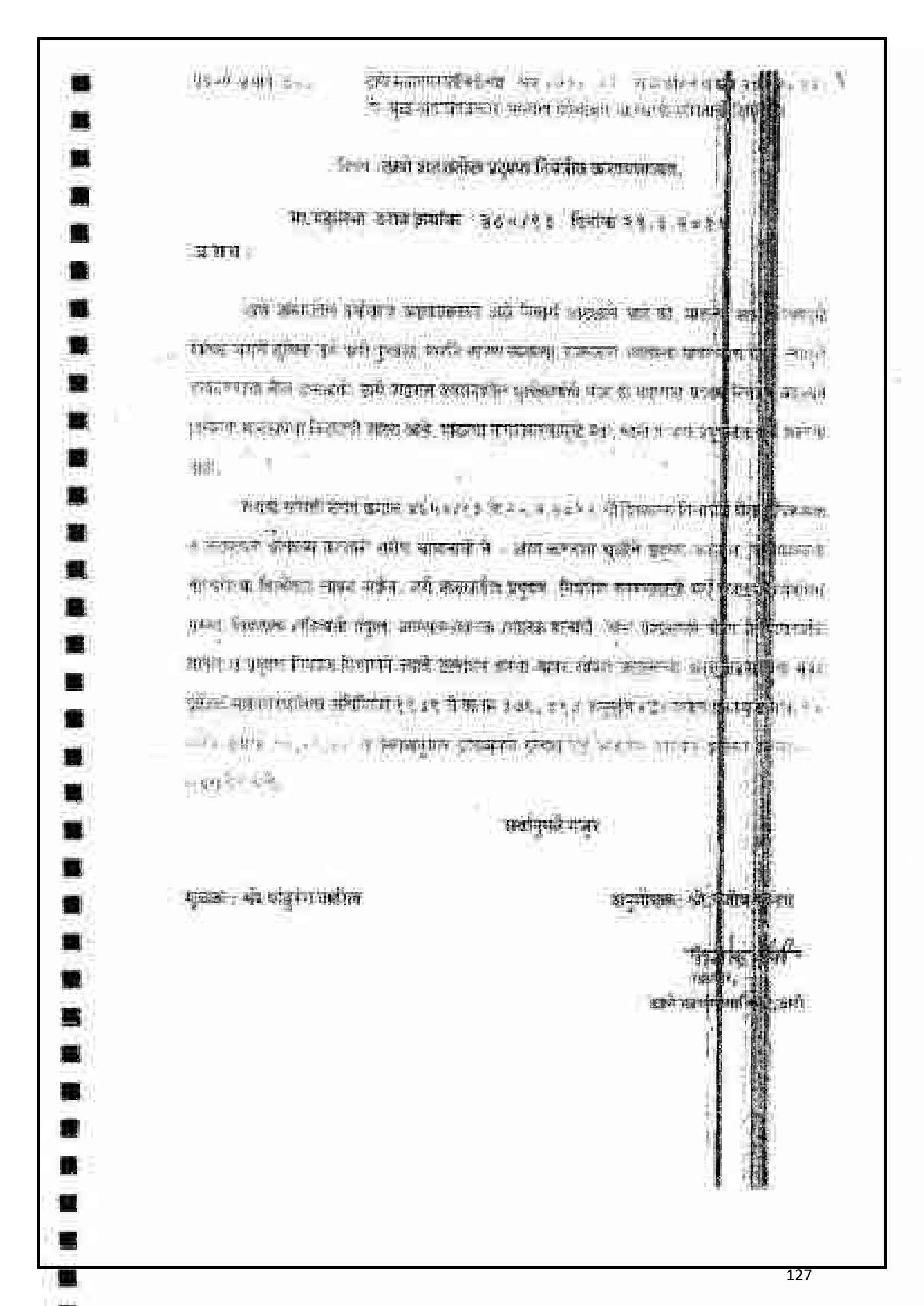
iii. Key Feature/Components:

- Improve the creek's ecosystem.
- Protecting mangroves & safe guarding encroachment along the creek sides.
- Restore mangrove belt to enhance coastal zone ecology.
- Improve creek side landscape to increase the soft mobility through the natural corridors.
- Creating recreational facilities. – Mangroves trails, Nature trail, Gardens, Public spaces, Cycle track etc.

iv. Beneficiaries:

City's Residents - Eco Tourism

- Environment Awareness



प्रदूषण नियंत्रण नियमावली

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CAD RULES

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CLEANLINESS MARSHALLS

विषय :

2018-19 245 people deployed as Pras[illegible]
Start
Check waste burning
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परिशिष्ट - ६ (दरसूची)

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THE MUNICIPAL CORPORATION OF THE CITY OF THANE

Solid Waste Management Project Department

T.M.C/SWM/Project/____ dated 12/03/2019

Subject: Notification for implementation of Construction and Demolition Waste Management Rules 2016, and Schedule of Tipping fees and Penalty.

Reference: 1. Construction & Demolition Waste Management Rules, 2016 dt.29/03/2016

2. General Body Resolution No. 383 dt.26/01/2016

3. Standing Committee Resolution No. 2329 dt.05/01/2017

4. Work order No. TMC/SWM/2016 dt.03/04/2017

5. G.B Resolution no. 315 dt.19/11/2018

1. Introduction –

Construction and Demolition Waste (C&D Waste) means the waste comprising of building materials, debris and rubble resulting from construction, re-modelling, repair and demolition of any civil structure. C&D waste generally includes bricks, tiles, stone, soil, rubble, plaster, drywall or gypsum board, wood, plumbing fixtures, non-hazardous insulating material, plastics, wall paper, glass, metal (e.g. steel, aluminum), asphalt, etc. Material generated from de-silting activity is excluded from C&D waste category as it contains decomposed organic matter and may also contain heavy metals & other toxic materials.

Construction & Demolition (C&D) waste is heavy (due to high density), often bulky, and occupy considerable storage space. C&D waste stored outside construction sites and along road sides are a cause of both traffic congestion and mishaps. These wastes are quite often given away for filling in low lying areas or plots to private agencies or disposed at open spaces or on the road side illegally. Waste from small generators often finds its way into the municipal bin, waste storage depots, making the municipal waste heavy and degrading its quality for further treatment like composting or energy recovery. C&D waste is also often dumped in storm water drains obstructing the flow of storm water leading to urban flooding. Furthermore, natural resources of construction materials are reducing day by day. Therefore, proper C&D waste management has become need of the day.

In order to improve the collection, segregation, recycling, treatment and disposal of C&D waste in an environmentally sound manner Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India has notified the Construction and Demolition Waste Management Rules, 2016 (C&D Rules

2016) on 25.01.2016. The C&D Waste Rules have introduced the concept of "Deconstruction," which means the planned selective demolition in which salvage, reuse, and recycling of the demolished structure is maximized. This is made possible by a planned sequence of construction so that facilities is built/used when desired. In a way, de-construction is "construction in reverse." De-construction leads to less wastage and higher environmental sustainability.

Objective –

Objective of these guidelines is to prevent or eliminate illegal/unauthorized/improper/unsafe dumping of C&D waste within TMC jurisdiction and provide a streamlined mechanism for Collection, Transportation, Processing and C&D of Construction & Demolition (C&D) Waste within Thane city and adjoining peripheral area of 20 KM from valid/extant TMC area.

Benefits of scientific C&D Waste Management System –

- C&D waste can be put to a profitable use, given the scarcity of resources for construction, thereby saving natural resources.
- It prevents public nuisance and traffic congestion issues arising from unauthorized dumping of C&D waste.
- It saves valuable space at landfill sites.
- It reduces cost of bulk transportation if recycled close to source of generation.
- It enhances the compost quality and calorific value of Municipal Solid Waste.

2. Applicability & Scope –

1. Territorial applicability –

These guidelines shall be applicable to and govern the management & disposal of all C&D waste generated within the city of Thane from the publication of the this notification. For any clarification you may contact The Medical Officer, Solid Waste Management, Thane Municipal Corporation Telephone No.022-25339382

2. Persons governed by guidelines –

These guidelines are applicable to all C&D waste generators within the city of Thane. "Waste Generator" means any person or association of persons or institution, residential and commercial establishments including Central/State Government departments, MMRDA, MMRC, MIDC, MSRDC, PWD, CPWD, Indian Railways, Airport, Port and Harbour and Defence establishments etc., who undertakes construction or re-development or any civil structure which generate construction and demolition waste. It shall be the responsibility of such C&D Waste generators

ensure that the C&D waste generation activity complies with these guidelines and C&D Waste Management Rules, 2016 as amended from time to time.

3. Activities governed by guidelines –

These shall apply to all C&D waste generation activities within the city of Thane.

4. Applicability –

These guidelines supersede all other policies or guidelines or circulars that may earlier have been issued by TMC dealing with or pertaining to the management of C&D waste generated within the city of Thane. It is hereby clarified that all rules, regulations, guidelines, policies, regulating all types of construction activities (including excavation, trenching) shall continue to be applicable to the relevant activities and these guidelines shall be read harmoniously with and in addition to such existing rules, regulations, guidelines, policies.

5. Responsibilities of C&D waste generator:

C&D waste generator –

(1) shall register prior to generation of waste with concern authority of TMC.

(2) shall primarily be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated, as directed or notified by the TMC in accordance with these rules.

(3) shall ensure that other waste (such as solid waste) does not get mixed with this waste and is stored and disposed separately.

(4) who generate more than 20 tons or more in one day or 300 tons per project in a month shall segregate the waste into five streams such as (i) concrete, (ii) soil, (iii) steel, wood and plastics, (iv) bricks and mortar and shall submit waste management plan and get appropriate approvals from the TMC before starting construction or demolition or remodelling work and keep the concerned authorities of TMC informed regarding the relevant activities from the planning stage to the implementation stage and this should be on project to project basis.

(5) shall keep the construction and demolition waste within the premise or get the waste deposited at Designated Collection Points notified by the TMC or handover it to the Authorised processing facilities of construction and demolition waste, and ensure that there is no littering or dispersion of construction and demolition waste so as to prevent obstruction to the traffic or the pedestrians or drains.

(6) shall pay relevant charges for collection, transportation, processing and disposal as notified by the TMC.

Service providers (Utility) and their contractors –

(1) "service provider" means authorities who provide services like water, sewerage, electricity, telephone, roads, drainage etc. often generate construction and demolition waste during their activities, which includes excavation, demolition and civil work;

(2) shall remove all construction and demolition waste and clean the area every day, if possible, or depending upon the duration of the work, the quantity and type of waste generated, appropriate storage and collection, a reasonable timeframe shall be worked out in consultation with the TMC / Set up in situ salvaging/processing and/or recycling facility

(3). In case of the service providers have no logistics support to carry out the work they shall tie up with the authorized agencies for Collection, Transportation and Processing of C&D waste and pay the relevant charges as notified by the TMC.

4. Categories of C&D Waste generators –

It has been estimated that about 50 kilogram per square meter (kg/m^2) of C&D waste is generated during new construction and about 45 kg/m^2 minor building repair or renovation. During demolition of proper concrete and masonry buildings (locally called pucca building), about 500 kg/m^2 of C&D waste is generated whereas 300 kg/m^2 is generated for structures with partial concreting and masonry.

Categories of C&D waste generators in TMC area are as below:

Table 1

Category	Type of Waste Generator
A	Small Generators (Household/Minor repairs) generating less than 1 ton and all those carrying out works that does not require any prior permission or approval of the TMC.
B	Large Generators (Major repairs/renovation/remodelling) generating between 1 ton to 20 tons, and/or all agencies, private or public, that carry out works that require the approval of the TMC.
C	Bulk Generators (Developers/demolition/infrastructure agencies/contractors) generating more than 20 tons in one day or 300 tons per project in a month and/or all agencies, private or public, that carry out works that require the approval of the TMC. C1: All private agencies /developers C2: Government Agencies C3: Thane Municipal Corporation

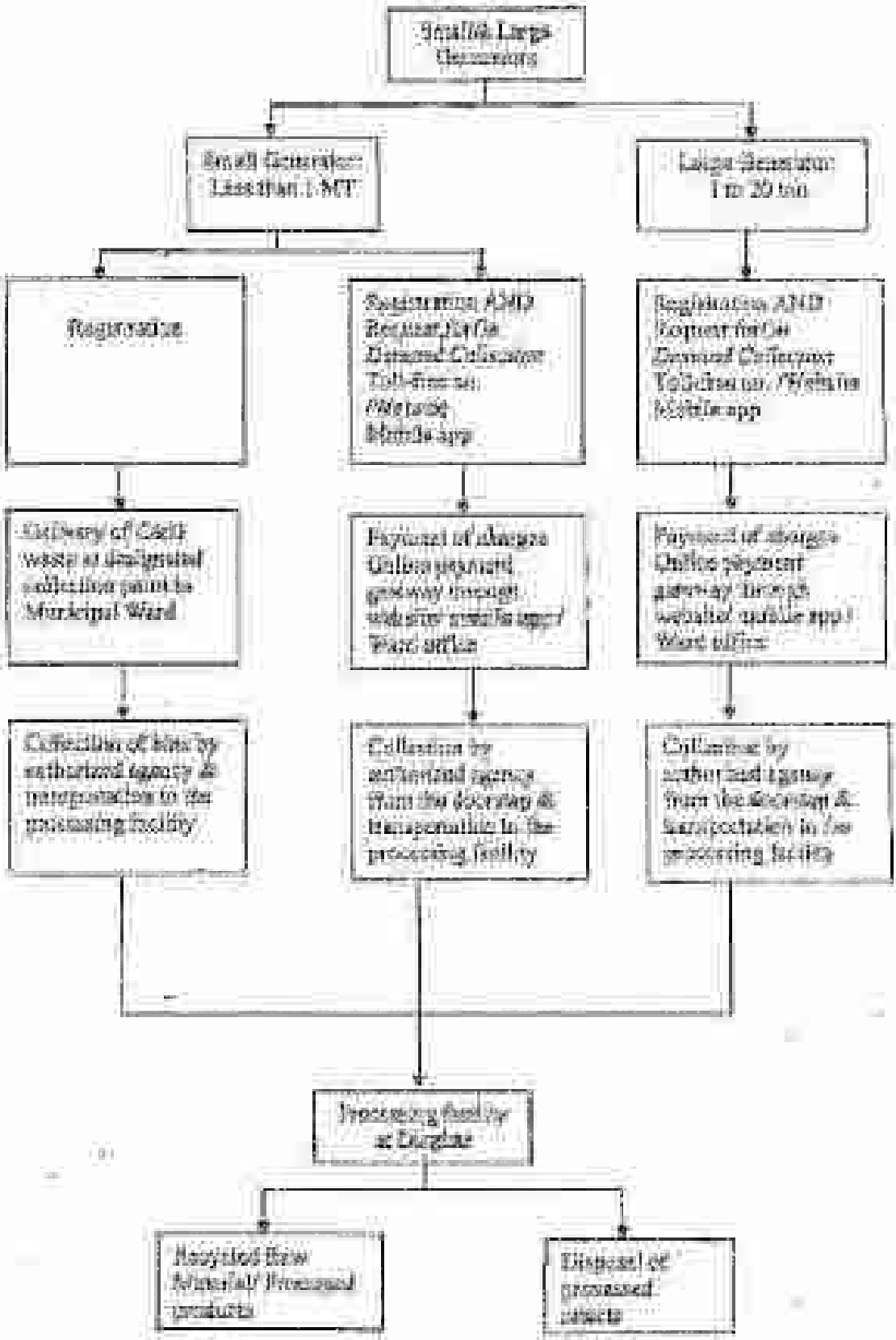
D	TMC workforce-bulk generation undertaken by staff and all contractors that are employed by the TMC for carrying out demolition/ construction/repairs works
E	Service providers (non-bulk generation authorities (other than TMC) who provides services like water, sewerage, electricity, telephone, roads, drainage, etc.

5. Collection &Transportationfor C&D Waste management in Thane-

5.1 Household/Small generator & Large generator (Category A & B):

1. Every waste generator after registration will submit a request on website/ward office/helpline for segregated collection of C&D waste.
2. Payment of charges –
   i. Every C&D waste generator has to pay to TMC the requisite charges per the rates notified by TMC for collection, transportation, processing & disposal of C&D wastebased on approximate quantity of C&D waste (estimated quantity of C&D waste generation fordifferent types of works as specified above can be referred by waste generator for deciding approximate quantity of C&D waste generation & payment as per the rates notified).
   ii. Payment can be done by online payment gateway through website/mobile app or directly at ward office.
   iii. For C&D waste less than 1ton, there will be no charges, but C&D waste generator has to register, followed by a request through website/mobile app/ward office and arrange for their own to transport the C&D waste to the Designated Collection Point or they may avail door-to-door collection by paying minimum rate of 1 ton.
   iv. In case of large generator 1 to 30 tons, they should store and keep C&D waste in their premises, which will be collected and transported and processed by the agency as per the schedule of tipping fees.
3. Every waste generator availing Door-to-door On DemandCollection service has to keep the C&D waste within their premises and provide the same promptly when collection vehicle arrives at the site.
4. List of Designated Collection Pointswill be notified by the TMC website from time to time on TMC website for Scheduled Collection service and this facility will be available only to Small C&D waste generator.
5. After receipt of payment of requisite charges, C&D waste On Demand Collectionwill be provided by TMC appointed agencywithin 24 hrs.
6. Rates for every waste generator (Category wise) collection, transportation and processing (CTP services) of C&D waste will be notified on TMC website from time to time.

Flowchart for management of C&D waste from Small & Large generators



5.3 Bulk Generators (Category C):-

1. Every bulk generator shall submit C&D Waste Management Plan (WMP) along Self Declaration form with Performa "A" (by Developer/ Architect/Authorised representative) to the Solid Waste Management (Project) Department of TMC at the building plan approval stage or before starting construction or demolition or re-modelling of work. SWM Project dept of TMC will approve the WMP within one month from submission and issue necessary NOC. Failing to do the same, will be treated as deemed approved.
2. For bulk generator C&D waste to be transported to the TMC's C&D waste processing facility, All the of C&D waste segregated, collected and transported to the Authorised C&D waste Processing facility shall be subject to a payment of relevant tipping fee. Generation of the C&D waste calculated according to the quantum of the waste generated. C&D waste collected and transported by Bulk Generator to the Authorised processing facility by paying 50% of the normal tipping fee.
3. Bulk generators shall pay the requisite charges notified by TMC & to keep/maintain the payment receipt of C&D waste.
4. Bulk Generators to segregate C&D waste in/from streams such as (i) concrete, (ii) soil, (iii) steel, wood and plastics, (iv) bricks and mortar.
5. Register of Collection & Transportation services of C&D waste shall be properly maintained & produced as & when required by TMC or any competent authorities.
6. Every C&D waste transportation vehicle shall be registered with GPS with TMC monitoring controls.
7. C&D waste shall be transported in mechanized vehicles registered with TMC. Vehicles used for collection &transportation of C&D waste shall be equipped with GPS & record of GPS services of C&D waste shall be properly maintained & produced as & when required by TMC or any competent authority.
8. The Bulk Generators classified into three categories:

   C1: All private agencies /developers.
   C2: Government Agencies.
   C3: Thane Municipal Corporation.

5.4 TMC works (Category D):-

1. C&D waste generated from TMC works such as Public Works department, Water Supply department, Sewerage department, Unauthorized Construction Removal and Encroachments department etc. to be collected and transported to the C&D processing facility.
2. The concerned TMC department to factoring in tipping fee and other guidelines as specified in provision of C&D Waste Management Rules 2016 while preparing estimate of works.

5. C&D waste generated during demolition of unauthorised structures, displaced structures project affected structures etc. will be kept in site for a week period for municipal inventory waste purpose. After a week period C&D waste generator / developer authorised contractor shall be responsible to collect & transport C&D waste for processing & disposal to processing facility. Failing to which penalty will levied and waste will be collected and transported to processing facility at risk & cost of C&D waste Generator by authorised agency.
6. C&D waste shall be transported in authorised vehicles registered with TMC Vehicles used for collection &transportation of C&D waste shall be equipped with GPS & record of GPS services of C&D waste shall be properly maintained & produced as & when required by TMC or any competent authority.
7. TMC Civil Contractor bill will be released on receipt of delivery challan copy issued by C&D waste processing facility
8. TMC wards classified into Bulk and Non-bulk C&D generation activities

5.4 Service providers and their contractors (Category E) -

Service providers shall collect & transport their C&D waste to Authorized processing facility for processing after receipt of NOC from TMC Public Works Department and payment of relevant tipping fees. The concerned TMC department while issuing the NOC to the works will ensure that the implementation of C&D Waste Management Rules, 2016, guidelines and schedule of tipping fees. The service providers activity classified into Bulk and Non-bulk C&D generation activities.

5.5 Unauthorized/indiscriminate dumping of C&D waste on roads/public areas (Category F)

1. Citizen, RWAs/ TMC can lodge complaint/ request of unauthorized/illegal dumping of C&D waste through toll-free helpline number in Complaint Centre. Authorized agency shall ensure C&D waste dumped unauthorized/indiscriminately on roadside / public space and lift the C&D waste through its established Command, Control and Response Mechanism and liaison with TMC for registering the complaint against defaulters & recovery of penalties.
2. If any Citizen / RWAs observe that C&D waste is being dumped illegally/indiscriminately on the roadside or open spaces, he/she can inform TMC regarding illegal dumping of C&D waste along with photo showing clear registration number of vehicles using illegal dumping.TMC shall initiate action against such defaulter/vehicle owners.
3. Penalty –Schedule of penalties ranging Rs. 5,000 to Rs. 20,000 to be recovered from C&D waste generators will authorized agencies for various lapses observed in compliance with th

C&D Waste Management Rules 2016 are annexed herewith. Authorised agency shall assess and report the quantity of C&D waste illegally dumped to TMC authorities. TMC will recover penalties from such C&D waste generators for lapses and non-compliance of C&D Waste Management Rules 2016.

5. In case of lifting of C&D Waste dumped illegally on public streets/ public land/ drains etc. TMC or requisitioning government agency shall pay 75% of normal tipping fees and the balance 25% of tipping fee shall be released within 90 days after through recoveries from penalties and fines duly by TMC from defaulters and/or from the TMC Escrow account or from requisitioned Government Agencies.

6. <u>C&D Waste Collection, Transportation and Processing services in designated adjoining area:</u>

Areas designated by TMC for the collection of C&D Waste within Thane city and adjoining peripheral area of 10 KM radius from TMC area. It shall include adjoining parts of nearby Urban Local Bodies also. A separate tripartite agreement shall be done with them for Collection & Transportation and Processing of C&D waste generated by them after receiving NOC from TMC.

7. <u>Provision for use of recycled raw material /products from C&D waste</u> -

With reference to SBM Star Rating for Garbage Free Cities module:

1. Provision made for minimum 40% use of raw C&D waste for any TMC/ Government / Municipality approved construction activities in non-structural application, lower layers of road pavements, inner colony roads, filling of plinth and basement, landscaping and leveling of ground etc. and
2. Provision made for minimum 20% use of material made out of C&D waste in TMC and/or Government construction activities (if available) in products such as bricks, tiles, paver blocks, drainage covers, kerb stones, structural concrete as manufactured aggregates, etc subject to strict quality controls: 80% of Schedule of Rates of TMC. (IS 383: 2016).

8. <u>RFID-GPS system with TMC Monitoring system:-</u>

1. All C&D waste collection bins shall be tagged with RFID system and all collection & transportation vehicles shall be equipped with RFID reader.
2. All C&D waste transport public or private vehicles in Thane city jurisdiction must be registered with TMC authorities and must have installed custom GPS devices compatible with TMC real time monitoring website.

Municipal Commissioner
Thane Municipal Corporation, Thane

SELF DECLARATION FORM BY BULK WASTE GENERATOR IN RESPECT of CONSTRUCTION & DEMOLITION ("C&D") WASTE MANAGEMENT PLAN ("WMP")
(To be submitted by Developer/ Architect/Authorised Representative of Concerned Bulk Waste Generator to SWM Project department)

To,

SWM (Project/Department)

Construction and Demolition Waste Management Plan for project site

_____

with reference to above, I the undersigned Shri _____

the Authorised representative of M/s. _____

the firm having office at _____

_____

And the project named under _____

situated at CTS No. _____ having site address

_____

in _____ Municipal Ward, declare here on solemn oath for the management of C&D waste generated from the above stated construction site, as follows.

I state that

1. The brief description of the project is

   _____

   _____
2. The estimated project completion period is _____ months
3. I shall start project work at location stated above on _____
4. The Proforma "A" in respect of checklist for "C&D waste management plan" with estimated generation of C&D waste duly signed by Architect is attached herewith. As the construction site the estimated demolition waste generation would i _____ M.T. and estimated excavated debris would be _____ M.T.
5. I have obtained /will obtain the extraction permission from the office of Collector Thane under no. _____. the copy of the same is attached will be submitted before starting the excavation work for reference.
6. I will follow the terms and conditions stated in the construction permissions issue by Collector and all related rules and regulations while performing excavation work at project site.
7. Out of the above stated demolition / excavated waste _____M.T. quantity of C&D waste will be reutilized /utilized within the project site as refilling, for which necessary NOCs /permissions are / will be obtained from the required authorities.
8. The quantity of daily C&D waste generation at site will be _____ M.T. I sha transport total _____ M.T of C&D waste generated at project site. I

authorised C&D Processing facility by depositing Processing & disposal charges a prevailing rate Rs. 545/- per M.T

9. I have confirmed that dispose off C&D waste by me / my firm does not fall unde Wetland/CRZ / no development zone / Reservation land / forest declared land.
10. The C&D waste generated from the said project site will be transported during the day time i.e. from 8.00 am to 8.00 pm only for its disposal at designated site for the period from ____________ to ____________ as per the period granted for excavation by Collector, Thane.
11. I have sufficient temporary storage available within site for holding undisposed C&D Waste generated thereat.
12. The list of vehicles utilised for appointed transport contractor for transportation of C&D waste is attached herewith.
13. M/s. ____________________, the transporter firm appointed by me/my firm to transport the C&D waste generated from the project site to the disposal site stated above for its disposal by following transport route as planned by my firm / transport firm. The copy of the same is attached herewith and strictly adhered.
14. I /my firm and appointed transport contractor will follow/abide all guidelines of C&D Waste management plan and other conditions stipulated by authorities and will be solely responsible for the disposal of C&D waste generated at above project site, failing which me, my firm and transport contractor is liable for the action deemed fit as per rules and regulations framed under C&D Waste Rules 2016, MMC Act, TMC's Bye Laws and Govt. Authorities under various act / sections.
15. I have attached herewith the letter of consent / agreement executed with the transporter firm M/s. ____________________ along with the list of vehicles RTO registration numbers , equipped with GPS compatible VTMS system and their load carrying capacities engaged for transportation of C&D waste from the project site.
16. I shall maintain C&D Waste transportation Register at site & duly record each trip stating Vehicle Registration numbers, timings of entry and exit and approx quantities transported in each trip.
17. In the event of any changes in the dates, quantities and route, an intimation for the same will be submitted in advance.
18. All documents mentioned above shall be available for scrutiny to SWM Project Department officers at site during progress of the work.
19. I shall provide for barricading and enclosure at construction site to avoid spreading of fugitive dust into the atmosphere as well as avoid its deposits spreading on the streets/footpaths/drains etc.
20. I shall adhere to pollution norms and the noise level norms during all the activity at site.
21. The vehicles used for transportation of C&D Waste shall not create any nuisance, spillage of slurry / waste on road while transportation. The body, wheels, the chassis etc. shall be therefore washed and cleaned thoroughly to avoid spreading of waste on the road.

22. Each of the vehicle deployed shall be properly covered with tarpaulin or any other suitable material firmly fixed on the vehicle to avoid any escape and falling of waste on road.

23. Each of the vehicle deployed under this declaration shall carry a copy of this declaration and receipted Challan issued by the project site mentioning all details like challan nos, name of the project site, transporter firm, disposal site and time of leaving the project site, failure of which the transportation shall be considered illegal as per EWC bye laws.

24. The surrounding and vicinity of loading and disposal site shall be maintained clean by me.

I/we hereby declare that the above information are true and correct to the best of my/our knowledge and belief. I/we will abide by guidelines issued under C&D Waste Management Plan, C&D Waste Management Rules 2016, and any other conditions stipulated by Govt. Authorities/environmental rules and regulations. I/we fully understand that any letter of approval granted to me/my firm for development of stated site on the basis of statement furnished herein is liable to cancellation or any other action that may be taken, having regard to the circumstances of the case if it is found that any of the statement or facts therein are incorrect or false.

I am attaching self-attested copies of the following documents along with this declaration.

a) Proposed Plan for Development by Architect

b) Proforma "A" duly signed/sealed by

c) Excavation permission from Collector, Thane

d) Appointment letter of transport contractor along with the acceptance letter.

Signature of the applicant

Name: _____

Contact No. _____

Designation _____

M/s. _____

Address _____

_____

Place _____

Date _____

PROFORMA "A"

To,

SWM (Project) Department,

Check list for C&D Waste Management Plan

Name & Address of Project Site:

____

____

____

Name & Address of Authorised representative of the Bulk C&D Waste Generator:

____

____

____

Approval / Work Order Reference No.

____

Sr.No.	Description	Details
1.	Brief project description, type of building - residential/commercial etc.	
2.	Project completion period (Months)	
3.	Project commencement date	
4.	A. Demolition Waste in M.T. [0.5 MT/sq.m (pucca) OR 0.3 MT/sq.m (others)] B. Excavation Waste in M.T. (As per Collector permission in brass) (1 brass= 2.833 cu.m. & 1.8 M.T./cu.m.) C. Waste during Construction in M.T. (0.05 MT/ sq. m of FSI & Non-FSI construction)	
5.	Total Quantity in C&D Waste in M.T. (4A+4B+4C)	
6.	Expected C&D waste to be utilised within the subject site	
7.	Expected C&D Waste to be transported to Processing site - A. Quantity of daily C&D waste transportation B. Total period till when C&D waste to be transported C. No. of vehicles per day	
8.	In house temporary storage facility within the subject site (Locations be marked on site plans to be submitted) Period till when will be consumed within the site with Activity / Bar Chart	
9.	C&D waste transportation agency- Name & Address	
10.	Tentative vehicle RTO registration numbers by which the C&D Waste will be transported	
11.	A. Period of work, till stored C&D waste would be utilised within the site under Subject B. Specify the Stacking method	
12.	Name and designation of authorised signatory who will sign the challan when C&D Waste sent for processing	

____

(Applicant)

THE MUNICIPAL CORPORATION OF THE CITY OF THANE

Solid Waste Management (Project) Department

Schedule of Tipping FeeRates for Collection, Transportation & Processing and Disposal of Construction & Demolition Waste

Reference: Standing Committee Resolution No. 2920 dated 08.11.2017

Basic tipping fee rate of Collection, Transportation (C&T) and Processing and Disposal (P&D) for First year (excluding taxes):

Rs. 1089/- per Ton for C&D Waste Generator Category: A, B, C, E & F

Rs. 1038/- per Ton for TMC C&Dwaste Generator Category: D

In case the C&D waste Collected & Transported by any Generator at the designated processing site at Diughar at his own cost for processing & disposal, for a such quantity 50% of the tipping fee will be applicable

Category	Type of Waste Generator	Tipping Feefor Waste Generator per Metric Ton	TMC share per Metric Ton
A	Small Generators (Household/Minor repairs) C&D Waste generating less than 1ton		
	(i) C&D waste delivered at Authorised Collection Centre (Scheduled Collection)	Free	Rs. 1089/- (from Escrow a/c)
	(ii) C&D waste collected from Generator site (On demand collection)	Rs. 1089/-	Nil
B	Large Generators (Major repair/Renovation) C&D Waste generating between 1 ton to 20 tons: C&D waste collected from Generator site (On demand collection)	Rs. 1089/-	Nil
C	Bulk Generators C&D Waste generating more than 20 tons in one day or 300 tons per project in a month and/or all agencies, private or public, that carry out works that require the approval to Waste Management Plan (WMP) by the SWM (Project) Department. C&D Waste collected and transported to Processing Plant by Bulk Generator, to pay 50% tipping fee of Rs. 1089/- per ton for Processing and Disposal of C&D waste quantity as per WMP.	Rs. 545/-	Nil

D	TMC works undertaken by itself and all contractors that are engaged by the TMC for carrying out public works. C&D Waste to be delivered to Processing Plant The proportionate processing cost to be included in estimate/ workorder prepared by the all concerned departments (PWD, Water Supply, Sewerage, Electrical, Unauthorised Construction and Encroachment Removal) and actual cost incurred is to be transferred to Escrow A/c maintained by SWM (Project) department.	Nil	Rs. 525/-
E	Service providers (Utility) such as PWD, MMRDA, MSEDC, MTNL, etc. C&D Waste to be delivered to Processing Plant	Rs. 545/-	Nil
F	Unauthorised /indiscriminate dumping of C&D waste on roadside / public spaces in TMC area. Collection, transportation processing by Agency (75% Tipping fee plus penalties collected on this account by TMC)	25% tipping fee from Penalty collected	75% tipping fee from Escrow a/c

Escrow A/c to be topped up through yearly Budget provision.

Municipal Commissioner
Thane Municipal Corporation, Thane

Schedule of Penalties

Schedule of Penalties to be recovered from C&D waste generators, Transport contractor for various lapses observed in compliance with the provisions of C&D Waste Management Rules 2016.

Sr. No.	Particular	Penalty in Rs. (Per each incidence/ violation/ complaint received)
1.	Failure to storage of C&D waste as per Rules	5,000
2.	Not delivering C&D waste in a segregated manner /Mixing C&D Waste with Other waste or vice versa	10,000
3.	Illegal dumping of C&D waste in front of houses, roads, parks or at any other public space	20,000
4.	Illegal dumping of C&D waste / polluting forest, mangroves, wetlands, creeks and quarries or in a non-designated area.	50,000
5.	Not removing C & D waste within stipulated time (as specified in Waste Management plan)	10,000
6.	Violating norms while transporting C&D waste/ Spilling on the Road during transit	10,000
7.	Non performance of any other obligation under the Rules/ reflecting a continuous period of 7 (seven) days	10,000

Municipal Commissioner
Thane Municipal Corporation, Thane

ठाणे महानगरपालिका

[illegible]

THE MUNICIPAL CORPORATION OF THE CITY OF THANE

[illegible]

कार्यादेश

प्रति,

[illegible]

विषय : [illegible]

संदर्भ : [illegible]

[illegible]

[illegible]

Work details
• Conduct 10 Awareness Workshops, Webinars and Stakeholder Consultation on Air Quality.
• Preparation of IEC material on Air Quality.
• Participation in meetings organized by MPCB or any other related government agency.
• Presentation on behalf of Thane Municipal Corporation in organized meetings or workshops.

[illegible]

ठाणे महानगरपालिका, ठाणे