



Solid Waste Management Practices in Ahmedabad City

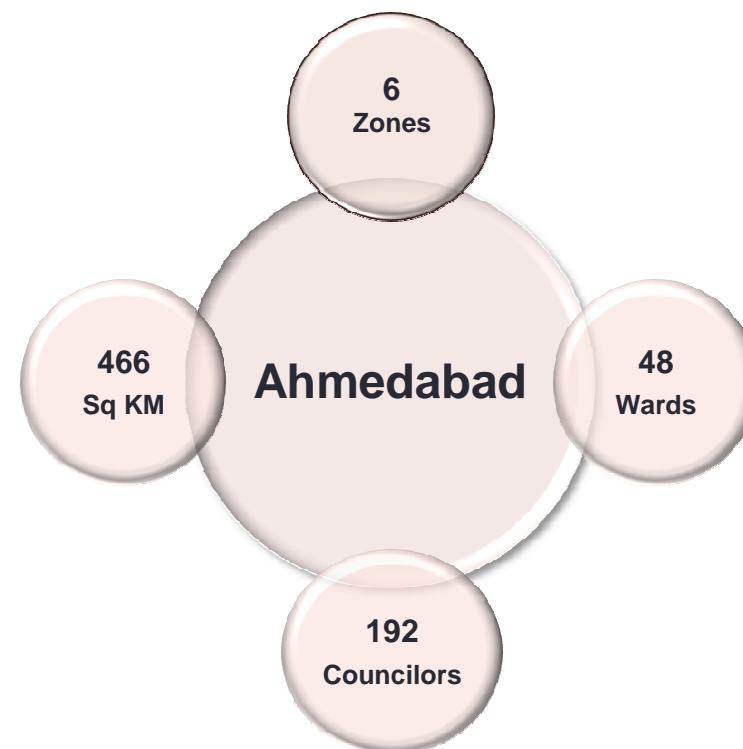
February, 2016

**Solid Waste Management Departement
Ahmedabad Municipal Corporation**



Ahmedabad City

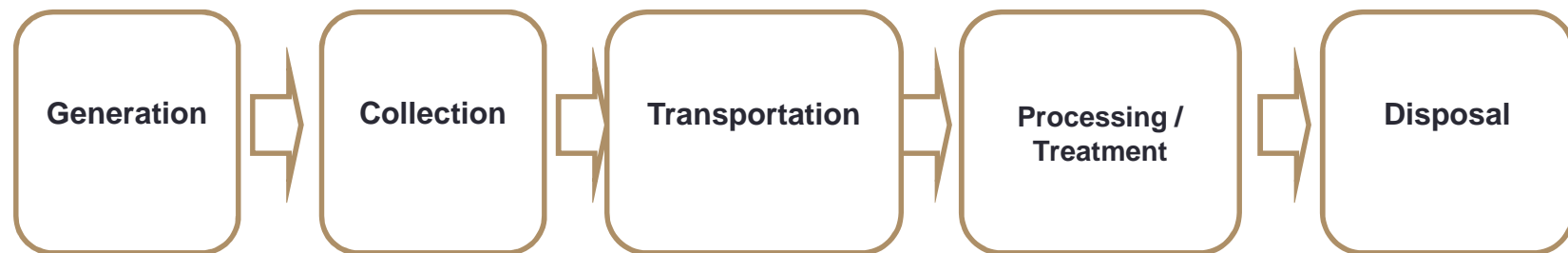
Details	Year 2015
Area (sq. km.)	466
Population (Lacs)	63 (approx)
Wards	48
Staff	12500+
Solid Waste (TPD)	4000+
Vehicle - Equipments	1500+
Annual Budget (Rs in Crore)	400+





System as per Rules

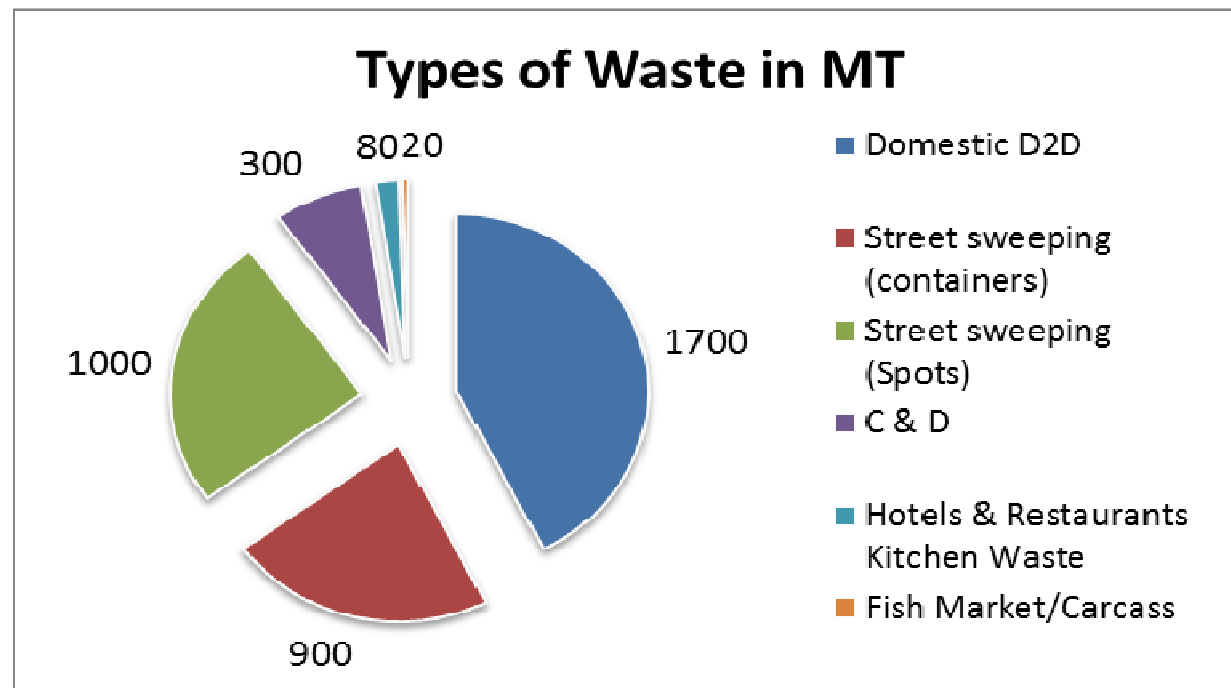
The Ministry of Environment and Forest (MoEF), Government of India issued a notification on 25 September, 2000 under the Environment Protection Act 1986 stating that all cities and towns of India should undertake municipal solid waste management as prescribed by the rules. These are known as “The Municipal Solid Waste (Management & Handling) Rules 2000”.





An Overview of Solid Waste Management from different sources

Population of City is 63 lacs plus and daily per capita waste generation is more than 600 gms. City generates more than 4000 TPD waste including 300 MT of construction and demolition debris Waste. All waste is collected, transported, treated and disposed according to the MSW Rules.





(A) Waste Collection System

1. Sweeping of Roads
2. Scrubbing of roads through Road Sweeping Machines
3. Waste Collection by Door / Gate to Dump System.
4. Waste collection from spots and from bins / trolleys
5. Collection of Construction & Demolition waste.
6. Collection of segregated of Kitchen waste from Hotels and Restaurants
7. Collection of Bio-Medical Waste.
8. Collection of Carcass / Animal Waste.
9. Cleaning of Public Urinals / Toilets and open defecation sites through machines
10. Steps taken for maintaining cleanliness in River
11. Safe Collection, Transportation & Disposal of E - waste

(1) Sweeping of Roads

- All public roads, streets, lanes and bye-lanes having habitation or commercial activity on one or both sides of the street should be cleaned on a daily basis assigning clearly demarcated area to each sweeper and street sweeping waste should not be mixed with domestic waste and be deposited in the special container placed at the secondary waste storage depot.
- 1484 km roads are swepted by more than 13000 AMC's own street sweepers on a daily basis.
- Street sweeper is provided with a lorry and 6 bins for cleaning activity with other hand tools.
- The cleaning activity is carried out daily 365 days in a year from morning 6:30 am to 11:30 am & 3 pm to 6 pm on all roads of the city.





(1) Sweeping of Roads

- As per the policy of giving service to the dependant / heir of the workers declared unfit or dead, in the year 2012-13, the 213 heirs, in the year 2013-14, the 318 heirs and in the year 2014-15, the 231 heirs were given permanent service.
- The 43 persons working as street sweepers in the year 2010-11 and 16 persons working as the Cleaning Workers up to December -2013, totaling to 59 employees have been given promotion as the Sanitary Sub-Inspector.
- Promotions have been given to street sweepers as a Sanitary Sub-Inspectors (43 persons in 2011 and 16 persons in 2013)
- Under Dr. Babasaheb Ambedkar Safai Kamdar Aawas Scheme, a total of 2496 quarters having 2 rooms, kitchen, toilet, bathroom, gallery, etc of ground plus 3 floors and facilities with water, drainage, electricity, street lights, etc were constructed. Each of these quarters have an area of about 36 sq mt. and constructed with RCC monolithic structure.

(2) Scrubbing of roads through Road Sweeping Machines

- a) All major public roads, BRTS roads & Model roads are covered under this system.
- b) 25 trucks / tractors mounted & 15 self rides Road Vacuum Sweeping machines are helping AMC to keep city as a dust free city.
- c) This work is given on O&M model for 5 years. AMC is paying the Agency on shift basis.
- d) Vehicles and TPM working is monitored through GPS, RFID Readers and Tags.





(3) Door / Gate to Dump System:-

- AMC introduced a concept of Door / Gate to Dump since July 2009-10, in which the AMC appointed contractor to collect waste from residential units in morning hours and from commercial units in evening hours in closed Hydraulic Euro III vehicles. Contract period is 7 years.
- Start the collection operation from 7 am onwards. The waste from these vehicles is transferred to Refuse Transfer Stations (RTS) or local transfer stations from each ward and thereafter to the treatment plants / disposal site.
- This system is completely outsourced. Agency has to provide vehicles, drivers, labours, fuel, maintenance, keep 10% spare vehicles, appoint one supervisor per ward, paint a complain number on the vehicle, etc.
- Payment to agency on per ton basis with yearly 5% increase. Average distance per trip total 5 to 7 km. Average rate at present AMC is giving Rs 800 per ton.





(3) Door / Gate to Dump System:-

- The project is successfully covering 100% of all residential (14.50 lacs plus) & commercial units (3 lacs plus) , on all 365 days of the year.
- Sta. More than 600 vehicles of Tata ACE with more than 1 ton capacity are deployed and more than 1700 TPD waste collection in this System.
- No responsibility on the Agency for collection of user charges. AMC issues a property tax bill (which covers conservancy tax) once in a year for all sanitation services to the citizens.
- At present no source segregation has been done by citizens, so agency is collected waste in mix nature (other then C&D waste)
- **Monitoring through GPS system:**

AMC has 6 Zones and 64 Wards. In each ward, there are fixed number of routes for waste collection covering all the societies, apartments and areas of the Ward. A vehicles traverses through the route, collects garbage from pre-defined points (POI) in the route. Total Routes : 600 plus, Total Door to Door vehicles : 700 plus, Total POIs (Point of Interest): 25,000 plus

Current status is:

- ✓ Ward wise route details and POIs are provided to the computer system.
- ✓ GPS device is installed in each vehicle.
- ✓ Monitoring for all routes is going on.



Swachhata Jan Model

Waste segregation at source and inclusion of waste pickers in main stream:

AMC has started an initiative (November, 2014) by approving private agencies to collect dry recyclables from commercial units in 2 zones out of 6 zones by engaging waste pickers.

Observing success of this practice, AMC has planned and started Swachhata Jan Model (SJM) in 3 wards on 2nd October, 2015 and spread it in another 4 wards in February, 2016.

Total 35000 residential units are planned to cover under SJM.

All units will be provided with 2 bins of 10 liters each, one green for wet waste and one blue for dry waste.

Separate vehicle / compartmentalized vehicle will be used for collection of segregated waste by deploying hydraulic vehicles. AMC will bear collection charges. Such vehicle will be equipped with GPS system.



- Dry waste will come at a sorting centre where AMC appointed agency will recover valuable dry waste and sale it to recyclers by engaging waste pickers.
- Such agency will retain 10% income over expenditure and remaining proceed will be distributed among waste pickers.
- Wet waste will be sent to a decentralized treatment plant for making manure.
- After the results, SJM will be implemented throughout the whole City covering all 6 zones in phase manner.





(4) Waste Collection from Spots:-

- a) AMC collect more than 1000 TPD waste from various spots in six zones by 130 tractors, trucks, JCB, etc. equipments & machineries. Monitoring through GPS system.
- b) In order to remove nuisance spots and to meet the increasing needs as well as to maintain cleanliness and public health, AMC has purchased 660 / 1100 liters capacity galvanized 1050 trolleys (silver colour) and 60 vehicles like Refuse Compactor.
- c) This work is given on O & M model for 5 years. Agency has to collect the waste from these Trolleys on a daily basis as per TPM. AMC is paying the Agency on shift basis.
- d) Vehicles and TPM working is monitored through GPS, RFID Readers and Tags.

**Statement of Zone wise deployment
of
660 / 1100 liters Trolleys**

Zone	Trolleys deployed	Compactors used
Central	73	6
East	109	5
North	152	5
South	134	6
New West	341	12
West	103	6
Total	912	40





Waste collection from road side small litter bins:-

- a) 1240 litter bins of 90 liters size have been installed in this year at various public roads, main roads, public places, pavements, as well as traffic locations, where citizens can dispose their waste easily, and it has been planned to install even more number of litterbins in the forthcoming year.
- b) This work is given on O&M model for 5 years. AMC has provided 8 vehicles and installed 1240 bins across the city. Agency has to put black garbage plastic bag in the bin and collect it on a daily basis (also put a new garbage plastic bag in a bin). AMC is paying the Agency on shift basis.
- c) Vehicles and TPM working is monitored through GPS, RFID Readers and Tags.

Waste collection from road side small litter bins:-



Statement of Zone wise deployment of 90 liters bins	
Zone	Installed
Central	210
East	150
North	148
South	80
New West	356
West	296
Total	1240
8 vehicles deployed for collection	



Lifting of Bins / Containers

- a) More than 934 locations are defined as waste collection points where 1025 closed body 7 cubic meter M. S. Community storage bins have been provided.
- b) AMC ensures that these containers are lifted at least once in a day and 900 TPD waste is collected under this system.
- c) This work is given on service model, AMC purchased lifters and containers and given on 5 years O&M basis where AMC is paying to Agency per trip basis and on variable km running.
- d) System is monitored by GPS, RFID Readers and Tags.





Statement of Zone wise deployment of 7 Cu. Mt. Containers, Sites and Dumper Placer Vehicles			
Zone	TOTAL		
	Container Sites	No. of Containers	No. of Dumper Placer Vehicles used for Lifting
Central	53	70	11
East	163	197	20
North	160	141	15
South	205	219	23
New West	185	191	17
West	168	207	16
Total	934	1025	102

Waste Collection (Overall):-

Various Containers / Bins put in use by AMC (as on 18th Feb., 2016)



Sr. No.	Size of Container / Bins	Approx Capacity of Solid Waste Storage (in Kg) per Unit	Qty. (Approx on road / at place)	Rate / PC	Total Amount Rs
1	20 m ³	14000	91	659299	59996209
2	7 m ³	2000	1025	60122	61625050
3	5 m ³	2000	70	55750	3902500
4	1100 LT	350	850	25250	21462500
5	660 LT	250	200	20250	4050000
6	90 LT	30	1240	3940	4885600
7	80 LT	25	22100	725	16022500
8	40 LT	12	23000	535	12305000
9	30 LT	10	50000	350	17500000
Total			98576		59996209



(5) Collection of Construction & Demolition Waste

- a) Earlier, Construction and Demolition (C&D) was being disposed without any treatment / recovery which resulted into wastage of land and loss of valuable materials.
- b) Ahmedabad Municipal Corporation (AMC) has issued an Expression of Interest (Eoi) on 18th March, 2012 for Design, Build, Finance, Own & Operate for 30 years on PPP (Public Private Partnership) Mode. Subsequently, 6 companies sent their offers to this Eoi.
- c) Work order was issued to Ahmedabad Enviro Projects Ltd. (AEPL) and 5 acres of land was allocated by AMC for this project.
- d) AEPL has commenced the plant phase wise from December 2013 and the plant is fully operational since June 2014.
- e) AEPL capital investment for this project till time is more than 7 Crore.
- f) Citizen are well informed to dump their C& D waste at their own cost at the defined 16 locations. Amdavad Enviro Pvt. Ltd. is authorized by AMC on PPP mode to collect, transport & process 300 TPD C & D waste from designated locations and convert it into various recyclables.



(5) Collection of Construction & Demolition Waste

- g) AMC is paying Rs. 155 per ton to AEPL (with an escalation clause of 5% yearly increase).
- h) Citizens can register their complaints for collection of construction debris by phone call on AMC operated Comprehensive Complaint Redressal System (CCRS) phone no 155303.
- i) After the successful resolution of the complaint, the citizen and the concerned municipal authority shall be informed by agency through CCRS.
- j) As per Mapping and Scheduling for C&D waste below 1 ton, 4 to 5 spots can be covered per trip for which citizens shall be charged a minimum flat charge of Rs 200 per trip.
- k) The collected waste will be weighed at AMC weigh bridge and also at weigh bridge of company's plant which will be offloaded at municipal plant.

Weight	Per Metric Ton Rate	Per Trip (Minimum Rate)
Less than 1 MT waste	-	Rs. 200/-
For 1-5 MT waste (Minimum quantity)	Rs. 225/-	Rs. 675/-
More than 5 MT waste (Large quantity)	Rs. 212.5/-	Rs. 1700/-



Location of Disposal of Construction & Demolition Waste

Name of Zone	Name of Ward	Location
New West	Jodhpur	Behind Karnavati Club, S. G. Highway
New West	Thaltej	Opp. Harihar - 2, Behind Silver Shopping, Abhpushp Bungalows, Shilaj Road,
New West	Jodhpur	Near Ropda Lake
New West	Jodhpur	Opp. Water Tank, Science City Road
East	Nikol	Opp. Avani Square, Via Harivilla to Naroda
East	Nikol	Behind Community Hall, Narayan Residency Cross Road
East	Nikol	Opp. Antriksh Arcade Road, Opp. Shrinidhi Apartment, Ahead of Kunj Mall
East	Vastral	Gokulnagar E.W.S., Opp. Satyam Vasahat, Opp. Tanmay Cross Road
North	Nobalnagar	Near Nobalnagar Canal
North	Naroda Road	Chamanpura Cross Road, Near Bridge
North	Sardarnagar	I.T.I. Road, Opp. I.T.I.
South	Narol	Near Rajnand Residency, Behind Samruddhi Residency, Narol
South	Vatva	Near Sangam Residency, National Highway No. 8, Narol - Aslali Highway, Vatva
South	Vatva	Near Aryaman Residency, Opp. Karnavati Apartment, Near Canal, Near OM Shantinagar, Vatva
West	Naranpura	Near A.E.C. Cross Road, Gopalnagar, Behind Satyam Skyline Plot
West	Nava Wadaj	Open Plot Opp. Balolnagar E.W.S. Quarters

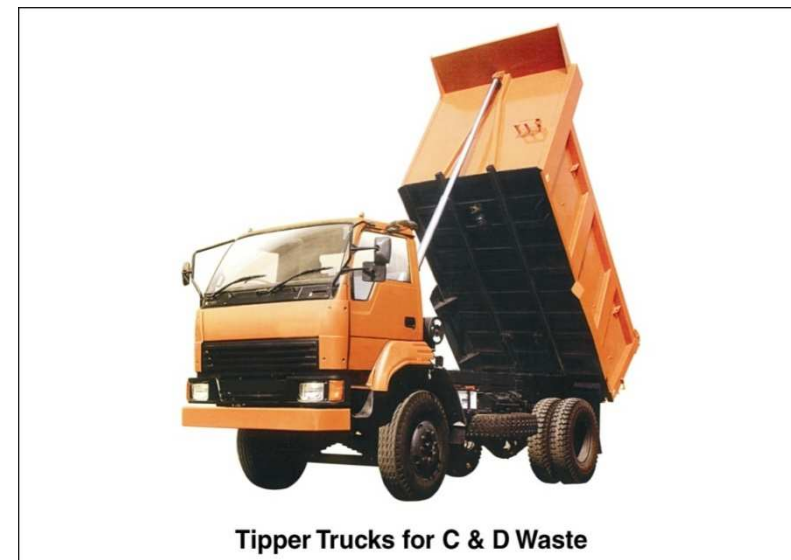
Collection of Construction & Demolition Waste



5 CMT skip containers for C & D removal on chargeable basis



JCB type machine for C & D waste



Tipper Trucks for C & D Waste

Final Products from C & D Waste :

- 1) Precast RCC
 - Benches, Drains, Concrete Manholes, Slabs
 - Sleeper, Louvers Fins, Pavers Rubber Mould, Walls, Drain Covers
 - Pipes & Cement Articles
- 2) Precast Concrete Box Culverts and Manhole
- 3) RCC Fencing Pole, Door Frame, Grill
- 4) Kerb Stone & Ferro Cover, Road Edge Stone, Paving Stone, Granite
- 5) Paving Blocks Mortar less for Concrete and Interlock Pathways
- 6) Bitumen bound materials
- 7) Concrete
- 8) Pipe bedding
- 9) Hydraulically bound mixtures (HBM) for sub-base and base
- 10) Unbound mixtures for sub-base
- 11) Capping
- 12) Embankments and Fill





(6) Collection of segregated Kitchen waste from Hotels and Restaurants

- a) The tender for collection of kitchen waste from different non-residential units and segregate on spot and transport in closed body vehicles for final disposals at the spots suggested by solid waste management department for seven years using own vehicles, equipments and manpower was published in 2008. These non-residential units include like hotels / restaurants / eateries and marriage places/ wadi / halls / canteens / malls and big government / semi-government / private units / institutions / educational campuses with facility of eateries.
- b) AMC has awarded work to three agencies for collection of food waste from such units and charge from hotel units on monthly basis so there is no cost to AMC in this system.
- c) 80 TPD segregated food waste is collected from more than 1000 units of hotels and restaurants.
- d) It is delivered to compost plant for treatment.



Details of the Project:

- a) The waste is transported through closed body hydraulic vehicles.
- b) All employees of agencies are supposed to wear a unique uniform and shall possess requisite protective gear.
- c) The agencies will incur all capital and operating costs for all types of vehicles, employees etc.
- d) The agencies will charge rates approved by AMC from the waste generating units.
- e) There will be an increase in the number of units from time to time for the more than 1600 units which have been identified at the launch of this project.
- f) The duration of the project is 7 years with an escalation of 5% in payments every year.
- g) The vehicles used for this project must be manufacture in the year 2011 or post 2011.
- h) 24x7 helpline numbers are operated by the agencies so that any unit can obtain information or lodge complaint(s).
- i) The agency at his own cost has installed a GPS in coordination with Solid Waste Management Department and has to maintain a system of generating daily reports as well as see that the system operates round the clock.



Following agencies have been issued work order for (in 2014) collection:

Sr. No.	Zone	Agency	Rate Rs per Kg of collection
1	West, New West (Group 1)	Scran Biotrans Pvt Ltd.	0.23
2	Central, South (Group 2)	Safar Bioenergy Pvt Ltd.	0.55
3	East, North (Group 3)	Soham Biomethane Pvt Ltd.	0.82

- The units which produce such kitchen waste have to obtain a health licence from AMC to operate and such licenses are renewed every year. For such units, the health licences shall be renewed only if they follow this kitchen waste collection model.
- AMC is in a process of planning to utilize food waste for Gas / Electricity generation by bio-methanation.

(7) Collection of Municipal Bio Medical Waste

AMC has contracted 2 agencies approved by GPCB for daily collection, transportation and disposal of bio-medical waste from 4 municipal hospitals, 2 referral hospitals, 64 urban health centers and dispose it in their incineration plant.

(8) Collection of Carcass / Animal Waste

- a) AMC has deployed 4 hydraulic based vehicles and staffs to collect carcass of dead animal like cow, camel, buffalo, donkey, dog, rat, etc. AMC has deployed 2 vehicles to collect fish market, meat market and slaughter house waste from market.
- b) The facility is available from 7 am to 11 pm on all 365 days round the year. (Telephone No 079-32984152 & 079-25352911).
- c) Around 8 TPD animal waste is collected from the city under this system.





(9) Cleaning of Public Urinals / Toilets and open defecation sites through machines

- a) AMC has deployed more than 30 vehicles for daily cleaning of Public Urinals and Public Toilets Nuisance Tankers.
- b) All vehicles are equipped with GPS

Name of Zone	No. of Public Urinals	No. of Community Toilets	No. of Pay & Use Toilets	Total
Central	132	257	83	472
East	102	249	52	403
North	72	146	46	264
South	7	201	29	237
New West	17	42	0	59
West	48	48	54	150
Total	378	943	264	1585

Cleaning of open defecation sites through machines

- a) For cleaning of 194 open defecation sites AMC has deployed 6 trolley mounted and 14 auto rickshaw mounted types manure lifting machines.
- b) This cleaning is done on a predefined time with proper safety gear on a daily basis.
- c) In each zone, 1 trolley mounted machine and 2 rickshaw mounted manure lifting machines have been allotted for doing the work.
- d) Extensive IEC campaign and construction of individual / community toilets construction work are also taken up in these areas.



(10) Steps taken for maintaining cleanliness in River

A. Collection of Flower Waste / Holistic Materials

- a) City has a historical Sabarmati river.
- b) To reduce pollution and maintain cleanliness citizens are motivated to deliver flower waste and such holistic materials in the “KALASH” instead of throwing into the river.
- c) AMC has deployed 16 “KALASH” on 8 bridges of Sabarmati river.
- d) Such flower waste is collected daily and delivered to decentralized compost plant for treatment.



B. Cleaning by Machine

Floating Trash Skimmer and waste removal machine with weed cutting arrangement has purchased by AMC and given on O&M basis. This machine is very much useful for cleaning of all types of floating waste as well as for removal of weeds / vegetation etc growing in river water (stagnant water). Cost of machine is Rs 3 Crore.



<http://youtu.be/nTV9selozUs>



11. Safe Collection, Transportation & Disposal of E - waste

- a) For effective implementation of e-waste (Management and Handling) Rules, 2011 in city. AMC has assigned a work to a Consultant who Co-ordinate with Corporate Sector GPCB, dealers, producers, etc. to prepare effective plan & strategy, IEC plan, Finalise player on PPP mode activity to establish the collection centres for e-waste collection, safe transportation and safe storage / disposal.
- b) AMC has invited Notice Inviting Proposal (Tender) for selection of a private agency for E-Waste Management System in Ahmedabad Municipal Corporation Region on Public Private Partnership basis (“Project”). Selection procedure has been completed.
- c) ECS Environment Private Ltd has been selected for the above work for 20 years. AMC has issued the Letter of Award for the same on 16th September, 2015. ECS will give AMC Rs. 1.19 Crore in 20 years a Project Development Fee.



Deployment of Machineries & Equipments

AMC has deployed 89 Tipper Trucks, 40 JCB Machines, 24 Bobcat type machines, 120 Hydraulic Dumper Placers, 11 Skip Lifters, 84 Compactors, 4 Dead Animal Vans, 14 Nuisance Tankers, 1 Mobile Court, 60 Tractors, 5 Excavators, 5 Bull dozers, 6 Wheel dozers, 25 Trucks / Tractors mounted Road Vacuum Sweepers, 15 self ride on road vacuum sweepers, 18 manure lifting vehicles (for cleaning of open defecation spots), 24 mini vans and other contactors' 700 vehicles in all 6 zones. AMC deploys more than 1500 total vehicles/Equipments on daily basis for efficient handling of waste cleaning of the city.

Several part of the city is not having wall to wall construction of roads. Lots of vegetation / dirt comes up on the road and on account of development works, uneven surface of the roads need leveling and restoration. 24 Front end Loader type multi utility machines with sweeper attachments are used for these functions.





(B) Transfer Stations for Secondary Transportation of Waste

- a) AMC has decided to construct minimum one Refuse Transfer Station (RTS) with capacity of 400 TPD in all Six Zones. 6 RTS are operational and 2 RTS are under construction.
- b) Each transfer Station have 2 Stationary Compactors, 9 Large Hook Loader Vehicles and 11 Large Containers with 20-25 CMT Capacity to carry 10 to 12 MT waste.
- c) These RTS are constructed by AMC and given on O&M basis for 5 years to various agencies and AMC is paying per ton basis with 5% yearly increase.
- d) Transfer station helps AMC to save on transportation cost, reduce pollution and ease traffic congestion, and effective & speedily collection of waste.
- e) AMC is planning to construct additional 6 Transfer Stations in zones.

Transfer Station





(C) ICT SYSTEM

All contractual vehicles and machineries are monitored through Information, Communication Technology (ICT) since December, 2014 in more than 1000 vehicles



GPS Device



System Monitoring



RFID Reader



RFID Tag



CURRENT ICT SYSTEM IN AMC for Door / Gate to Dump project



Components	Remarks
Route	Specific route description like-route-1,2,3 or 4
Vehicle No.	Mention the respective vehicle number for specific route. Like-GJ-1-CT-1180
Update Time	Indicates the specific time of collection. Like-11.30 am.
Point of Interest (POI)/Bins Collected	Mention total number of bins collected in the specific routes.
Plot on Map	Show the details of the area where from the vehicle collects waste in the map.
Root Summary	Show the details route summary in the map
Vehicle Info.	Show vehicle number with the driver name and contact number



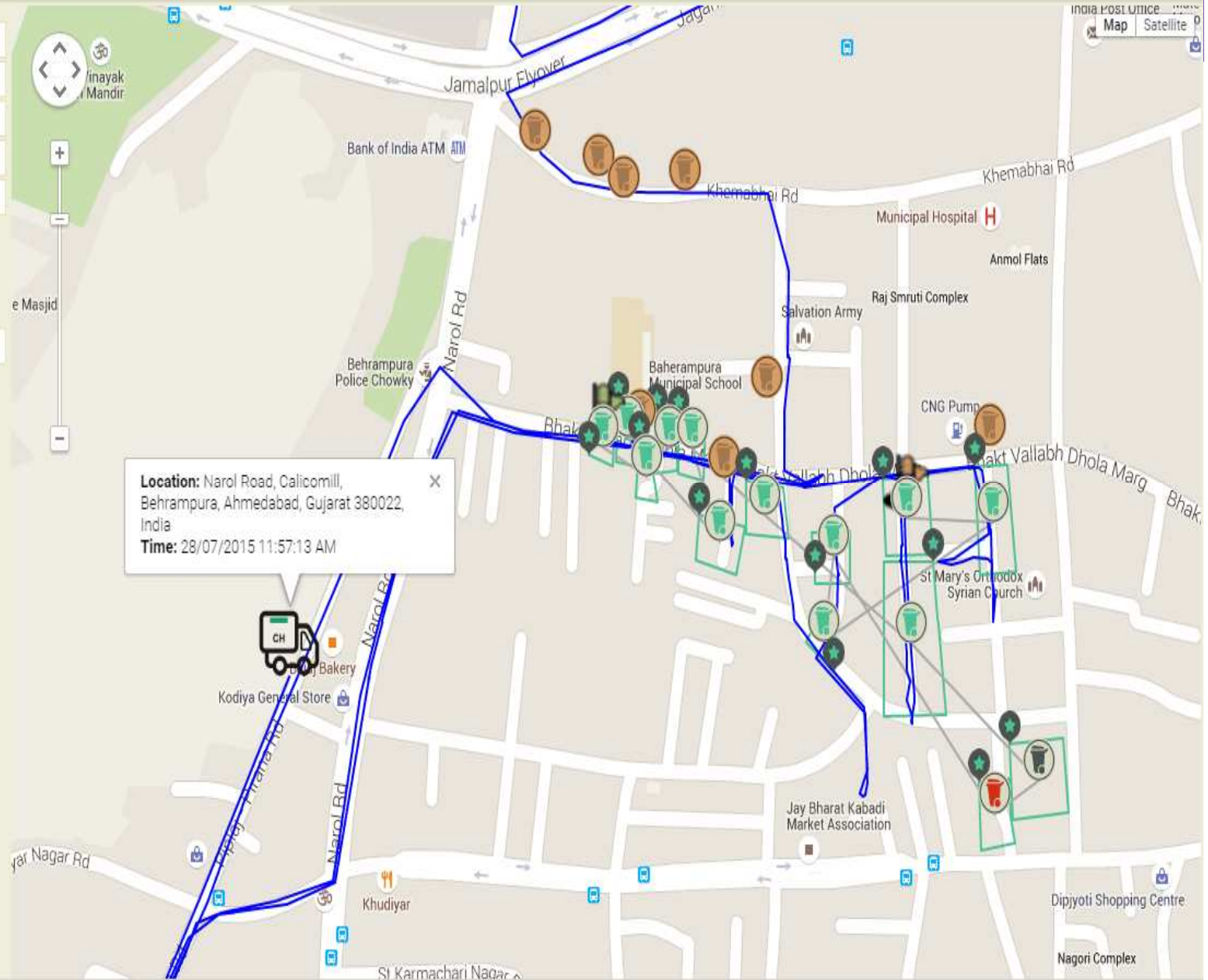
GPS Based Served/Unserved related Route Replay Screen Shots

Zone: CENTRAL
 Ward: Jamalpur
 Transporter: Swachhata Corporation
 Vehicle Type: Chota Hathi
 Vehicle: GJ-6-XX-8947
 Date: 28/07/2015
 From Time: 06:00
 To Time: 20:00
 Display Speed: Direct
 Speed
 Stoppage

Show Play

Vehicle Summary

Vehicle No: GJ-6-XX-8947
 Vehicle Type: Chota Hathi
 Route: Route-12
 Job Start Time:
 Job End Time:
 Tot KM travelled: 23
 Assigned Srvd POIs: 12 / 14
 Served By Others: 1
 Unass Srvd POIs: 8
 Unsrvd POIs: 1 / 14



ICT SYSTEM : Current Status & Benefits



Current status of project is:

- Zone wise Bin Lifter vehicle details and Bin locations is provided to the computer system.
- GPS device is installed in each Bin Lifter vehicle.
- RFID Tag is mounted on each Bin.
- RFID readers are installed at ward offices, Transfer stations, dump site weighbridges.
- One supervisor for each zone is deployed by the contractor for effective monitoring from 8 am to 6 pm.

Benefits after installation:

- Efficient monitoring and assessment.
- Citizen complaints can be handled with actual details.
- Analytical reports are available for operation monitoring.
- Bin movement can be tracked live.
- Vehicle movement can be tracked live.
- Route optimization.
- Integration of dumpsite and weighbridge data.
- Increase in service, accuracy and safety.
- Improvement of cleanliness of the city.
- Help in identifying the gaps in Solid Waste Management.



(E) Solid Waste Treatment / Processing :-

Present Scenario :



Sr. No.	Name of Company	Daily MSW Treatment	Mode of Agreement	Operational Since
1	Excel Industries Ltd	300 Tons	DBFOO * mode No tipping fee	January-2000
2	Bharuch Enviro Engineers Ltd. (UPL Djai Power Ltd.)	250 Tons	DBFOO * mode No tipping fee	July -2009
3	Creative Eco-Recycle Port Pvt. Ltd.	800 Tons (at present taking daily 400 tons)	DBFOO * mode No tipping fee	December-2012
4	Amdavad Enviro Projects Pvt Ltd	300 Tons (C&D Waste treatment)	DBFOO * mode No tipping fee	December-2013
5	Innovative Eco-Care Pvt. Ltd.	1 Ton (Green Waste Treatment)	DBO ** mode Capital investment by AMC Rs. 4.50 lacs and Monthly O & M Rs. 41,000/-	December-2013
6	Gujarat Consumer Industry	1 Ton (Green Waste Treatment)	DBO mode Capital investment by AMC Rs. 11.11 lacs and Monthly O & M Rs. 50,000/-	December-2013

DBFOO *: Design, Built, Finance, Own & Operate

DBO **: Design, Built & Operate



Concession period, Land area provided, Lease period :

Sr. No.	Name of Company	Daily MSW Treatment	Work Given in the year	Agreement Period (Years)	Land Given
1	Excel Industries Ltd	300 Tons	1997 Renew 2013	15 15	25 Acres
2	Bharuch Enviro Engineers Ltd. (UPL Djai Power Ltd.)	250 Tons	2007	25	15 Acres
3	Creative Eco-Recycle Port Pvt. Ltd.	800 Tons (at present taking daily 400 tons)	2009	25	12.5 Acres (as per agreement 25 Acres but allotted 12.5 acres)
4	Amdavad Enviro Projects Pvt Ltd	300 Tons (C&D Waste treatment)	2012	30	5 Acres
5	Innovative Eco-Care Pvt. Ltd.	1 Ton (Green Waste Treatment)	2013	5	100 Sq. Mtrs
6	Gujarat Consumer Industry	1 Ton (Green Waste Treatment)	2013	5	100 Sq. Mtrs



Project Cancelled due to Non-performance :

Sr. No.	Name of Company	Daily MSW Treatment	Work Given in the year	Agreement Period (Years)	Land Given
1	Hanjer Biotech Energies Ltd.	500 Tons into Compost & RDF	2010	25	12.5 Acres
<p>Note: Due to non-functioning of plant since December-2012, AMC has forfeited performance security deposit of Rs. 50 lacs, taken back the land, terminated the concession agreement and black listed the company. (vide Standing Committee Resolution No. 881 dated 15th October, 2015)</p>					
2	A2Z Infrastructure Ltd.	1000 Tons into Compost, RDF and Power	2012	29	25 Acres
<p>Note: Due to no work carried out for construction of plant, AMC has given a legal notice and initiated a procedure to forfeit performance security deposit of Rs. 1.50 crore, taken back the land, terminated the concession agreement and levy liquidated damages of Rs. 57 lacs from the company. (Passed in Standing Committee dated 28th January, 2016 for the same)</p>					



AMC projects for Direct MSW to Electricity

- Abellon + Keppel Seghers
Rs. 211 Cr/ 1000 TPD/ 14 MW. *Approx. Rs. 15.1 Cr / MW.*
European norms compliant., project period – 29 years
(Core technology from Europe + make in India fabrication of standard components)
Land Requires – 13 acres
Operation & Maintenance Cost – 8 % to 10% per annum
Support asked from AMC as 20% upfront support of under VGF or Rs. 0.60 per unit of gross generation of power for entire project period
- Offer under consideration, Essel Group + Hitachi Zosen
Rs. 480 Cr / 1000 TPD / 20 MW.
Approx. Rs. 24 Cr / MW, project period – 30 years
Land Requires – 10 acres
Operation & Maintenance Cost – 8 % to 10% per annum.
Support asked from AMC as a Tipping Fee for MSW input.
- CERC Reference Cost: *Rs. 15 Cr / MW - Order in October 2015*

Future Planning of Solid Waste Treatment : New Tender



- AMC has issued Request for Qualification (RFQ) for treatment of 1000 TPD mixed municipal solid waste (MSW) to Power at Ahmedabad on Design, Build, Finance, Own & Operate (DBFOO) basis for 30 years.
- 5 companies have submitted their offer and qualified after Technical Evaluation.

Sr. No.	Name of Agency	City
1.	Essel Infraprojects Ltd. Consortium with Hitachi Zosen India Pvt. Ltd., Japan	Mumbai
2.	IL&FS Environmental Infrastructure & Services Ltd.	New Delhi
3.	Ramky Enviro Engineers Ltd. Consortium with Jaingxi Jianglian International Eng. Co. Ltd., China	Hyderabad
4.	JITF Urban Infrastructure Limited.	New Delhi
5.	CTCI Corporation Consortium with Sino Environmental Services Corporation and CINDA Engineering & Construction Pvt. Ltd., Taiwan	Noida

- AMC has issued Request for Proposal (RFP) and Term Sheet to these 5 companies, last date for submission is 25th February, 2016



(E) Disposal of Waste

AMC has secured engineered landfill site in operation and made provision for another five scientific landfill sights for Disposal of Inert / Post Process Solid Waste at Gyaspur which is operational since October-2009.

Capacity:

11.50 Lakh Metric Tones
(i.e. 1.15 million tons)

Total construction cost of the site:

Rs. 13 Crore (i.e.
Rs.130 million)

Area: 12.88 Hectares
(32.8271 acres)



Usage of Heavy Machineries at disposal site

AMC is using several types of Heavy Machineries at disposal site.



Heavy duty Bull Dozer



Wheel Loader Machine



Excavator

It is multipurpose machine it can be put in use for various Municipal activities like waste dump site / Landfill site management, at waste treatment plant for turning of waste / for encroachment removal / excavation / heavy C & D waste clearing activities.



Soil Compactor

Soil compactor is also a type of earth moving machinery. It is required for better waste Landfill / Dump site management. Effective utilization of soil compactor with pad foot from compresses the waste with landfill material & reduces the land requirement & accommodation more waste in available site.



(F) Initiatives in Solid Waste Management



(1) IEC Project for Awareness to citizens

AMC has started a Project for IEC (Information, Education, Communication) Activities and Awareness of citizens towards Cleanliness, Waste Treatment & Waste Disposal and get their co-operation & participation

- Regular meetings of Committees in the Wards
- Publicity through Television Channels / Local Cable Network
- Advertisement in Newspapers
- Distribution of pamphlets and Banners
- Exhibition of Awareness Creation slides in Cinema Theatres
- Conducting Street plays
- Organizing of rally involving School & College students
- Awareness training to Municipal staff and Councilors
- Conducting miscellaneous even





(2) Public Health Byelaws:-

AMC has prepared Public Health Bye-laws for effective enforcement and maintaining discipline.

- Classification of waste in 30 categories
- Generators of waste based on their type, 20 categories
- Segregation of waste
- Storage of waste
- Delivery & collection of waste
- Processing & disposal of waste
- Liquid Waste Management
- Prevention of Waterborne, Vector borne and Food borne diseases
- Offences under the bye-laws
- General offenses which is applicable to all the citizens within city limit (20 in number)
- Enforcement of the provisions
- Schedule of Fines

This PHBL has sanctioned by Government of Gujarat and Notified in Government Gazette.



(3) Mobile Court for Littering & Nuisance

AMC launched country's first Sanitation Mobile Court on 4th June, 2009 dedicated to contain littering. Total of 2,25,442 cases have been registered and Rs. 9.43 crore penalty levied from such offenders.



Year	Cases	Penalty (Rs)
Jun 09-Dec 09	14939	1592470
2010	27358	5176150
2011	30276	4822165
2012	38111	27952402
2013	29234	23702120
2014	43547	17339999
2015	41977	13725685

Year	Plastic (kg)	Notice	Penalty (Rs)
2011	16093	3608	564910
2012	5135	7527	630850
2013	8748	22037	4261441
2014	7408	15588	2244081
2015	75943	15490	4243360



(4) Roadmap for Zero Waste Ahmedabad by 2031

AMC has participated at the Special Event of ISWA World Congress 2011 and agreed on the “Declaration for Zero Waste Ahmedabad” by 2031. AMC has signed a Memorandum of Understanding with UNCRD (United Nations Center for Regional Development, Japan) to get technical assistance for developing a “Roadmap for Zero Waste Ahmedabad by 2031”. AMC had a detailed Multi-stake holders' consultation meetings with the help and support from UNCRD Japan and Zero Waste South Australia.





- The Zero Waste concept for Ahmedabad will serve as a catalyst for policy changes at National level in realizing Resource efficient and Zero waste societies in India.





10 Focus Areas

- 1) Environmental Protection
- 2) Health and Safety standards
- 3) Dedicated Institutional Structures & Governance arrangements
- 4) Community awareness & ownership
- 5) Segregation of waste streams
- 6) Partnerships & Collaborations
- 7) Sustainable innovative Infrastructure & Technologies
- 8) Education & Awareness at all levels
- 9) Investment in 3R Infrastructure (Eco-Towns, Science Parks, Eco-Industrial Zones)
- 10) Implementation & Systematic Review Process

(5) SWM Master Plan upto 2031



AMC prepared a SWM Master Plan which provides a detailed profile of Ahmedabad City, existing system in city, solid waste characteristics, current leading waste management practices, strategy and options for city, planning for 'Zero Waste' management system, institutional strengthening and training, capital investment plan and need for monitoring & evaluation.

Process adopted

- Process tracking of all streams of SWM
- Numerous stakeholders' consultations
- Strategy development towards zero waste
- Infrastructure gap and management assessment
- Recommendations and capital investment



(6) Scientific and safe disposal of Carcass of Animal & Waste from Slaughter House, Fish Market, Meat Market etc.

AMC has assigned work to a consultant for issuing a competitive Bid for Design, Construction, Operation & Maintenance of a daily 8-10 tons processing plant on Public Private Partnership mode for 30 years. AMC has initiated a pilot project in December 2014 for exploring best suitable technology. The company (who has done the pilot study) has given an offer to AMC for doing this project for a longer period by investing its own capital and o&m cost, same is under consideration.

(7) Decentralized Bio-Gas Plants / Mechanized Compost Plants

AMC is planning to set up decentralized bio-gas plant of 2 to 10 tons capacity in different Zones/locations of the city to utilize vegetable waste, food waste, flower waste, green waste, night soil, to generate bio-gas and energy.



(8) Scientific Closure of existing Pirana Dump Site

- Legacy Solid Waste is being disposed & accumulated at Pirana dumping site having total area of about 84 acres for a long back. 65 acres of land is accumulated with heaps of garbage having 15-20 meter height at various locations.
- AMC has planned a project for Scientific Closure like Mumbai and Pune.
- AMC has issued an Expression of Interest for selection of expert and competent Consultant firm to appoint for preparation of detailed project report, design and tender.
- In total 30 months, Scientific Closure of this site has been completed.



(8) Scientific Closure of existing Pirana Dump Site

- Work order has been issued to following Consultant Firms :
 - 1) Work for **Project Management Consultancy** for Scientific Closure of Pirana Dump site is awarded to IL&FS Environmental Infrastructure and Services Ltd. for Rs. 5 Lacs + 1.75% of the Total Project Cost (Service Tax extra)
 - 2) Work for **Legal Vetting** for Scientific Closure of Pirana Dump site is awarded to Link Legal Advocates for Rs. 17 Lacs + Taxes Extra

The Project Management Consultant has conducted required various environmental investigations and prepared all necessary reports for scientifically closure. AMC has finalised a design out of various options and the Consultant is preparing DPR and Tender.



(9) Utilization of Plastic Waste

a) Using Plastic Waste for Construction of Roads

- Taking cue from Chennai, where roads have been built using polymer bitumen in coastal areas of Chennai and to curb the increasing plastic waste in the city and enhance environmental protection, Hon. Municipal Commissioner instructed officials from Road and Building Department of AMC visited Chennai to review the quality of roads built with polymer bitumen.
- Based on the conclusions from this visit, AMC's Solid Waste Management Department dispatched the plastics waste to the hot mix plant to prepare the polymer bitumen.
- Accordingly, AMC started road resurfacing in Ahmedabad using polymer bitumen.
- Under this pilot project, one km long stretch was constructed.



b) Recycling of PET Bottles

The machine named 'My Pet' collects and crushes plastic (PET) bottles. The company, Arts Alive Ventures Pvt. Ltd has installed machines at Ahmedabad Railway Station, to crush the PET bottles and sell the shredded material to recycling companies as "PET flakes", which are then used as a raw material for a range of products like polyester sheets & fibers or back into PET bottles. In November 2014 as a Pilot project, AMC allocated 12 locations to this company to install machines to collect and recycle plastic waste. AMC will charge Rs 101 as token fees from the company. The company has signed a contract with AMC for one year.

THANKS



In World level competition of ISWA, AMC achieved 3rd place for Best Short Film giving message 'After Life' for Public Awareness (Prepared with the help of Students from Mahatma Gandhi International School)



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THANKS

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