

**INDICATIVE FORMAT FOR PREPARATION OF
DETAILED PROJECT REPORT (DPR)
FOR
MANAGEMENT OF MUNICIPAL SOLID WASTE**



CENTRAL POLLUTION CONTROL BOARD
(Ministry of Environment & Forests)
Parivesh Bhawan, East Arjun Nagar,
DELHI-110 032

**FORMAT FOR PREPARATION OF DETAILED PROJECT REPORT (DPR)
FOR
MANAGEMENT OF MUNICIPAL SOLID WASTE
(Solid Waste Management Rules, 2016)**

CHAPTER - 1: INTRODUCTION

Objectives/ Scope of DPR:

The preparation of DPR includes following objectives;

CHAPTER - 2: CITY PROFILE

- 2.1 General Profile (including city map):
- 2.2 Historical Profile:
- 2.3 Tourist, religious or any other specific Profile of the city:

2.4 Area and Population:

Area of the city/ town (under the jurisdiction of the local body) in Sq. Km.

Details of Population

Census Year	Population				Projected population
	1991	2001	2011	2021	2031
Population					
Decadal growth					

2.5 Slum Population (no. of slum pockets and approximate population, ward-wise list of slums and the area occupied by them, population)

2.6 Main tourist spots in the city

2.7 Climate

2.8 Political Set up of the local body (no. of election wards etc.)

2.9 Administrative Set up of the local body:

Municipal Solid Waste Management Department: (health officer, assistant health officers, details of Supervisory staff etc.)

Name of the circle/ ward	No. of AHOs	No. of sanitary inspectors	No. of Supervisors	No. of Sweepers	Ward Area	Population
Total						

2.10 GENERAL INFORMATION TO BE COLLECTED AND UPDATED FROM TIME TO TIME

1. Area of the city;
2. Population of the city;
3. Decadal growth of population;
4. Number of wards, their area and population;
5. Ward-wise information in regard to:
 - Population density in different wards;
 - No, of Households, shops and Establishments
 - Vegetable/fruit/meat/fish markets
 - Number of Hotels & Restaurants
 - Number Of Hospitals and Nursing Homes
 - Number Of Industries
 - Number Of slum pockets/their population

- Road length width wise
- Percentage of area covered with under-Ground sewage system
- Percentage of area having surface Drains
- Percentage of area having no drainage Facility
- Number of slaughter houses
- Total number of public toilets and Toilet seats.
- Number Of public urinals
- Number Of Nuisance spots

CHAPTER - 3: PRESENT PRACTICES OF SOLID WASTE MANAGEMENT IN THE CITY

- 3.1 Waste generation rate: (MSW generated in MT per day)
- 3.2 Break-up of waste generation (domestic, markets, industrial etc.)
- 3.3 Storage of Domestic Waste at Source: (existing system of storage and segregation of waste at source at the household level)
- 3.4 Storage of market and trade waste at source: (existing system of storage and segregation of waste in the vegetable, fruit, meat or fish market)
- 3.5 Storage at slums
- 3.6 Segregation of Recyclable wastes
- 3.7 Primary Collection of Domestic, Trade and Institutional Wastes: (existing system of door-to-door collection, adequacy of community bin facilities etc.)
- 3.8 Hospital and Nursing Home Waste: (no. of hospitals and nursing homes, estimated bio-medical wastes generation, existing processing and disposal system)
- 3.9 Hotels and Restaurants waste (nos. of hotels and system of primary collection)
- 3.10 Construction Waste (system of storage and its primary collection)
- 3.11 Street Sweeping: (Work norms and frequency of street sweeping, circle/ward wise road length)

Frequency of street cleaning	Wards covered or % of street covered
Daily	
Alternate day	
Once a week	
Occasionally	

- 3.12 Tools Used: (availability of traditional/ containerized handcarts, long handled brooms etc.)
- 3.13 Waste Storage Depots: (circle/ ward wise nos. of waste storage depots, mode of transmission of waste upto depots, condition of depots, nos. of litter bins provided etc.)
- 3.14 Material Recovery Facilities (MRFs): (circle/ ward wise nos. of MRFs, mode of transmission of waste upto MRF, nos. of MRFs provided, employee, facility, etc.)
- 3.15 Transportation of Waste: (frequency of transportation, mode of loading- manual/ mechanized loader, vehicles- tractor, trucks, autos etc.)

Name of the Circle/ Ward	Frequency of lifting#	Types of vehicle\$	No. of vehicles		
			Total	Function AI	Out of order

Daily, Alternate day. Once in week, Occasionally etc.
 \$ Tractors, Tipper trucks, Loader cum excavator, Mini loaders etc.

- 3.16 Waste Processing and Disposal Facilities: (Details of waste processing and disposal facility like- year of commissioning, designed life, design capacity (Mt/ Day), operation capacity (MT/ Day), Scientifically operated or haphazard dumping in low lying areas, daily soil coverage provided or not, availability of weigh bridge facility, buffer zone, road facilities, status of authorization from SPCB etc.)

3. 17 **Financial Aspects**

Years	Actual Receipt including Grant	Actual Expenditure	Expenditure incurred on management	
			MSW department	
			Expenditure on salary	Expenditure On infrastructure
2014-15				
2015-16				
2016-17				

3.17 GENERAL INFORMATION OF MSW TO BE COLLECTED AND UPDATED FROM TIME TO TIME

Waste generation

1. Average quantity of waste produced each day.
2. Seasonal variations in daily waste generation.
3. Total quantity of waste produced annually during last 3 years
4. Breakup of the quantity of wastes generated
 - i Household, shops and establishment waste;
 - ii Vegetable and food market waste;
 - iii Meat, fish and slaughter house waste;
 - iv Construction & demolition waste;
 - v. Horticultural waste
 - vi Hospital waste
 - vii Industrial waste

- 5 Average number of carcass removed each day

Staff Position

- 6 Number of sanitation workers deployed in the city for the collection of waste
- 7 Number of sanitation workers deployed for the transportation of waste
- 8 Ward wise allocation of sanitation workers
- 9 Sweeper population ratio in each ward
- 10 Sweeper road length ratio in each ward
- 11 Sweeper supervisor ratio in each ward

Waste storage depots

- 12 Number of sites designated/notified for temporary of waste (Dust bins)
- 13 Type and size of Dustbin provided in each ward.
- 14 Ward-wise Quantum of waste generated each day.

Material Recovery Facility:

- 15 Nos. of facility exist/ converted/proposed
- 16 Infrastructure facilities
- 17 Mode of operation
- 18 Quantity recovered- disposal

Transportation

- 19 Number Of vehicles available with the local body for the transportation of waste, their types, size and age.
- 20 Number of trips made by each vehicle in one shift.
- 21 Number of vehicles used in:

First shift
Second shift &

Third shift

- 22 Qty. of waste transported in each shift.
- 23 Total qty. of waste transported each day.
- 24 Percentage of waste transported each day.

Waste processing and disposal

- 25 Number of waste processing and disposal sites in the city.
- 26 Their distances from the Centre of the city.
- 27 The area of these sites
- 28 The qty. of waste treated/disposed of at each site
- 29 The expected life of each land filled site

Financial aspects

- 30 Operating cost
 - a. Cost of collection per ton/day
 - b. Cost of transportation per ton/day
 - c. Cost of disposal per ton/day

CHAPTER-4: PROPOSED ACTION PLAN FOR MSW MANAGEMENT (In accordance with the Solid Wastes Management Rules, 2016):

4.1 Storage of Waste at Source:

No waste should be thrown on the streets, footpaths, open spaces, drains or water bodies, nallas, etc.

Waste should be stored at source of waste generation in two bins/ bags, one for food waste/ bio-degradable waste and another for recyclable waste such as papers, plastic, metal, glass, rags etc.

Waste such as used batteries, containers for chemicals plastics pesticides, discarded medicines and other toxic or hazardous household waste, if and when produced, should be kept separately from the above two streams of waste.

The following indicative measures may be taken by the local body to meet the above;

- All the household may be directed that they shall (a) keep the food waste/ bio-degradable as and when generated, in any type of domestic waste container, preferably with a cover, and (b) keep dry/ recyclable wastes preferably in bags or sacks.
- A metal or plastic container of 15 litre capacity for a family of 5 members would ordinarily be adequate to store the waste produced in 24 hours having a spare capacity of 100% to meet unforeseen delay in clearance or unforeseen extra loads.
- In slum pockets where it may be difficult to do house-to-house collection, community bins of 80 to 100 litres capacity @ 1 community bin per 20-30 dwelling units may be placed at suitable locations to facilitate the storage of waste generated by them.
- Shops/ offices/ institutions/ workshops/ hotels/ restaurants/ meat shops/ fish shops etc. should be directed to store their waste on-site in sturdy containers of about 100 litres capacity.
- In case of large hotels/ restaurants/ commercial complexes, residential societies, vegetable markets etc., they should be directed to provide large size containers 3.0 cmt to 7.0 cmt, which should match with the transportation system of the city.

4.2 Segregation of Recyclable/ non-biodegradable Waste:

The local body may draw up a program of conducting awareness campaign in various wards of the city utilizing the ward committees, local NGOs and resident welfare association. Simple literature may be developed for bringing in the awareness, which may be publicized through media using cable net

work, and group meetings in different areas through NGOs. The sanitation supervisors may also create awareness during their field visits.

As soon as the awareness campaign picks up, the local body may direct households, shops and establishments not to mix recyclable waste with domestic food/bio-degradable waste and instead store recyclable/non-bio degradable wastes in a separate bin or bag at the source of waste generation.

- The local body may mobilize NGOs or Co-operatives to take up the work of organizing street rag-pickers and convert them to door step "waste collectors" by motivating them to stop picking up soiled and contaminated solid waste from streets, bins or disposal site and instead improve their lot by collecting recyclable clean material from the doorstep at regular intervals of time.
- The upgraded rag pickers on becoming doorstep waste-collectors may be given an identity card by NGOs organizing them so that they may have acceptability in society. The local body may notify such an arrangement made by the NGOs and advise the people to cooperate.

4.3 Primary collection of waste

The local body shall arrange for the primary collection of putrescible organic/food/bio-degradable waste from the doorstep on a daily basis. This service should be regular and reliable. Recyclable material can be collected at longer regular intervals as may be convenient to the waste producer and the waste collector, as this waste does not normally decay and need not be collected daily. Domestic hazardous waste is produced occasionally and so such waste need not be collected from the doorstep. People could be advised or directed to put such waste in special bins kept in the city for disposal of such wastes.

The following arrangements may be made by the local body:

- Garbage is to be containerized at the point of generation to reduce collection time and health hazard. The system of house-to-house collection is to be extended to all the households of all wards, slums, markets, establishments etc. either through containerized wheelbarrow (handcarts) or containerized pedal tricycles with bells or whistles or through community collection (central bin).
- Devising collection of waste from slums and squatter areas or locality including hotels, restaurants, office complexes and commercial areas.
- Modus Operandi: Each sweeper may be given a handcart or pedal tricycle having detachable containers (preferably six) of 25-30 litres capacity each and provided with a bell or whistle. Each sweeper should be given a fixed area or beat for sweeping plus a fixed number of stretches/ houses from which to collect the domestic waste. The local body may, based on local conditions, fix the work norms as they deem appropriate.

- However, it is suggested that in a congested or thickly populated areas, 350 running meters of road length and the adjoining houses may be given to each sweeper, whereas in medium density areas 500 to 600 running meter of the road length with adjoining houses may be allotted to a sweeper depending upon the density of population in the given area and local conditions. In low density areas even 750 running meter of road length can be given. Normal 150 to 250 houses coupled with the above roads length may be taken as a yard stick for allotment of work to an individual sweeper.
- Motorized vehicles having unconventional horns may be deployed in highly congested areas where containers cannot be placed for the doorstep collection of waste.
- The local body should collect waste from slums either from house-to-house collection or through central bins (of about 100 litres capacity) or through community bins (3.0 to 4.5 cum capacity) provided @ 1 bin per 20-30 households. Residents should bring their biodegradable wastes from their houses to bins.
- Societies, complexes, market associations, hotels etc. could be advised or directed to deliver their biodegradable wastes into central bins or community bins to facilitate its easy collection by municipal staff.

4.3 Sweeping of Streets and Public Spaces:

Daily sweeping of public streets is almost becomes essential where there is habitation close by. Isolated pockets or roads with little or no habitation around are to be cleaned periodically. A schedule of streets cleaning should be prepared, assigning clearly demarcated area to each sweeper and street sweepings should be deposited in the storage containers.

The following measures may be taken to ensure regular sweeping of streets and public places:

- Each sweeper engaged in street sweeping should be given individual containerized handcarts having 4 to 6 containers or a tricycle having 6 to 8 containers of 25 to 30 litres capacity. These containers should be detachable to facilitate the direct transfer of street sweepings and household wastes from the container into the communal waste storage bins.
- Each sweeper engaged in street sweeping should be given a metal tray, a metal plate, a long handled brooms and protective gears, etc.
- Measures should be taken to prevent burning of the leaves and other waste by sweepers on the roadside and direct sweepers to take all waste to the communal waste storage bins.

- By adopting the norms of road length for the purpose of entrusting work to the sanitation workers, the requirement of sweepers and their tools may be worked out as under;

Types of roads	High density Roads	Medium density Roads	Low density roads	Total
Length of roads				
No. of sweepers required @ 1 sweeper per 350Mt. in dense area, 500 Mt. in medium density areas and 750 Mt. in low density areas, coupled with 150 to 250 houses.				
No. of metal trays, metal plates, long handled brooms, pairs of protective gears etc.	No. of sweepers worked out above			

Estimated need of the containerized handcarts and pedal tricycles for primary collection system:

S.No.	Name of Item	Nos.
a)	Design parameters	
	Base year 2017	
	Design Period 10 years	
	Population of city/ town (2011 Census)	
	Projected population 2017 (by Geometric Increase Method)	
	Projected population 2027 (by Geometric Increase Method)	
	Population considered for design (Arithmetic average of projected population for years 2017 and 2027)	P
	Total Waste generated (Mt/ day) = Design population x waste generated, kg/capita/day	W
	Volume of waste (V) (Cum/ day) = Total waste generated (Mt/day) / density (Mt/ Cum) {density of MSW may be taken as 0.425 Mt/Cum}	V
b)	Calculation for 30 litres capacity containers (Sweepers are expected to make at least two trips to the temporary waste storage depots and therefore, will use the same containers at least two times a day)	
	Nos. of Containers = $[(V \text{ Cmt} \times 1000 \text{ litre/Cmt}) / 30 \text{ litre}] / 2$ trips a day	A
c)	Calculation for six containerized handcarts and tricycles (Assuming X% of waste collection will be through handcarts and Y% of waste collection will be through tricycles only. It is suggested that handcarts may be used by female sanitary workers and tricycles may be used by male sanitary workers.)	
	No. of six containerized handcarts = $(A/6) \times X\% = \text{Say, B}$	B
	No. of six containerized tricycles = $(A/6) \times Y\% = \text{Say, C}$	C
d)	Nos. of central bins (100 litres capacity)/ community bins	D

S.No.	Name of Item	Nos.
	required in slum areas/ markets etc. = Say, D	
e)	Add Standby containers, handcarts, tricycles, bins @ 10%	

4.5 Provision of Litterbins:

To enable citizens to dispose of their waste -in-hand, litterbins should be provided at all railway stations, bus stations, in all market places, places where people gather or wait in squares and on important roads at a reasonable distance ranging from 25 to 250 metres.

Ordinarily providing about 11 litter bins per square Km area of city/ town, depending on local condition may fulfill the requirements.

4.5 Temporary Waste Storage Depots for onward transportation of Waste

Solid waste collected from the doorstep or from the central bins (kept in slums, markets etc.) by the primary collection system has to be unloaded and stored at a convenient place for their onward transportation in a cost-effective manner. Temporary waste storage depots/MRFs are required to be created at suitable locations in lieu of open waste storage sites.

The following systems could be considered for set up by the local body:

- Provide large metallic containers (3.0, 4.5, 6.0, 7.0 cum capacity) with lid at a distance not exceeding 250 m from the place of work of the sweepers and to cover all the wards. The distance between two consecutive storage bins should therefore, not exceed 500m. The distance between the communal storage bins can be determined on the basis of load of garbage/ refuse that is likely to be received at the containers from the area concerned.

Ordinarily 4 to 5 communal storage bins (3.0 to 7.0 cum capacity) are required per square Km area. It has also to be ensured that at least twice the storage capacity of the total wastes generated per day, should be created for the storage of wastes in the city/ town. This will ensure that no waste will spill outside the bin and will give sufficient time to the local body to remove the waste by organizing a periodic cycle of transportation of waste. This number could also cover ward-wise bins for storage of domestic recyclable and hazardous wastes.

- The bins should be placed on cement concrete or asphalt flooring having a gradual slope towards the road to keep the site clean. The flooring should be flush with the border of the road to maintain hygienic conditions and facilitate the transfer of waste from the containerized handcarts/ tricycles into the container. A catch pit may be provided close by if storm water drain exists in the city/ town.
- In highly congested areas an option of using small vehicles (like auto bins) for direct collection of waste instead of placing containers on the roads could be

considered. Such vehicles can be parked at suitable locations in the congested areas where sweepers can bring the waste easily.

4.7 Transportation of Waste

The system of transportation should appropriately match with the system adopted for the storage of waste at the communal bins/ containers, i.e., at the temporary waste storage depots. Manual loading should be discouraged and phased out expeditiously and replaced by direct lifting of containers through hydraulic system or non-hydraulic devices or direct loading of waste into transport vehicles.

The following measures may be taken by the local body to achieve effective transportation of wastes:

- The transportation of waste from the temporary waste storage depots/ sites may be planned in accordance with the frequency of containers becoming full. The locations where the containers are placed may be grouped into following categories as under;
 - (a) Containers which are required to be cleared more than once a day.
 - (b) Containers which are required to be cleared daily.
 - (c) Containers which are required to be cleared on alternate days.
 - (d) Containers which take longer time to fill and need clearance twice a week.
- Depending on the containers to be cleared each day, the route for lifting the containers may be worked out avoiding zigzag movement of the vehicles to the extent possible.
- All the vehicles may be utilized at least in two shifts to lift containers, to ensure full utilization of the fleet of vehicles and to reduce the requirement of new vehicles.
- Transportation of waste during night may be done in areas where there is serious traffic congestion during the day and it hampers MSW management operations. Work at night will increase the productivity and reduce the cost of the service.
- The containers lifting tractors and devices such as dumper placers/ skip lifters may be utilized for transportation of 3.0 to 7.0 cum containers to the wastes processing and disposal sites.
- The local body may enter into a rate contract for maintenance of vehicles and equipment and ensure that they are kept in a good working condition.

Estimated need of the vehicles and temporary waste storage containers:

S. No.	Name of Equipments/ tools	Nos	Rate per unit	Total Cost
a)	Dumper placer containers (4 to 5 nos. per Sq. Km)			
	3.0 cum containers			
	4.5 cum containers			

	6.0 cum containers			
	7.0 cum containers			
	Total			
	No. of containers available with the local body			
	No. of containers required to be purchased			
b)	Container lifting devices/ vehicles			
	No. of 3.0 cum containers to be lifted each day			
	No. of 4.5 cum containers to be lifted each day			
	No. of 6.0 cum containers to be lifted each day			
	No of 7 cum containers to be lifted each day			
	No. of containers that can be lifted by one tractor/dumper placers in two shifts	8 to 10		
	No. of containers lifting tractors required			
	No. standby tractors required			
	Total nos. of containers lifting tractors			
	No. of dumper placers required to lift 6 -7 cum containers			
	Standby dumper placers required			
	Total dumper placers required			
	No. of tractors available with the local body			
	Therefore, new tractors to be procured			
	Existing tractors to be mounted with container lifting Devices			
	No. of dumper placers available with the local body			
	No. of dumper placers to be procured by the local body			

c)	Small vehicles (like auto bins) required for direct collection			
	No. of vehicles required for direct collection of waste from highly congested areas and narrow lanes			
	No. of standby			
	vehicle Total			
d)	Hotel/ market waste collection vehicles			
	No. of vehicles required for collection of hotel/ market waste			
	No. of standby			
	vehicle Total			
e)	Construction waste collection vehicles and skips			
	No. of skip containers required			
	No. of skip lifters required			

4.8 Waste Processing (Composting) and Disposal

All organic/ biodegradable wastes collected from households, shops, markets, hotels and other establishments should preferably be biologically processed; and

Only rejects, drain silts & domestic hazardous waste should be carefully landfilled. Bio-Medical Waste should be disposed of as per the Bio-Medical Waste Management Rules, 2016

Available technologies: The waste processing can be achieved either through biological route or the thermal route. In the biological route mainly two processes, aerobic stabilization (composting) and anaerobic process (biomethanation) are used.

Aerobic stabilization of organic fraction of waste yields a final product which can be used as organic manure and is called compost. In the anaerobic process, also referred as biomethanation, the organic matter after segregation and size reduction is mixed with water and allowed to degrade under controlled anaerobic conditions. The generated biogas has a fuel value, which is used as a source of energy and the digested residue as compost. The biofuel (ethanol) also can be processed from biodegradable fraction for locomotive use.

In the thermal route, two processes are commonly adopted. In the first process, commonly referred to as 'Incineration' the waste is burnt in an excess amount of oxygen and the related heat is utilized to generate electricity. The second process in the thermal route involves combustion of the material in the absence of air or in an oxygen deficient atmosphere. This is commonly referred to as 'pyrolysis', which results in the generation of three different products namely, gas, liquid and char each of which has certain calorific value.

To facilitate the thermal processing of waste, the combustible portion of MSW is separated in yet another process to obtain Refuse Derived Fuel (RDF) which is then subjected to incineration or pyrolysis process.

Further, it is to mention that out of the various processing technologies, the technologies which are being used/ considered for use in Indian conditions are: (i) Composting, (ii) Anaerobic digestion to recover biogas and electricity, (iii) Refuse Derived Fuel and (iv) Pyrolysis.

The following measures may be taken by the local body for setting up of waste processing plant and for development of landfill site:

The waste processing should be addressed by the local bodies in compliance with Schedule II and IV of the Municipal Solid Wastes (Management and Handling) Rules, 2000. Similarly, the waste disposal by landfilling should meet the criteria as laid under Schedule II, III and IV of the Municipal Solid Wastes. Solid Waste Management Rules, 2016

Presently in most of cities/ towns, the waste is collected without any source segregation. SWM Rules 2016 has given one year for implementation of segregation. The experience all over the world indicates that it will need a decade before effective source segregation is achieved. It is, therefore, desirable that all the MSW produced be first biologically processed and the non-biodegradable removed for disposal in a landfill along with drain silt and such other inorganic material.

Therefore, till such time the people develop a habit of segregation and effective source segregation can be achieved, local body should set up and operate and maintain waste processing plant(s) of adequate design capacity to process all the waste of generated per day from the municipality, other than debris, biomedical waste, etc.

Based on some compost plants set by private entrepreneurs in the country, it has been estimated that a compost plant processing 100 MT of wastes per day would cost around Rs.1.50 Crores (excluding land cost). For preliminary cost estimation for setting up of a compost plant of adequate design capacity local body may use this estimates.

Similarly, preliminary estimated cost for development/ setting up of engineered landfill site could be carried out at Rs.700/- to Rs.800/- per square metre of landfill surface area to be developed (excluding land cost). A land area of about 100 -150 acres may be considered as ideal for setting up of compost plant and for development of sanitary landfill site having life span of about 20 years.

However, it is required to get the waste quantification, characterization, detailed engineering site investigation, design, drawing, specification and cost estimate done for setting up of a common compost plant of adequate capacity for processing of MSW and development/ setting up of engineered landfill site from an expert consultants. It is suggested that a separate 'Detailed Project

report' (DPR) for setting up of a compost plant/ waste processing facility and for development of sanitary landfill site may got prepared.

It may be necessary that the local body may invite competitive bids from private sector to set up waste processing plant on BOO basis as well as to run the plant that may alternately be set up by the local body, on O & M basis. In case of BOO the entire investment will have to be done by the private sector whereas, land will be made available by the local body to the private sector for a minimum 20 years on a nominal lease rent, preferably of Re.1 per Sq. metre per year and delivery of garbage at the plant site without levy of any charges. The local body may negotiate with the private sector regarding the payment of royalty by the private sector for the valuables (like compost, energy etc.) produced or payment of tipping fees by the local body to the private company as may transpire from the bids received. Whereas, in O & M contract the investments will be made by the local body to set up plant particularly compost plant and operation and maintenance will have to be done by the private sector on its own and in return they will get the compost produced to be marketed by them at their own cost. Here, the local body will not pay any charges for O & M but, will supply agreed quantities of garbage on day to day basis at its own cost at the plant site.

4.8 Intra-city Activity:

The local body should set up a 'Surveillance Squad' for efficient management of intra city activities and attainment of emergency matter/ public calls related to MSW management on urgent basis.

Local body may procure requisite nos. of sets of Walky& Talky/mobile phones, web camera for management levels officials to be associated with the MSW activities and for implementation of the proposed project; and

Control rooms may be set up to register complaints received from the public and settle such complaints expeditiously on 'no-delay' basis..

CHAPTER - 5: REQUIREMENT OF FUNDS FOR SETTING UP OF FACILITIES FOR MSW MANAGEMENT (Indicative equipments/ tools)

S. No.	Equipments/ tools	Quantity required	Qty. existing	Qty. Shortfall	Cost per unit	Total estimated cost
Compliance with Schedule II of the MSW Rules to cover:						
1	Mass Awareness (through booklets, print and electronics media, workshops, seminar etc.)					
Primary Collection System						
2	Containers (30 litres capacity)					
3	Containerized handcarts					
4	Containerized pedal tricycles					
5	Central bins (100 litres capacity)					
6	Community bins (3.0 to 4.5 Cum) for slums					
	Street Sweeping					

S. No.	Equipments/ tools	Quantity required	Qty. existing	Qty. Shortfall	Cost per unit	Total estimated cost
7	Mechanical Sweeper					
8	Seamless handcarts for drain Desilting					
9	Sweeping tools (Metal tray and metal plate, Long handled brooms, shovels and protective gears)					
	Litter bins					
10	Litter bins (approx. 11 bins per Sq. Km.)					
	Temporary Waste Storage Depots					
11	Small vehicles for congested places/ important places					
12	Dumper placer containers 7 cmt.					
13	Dumper placer containers 6 cmt.					
14	Dumper placer containers 4.5 cmt.					
15	Dumper placer containers 3 cmt.					
16	Skip containers					
17	Auto bins					
	Transportation/ Vehicles					
18	Dumper placer vehicles					
19	Tractors to be fitted with containers lifting device					
20	Trolleys					
21	Wheel dozer					
22	JCB					
23	Trucks with JCB					
24	Bob Cat					
25	Cattle catcher					
	Compliance with Schedule II and IV of the MSW Rules relating to Waste Processing:					
26	Setting up of Waste Processing Plant (For compost plant estimated cost at Rs.1.5 crores per 100 MT of waste, excluding land cost)					
	Compliance with Schedule II, III and IV of the MSW Rules relating to Waste Disposal by landfilling:					
27	Development of landfill sites (estimated cost at Rs.700-Rs.800/- per Sq. Mt of landfill area to be developed, excluding land cost)					
	Intra-city activities					
28	Surveillance Squad (Walky- Talky)					

Estimation of requirement of Sanitation workers, drivers etc. (indication)

Designation of Post	Sanitation Workers	Drivers
Street sweepers for street sweeping and primary collection of waste from households, shops and establishments		
Sanitation workers/drivers on tractors and dumper placers in 2 shifts @ 1 person per vehicle		
Sanitation workers/drivers on small vehicles @ 1 labour and 1 drivers per Vehicle		
Sanitation workers/drivers on skips @ 1 per vehicle on vehicles for construction waste		
Sanitation workers/drivers on hospital vans @ 1 per van		
Sanitation workers/drivers on hotel waste collection vans @ 2/1 per van		
Sanitation workers/drivers on garden waste van, @ 2/1 per vehicle		
Sanitation workers/drivers on bull dozer		
Labour at land fill site		
Sub-Total		
Weekly off relievers @ 17% for round the year service		
Total		

REFERENCES:

1. Solid Wastes Management Rules, 2016
2. Manual on Municipal Solid Waste Management, 2000 (Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, Government of India).
3. Municipal Solid Wastes Processing Technologies: Reference Manual for Local Bodies, 2002 (Central Pollution Control Board)
4. Guidelines for Selection of Site for Landfilling, 2003 (Central Pollution Control Board)

Baseline Data Collection Sheet for DPR Preparation

S. No	Details	Please Check
1.	Name of Municipality/Town/ULB:	
2.	Area under MC/ULB/Town in sq.km.	
3.	Number of wards (Latest Number):	
4.	Please enclose ULB Map of depicting Ward Boundaries /major-points/slums/Road Network	
5.	Population data:	
a)	<i>Current Population (2017) :</i>	
b)	<i>Population (2011 census)</i>	
c)	<i>Population (2001 census)</i>	
d)	<i>Population (1991 census)</i>	
e)	<i>Ward wise Population Table</i> <i>For Example:</i> <i>Ward 1= 10000</i>	
	<i>Ward 2= 15000 etc</i>	
6.	Slum Information:	
a)	<i>Number of slums:</i>	
b)	<i>Households in Slums:</i>	
7.	Household Information	
a)	<i>Number of individual Households (HH)</i>	
Point 8: Applicable For Kharar, Dera Bassi, Zirakpur, where high rise buildings exist		
8.	Private Dwellings/Socitieis/Apartment Buildings/RWA	
a)	<i>Total Number of Gated community/High Rising Buildings/Apartments/Societies of Private developers (e.g Gillco, TDI, SBP, Sanchi Homes etc)</i>	
b)	<i>Total number of HH in gated community/RWA</i>	
9.	Existing Infrastructure:	

a)	Total Road Length (KM)	
b)	Sewerage System Network in KM (% Coverage and no of wards covered)	
10.	Commercial establishment/Bulk Waste Generator:	
a)	Number of shops:	
b)	Number of Shopping Complex/Plaza North Country Mall etc	
c)	Number of Hotels/restaurants in the city:	
d)	Number of Sabzi mandi/Fruit/Vegetable Market	
e)	Total Number of Schools, Colleges and Universities:	
f)	Number of Marriage Halls	
g)	Number of industries and type of industry	
11.	Surface Water Bodies information:	
a)	Any river/choe/water body flowing in the city (Y/N)? If Yes, Name the river etc:	
12.	Medical Institutes	
a)	Number of Government/Private Hospitals, PHPs, Labs, and Clinics in city	
13.	Electricity Connection Data	
a)	Total number of Electricity meter connections within the town	
14.	SWM Primary Collection	
a)	Percentage of the ULB area covered for primary collection - door to door collection	
b)	Whether MC/ULB engage in Door to door collection: Y/N	
	If Yes, %age coverage by ULB staff in ULBs:	
c)	Give the number of wards and ward numbers for D/d/ collection	
d)	Remaining d/d collection mechanism (informal/semi-informal etc):	
e)	Any User Charges (U.C) charged & collected by D/D workers- Y/N	

f)	<i>Current rates for U.C (Provide details) per household?</i>	
g)	<i>Is segregation done at house hold level, Yes/No</i>	
15.	<i>Number of Secondary points (S.P is considered from where ULB is lifting garbage) Attach 2 Photos:</i>	
	<i>Location of Secondary Points (For example along the Govt School, by Bus stand etc)</i>	
16.	Machinery OWNED by ULB for Primary (d/d) and Secondary collection :	
a)	<i>Number of manual Rickshaw/Tricycle</i>	
b)	<i>Number of Tata Ace (1.5 cu m) etc or Auto tippers & capacity</i>	
c)	<i>Number of Truck/Tipper & its capacity in (cu m)</i>	
d)	<i>Number of tractor trolley & capacity in (cu m)</i>	
e)	<i>Refuse Compactor Wheelie Bins available (660 L)- Numbers and locations</i>	
f)	<i>Any other street bins like concrete, brick, steel provided with their capacities and locations</i>	
	Number of manpower available:	
g)	<i>Number of CSI/SI</i>	
h)	<i>Number of Municipal Engineers for SWM</i>	
i)	<i>Number of Sweepers</i>	
j)	<i>Number of Safai karmchari</i>	
k)	<i>Number of Supervisors</i>	
l)	<i>Number of Drivers</i>	
m)	<i>Number of Contractual employee for SW Collection through Thekedar</i>	
n)	<i>Number of Tractor Trolley on Lease for SW Collection through Thekedar</i>	
17.	Dumper Placer Containers	
a)	<i>Number of 4.5 cu.m capacity</i>	
b)	<i>Number of 7.5 cu.m. capacity</i>	
c)	<i>Any other capacity equipment available, specify here</i>	

18.	Details of waste produced (TPD)	
	Total Household and Commercial Waste Generation in (TPD)	
a)	<i>Whether ULB use its own machinery and manpower to collect 100% waste? (Y/N)</i>	
	Waste Transportation System	
a)	<i>Number of Tractors X Number of Trips X the capacity of tractor/ lorry Number of Lorries X Number of Trips X the capacity of tractor/ lorry</i>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
b)	<i>Any data available to calculate the total weight of solid waste generated in a day, like payment made to private contractors, vehicles based on trips and weight</i>	
19.	Processing (Waste to Compost, Biogas, MRF)	
a)	<i>Any processing plant available in the ULB (Y/N), and which one?</i>	
b)	<i>Please give complete details of processing facility - type, location, area, method, capacity and present waste being treated</i>	
c)	Any Waste Segregation is happening	
	<i>At House Hold Level (Y/N), & How many HH?</i>	
	<i>At processing Plant (Y/N)</i>	
20.	Dump Site (Please provide 5 photos of site)	
a)	<i>Details of Present disposal site/dump yard</i>	
b)	<i>Area of Dump Site (acres or Kanals)</i>	
c)	<i>Location, and ownership (ULB owns/ or On Lease)</i>	
d)	<i>If Leased, name of Owner and years till leased:</i>	
e)	<i>Area of each disposal (acres/kanals)</i>	
f)	<i>How long the waste disposed in this dump site-(Years)</i>	
g)	<i>Any new site identified for the disposal, if so please give complete details of the site. area, location, ownership</i>	
21.	Whether charges being levied?	
a)	<i>Charges collected from House Holds for door to door collection (Y/N)</i>	

b)	<i>Charges collected from Bulk Waste Producers like Restaurants, marriage halls, malls, commercial areas, hospitals, (Y/N) and how much per Shop or marriage halls</i>	
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Note:

- Please provide a separate sheet where it is required.
- Please provide the soft/hard copies of ULB base Maps, ward wise demarcation maps etc. available with ULB's.
- Please provide any reports prepared / studies done before.
- For Help: PMIDC Officers: **Gurpreet Singh-7087046340**