

# POST COVID – ZERO WASTE MANAGEMENT STRATEGIES

# Solid Waste Management in India

- Urban India generates **62 million tonnes** of Municipal Solid waste (MSW) annually, and it has been predicted that this will reach **165 million tonnes in 2030**.
- **43 million tonnes (70%)** of collected annually,
- **11.9 million tonnes (20%)** is treated
- **31 million tonnes (50%)** is dumped in landfill sites



# ZERO WASTE

## Zero Waste International Alliance (zwia.org) definition -

*“Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.”*

*Last updated December 20th, 2018*

## Why?



Saves money



Reduces greenhouse gases



Saves energy



Saves resources

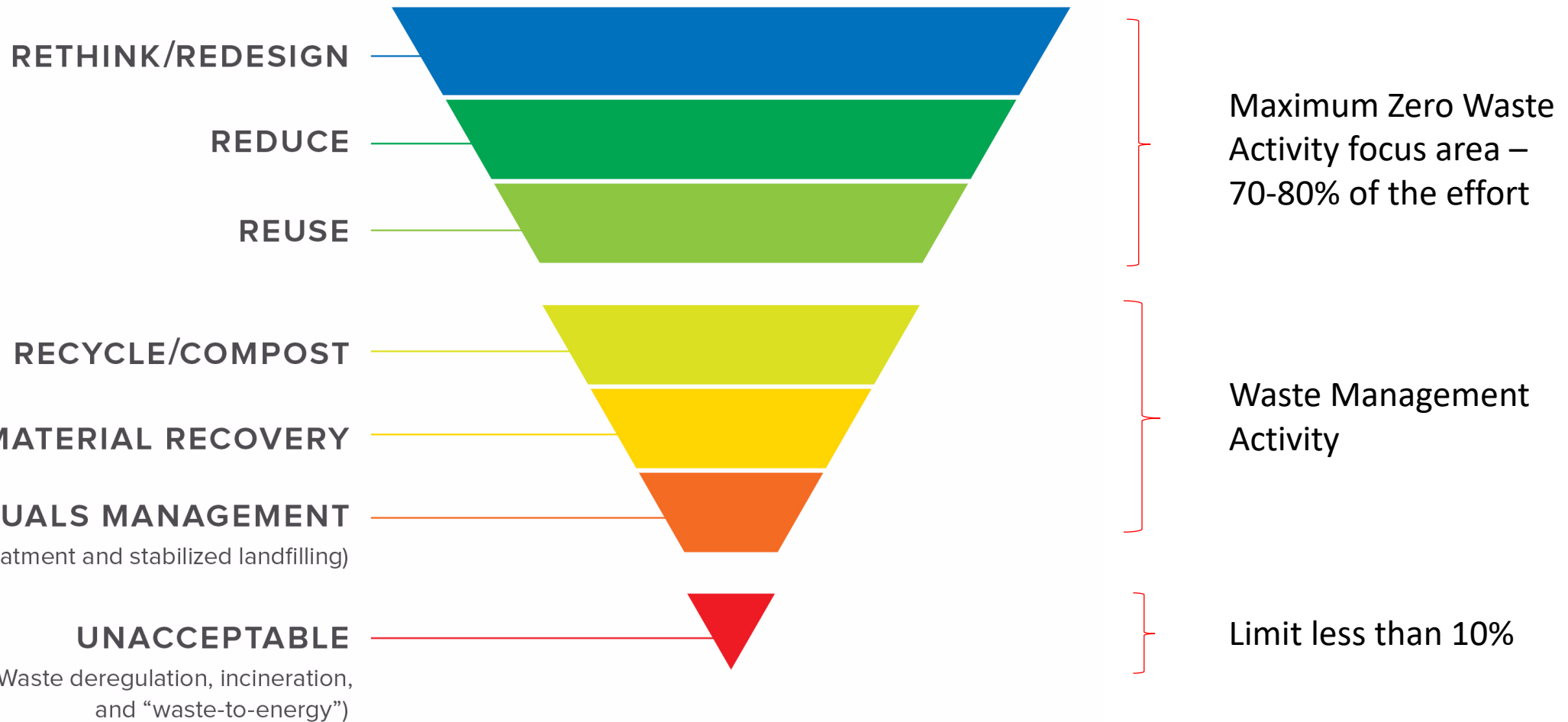


Reduces litter and pollution



Adds value to their organization

# ZERO WASTE HIERARCHY



# ZERO WASTE: CASE STUDY



## Colgate India nation's first to earn TRUE Zero Waste certification

- All four of Colgate's manufacturing plants receive highest-level recognition
- TRUE Zero Waste certification helps organisations define, pursue and achieve zero waste goals

**Mumbai, May 14, 2019:** Colgate India has received **TRUE Zero Waste Platinum certification**, for all its four manufacturing sites in India, from **Green Business Certification Inc. (GBCI)**, the premier organization independently recognizing excellence in green business industry performance and practice globally. GBCI administers TRUE Zero Waste certification, a program for businesses to assess performance in reducing waste and maximizing resource efficiency. Facilities earn TRUE certification by achieving minimum program requirements and attaining points; the program operates on a ranking system, with 'Platinum' being the highest certification level.

The TRUE Zero Waste certification program is meant to enable facilities to define, pursue and achieve their zero waste goals, cutting their carbon footprint and supporting public health. TRUE-certified spaces support sustainability and facilities that achieve the highest level of the rating system are acknowledged for minimizing their waste to landfill, incineration (waste-to-energy) or to the environment. All the four manufacturing plants of **Colgate India - Baddi (Himachal Pradesh), Goa, Sanand (Gujarat), and Sri City (Andhra Pradesh) - have achieved Platinum, the highest level of certification.** This makes Colgate India the first Indian company to receive this accreditation.



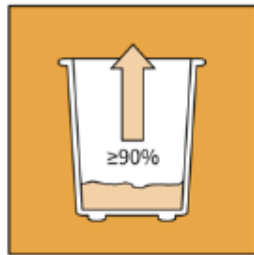
Source: Colgate India page on Facebook, post 25<sup>th</sup> April 2019  
<https://www.colgatepalmolive.co.in/core-values/sustainability/waste-management/true-zero-waste-certification>

# ZERO WASTE FACILITY

## Typical characteristics of a Zero Waste Facility



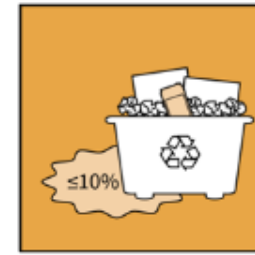
Develop and Implement a Zero Waste Policy



Divert more than 90% waste from landfill



Meet all regional laws on solid waste management and environmental regulations



Not more than 10% contamination of waste leaving the facility



Conduct Annual Waste Audit

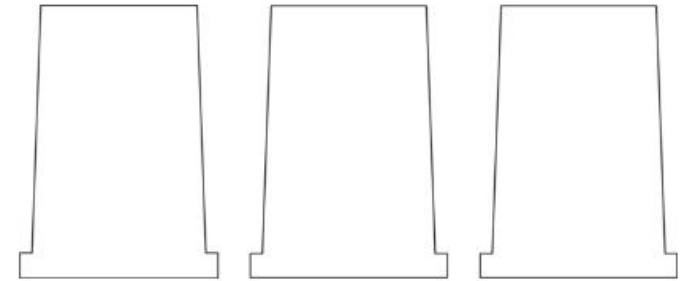
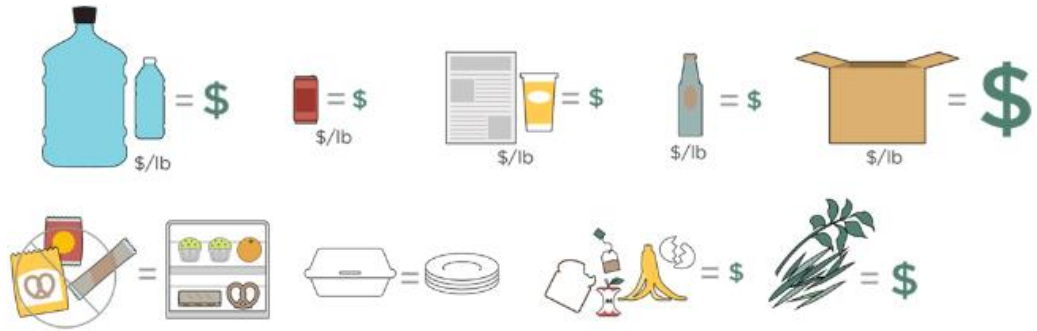
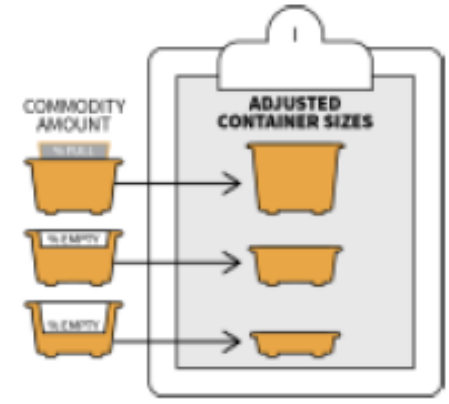


# ZERO WASTE PRINCIPLES

- Redesign
- Reduce
- Reuse
- Recycle
- Waste Audit
- Information, Education and Communication (IEC)

# Redesign

- Bin Size appropriate as per the waste generated
- Designate bin types as per the type of waste generated
- 100% Waste Segregation at Source





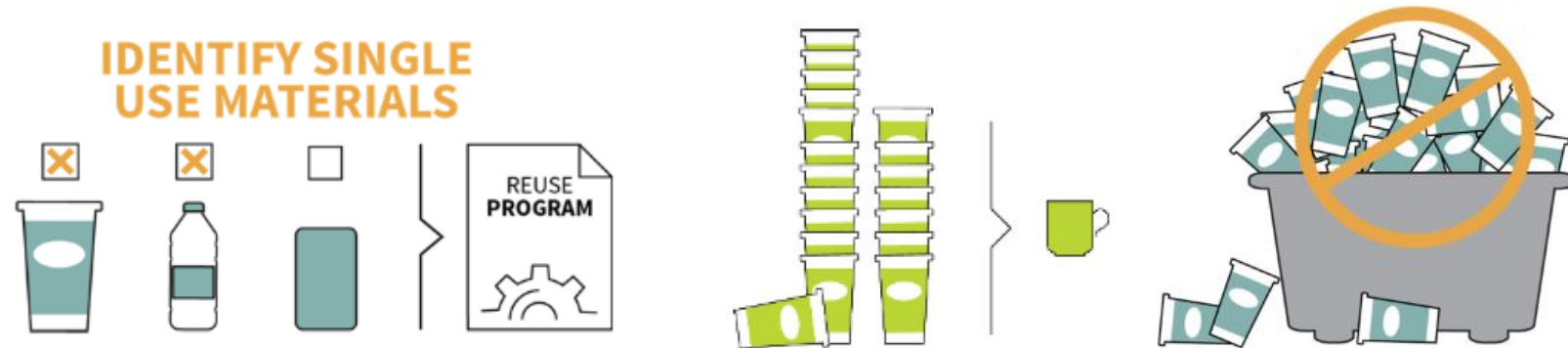
# Reduce

- Analyse incoming materials and outgoing waste generation
- Go digital, reduce paper use
- Reduce the volume of waste



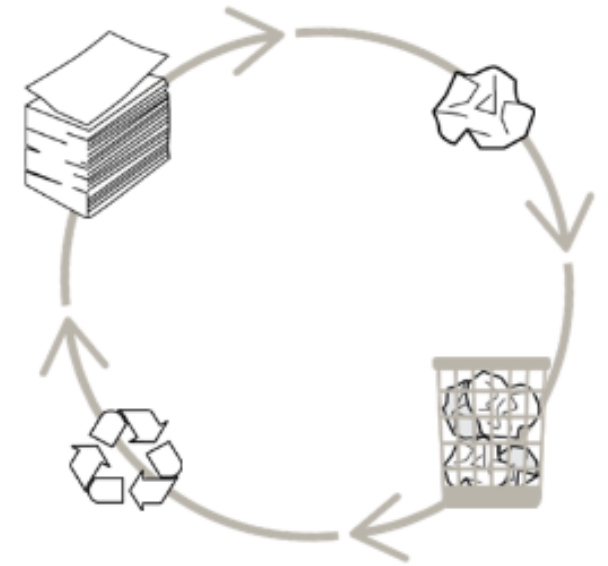
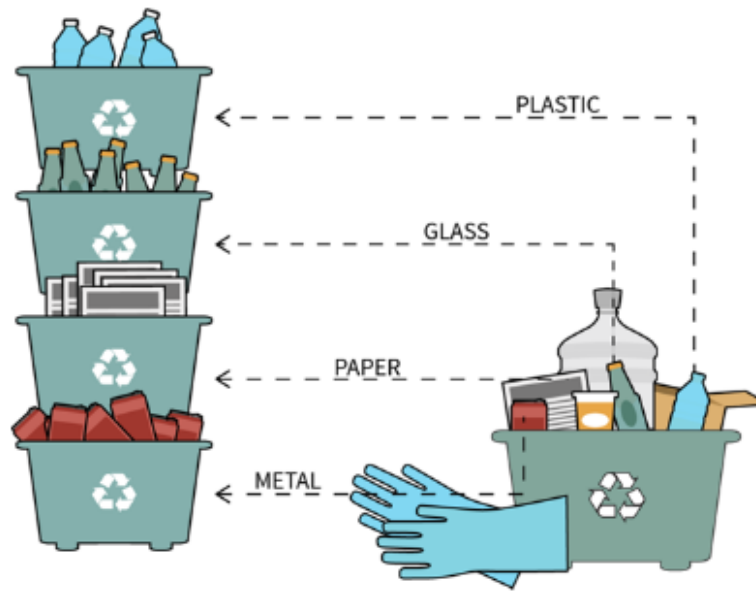
# Reuse

- Ban single use materials
- Replace single use with durable goods
- Explore re-usability of every item before being discarded

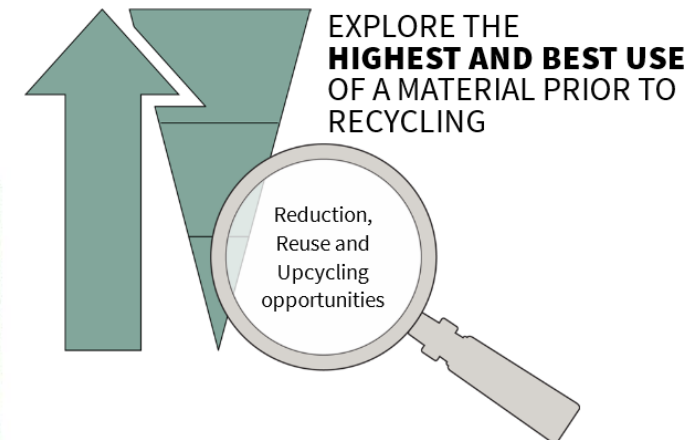


# Recycle

- Highest and best use of the material prior to recycling
- Explore closed loop solutions for the re-cyclable waste generated

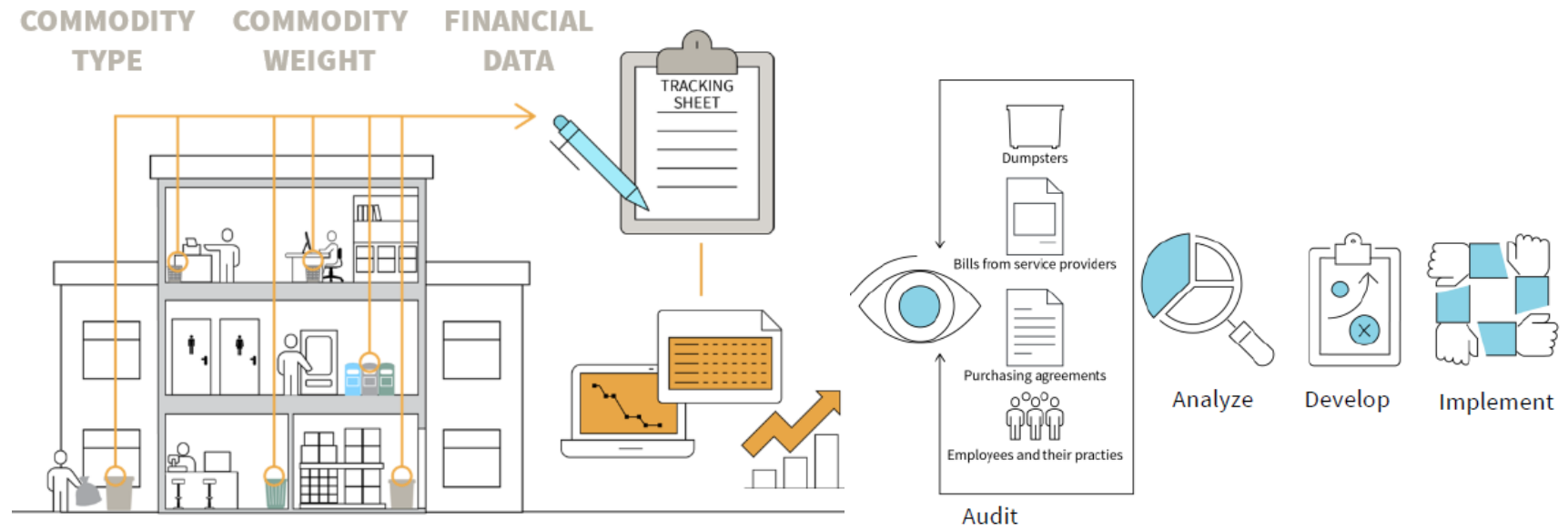


**COLLECTED  
SORTED  
PROCESSED  
CONVERTED  
MADE NEW**



# Waste Audit

- To measure and verify, track performance towards zero waste
- Document Waste generation
- Conduct regular Waste Audit
- Waste analysis for contamination checks and improve the process



**WASTE AUDIT**

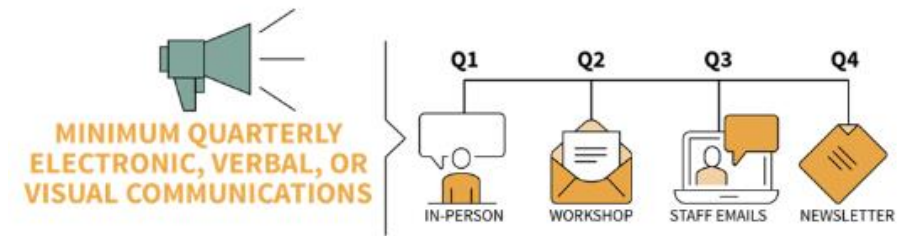
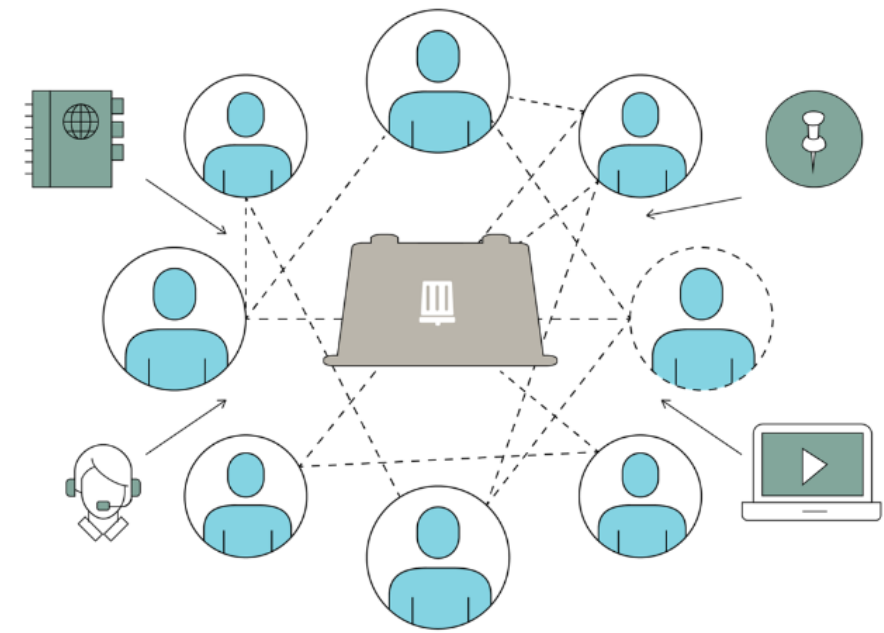
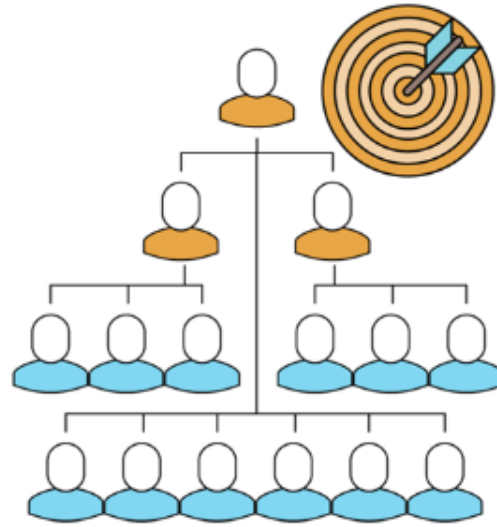
**Audit** landfill waste, **analyze** the results, **identify** opportunities for improvement, and **implement** recommended changes.

**RECYCLABLES AUDIT**

Search for reduce/reuse opportunities and **contaminants** (materials that diminish/destroy the value).

# Information Education Communication

- Provide the right information
- Necessary training and education
- Clear communication of outputs, success story
- Behaviour change to accept and contribute towards Zero Waste Initiative



# COVID 19 impact on Solid Waste Management

- **Susceptibility** in all age groups
- **Asymptomatic** persons are greater risk
- **Droplets** can live on infected surfaces
- **Mixed Waste handling** is a challenge

## How long the new coronavirus can live on surfaces

SURFACE	LIFESPAN OF COVID-19 VIRUS
 Paper and tissue paper**	3 hours
 Copper*	4 hours
 Cardboard*	24 hours ■
 Wood**	2 days ■
 Cloth**	2 days ■
 Stainless steel*	2–3 days ■
 Polypropylene plastic*	3 days ■
 Glass**	4 days ■
 Paper money**	4 days ■
 Outside of surgical mask**	7 days ■

\*At 69.8 to 73.4°F (21 to 23 °C) and 40% relative humidity

\*\*At 71°F and 65% relative humidity

Source: New England Journal of Medicine\*; The Lancet Microbe\*\*

BUSINESS INSIDER

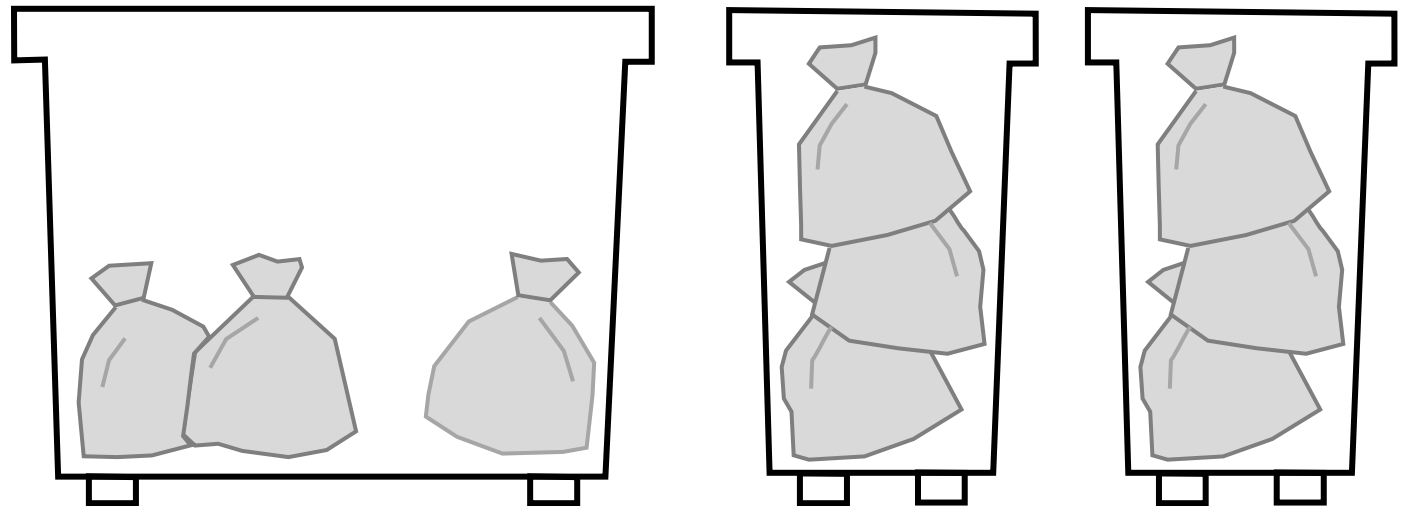
*A fomite is any inanimate object that, when contaminated with or exposed to infectious agents (such as pathogenic bacteria, viruses, or fungi), can transfer disease to a new host.*

# Right Size of Waste Bins

- Prevent Contamination **by bin overflow and mixed waste**
- Occupancy Count **will be low due to social distancing norms**
- Type of Waste generation **e.g. single use plastics, paper, biomedical waste**
- Storage of waste **to negate the transmission by fomite**



k54604760 www.fotosearch.com



# Source Segregation + Storage

## Residential



COMPOSTING

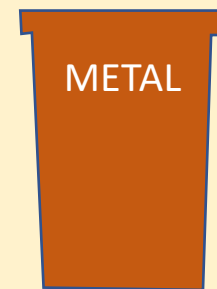
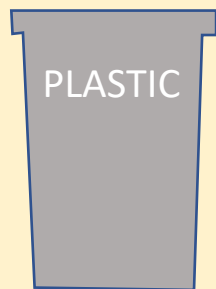
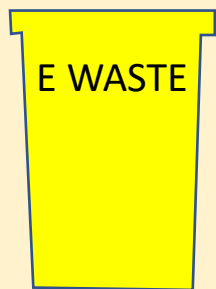
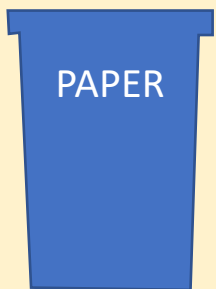
4 DAYS

4 DAYS

Storage recommended for up to 4 days



## Commercial



COMPOSTING

4 HOURS

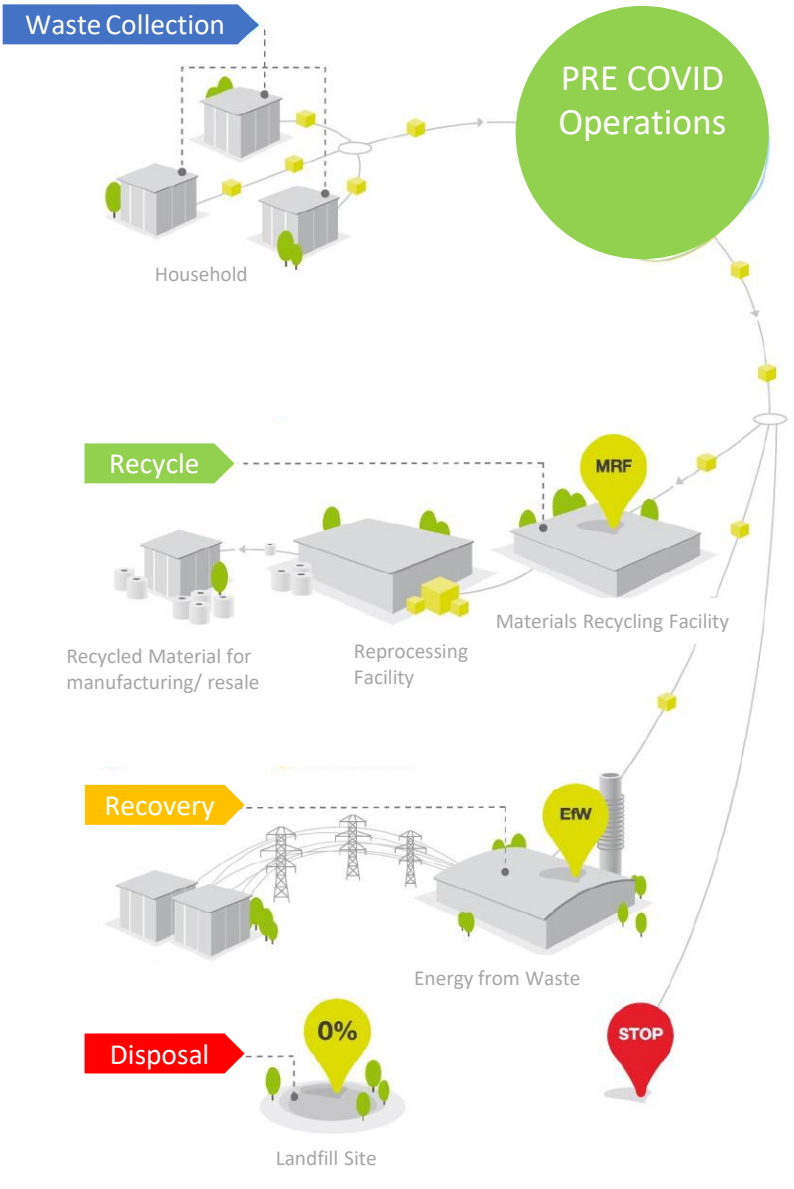
4 DAYS

3 DAYS

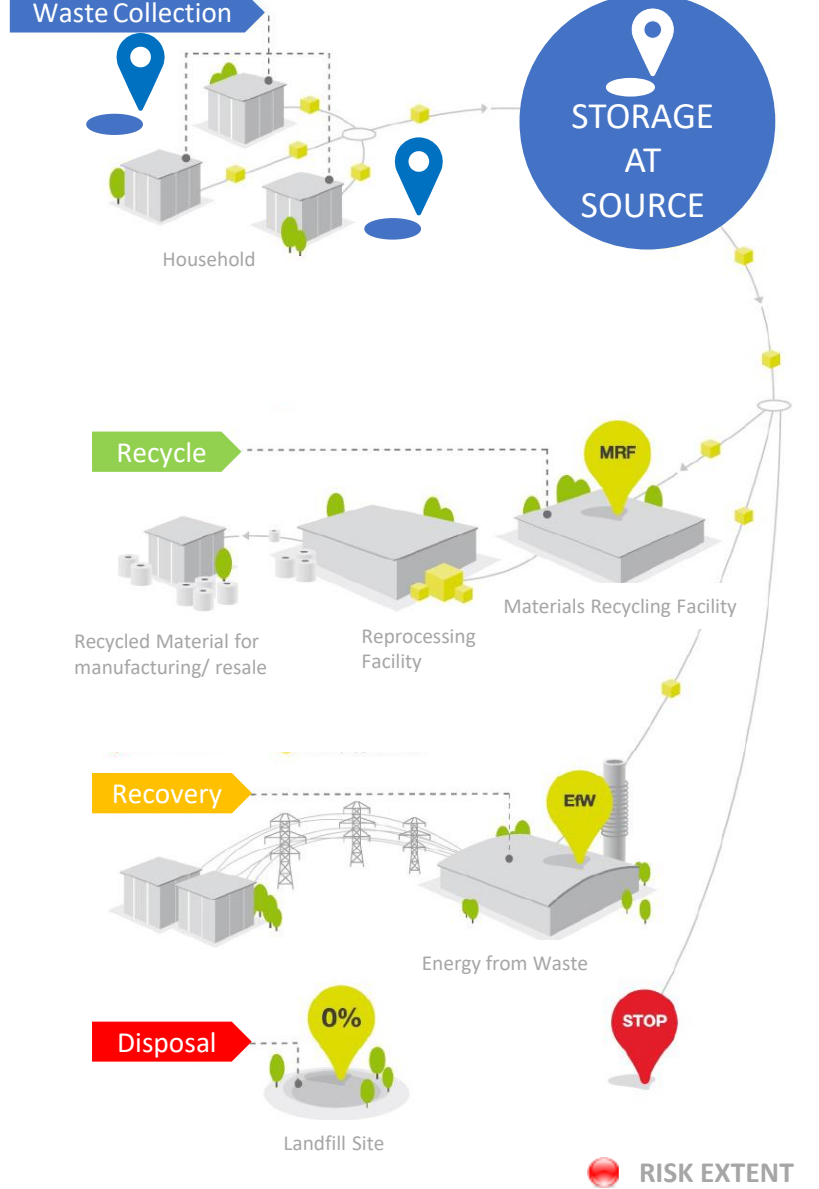
1 DAY

4 DAYS

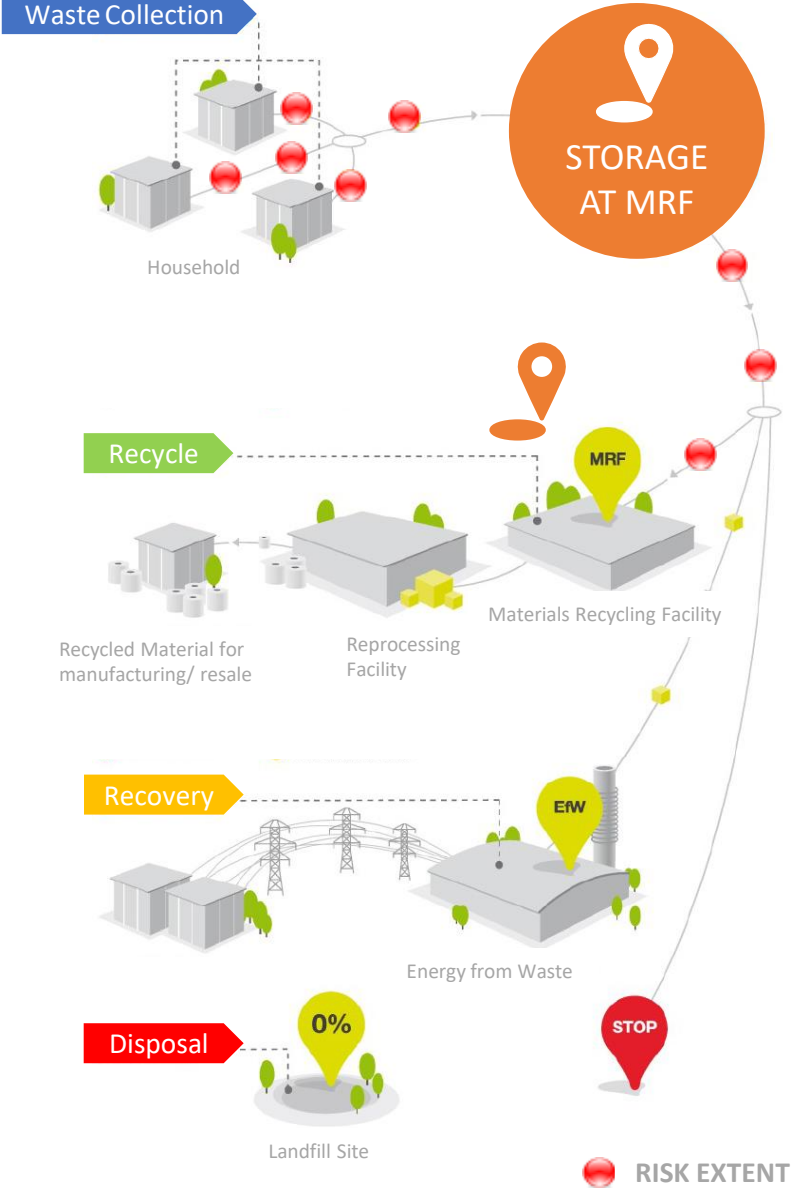




PRE COVID 19, Recyclable Waste movement same day  
<https://www.selectenviro.co.uk/>



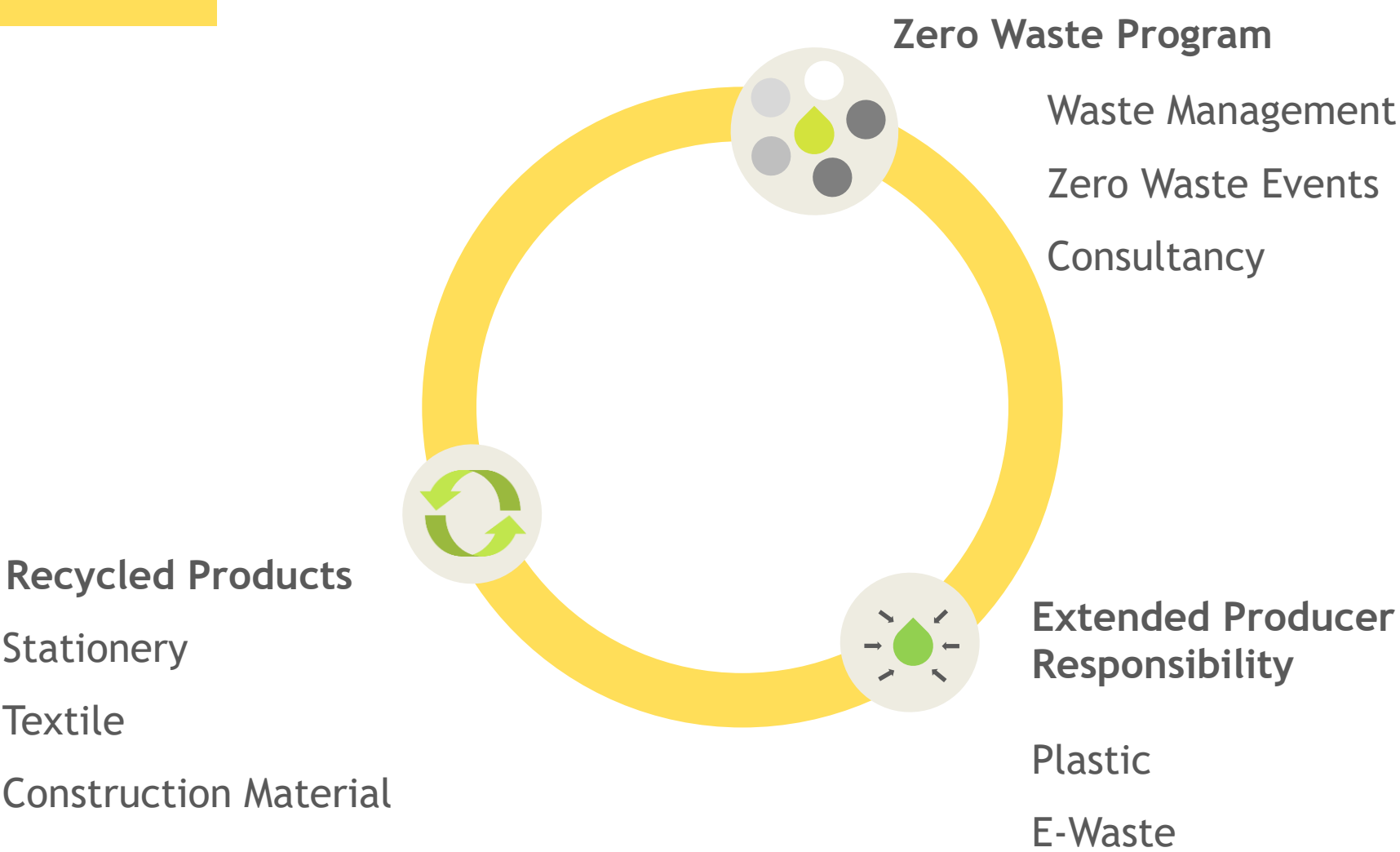
Recyclable Waste Transported for disposal after Storage at Source up to 4 DAYS



Recyclable Waste Transported for disposal with Storage at MRF up to 4 DAYS



# Our Solutions



# COVID Biomedical Waste



# COVID Biomedical Waste Management SOP

1.



## **Preferable bin location**

- Demarcated floor space
- Rest Rooms
- Security Gate

## **Sanitization**

- Keep sanitizer on table adjacent to bins
- Sanitize bins after bag clearance

# COVID Biomedical Waste Management SOP

2.

## Collection



- Housekeeping personnel to collect liners every 4- 8 hours
- Sanitize service lift after moving waste
- Carry Liners in a central carrying bin to transport it to biomedical waste management unit/demarcated space
- Sanitize Central Bins regularly

# COVID Biomedical Waste Management SOP

3.



- Drop Liners with biomedical waste at biomedical waste management unit/ demarcated space inside the campus
- Waste to be cleared by authorized biomedical waste management vendor regularly

# Bin Requisites

## Preferable Sizes



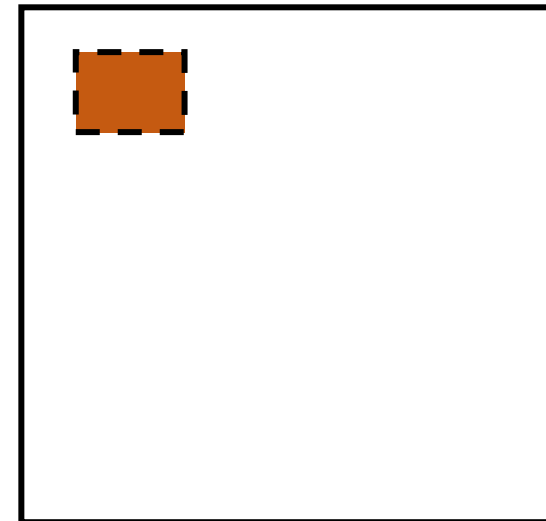
90 L

500 L

## Proper signage on existing bins



## Clear demarcation for storage/bin space



# PPE during waste collection and disposal

- Gloves
- Aprons/Gowns
- Head Covers
- Masks
- Safety Shoes



# Precautions

- Ensure staffs wear PPE when handling and disposing waste.
- Train staffs on how to put and remove PPE.
- Wash hands or use alcohol-based hand sanitizer immediately after removing all the PPE.
- Train the staffs who are assigned in handling and disposal of waste management





# Laws around Waste

## Relevant Law

- Solid Waste Management Rules 2016
- Plastic Waste Management Rules 2016
- E-Waste (Management) Rules 2016
- Construction and Demolition Waste Management Rules 2016
- Solid Waste Management Rules 2016

## Waste category



Biodegradable (wet)



Non-biodegradable (dry)



Plastic



E-Waste



Construction and Demolition



Domestic hazardous and sanitary wastes

# Rules and Regulations

- Mandatory **Segregation** at source
- Pay **user fees** for collection, processing and disposal
- Producer Responsibility
- No incineration or landfill
- If there is no space constraint bulk waste generators are required to **process wet waste onsite**
- Only non-recyclable, non-biodegradable (having calorific value of less than 1500K/cal/kg) and inert wastes and pre-processing rejects and residue to be landfilled.

# Circular Economy





SORTING AREA





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269, 245 3515  
www.vemmarorganic.com



10.07.2018 12:04







TOWARDS ZERO WASTE CITIES

# National Policies and Programs

2014

Introduction of **Swachh Bharat Mission** to address both elimination of open defecation and solid waste management

2016

Introduction of **Open Defecation Free(ODF) Sustainability Policy**

2017

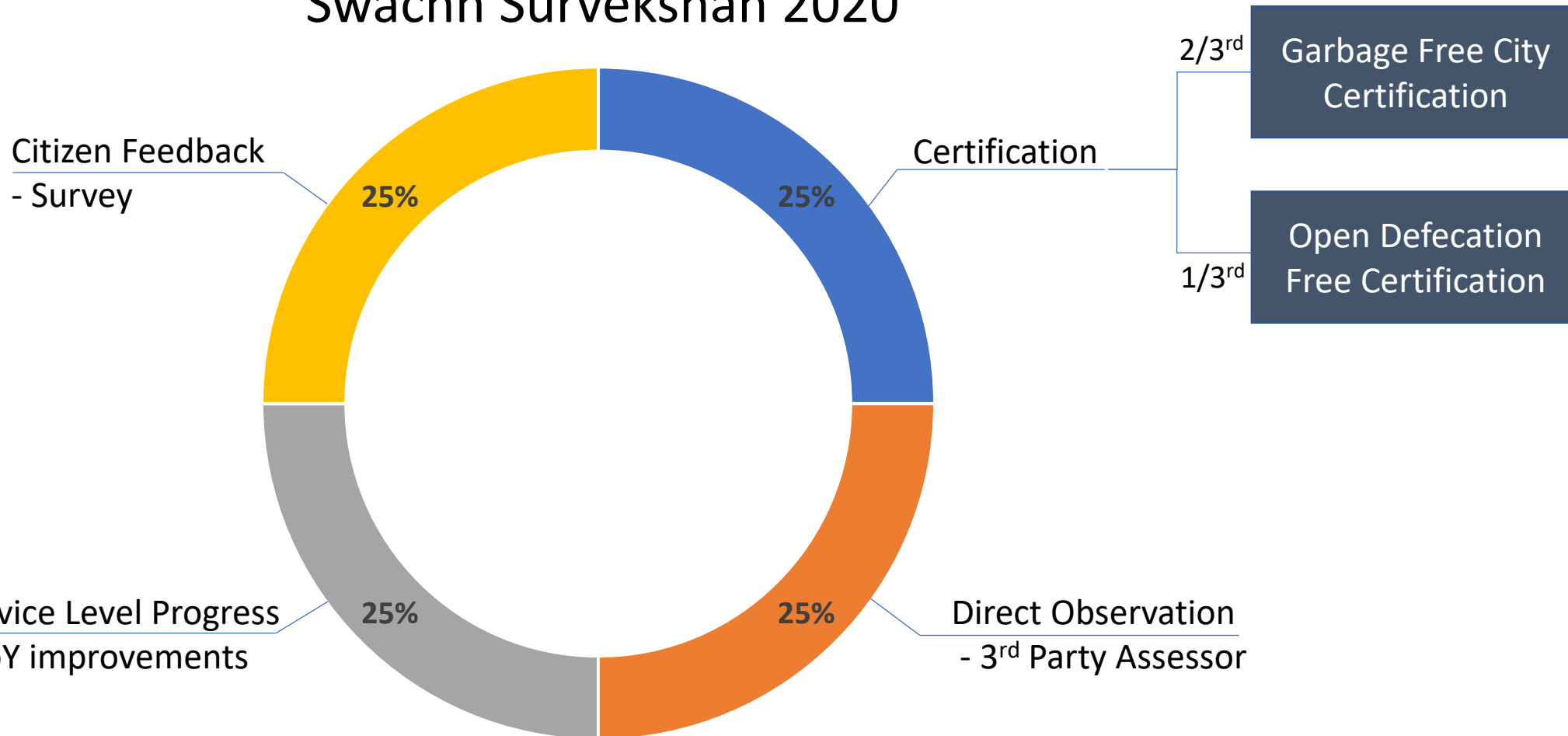
Introduction of **Swachh Survekshan**, a pan-India based ranking system for ULBS

2018

The Ministry of Housing and Urban Affairs (MOHUA) had launched the Protocol for **Star Rating of Garbage Free cities**.

# Government Tools and Frameworks

## Swachh Survekshan 2020



# GARBAGE FREE CITY ensures holistic evaluation across entire SWM Chain



Door to Door Collection of waste



Scientific Waste Processing, Scientific Landfilling and C&D Waste Management



Source Segregation of waste at both ward and city level



Citizen Grievance Redressal and feedback system



Sweeping of public, commercial & residential areas



Eradication of crude dumping of garbage and dump remediation



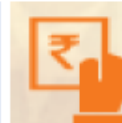
Waste Storage Bins, Litter Bins



Cleaning of storm drains, surface of water bodies and screening of Nallahs



User Fees, Penalties, Spot Fines for littering and Enforcement of Plastic Ban



Visible beautification in the city with a focus on it's sustainability



Bulk Waste Generators Compliance



On-site processing of wet waste



## Swachh Survekshan Ranking 2019

SS Rank (National)	Name of ULB	SS Marks (out of 5000)	ODF Status	Garbage Free Star Rating
1	Indore	4659.09	ODF++	5 star
2	Ambikapur	4394.09	ODF++	5 star
3	Mysore	4378.54	ODF+	5 star
4	Ujjain	4244.47	ODF++	3 star
5	NDMC	4190.52	ODF ++	3 star
6	Ahmedabad	4137.43	ODF++	3 star
7	Navi Mumbai	4128.85	ODF++	3 star
8	Tirupati	4024.61	ODF++	3 star
9	Rajkot	4000.15	ODF++	3 star
10	Dewas	3967.61	ODF++	3 star
11	Bhilai Nagar	3929.48	ODF++	3 star
12	Vijaywada	3882.46	ODF++	3 star
13	Ghaziabad	3877.43	ODF+	3 star
14	Surat	3860.66	ODF++	3 star
15	Jamshedpur	3805.72	ODF++	2 star

Conclusion