

# LITERATURE REVIEW

## SMART WASTE MANAGEMENT SYSTEM FOR METROPOLITAN CITIES

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**1. Title:** Inventory routing for dynamic waste collection

**Author's Name:** Martijn Mes, Marco Schutten, and Arturo Perez Rivera

**Year:** 2014

**Description:** Martijn Mes et al address the problem of collecting waste from sensor-equipped underground containers. These sensors enable the use of a dynamic collection policy. The problem, which is known as a reverse inventory routing problem, involves decisions regarding routing and container selection. In more dense networks, the latter becomes more important. To ensure uncertainty in deposit volumes and fluctuations due to daily and seasonal effects, we need the balances over time. We tune the parameters of this policy using optimal learning techniques combined with simulation

**2. Title:** Capacitated location of collection sites in an urban waste management system

**Author's Name:** Giampaolo Ghiani, Demetri Lagana, Emanuele Manni and Chefi Trik

**Year:** 2012

**Description:** Giampaolo Ghiani et al propose an integer programming model that helps decision-makers in choosing the sites where to locate the unsorted waste collection bins in a residential town, as well as the capacities of the bins to be located at each collection site. This model helps in assessing tactical decisions through constraints that force each collection area to be capacitated enough to fit

the expected waste to be directed to that area. It resulted in a lower number of activated collection sites and fewer bins to be used.

**3. Title: IOT-based** waste management for smart city

**Author's Name:** Parkash and Prabus V

**Year:** 2015

**Description:** Parkash et al present the day scenario or the problems, many times we see that the garbage bins or Dust bins placed in public places in the cities are overflowing due to the increase in waste every day. It creates unhygienic conditions for the people and creates a bad smell around the surroundings which leads to the spreading of some deadly diseases & human illnesses, to avoid such a situation we are planning to design “IoT Based Waste Management for Smart Cities”. In this system there are multiple dustbins located throughout the city or the Campus, these dustbins are provided with a low-cost embedded device that helps in tracking the level of the garbage bins and a unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. When the level reaches the threshold limit, the device will transmit the level along with the unique ID provided. These details can be accessed by the concerned authorities or workers from their place with the help of the Internet and immediate action can be made to clean the dustbins

**4. Title: IOT-based** smart waste management system using Wireless Sensor Network and Embedded Linux Board

**Author's Name:** Lata Kusum and Shri S K Singh

**Year:** 2016

**Description:** Lata Kusum et al present the Smart waste management system that identifies the fullness of the bin using a wireless sensor network and embedded Linux board and informs the authorized person about the cleaning of the bin. The system provides a web interface to the cleaning authority so that they can monitor and clean the garbage bin. In this project, Raspberry Pi is used as an embedded Linux board which is designed based on the arm 11 microcontroller architecture. The Embedded Linux board makes the communication with all distributed sensor

nodes placed in the tested area through ZigBee protocol and itself acts as a coordinating node in the wireless sensor network. The goal of the coordinator node is to collect parameters like the bin level and odor wirelessly. Each sensor node consists of a level sensor and gas sensors and one ZigBee RF antenna device for communication with the coordinator node. Raspberry Pi stores collected data in the database and analyze the stored data. The board has an Ethernet interface and runs a simple data web server. Hence coordinator collects the data over ZigBee wireless communication protocol and allows the user to monitor the data from a web browser. The cleaning authority can collect the garbage on time.

**5. Title:** Overview of solid waste bin monitoring and collection system

**Author's Name:** Md. Shafiqul Islam, Maher Arebey, M.A. Hannan and Hasan Basri

**Year:** 2012

**Description:** Md. Shafiqul Islam et al introduced an integrated system combined with an integrated system of Radio Frequency Identification, Global Position System, General Packet Radio Service, Geographic Information System, and web camera. The built-in RFID reader in collection trucks would automatically retrieve all sorts of customer information and bin information from the RFID tag, mounted with each bin. GPS would give the location information of the collection truck. All The information on the central server would be updated automatically through the GPRS communication system. The performance of the implemented system has been analyzed and focused that the proposed being stem being much betterer than the existing system in terms of high-speed data transmission, precise real-time, and reliability.

**6. Title:** RFID-based real-time smart waste management system

**Author's Name:** Chowdhury Belal and U Chowdhury Morshed

**Year:** 2007

**Description:** Chowdhury Belal et al present the outline of RFID and sensor models for designing a system in real-time waste management. An application of

the architecture is described in the area of RFID and sensor-based automatic waste identity, weight, and stolen bin identification systems.

## **PROBLEM STATEMENT**

Mostly the Garbage bins are Underutilized, if the waste is compressed regularly it could lead to significantly higher storage of waste in the same volume of bins, leading to lesser numbers of pickup turns and improved efficiency. For the same, we can incorporate a solar-based compactor that works on Linear Actuator Principle and would work on the inputs from the Arduino Board.