

# Smart and Sustainable Waste Management in Dubai

Eng. Abdulmajeed Abdulaziz Saifaie  
 Head of Waste Management Department  
 Dubai Municipality  
[www.dm.gov.ae](http://www.dm.gov.ae)



## I. Introduction

Rapid growth of industry, trade and urbanization, a result of a booming prosperous economy. Dubai a city like no other, has now challenged the consequences of its prosperity which are mainly cleanliness and safety. In an attempt to steer the city to a zero-waste scenario, Dubai Municipality has developed from its simple cleaning cadre, to today a fully integrated and sustainable waste management system.

Faced with unique challenges such as the transitory population, tourists and a multinational resident population, Dubai Municipality implemented and enforced innovative legislations, policies and strategies. Thru a unified approach and putting emphasis on sustainability, Dubai Municipality continues to meet and exceed the demands of the society for a high quality, efficient and effective waste management services.



## II. Current Initiatives

### 1. Smart Sustainability Oasis

A solar powered self-efficient recycling center with built in sensors and CCTV cameras that directly connect to headquarters, the smart sustainability oasis is Dubai's innovative recycling bring centers. These centers shall be the places where the public can dispose their unwanted but recyclable materials which may not normally be included in the curbside collection service. With (13) centers strategically placed in the city, Dubai Municipality intends to encourage the public to use these facilities to recycle and not to dispose unwanted recyclables. With the implementation of this new system which also serves as an educational hub due to smart screens that encourage users through displayed messages, the government aims to create a mindset of recycling as opposed to disposal. This initiative is projected to increase recycling in the Emirate and in turn reduce the quantity of waste going to landfills.

### 2. Smart Gate System (Nafith)

Smart Gate System (Nafith) is a fully automated entry management system at Dubai Municipality landfill sites. Radio Frequency Identification technology (RFID), Automatic Number Plate Recognition (ANPR) and integrated software are utilized to control entry of vehicles at sites, gather weight information and automatic credit deduction. The initiative will reduce the time spent for vehicle entry therefore curbing emissions and increasing efficiency. The new system will also eliminate the use of paper in entry transactions and reporting as well as eliminate human induced errors as all information will be automated.

## Fully Automated Entry System at Landfill



- **RFID Technologies**  
(Radio Frequency Identification)
- **ANPR Cameras**  
(Automatic Number Plate Recognition)
- **Smart Software**

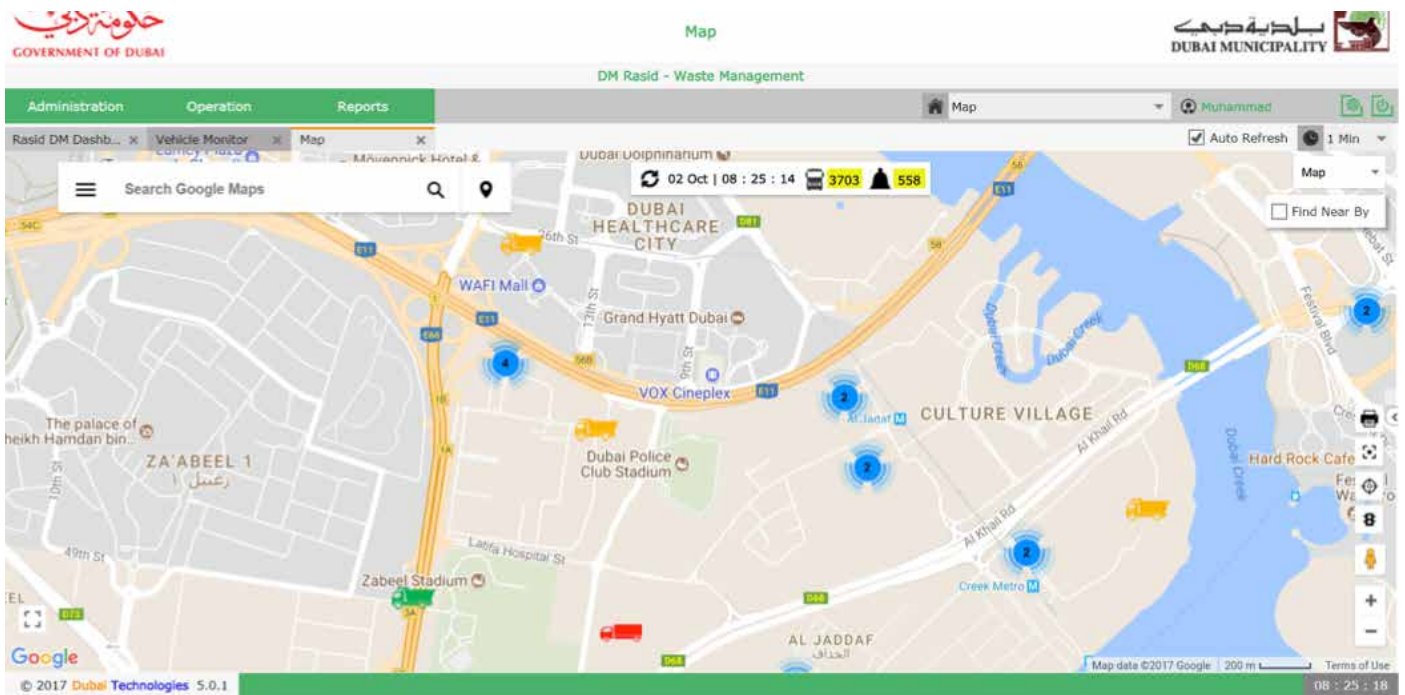
### 3. Bigbelly Waste Containers

Bigbelly is a waste container (bin) that uses solar power for 100% of its energy needs making it carbon neutral. Bigbelly is fitted with a compaction capability, which thus it can hold six to eight times more waste than the average street bin. The volume sensors installed in the bin triggers compaction when the waste reaches a certain level. Each of the Bigbelly stations are geotagged in CLEAN (Management Software) allowing headquarters to monitor the efficiency of the bins based on their location. The sensor also notifies headquarters when the bins are almost full, allowing for logistics efficiency. Overall the bigbelly enhances the Dubai Municipality fleet's efficiency due to significant increase in collection at one time, less fuel consumption due to reduced trips, as well as minimization of exploiting manpower and equipment.



### 4. Vehicle Tracking System (Rasid)

Is a GPS based technology that provides real time management and tracking system of the Dubai Municipality fleet as well as private waste management companies registered in the Emirate. The system is also integrated with efficiency and security applications to enhance the productivity of the vehicle and manpower. RASID's flexibility, strength, stability and continuous uninterrupted performance is a tool that has enhanced the Dubai Municipality's Waste Management to monitor, report and eliminate trespassers, thereby allowing better use of the landfill. Incorporated in the design are wide range of functionalities such as vehicle maintenance, vehicle tracking and diagnostics, driver management, speed management, fuel management and health and safety management. Waste Management Department has the system installed and operational in its fleet, and private companies that are licensed to use the landfills in the Emirate of Dubai.



## 5. My City My Environment

Dubai Municipality is keen on applying international best practices to provide top class services to its residents and in turn proactively promote individual environmental responsibility and sustainability. Door to door waste collection is an “at source” waste segregation program aimed to increase the collection rate of recyclables at the residential sector while at the same time providing also disposal option for unrecyclable waste. The system provides two bins, one for recyclables and the other one for general waste. Various areas in the Emirate are currently covered by this initiative, and in there are future plans to implement this all over Dubai.



## 6. Underground Waste Compactors

The underground waste collection system is an innovative solution to address the waste disposal needs in busy and heavily populated public areas. With only one large bin under the ground, the system retrieves valuable space which is otherwise occupied by communal bins. Having a compacting mechanism, the system has more storage capacity which in turn reduces collection frequency to empty the container improving our fleet's logistics. The system also eliminates odors, protects the machinery from vandalism, and provides a better aesthetic look in the area. The underground waste compactors were installed in various strategic locations all around Dubai.

