Data Driven Waste Management Solutions

Impacts of Municipal Solid Waste

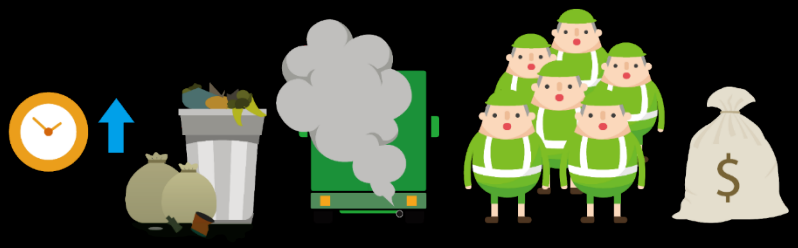
TRADITIONAL WASTE MANAGEMENT

THE WASTE IN WASTE

OVERFLOWING trash makes streets and communities dirty, identifying trouble spots are difficult because collectors do not know when or where it occurs

EMPTY BINS do not need to be collected, but because of the lack of technology they go along with traditional routes

INEFFICIENCIES in waste management operations ranging from resource allocation and collection methods to scheduling and lack of optimization



SOLUTIONS

Ecube Labs offers a comprehensive smart waste management solution using industry leading cloud-based software connected to the latest in custom IoT smart sensor and smart bin technology.

CleanCityNetworks (CCN)

CCNx

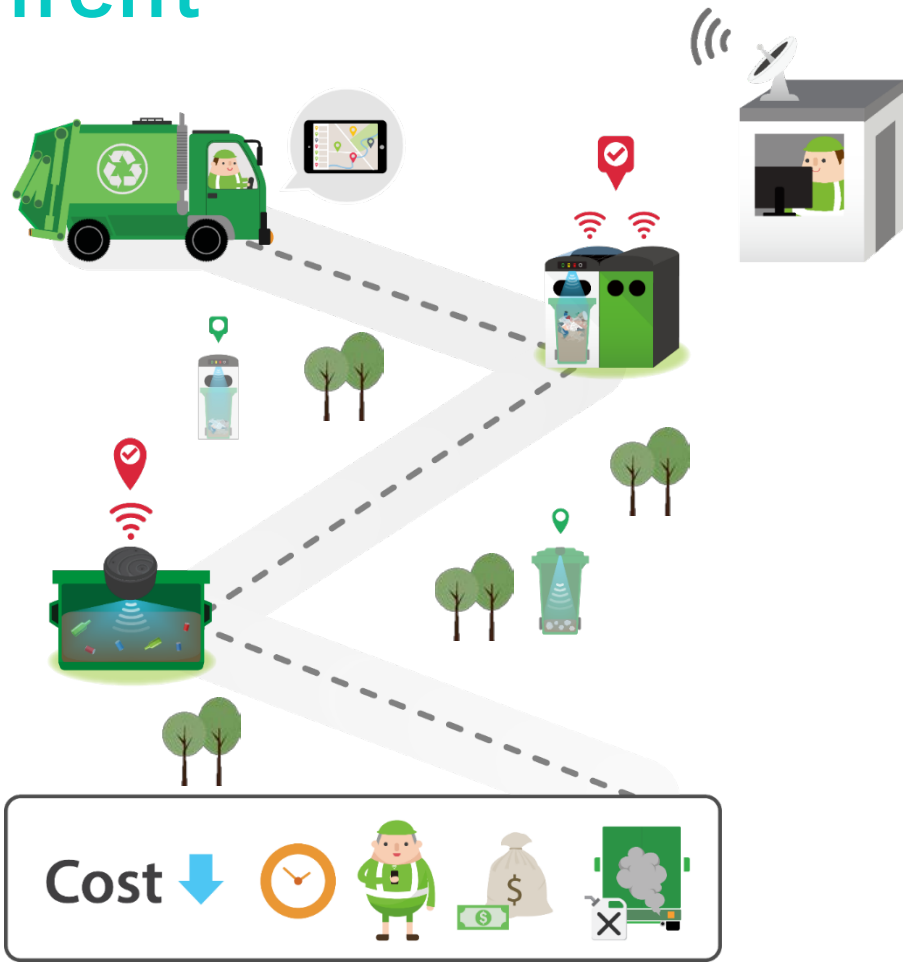
CleanCUBE

CleanCAP/FLEX

- CleanCityNetworks (CCN)
- CCNx (Fleet Management)
- CleanCUBE (CCB)
- CleanCAP/FLEX (CCP/CFX)


CUBE
Labs

Smart Waste Management



VISIBILITY LEADS TO ACTION

- Find Problems
- Collect Data
- Establishment of Baseline

- Analyze data
- Reveal what works, what doesn't
- Seek Improvement

- Implementation of Strategy
- Adopt new Methods

THE

STAGES

OUR METHOD IS ECHOED IN THE BIG PICTURE

EARLY STAGE

- Discovery Stage
- Collect and Monitor Data

MID STAGE

- Insight Stage
- Analyze the data and draw conclusion for strategies

LATE STAGE

- Action Stage
- Development strategies should be approved and applied for the next phase

THE

EARLY STAGE

Defining Features

- Deploy sensors to collect and monitor data
- Assess and track performance while gaining insights on day to day operations
- Historical/Archival data increases transparency and accountability

THE

MID STAGE

Defining Features

- Change existing bins to smart bins
- Modify collection schedules and optimize routes
- Decrease in operational costs and increase efficiency

THE

LATE STAGE

Defining Features

- Deployment of fleet management systems
- Optimize for specific parameters that account for all operational aspects
- Decrease in collection frequency, overflows, and operational costs


Smarter Cities,
Greener Communities
www.ecubelabs.com

CASE STUDIES

Hermosa Beach, USA

A popular beach town in Southern California, Hermosa Beach is visited by millions of tourists each year, resulting in frequent premature collections to avoid overflow. Utilizing CCN reduced operational costs.

- **Lack of waste bins created high number of overflow occurrences and was causing hygiene issues on the streets**
- Needed a better solution than “over-zealous” collection

- 14 initial CleanCUBEs were installed in the busiest areas (pier) in Hermosa Beach, with the next phase to include 20 additional CleanCUBES & 100 CleanCAPs
- City officials and 3rd party collection organizations were trained on operation methods
- Monitoring revealed inefficient operation and high waste generation areas

90% DECREASE IN OVERFLOW

- Collections performed based on real-time and predictive analysis increased efficiency
- Combined with compaction of waste in the CleanCUBEs, collections were reduced to once per day

Universal Studios, California, USA

Universal Studio's waste collection campaign for park services will utilize smart waste management to optimize their resource allocation including collection times, personnel and frequency.

- Every waste bin in the park is checked every 15mins
- Monitoring collection services is difficult and take too long to resolve overflow issues
- Did not know if existing waste collection staff too large or small for the park

- Installed 5 CleanCAPs in front of its Harry Potter (most popular) section of the park
- Restrictions on the aesthetic of the bins, resulting in the utilization of external antenna
- Trial and error testing to locate an optimal location within the bin

DATA GATHERING PHASE

- 30 additional CleanCAPs were ordered for further monitoring in other parts of the park
- Testing of external antenna shows that it is possible under a fully enclosed bin
- The sample data collected shows that the Harry Potter waste generation is not as bad as they initial thought and rather too much focus was put on that section

Shanghai, China

The realized benefits of real-time and historical data insights has helped to push forward Clean City movement within the greater Chinese society

- As newly established building, they wanted to maintain the environment as clean as possible (Shanghai Exhibition Center)
- It is the main Street of Shanghai with the most influx of tourists and the most number of trash bins installed. Waste overflow often occurred and did not leave good impression
  (High levels of foot traffic generated equally high levels of waste generation)

- Installed 4 CleanCUBEs and 20 CleanCAPs on Shanghai National Exhibition and Convention Center
- Installed 50 CleanCAPs in Nanjing Road

COLLECTION REDUCTION FROM 4.6 TO 0.6 TIMES A DAY

- Able to analyze the data of high traffic time, waste level, collection number etc.
- Enhanced street cleanliness by using CleanCUBE and real-time monitoring made it possible to optimize collection time/person and their workload

Melbourne, Australia

Melbourne wanted to not only reduce collections but also reduce overflow, proven possible through CCN

- Lack of data on the waste generation and collection performance
- Too many collections were required and not enough workers to match the need
- Unpleasant environment for citizens due to overflowing bins

- Total installation of 700 CleanCUBEs are planned
- Initial 47 CleanCAPs were installed
- CCN notifications and real-time data used to perform collections

25% INCREASE IN EFFICIENCY

- Total collections and inefficient collections (when fill-level is less than 30%) reduced by 25%
- Along with 35% fewer overflow occurrences, response time to an overflowing bin decreased by 71%
- Reduced response time resulted in roughly 85% less overflow volume, increasing quality of life for citizens

Washington D.C., USA

Rodent abatement program is seen as a growing success story within the office of the D.C. mayor along with the Dept. of Public Works that is continuing to better understand their waste operations for further optimization.

- The growing rodent population in the District is causing concern related to health and safety of its residents & tourists
- Waste is inappropriately thrown away by local businesses and residents alike; main source of food for rodents

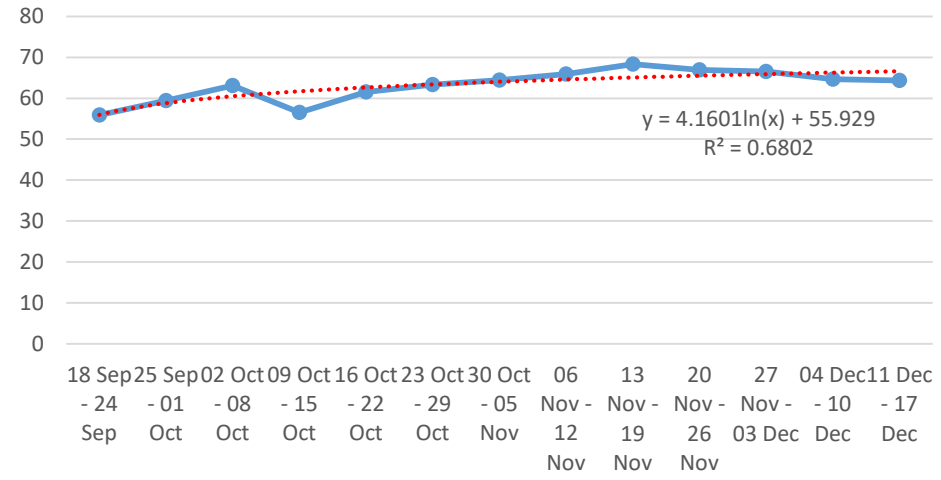
- 25 CleanCUBEs in SE/NW DC
  (Barrack's Row, Freedom Plaza and Indiana Ave, Pennsylvania Ave.)
- 100 CleanCAPs to be installed with DowntownDC Business Improvement District in conjunction with Office of the CTO
- Monitor and analyze collection frequency to optimize collection personnel routes and downtime

REDUCTION IN THE NUMBER OF RODENT APPEARANCES

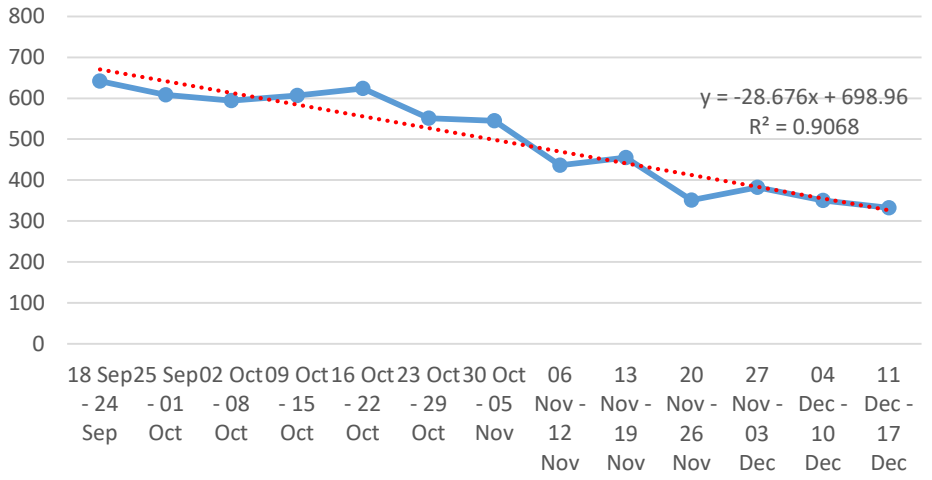
- Identified the least waste generated locations and optimized collection frequency from 21 times a week to 3 times a week
- The local businesses where CleanCUBE has been deployed has seen a reduction in the number of rodent appearances
- Due to less frequent collections, it has reduce the downtime of waste collectors to focus on secondary waste related issues

Washington D.C., USA

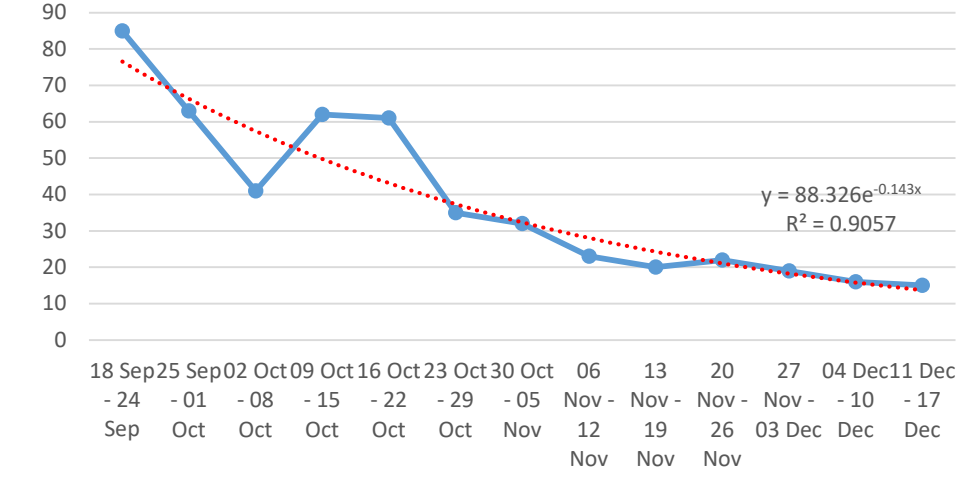
avg fill-level at collection(%)



of collection



of unnecessary collection



of overflow