



Smart Waste Solutions

3 Case Studies from Seoul
Focusing on high footfall spaces

With special thanks to our partners at



Case Study 1: Four Korean Universities in Seoul



“Significant cost reductions, cleaner public spaces, and it also increased our recycling diversion rates by over 300%.”

Bureau of Facilities Management, Seoul National University

Problem

- High weekly collection frequency
- Overflowing waste bins in public areas
- Waste bins placed across large campuses
- 12% recycling diversion rate

Solution

- Installation of 144 Clean Cubes across 4 university campuses
- Real-time monitoring with Clean City Networks (CCN)
- Route optimization for waste collections

Results

- Weekly waste collections reduced from 12 to less than 2
- Less litter and cleaner public areas
- Increased recycling diversion rate to 54%
- 82% reduction in operational costs

Case Study 1: Four Korean Universities in Seoul

Cleaning up campuses the green and smart way.

The top four universities in Korea: Seoul National, Korea, Yonsei and Dongguk wanted a solution that would keep campuses clean and costs down. Traditional bins often overflowed with waste, which led to more littering across campuses. The cost of increasing the frequency of waste collection was unaffordable.

The universities recognised that the waste compaction the Clean Cube provided - using solar energy - could increase bin capacity six to eight-fold. This meant that even with fewer bins, waste overflow can be prevented, leading to cleaner campuses for both students and visitors.

Additionally, Clean Cubes are designed to promote environmental awareness. With clear signs and specially-fabricated bin openings that encourage single stream recycling, Clean Cubes allow universities to achieve higher recycling diversion rates.

Due to the size of the universities, traditional bins were spread out across the campuses. Not knowing how full any of these bins were meant that waste collection operators

had to collect all of the bins on a regular schedule.

Clean City Networks (CCN) provided immense value by providing waste operators a way to monitor the status and fill-level of bins in real-time, allowing them to schedule their collections for only the bins that required emptying.

Additionally, CCN optimizes waste collection by calculating the fastest way to empty only the bins that require it. This results in shorter collection trips, and so less fuel and lower maintenance costs for waste collection vehicles.

Dean of the United Campus Sustainability Office Kim Jang Hee praised the effectiveness of the Clean Cubes and their smart technology, saying they “*allow university campuses to more efficiently provide waste collection services. Their solutions not only save universities money by reducing required labour, time, and fuel, but it also ensures cleaner public areas and encourages people to recycle.*”

The Clean Cube has set the new standard of waste bins for Korean universities.



“By installing just 144 of the waste compacting Clean Cubes, we managed to replace over 400 traditional bins. Waste collection costs have reduced by 86% and public areas are cleaner than ever. The waste collection workers find using the monitoring system to be convenient, and it allows them to provide better service much more efficiently. Everyone wins!”

**Office of Campus Facility Management,
Korea University.**



Problem

- Insufficient public waste bins
- Littering due to overflowing waste bins
- Low recycling rates

Solution

- Installation of 85 Clean Cubes for general waste and recyclables in the city centre
- Real-time monitoring with Clean City Networks (CCN)
- Hourly report to track collection efficiency
- Route optimization for waste collections

Results

- Eliminated overflowing waste bins with 66% reduction in collection frequency
- Significantly less litter and cleaner public areas
- Reduced waste collection costs by 83%
- Increased recycling diversion rate to 46%

Case Study 2: City of Seoul

Improving the cityscape: cleaner streets with reduced costs.

Seoul, South Korea's capital, is the world's second largest metropolitan area by population. As a rising global city, it is home to more than half of South Koreans and 632,000 international residents. International tourists are drawn in large numbers by Seoul's five UNESCO World Heritage Sites, numerous shopping centres and cultural attractions.

The Seoul Metropolitan Government had a problem with frequent waste collection and waste overflow. With not enough public waste bins, and with four to five daily waste collections also proving insufficient, they had a serious problem on their hands. Furthermore, because the waste collection planners did not know how full or how quickly the bins became full, Seoul's waste collection staff had to deal with plastic bottles and paper cups that continuously piled up atop recycling bins.

With the main goal of improving the cityscape by making streets cleaner and reducing waste collection costs, Seoul municipality decided to install 85 Clean Cubes in 2014 for general waste and recyclables in particularly crowded areas of the city centre.

The managers of the Public Cleanliness Department utilized Clean City Networks (CCN) to monitor the status and fill-level of Clean Cubes and observe the collection efficiency throughout Seoul.

Within just three months of using Ecube Labs' solutions, the city was able to see huge improvements in public sanitation. Since installing the Clean Cubes, waste overflow was eliminated and there was a significant reduction of litter on the streets. Through the status and fill-level information provided by CCN, the waste collection team was able to organize efficient collection schedules and collect recycling bins before bottles and cups began piling up on top of the bins.

Our smart waste management solution is contributing to making the city cleaner and more pleasant for both residents and tourists.



“Unlike the traditional way of collecting general waste and recycling materials, the new way of managing our bins using Ecube Labs' monitoring system not only reduced our collection costs by 83% but also eliminated waste overflow as well.”

**Waste Collection Staff,
Seoul Metropolitan Government**

Case Study 3: Shopping Mall/Department Store



Problem

- Bins in high traffic areas becoming full quickly
- Frequent bin emptying during store operations
- Interfering with customers' shopping experiences

Solution

- Installation of 24 Clean Cubes
- 8 Clean Cubes with LED advertisement panels

Results

- Increase in collection efficiency from 4-7 times daily to once a day
- More pleasant shopping experience for customers
- High advertising effect from the LED ad panels
 - 15% increase in customers' participation in storewide events

"Honestly, nobody expected that trash cans could raise customer satisfaction. Thanks to these smart waste bins, our customers can now focus on shopping and enjoy the pleasant department store atmosphere. We wanted to present the least amount of interference

to our customers during the day. As a result of installing over 20 Clean Cubes, we did not have to pick up garbage during the day at all. That was exactly what we were looking for."

Operations Manager, Lotte Department Store

Case Study 3: Shopping Mall/Department Store

Less disruption. More engaged shoppers.

Lotte Department Store is a Korean retail company, one of eight business units of Lotte Shopping. Lotte Department Store offers shopping services and operates cultural centres, galleries, and event halls. There are currently 48 branches nationwide, including 10 branches in Seoul.

In order to maximize the shopping experience of their customers, Lotte wanted to minimize the waste collection frequency during operations. Whether indoors or outdoors, the store's cleaning staff had to visit high traffic areas of their malls and outlets during business hours up to four times on weekdays and seven times on weekends. These frequent waste collections not only meant high operational costs but it also interfered with customers' shopping experiences.

After the installation, Lotte's collection frequency decreased from four to seven times to just once a day. Even though the department store could have experienced even greater benefits, their company policy to empty out all the bins at least once a day limited these benefits. However, Lotte more than achieved their goal, which was to offer a better shopping experience to their customers by collecting waste only once after store hours.

Moreover, Lotte was very satisfied with the fact that the Clean Cube's ad panel feature drew more attention and contributed to the 15% increase in customers' participation in storewide events.



To solve their problem, Lotte installed 24 Clean Cubes in central spots as well as near restrooms of Lotte Department Store locations. 8 of the 24 Clean Cubes were equipped with LED advertising panels to promote various storewide events at the department store.

After a successful pilot period, Lotte plans to make the Clean Cube solution a standard for all of their nationwide locations.