CASE STUDIES

Objective: Remove Garbage Obstructions from Sidewalks

Solutions for Containerized Refuse and Recycling

Compiled By: Shruti Punjabi

Table of Contents

VILLIGER

Company devising optimal solutions for disposal needs, Based in Switzerland

Above Ground Systems

City Line

The classic system

The City Line above ground systems adapt to multi-purpose requirements. A modern design combined with high-class materials and professional manufacturing.

Product Specifications

- Volume: 2.2 – 4.6 m^3
- Modular System
- Emptying Hook: Pilz, 1 Hook, 2 Hook, 3 Hook

Suiteable to collect

- Mixed Waste
- Paper + Cardboard
- Plastic + Plastic Bottles
- Glass
- Aluminium
- Recycables
- Used Kitchen or Motor Oil

Smart Line

For a well-groomed cityscape

The SMART Line family combines a modern and urban design with perfect functionality. It is an all-round intelligent solution with a mature and reliable technology.

The SMART Line system can be operated very easily and extremely comfortably with minimal effort. It persuades with its ideal insertion height and size for an even faster and more convenient disposal of waste.

Product Specifications

- Volume: 2.2 – 4.6 m^3
- Modular System
- Emptying Hooks: Mushroom, 1 Hook, 2 Hook, 3 Hook

Suiteable to collect

- Mixed Waste
- Organic Waste
- Paper + Cardboard
- Plastic + Plastic Bottles
- Glass
- Alumimium
- Recycables

Semi Underground Systems

Cupola

The flexible all-rounder

With our Cupola semi underground container system and its various compatible container sizes, you can optimally respond to the requirements of seasonally varying waste amounts. The high flexibility of the system allows you to change the Big Bags to steel containers or vice versa at any time.

With its rugged construction and timeless design, the Cupola system can be deployed anywhere. Particularly our customers from mountainous and snow-prone areas appreciate the system's durable and straightforward operation. Cupola withstands even the harshest winter conditions and modular container capacity easily handles extreme fluctuations in workload requirements.

Product Specifications

- Volume: 3.0 – 6.0 m^3
- Modular System
- Steel container or Big Bag
- Emptying Hooks:
  Mushroom, 1 Hook, 2 Hook

Suiteable to collect

- Mixed Waste
- Paper + Cardboard
- Plastic + Plastic Bottles
- Glass
- Aluminium
- Recycables

Underground Systems

Sub Vil

An elegant and well-groomed townscape

Sub Vil, our thousand-fold well-tried underground system, offers the option for an environmentally integrated and highly attractive waste management concept where users can dispose waste 24/7. The system forever eliminates the sight of overflowing containers and raucous waste deposits.

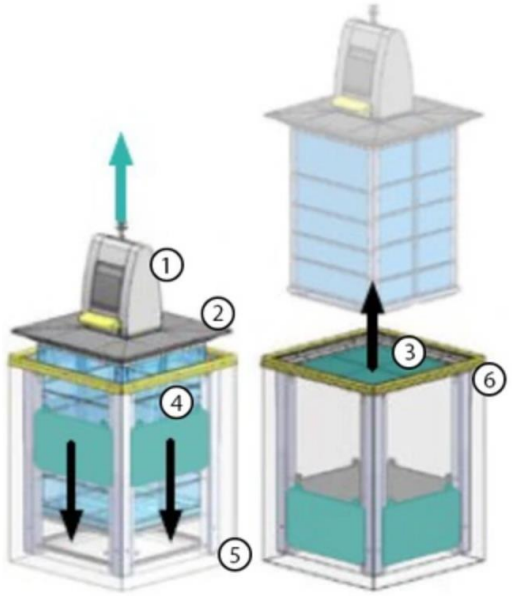
This future-focused underground concept has proven itself in communities and cities throughout Europe. It is best suited to replace traditional waste collection practices and locations – particularly because it enables centralized collection points, emptying intervals and associated costs can be substantially reduced.

Product Specifications

- Volume: 3.0 – 6.5 m^3
- Modular System
- Throw-in column: different models available
- Emptying Hooks : Mushroom, 1 Hook, 2 Hook, 3 Hook (Please contact us for further systems)

Suitable to collect

- Mixed Waste
- Paper + Cardboard
- Plastic + Plastic Bottles
- Glass
- Aluminium
- Recycables



Product Description

1. Throw-in Column
2. Walkway Platform
3. Safety Platform with Counter Weights
4. Steel Container
5. Concrete Element
6. Drainage Frame

Please Watch: https://mashable.com/2017/02/15/villiger-underground-waste-disposal-system/

Paris Trilib (Meaning – To Sort)

Shared surface container on curb

Trilib' waste streams are collected by several different entities including the nonprofit Carton Plein who collect salvaged boxes by cargo bike and sell them for reuse

Paris Trilib (Meaning – To Sort)

Shared surface container on curb

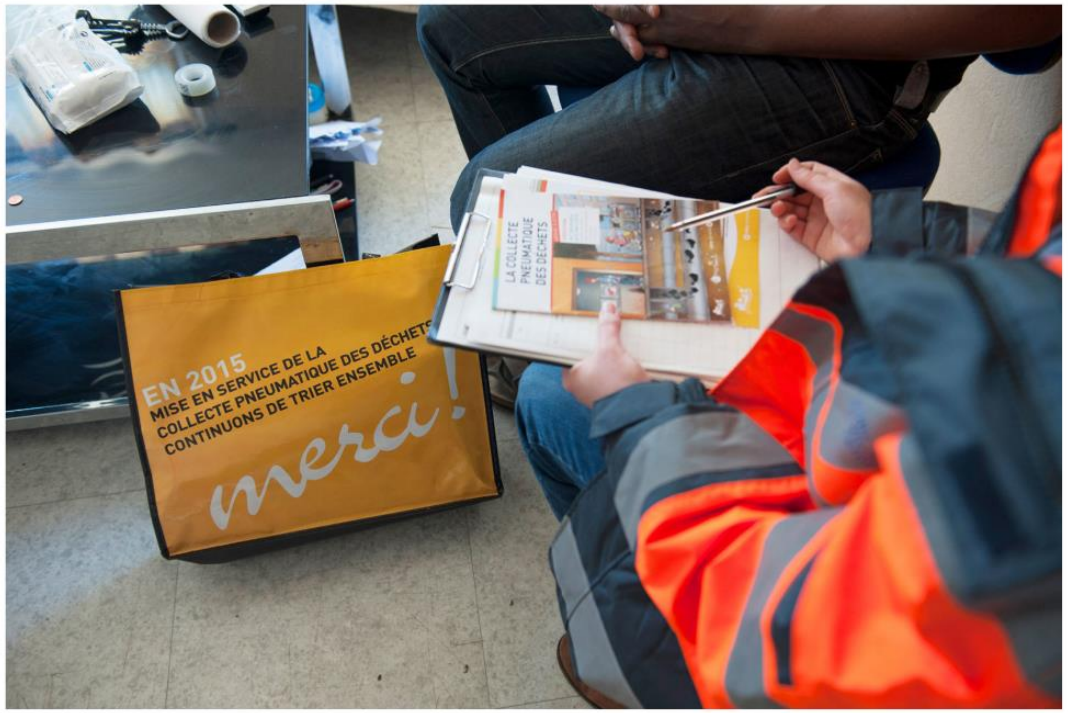
- The kiosks have foot pedal–operated openings on the sidewalk side and a street-facing door from which sanitation crews remove a wheeled container. Trilib' kiosks include four to six modules providing access to up to five streams: metal and plastic packaging, paper and small cardboard, glass, textiles and large cardboard, each color-coded with its own type of opening. The number and type of containers varies depending on waste generation characteristics in the immediate area.

- **For NYC, Specially designed surface containers could be installed in public plazas or parking spaces to expand access to recycling in NYC neighborhoods where there is not adequate space for waste storage. Reconceiving bins as public amenities akin to bike-sharing equipment, as Paris has done, could be helpful in siting drop-off stations for a range of materials.**

- https://www.citeo.com/le-mag/531/

Vitry-sur-Seine, France

Provide a system of pneumatic tubes to connect buildings to a central terminal
Population of City – 90,000



View inside pneumatic terminal, containers are loaded several stories below grade and lifted up to a loading dock with a bridge crane; City staff making home visits to explain how the new system works

Vitry-sur-Seine, France

Provide a system of pneumatic tubes to connect buildings to a central terminal
Population of City – 90,000

- The first-phase of the system, which will serve an eventual 10,000 apartments, began operation in 2015 and now serves 1,200 apartments, small businesses and a school.30 Most of the 60 input points activated so far are adjacent to building entrances. (Residential inlets are located outside buildings but on private property, to encourage residents and building managers to take ownership of the inlets and reduce maintenance issues.) Vitry's system currently collects two streams— mixed recycling and refuse—but was designed to allow for a potential third stream: organics.
- The terminal sits on narrow parcel between two streets. In order to have enough room for trucks to load inside the small facility, containers are filled underground and raised with a crane bridge to a single street-level loading dock. Large picture windows allow passersby to see into the facility, with the tubes and turbines of its otherwise invisible network.
- **For NYC, New York City could take advantage of large-scale urban renewal and transit projects to install infrastructure that would reduce the impacts of truck collection. Surveys will be critical for any project taking place below city streets.**

Residents depositing household waste in an inlet on the sidewalk

The Hague, Netherlands

Submerged container

Truck removing container

The Hague, Netherlands

Submerged container

- In 2009, The Hague decided to address the issue by replacing bags on the curb with shared containers submerged under the sidewalk. Although the city anticipated some operational efficiencies, its primary objectives in selecting a submerged container system were to improve public and health and hygiene, enhance public space aesthetics and provide an opportunity for residents dispose of refuse 24/7 instead of having to store the material in their small apartments until pickup day.

- The containers are designed to be within convenient walking distance (250 feet [75 meters]) of a residential building's front door. (If necessary, the containers may be installed at distances up to 410 feet [125 meters].) Each 6.5 cu yd container serves an average of 35-38 households. They are emptied twice weekly and are cleaned, inside and out, twice a year. Equipment is checked once a year.

- Agencies Involved: Container location plans are made in collaboration with the municipal committee for public space (an entity composed of key street infrastructure stakeholders, which coordinates short-, medium- and long-term planning), the departments of transportation and environmental services.

The Hague, Netherlands

Submerged container

- The primary operational change for collection personnel is that truck crews are reduced from three to one, and some training is needed to provide the skills needed to manage the equipment. The shift to submerged containers has led to improved working conditions and reduced labor costs. A shift from fixed routes to a flexible “smart schedule” based on sensors will be implemented next.

- **For NYC, New York City is similar to The Hague in that it is a dense city with infrastructure and utility systems running under its streets. The Hague’s implementation process, involving coordination among key street infrastructure agencies, with test pits to check field conditions, would be appropriate in NYC as well. DSNY’s existing Adopt-a-Basket program could be expanded to include training volunteers to be first responders who could resolve minor maintenance issues with their “adopted” submerged containers.**

Songdo, South Korea

(Left) The door in the staircase opening onto a pipe, which transports household garbage directly into the the waste disposal plant. (Right) Automated waste disposal bins in front of a row of apartments.

Songdo, South Korea

Songdo is connected by an underground system of pipes. Garbage is sucked directly from people's apartments into the "Third Zone Automated Waste Collection Plant," where it is automatically processed. (Ross Arbes)

Songdo, South Korea

- Songdo employs an innovative waste disposal system. Every flat in the city has a pneumatic trash pipe. Once residents of Songdo throw their domestic trash in the pipe, it will be supplied to a central waste processing center by the underground system and recycled there without having any trucks going around to collect trash. There are also waste containers on the streets to transport the garbage to the waste disposal plant. Such a system reduces city traffic and thus automobile emissions and makes the city cleaner. Among the first of its kind in the world, the system currently requires just seven employees for the entire city.

Domestic Case Studies

Please see: https://www.zerowastedesign.org/03-collection-and-urban-design/c-collection-urban-design-case-studies/

M-CB4 CASE – Trash Off Sidewalk Space Program

Source: https://www.scribd.com/document/412334267/Chekpeds-Sanitation-Rfei - CHECKPEDS

Characteristics

- Using Public Right-of-ways which is currently used for private vehicle parking
- Defining spaces on both sides of the streets for waste storage based on the size of the street
- Location of waste storage sites will be adjusted based on fire hydrants, tree pits, bus stops etc.
- Each waste storage site will be equivalent to the size of a typical parking unit (8 ft x20 ft)
- To calculate the number of storage sites required on different streets inside M-CB4, survey the number of trash bags generally disposed in a week.
- Accounting for future needs, based on redevelopment, more parking spaces could be acquired

Demarcations

1. Cross hatching the area with paint

2. Installing parking blocks to protect the space from adjacent parked vehicles

3. Chain link fencing

Installation

On the parking lane of the roadway, not on the side walk. Gap between enclosure and curb to allow for storm water drainage. Street cleaners tasks wouldn't be affected. Snow cleaners tasks wouldn't be affected as parking lane is not plowed.

Phase 1: Disposal of Bags in the demarcated area in the right-of-way.

Phase 2: DSNY should install enclosed containers for Recyclables and Regular Waste

Phase 3: Convert sites into repositories for all kinds of wastes

M-CB4 CASE – Trash Off Sidewalk Space Program

Source: https://www.scribd.com/document/412334267/Chekpeds-Sanitation-Rfei - CHECKPEDS

Capacity of each waste storage site (Each storage site is equal to one parking space)

85 bags (Each black plastic bag – 24’ x 24’ x 16’ stacked 3 bags high)

Efficiency

Currently, the waste takes up to 300 linear feet on each side with a 2.5 feet width. This totals to 750 feet each side to 1500 ft. total. With this intervention, it would be 840 square feet per block, saving 44% of the space.

Reduced pick up time overall leading to reduction in number of pick up trucks.

Operations and Maintenance

Waste storage sites located no more than 100 ft away from any building. Need to hire an inexpensive cleaning service to keep the waste storage sites clean. Modified street cleaning services by DSNY to keep waste storage sites clean. Using supplemental sanitation services to keep the sites clean and bring any stray bags from the sidewalks. This should be used as a short term transition to educate the residents and building superintendents. Installation of anti –rodent devices in the storage site. Signages to prevent illegal dumping.

https://www.brownstoner.com/interiors-renovation/outdoor-garbage-bins-brooklyn-urban-gardening-ideas-enclosures-disguise/

Note* All these prototypes can be enlarged to any size of trash storage units on streets