

Company deck

Data-driven waste management

((SENSONEO))

About us



Insured for Cybersecurity (10M €),
Public Liability, and Professional Indemnity
by renowned insurance providers



Professionally audited by
Deloitte.

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90+ countries

600+ projects

160+ professionals in the team

50+ certified partners

55k+ users of the software

2014

First prototype of sensor and software solution developed

2015

Start-up Awards finalist

2016

2017

Sensoneo was founded

2018

First large international smart waste deployment of sensors in Prague

2019

First commercial Narrowband IoT deployment in the United States

2020

Innovation World Cup Series Winner

EIC Accelerator Grant from the European Innovation Council

2021

First commercial Narrowband IoT deployment in MENA Region (KSA)

2022

Reached the mark of 500+ projects in 80+ countries

1.000.000.000+ beverage containers processed through our DRS systems

More than 600.000 digitalized bins and 22.000 sensors deployed

2023

Revenues surpassed 4 mil. EUR

Series A Investment of 6.3 million

100+ employees

DRS IT System powered by Sensoneo in 7 countries

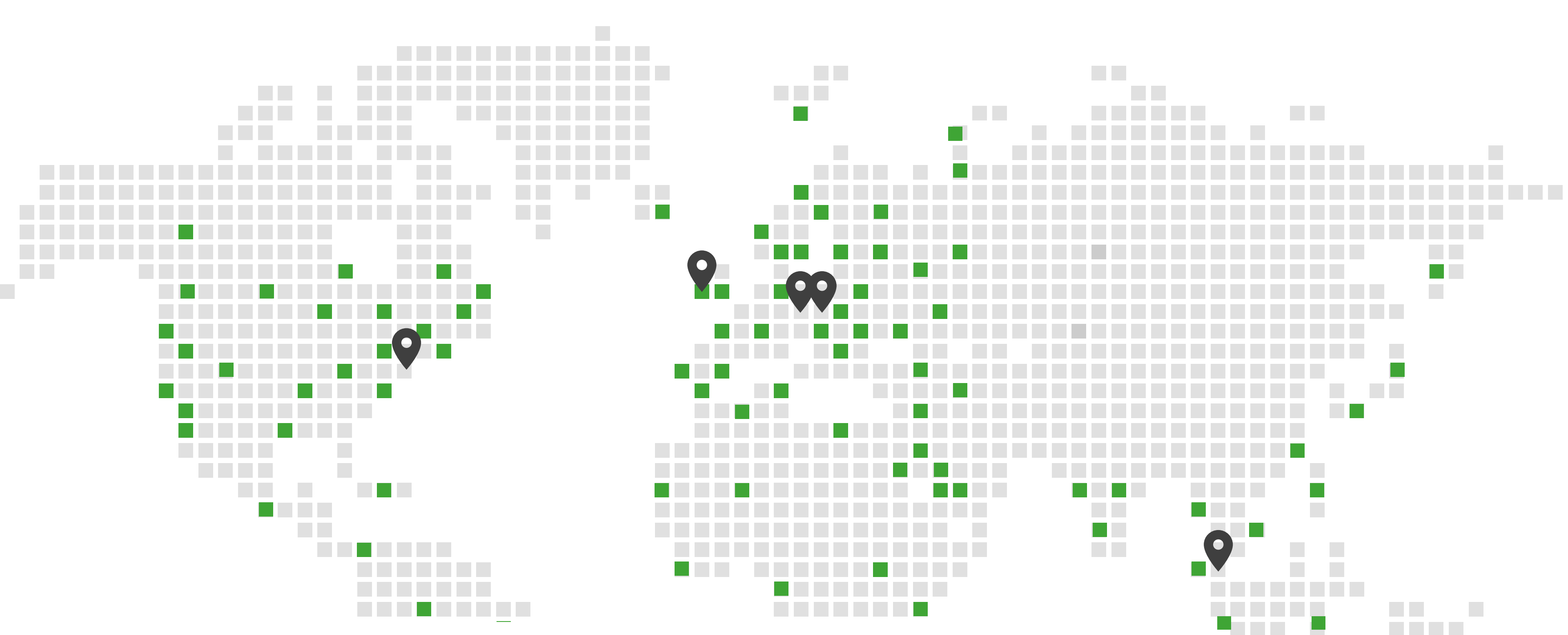
2024

Revenues surpassed 8 mil. EUR

New subsidiaries in USA and Czechia

10 years since the first sensor installation

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Our offices

USA, North America

Delaware
651 N Broad St.
Suite #206
Middletown 197 09
United States

Singapore, Asia

68 Circular Road
#02-01, 0494 22
Singapore

Czechia, Europe

Purkyňova 649/127
612 00 Brno
Czechia

Slovakia, Europe

Stare Grunty 12
841 04 Bratislava
Slovakia

Dublin, Ireland

Smart DRS Limited
70 Sir John Rogerson's Quay
Dublin 2, Ireland

Providing solutions to universal challenges

Municipal Waste Collection (Collection of waste produced by citizens and businesses)

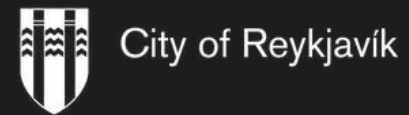
Deposit Return Schemes (Nationwide collection of deposited packagings paid by vendors)

Industrial Waste Collection (Collection of waste produced in factories)

Extended Producer Responsibility (Collection of used products paid by vendors)

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Trusted by



Waste Collection

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Problems

Inefficient collection of empty or half-empty bins



Delayed collection and overflowing bins



Absence of real-time data, making waste collection scheduling a challenge



Poor quality of service and no chance of verification or supervision



Critical situations with bin infrastructure like fire, vandalism, theft and robberies



Increasing operational costs



Outdated Route Planning



Difficulty in compiling accurate reports and meeting sustainability goals



Our solution

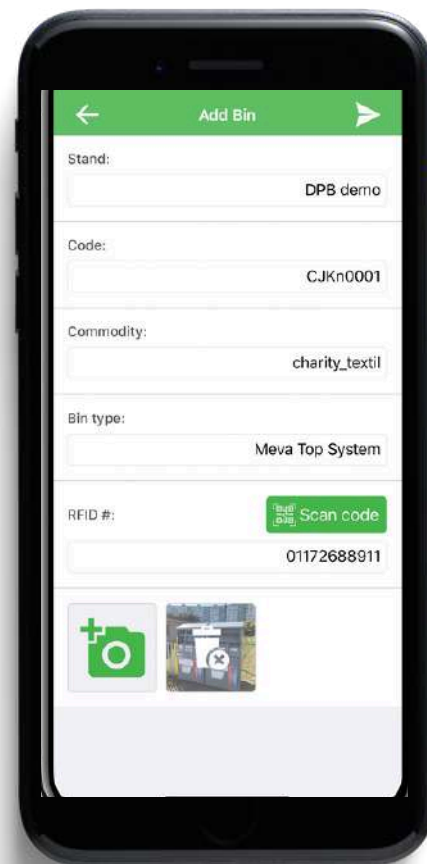
Waste Asset Digitalization

- Identify and record all assets in a digital inventory
- Maintenance and collection records
- Simplify billing & customer communication
- Prevent frauds
- Overview of citizen feedback

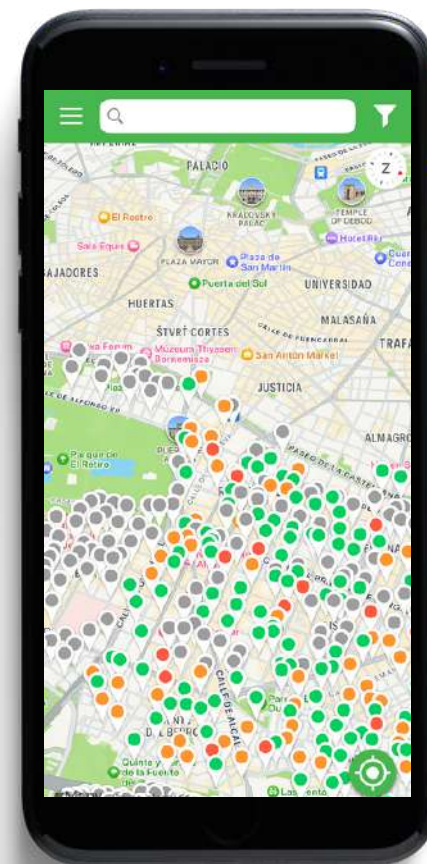
RFID tags or stickers with QR / bar / numerical code for bins and trash bags



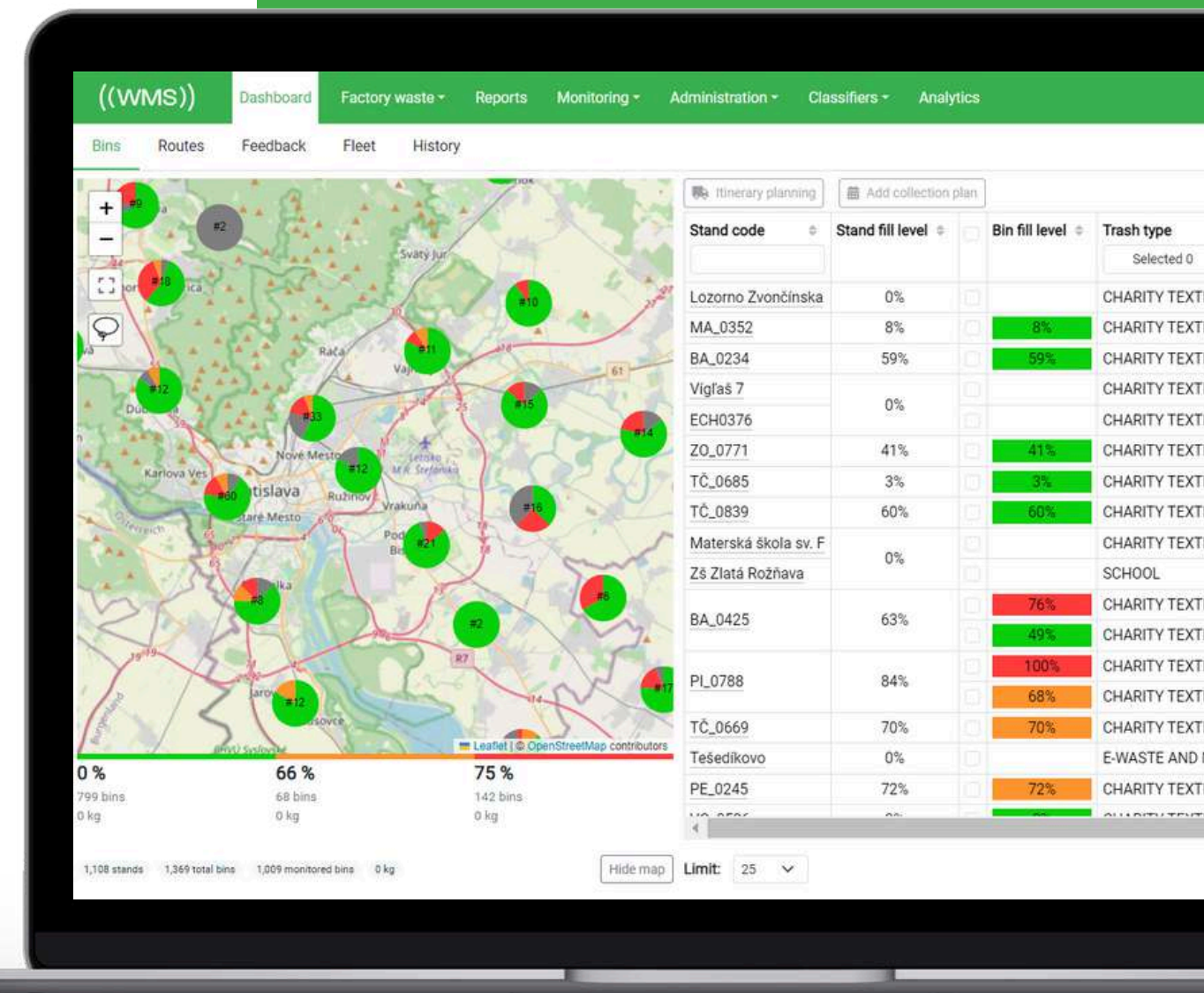
Passportization App



Citizen App



Asset Management Module in
Waste Management System (WMS)



Success story from European capital

Digitalisation of bins

1,753

fill level sensors

85,000

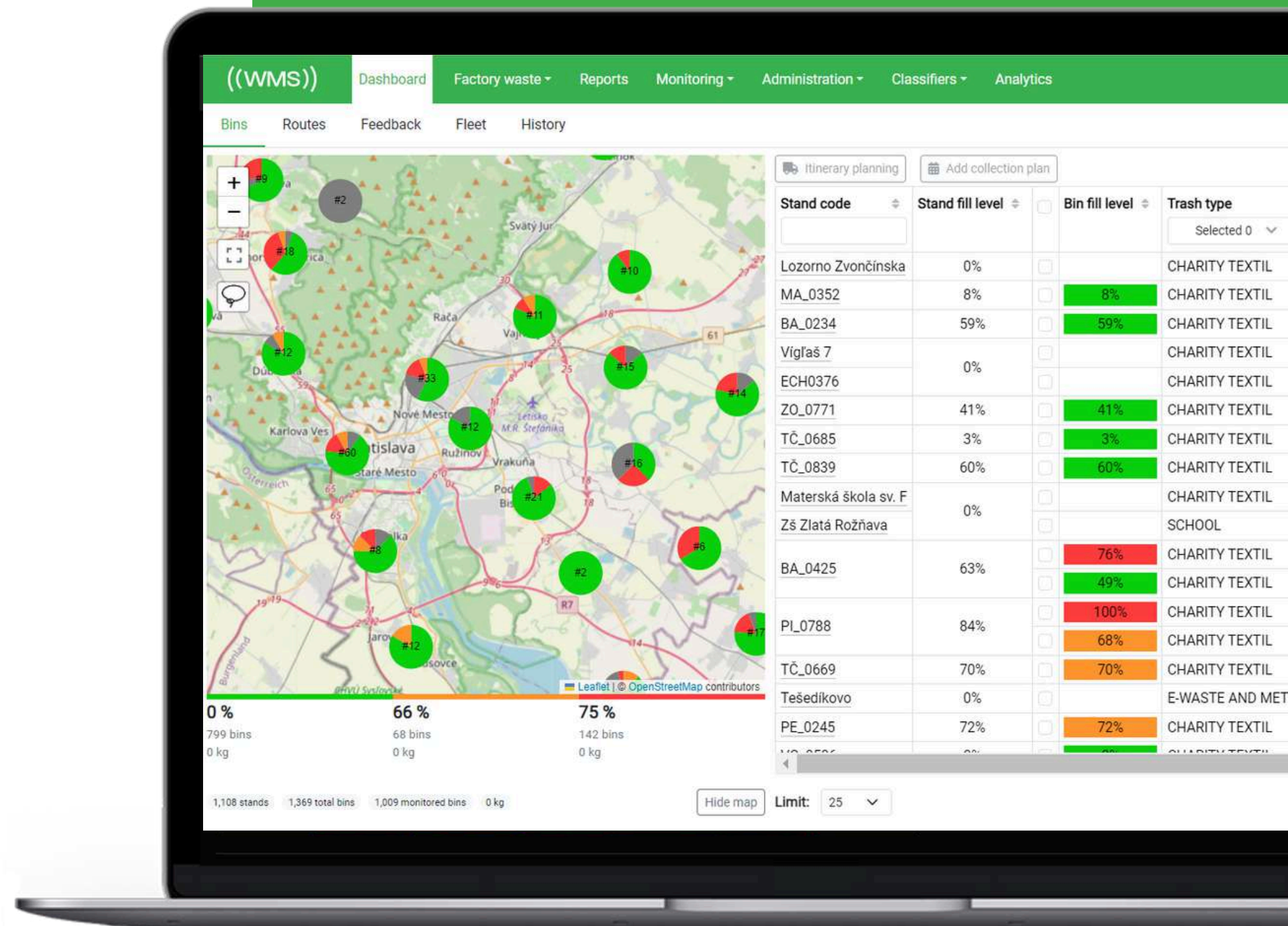
bin tags



Software solution

Waste Management System (WMS)

- Detailed bin inventory
- Digital interactive map
- Sensor configuration
- Live data from sensors
- Future predictions on fill levels
- Citizen feedback
- Different notifications - full bin, fire and tilt alerts
- Itinerary planning for waste collection



Hardware solution

Ultrasonic sensor

- Measure any type of waste in bins of various types and sizes
- Frequency adjustable according to preferences
- Robust design made in the EU: water-, shock- and temperature-resistant
- Replaceable batteries with lifespan of approximately 5 years
- Connectivity via various IoT networks
- Various mounting options
- Wireless configuration



Hardware solution

Radar sensor

- Measurement of fill levels through the plastic walls, screens, and borders
- Non-invasive measurements of dangerous waste
- Measurement with offset
- Completely closable and waterproof casing
- FOTA functionality (Firmware Over the Air)
- GPS functionality powered by GNSS





Single sensor 3.0

- Measuring range:
3cm - 255cm
- Connectivity:
LoRaWAN / Sigfox / NB-IoT
- Replaceable batteries
- IP69 casing
- IK10 rating: protection
against external
mechanical impacts



Single sensor 5.0

- Measuring range:
3cm - 12m
- Connectivity:
NB-IoT / CAT-M1
- Replaceable batteries
- IP69 casing
- IK10 rating: protection against external
mechanical impacts
- GPS functionality powered by GNSS
- FOTA (firmware over the air) available for NB-
IoT and CAT-M1 network and via BLE for all IoT
networks to remotely adjust the functionalities



Radar sensor 1.0

- Measuring range:
15cm - 320cm
- Connectivity:
NB-IoT / CAT-M1
- Replaceable batteries
- IP69 casing
- GPS functionality powered by
GNSS
- FOTA (firmware over the air)
available for NB-IoT and CAT-M1
network and via BLE for all IoT
networks to remotely adjust the
functionalities



(Semi-)
underground bins



Street bins



Manholes, wells,
septic tanks



Glass bins with hydraulic
arm collection



1100 liter bins for plastic,
paper, or general waste



Used oil bins,
kerosene tanks



Best features of our sensors

Competitive advantage

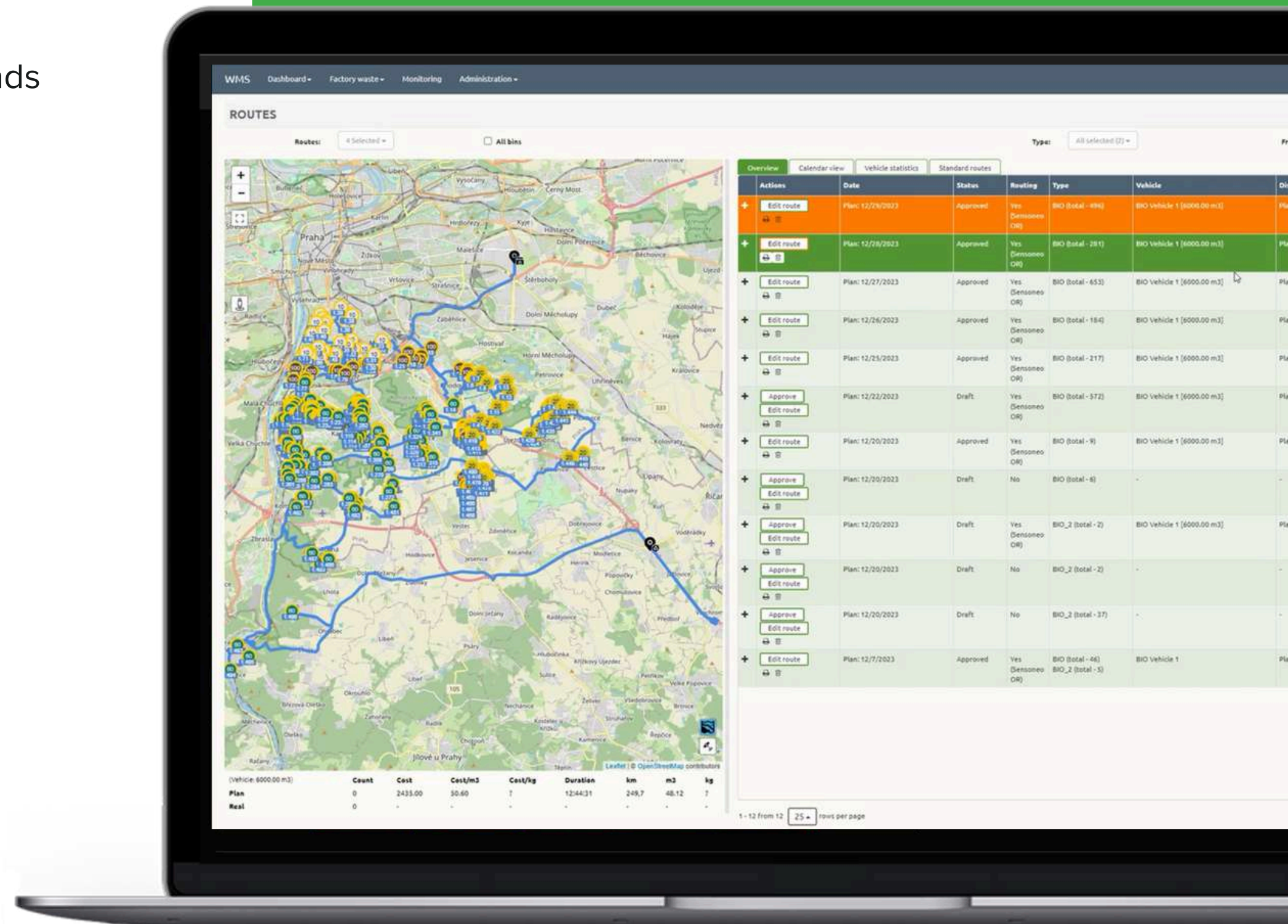


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Software solution

Route Planning

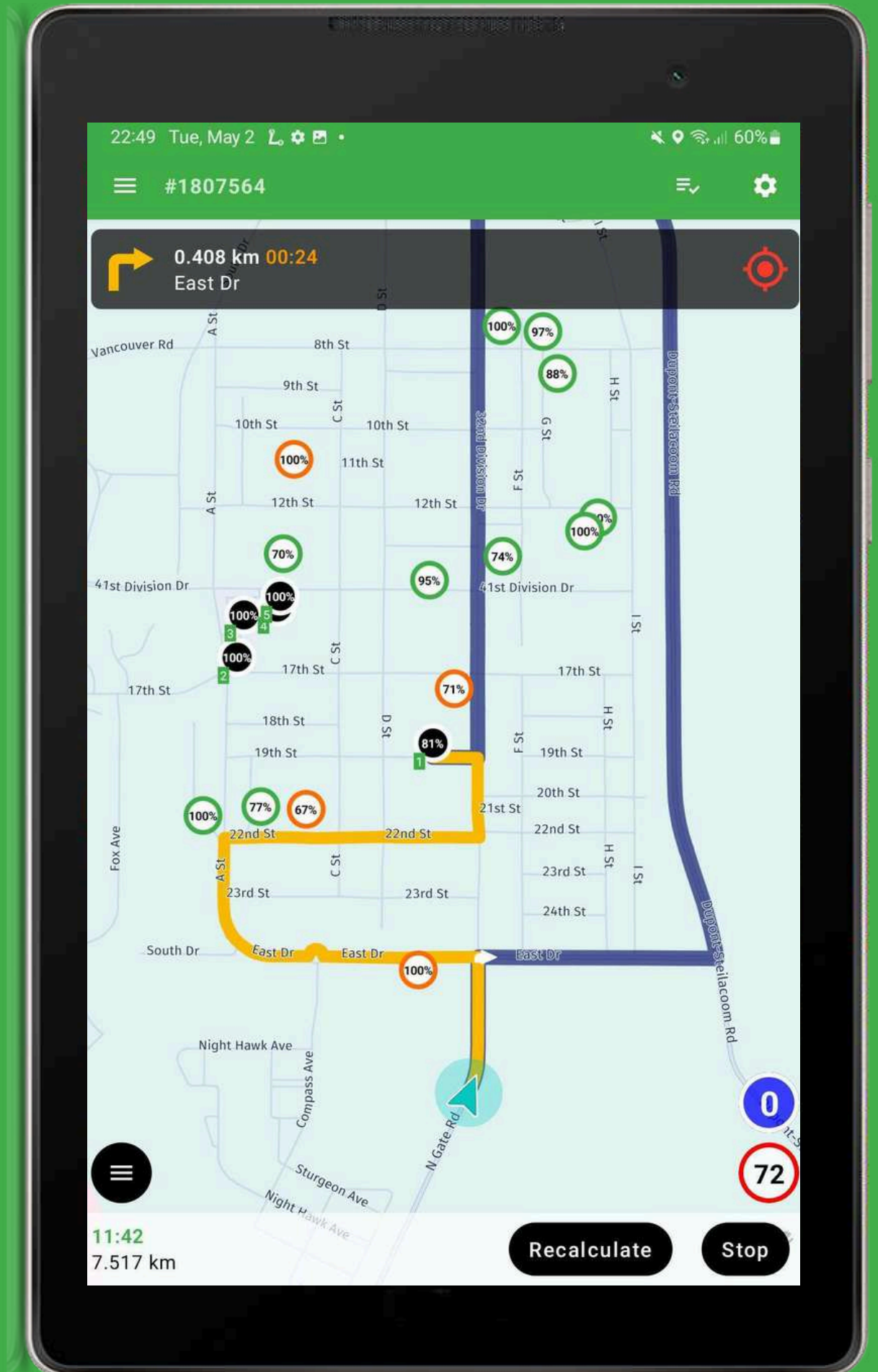
- Automation of the management of waste collection routes, optimization of collection routes, frequencies, and vehicle loads
- Fewer kilometers are driven per kilogram of collected waste
- Full utilization of vehicle capacity, availability and resources (fleet, FTEs, time) reducing the costs
- Able to process data from over 100K bins and hundreds of vehicles and provide optimal collection routes in seconds
- Help minimize the negative impacts of waste collection in the city with fewer emissions and less traffic congestion

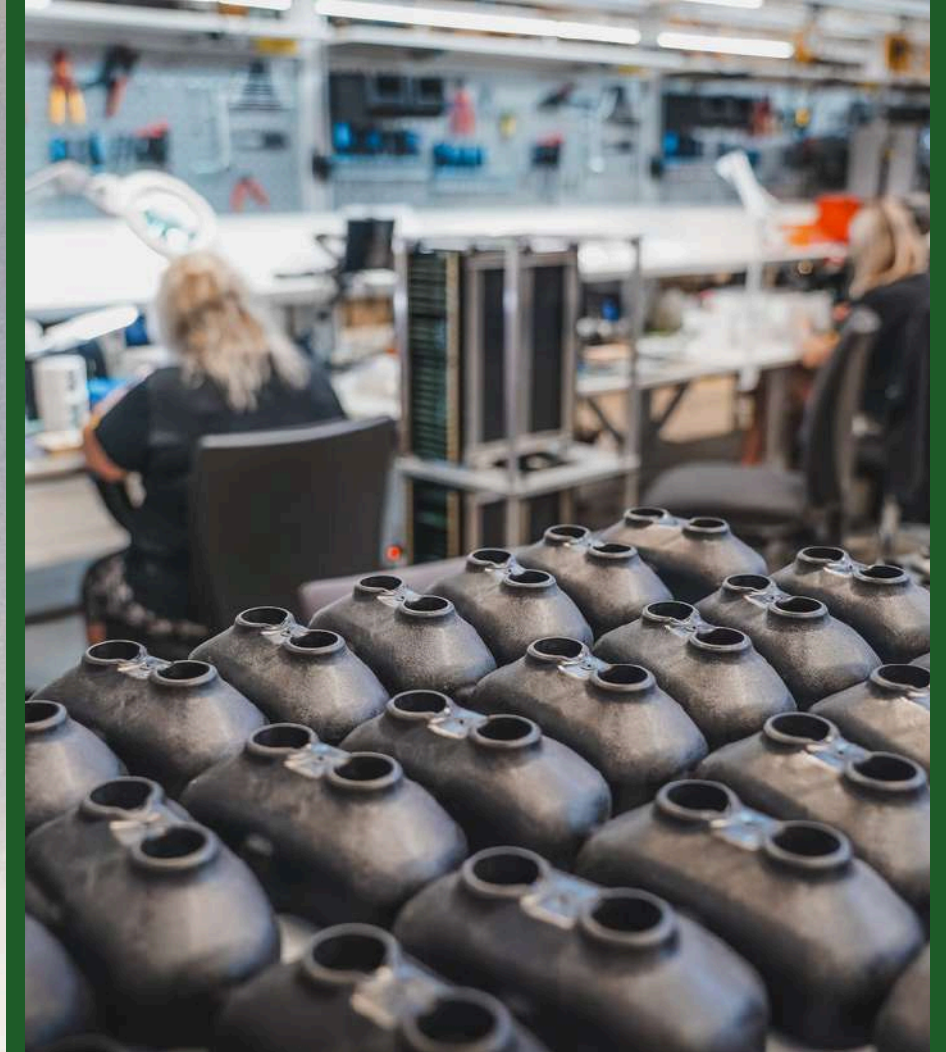


Software solution

Driver Navigation App

- Designed for the specific needs of waste collection vehicles
- Provides turn-by-turn voice-guided navigation via the shortest, completely safe, and most accessible route
- Able to easily cope even with the demanding environment of narrow streets in historical city centers





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Benefits

Dynamic waste collection, no unnecessary routing

Collection of only full bins and containers, saving resources on bins in remote locations

Reducing CO2 emissions, relieving traffic congestion and engaging citizens

Clean streets, no overflowing bins and mess

Best possible service for the money invested in the waste collection

Real overview on waste production thanks to comprehensive data

Rightsizing of frequencies, capacities or locations

Supervision over the efficiency of the collection

1000+ sensors projects worldwide

Large-scale deployments



Municipality - City of Prague | 3627 sensors

Results

45%

average fill level in 2019

43%

time of fleet capacity use in 2019

73%

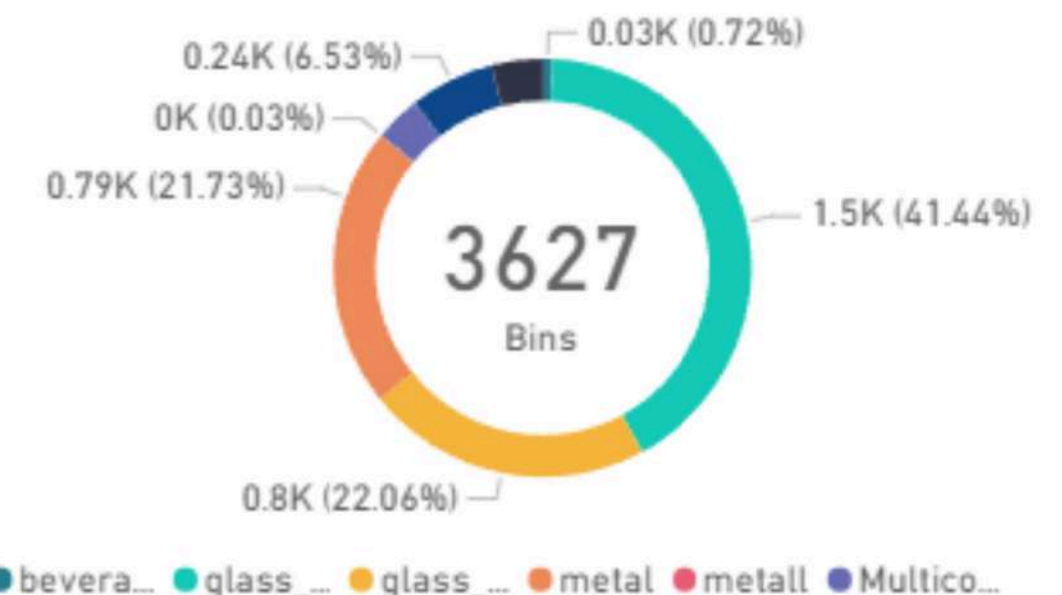
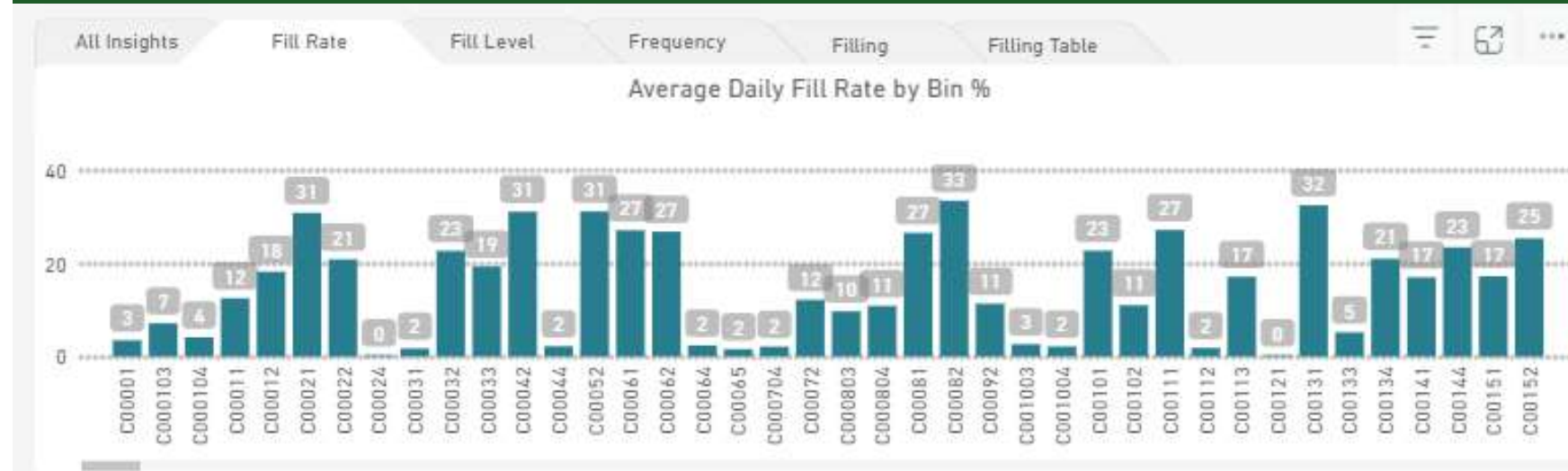
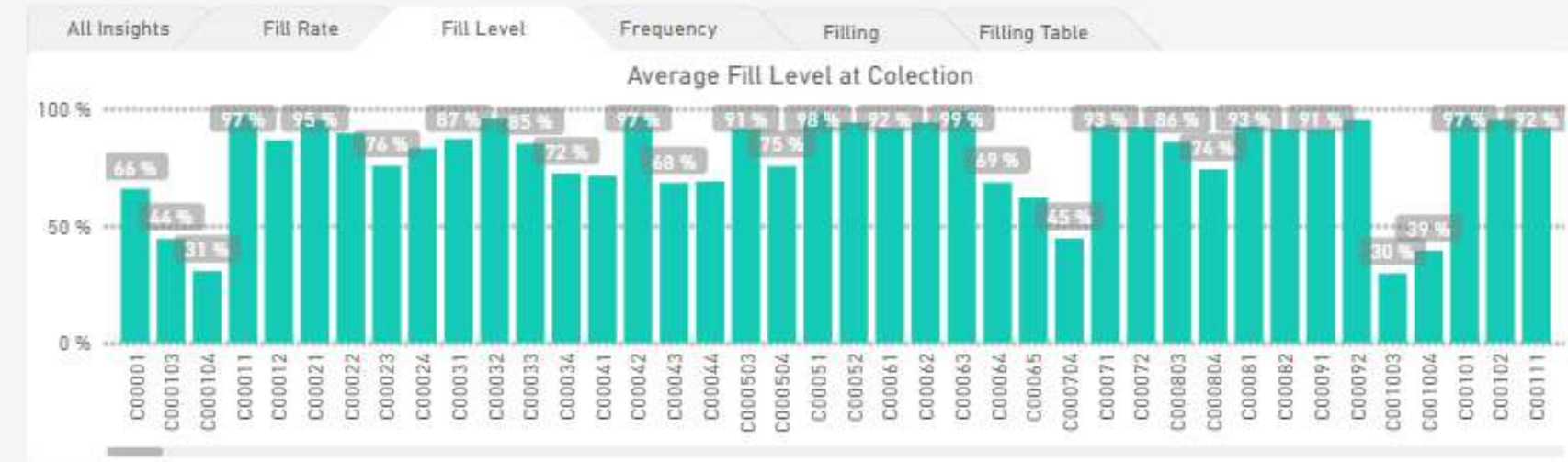
average fill level in 2024

24%

cost savings

\$156

estimated annual savings per 1 sensor



US University pilot program | 8 weeks

Results

Before

18%

of collections were missed

62%

average fill level at the time of collection

After

\$266

estimated ROI per container per month

\$89,519

yearly potential hauling savings on 28 bins



Textile waste collection company

Results

-22%

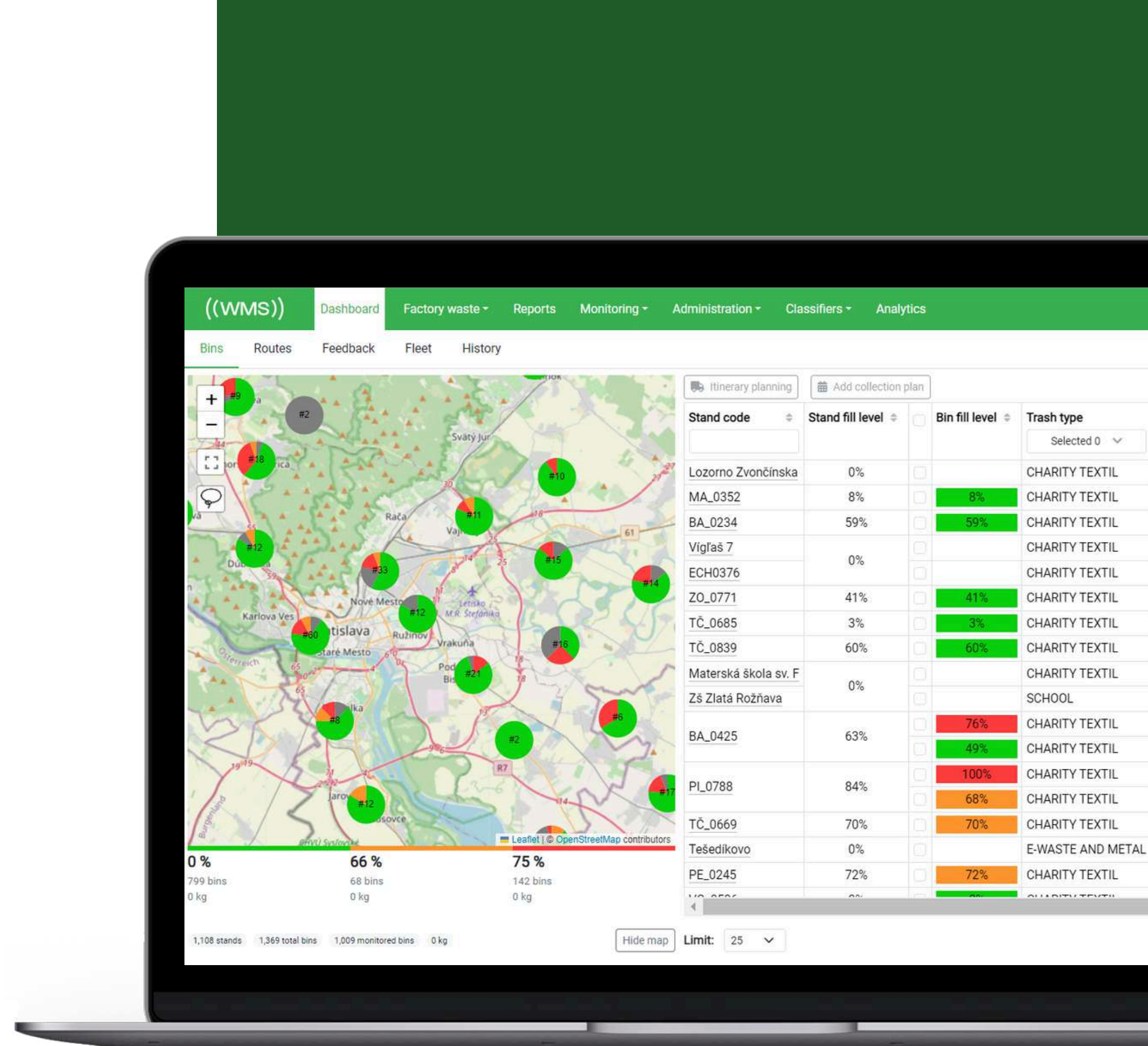
savings on waste collection cost

-29%

of time required for the collection of 1 tonne

7 months

ROI



Problems

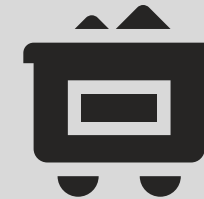
Trash tourism



Non-payers still using the waste disposal infrastructure



Insufficient space in bins for paying residents due to unauthorized access



No usage data with traditional physical locks



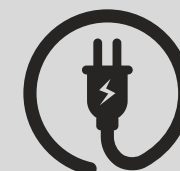
No fairness in the payment system in the apartment or housing units



Littered and dirty public spaces



Need for electricity to lock the bins or other objects



Frauds with misusing of physical access keys



Hardware solution

Smart lock

- No electricity required, powered by easily replaceable batteries
- Solution does not alter the aesthetics of waste bins or their surroundings
- Compatible with large variety of bin or other objects (mounting kit provided)
- Straightforward and quick installation
- Possibility of retrofitting into existing bins





BAM 4.0

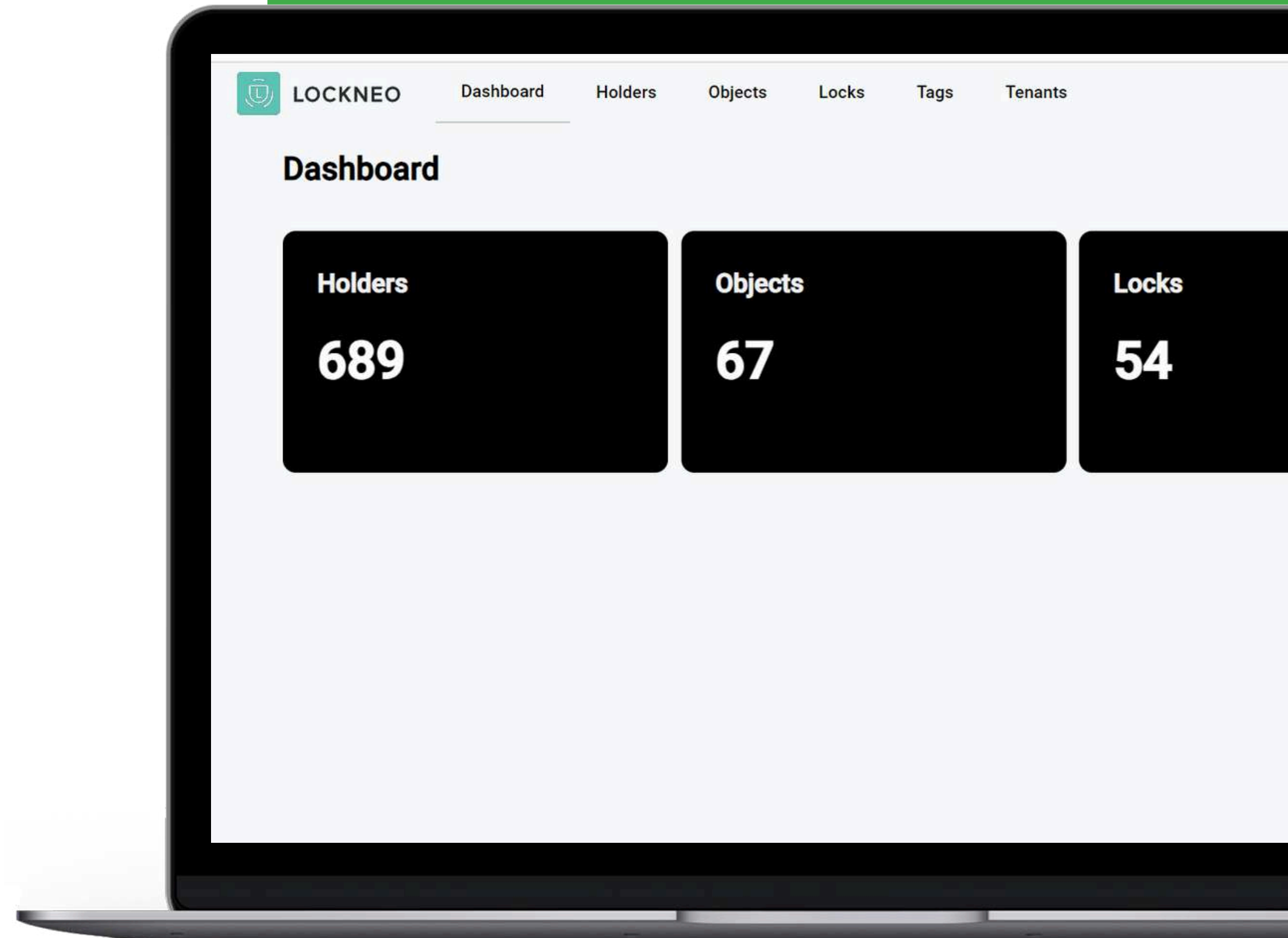
- Capability to be extended with external devices
- Ability to be paired with Sensoneo's ultrasonic fill-level sensors with no battery requirement
- Enabling bins to be locked automatically once they reach a predefined capacity
- Extremely beneficial from both a technological and financial perspective



Software solution

Lockneo portal

- Easy remote management of access rights
- Immediate insights into usage data, enabling precise monitoring of who accesses the bins and when (facilitating the introduction of PAYT system)
- Simplified process for both managers and users of the service - administrators can assign access keys to users with the RFID reader
- Users may also be able to access the platform and report or even deactivate the lost key





bit.ly/videoBAM

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Benefits

Remote bin access management

Restriction of access for non-payers

Prevention of unauthorized access

Comprehensive usage data

Input for Pay-as-you-throw Systems

Various access options (tags, cards, phone etc.)

Versatile use for different bins and objects

Easy and intuitive use and setup

Facilities & Factories

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An aerial photograph of a large industrial complex. The facility consists of several long, rectangular buildings with bright blue roofs and light-colored walls. The buildings are arranged in a grid-like pattern. In the foreground and middle ground, there is a paved area with various materials and equipment. There are stacks of dark-colored materials, possibly tires or mats, and large stacks of yellowish-brown material, possibly wood or paper. There are also some trucks and other vehicles parked in the area. The background shows a hazy landscape with some distant buildings and a clear sky.

Most factories and facilities struggle with the same

Problems

Delayed collection of overflowing bins disrupts your optimized logistics flow

Unnecessary collection of half-empty bins disrupts your logistics line workforce

Unnecessary routes are wasting your resources and increasing danger to safety

Lack of data about the volume of the waste produced at each logistic step

Contamination tracking in order to increase your sustainability goals

Poor quality of service and no chance of verification or supervision of collection



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1

2

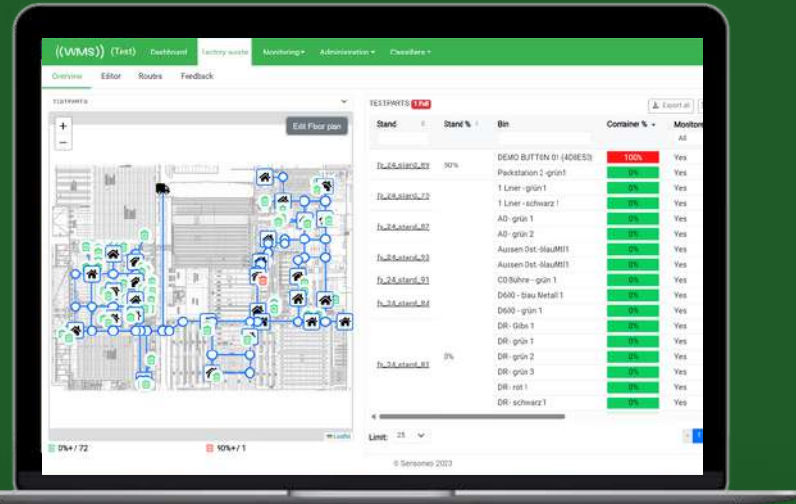
3

4

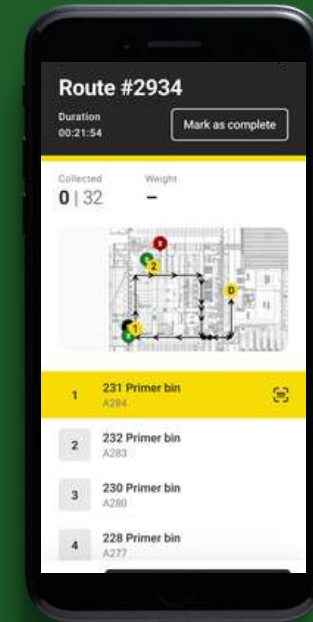
5



Collection Request /
Fullness Notification



Software Platform
with Automated
Route Planning



Mobile App with
Just-in-time Collection
& Navigation on the
Floorplan



Weighing and
Contamination
Control



Data Reporting
& Business
Intelligence

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Factory Waste Management



bit.ly/videoFWM

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Key functionalities of our solution

Benefits

Automation of waste collection



Increased efficiency of waste collection (lower expenses)



Increased quality of ESG Reporting



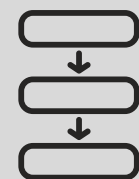
Collector supervision (internal and external)



Waste infrastructure overview (floorplan bins, stands, vehicles)



Waste flow registration and tracking of the whole collection process



Minimization of waste contamination, Improved circularity of the location & clean working area



Higher availability of bins



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Our FWM projects



First deployment
in Q1 2024 in
Scotland



10 Manufacturing
sites in Germany



Manufacturing sites
in Switzerland



Pilot project
in Czechia

Fulfillment center in UK pilot | 12 weeks

Results

42%

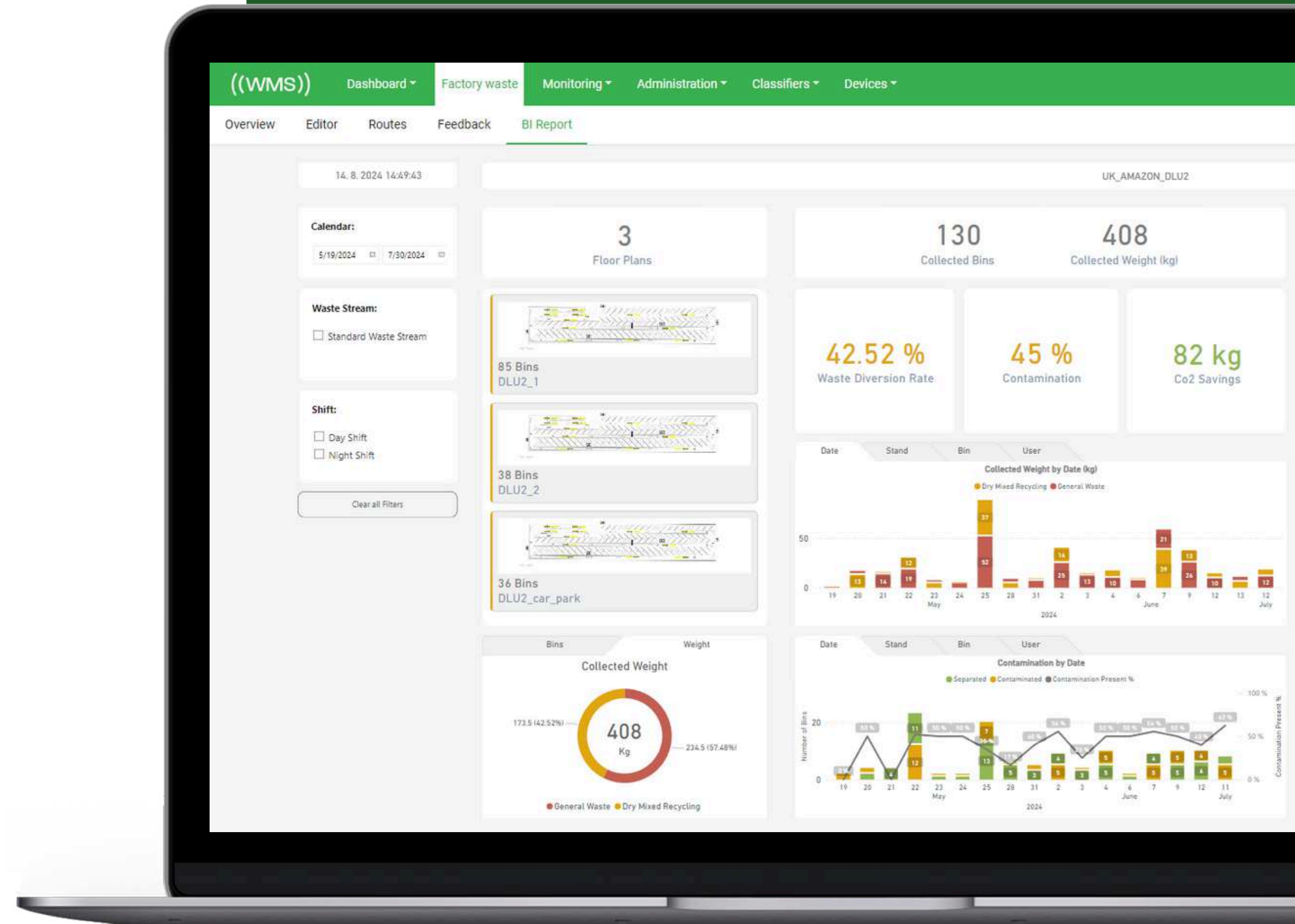
cost savings on personnel expenditures

7 to 4 FTEs

workforce diversion opportunity when implementing the system

£20,400,000

potential cost savings opportunity across all 200 locations after 2 years of implementation



Circular economy

A hand is shown holding a green plastic bottle in front of a washing machine door. The bottle is positioned as if it is about to be placed inside or has just been removed. The background is a dark, slightly blurred interior of a washing machine, with a window or door visible in the distance. The overall scene suggests a process of recycling or reusing plastic bottles.

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Our solution

Take-Back System (TBS)

- Tailor-made solution for the specific requirements of large-scale and nationwide take-back systems
- Developed to digitize, optimize, and automate daily operations
- Achieve control over financial streams
- Attain complete transparency in waste streams
- Minimize existing workloads for employees
- Obtain reliable data on collection for automated reporting

ISA v. 1.1.9.2

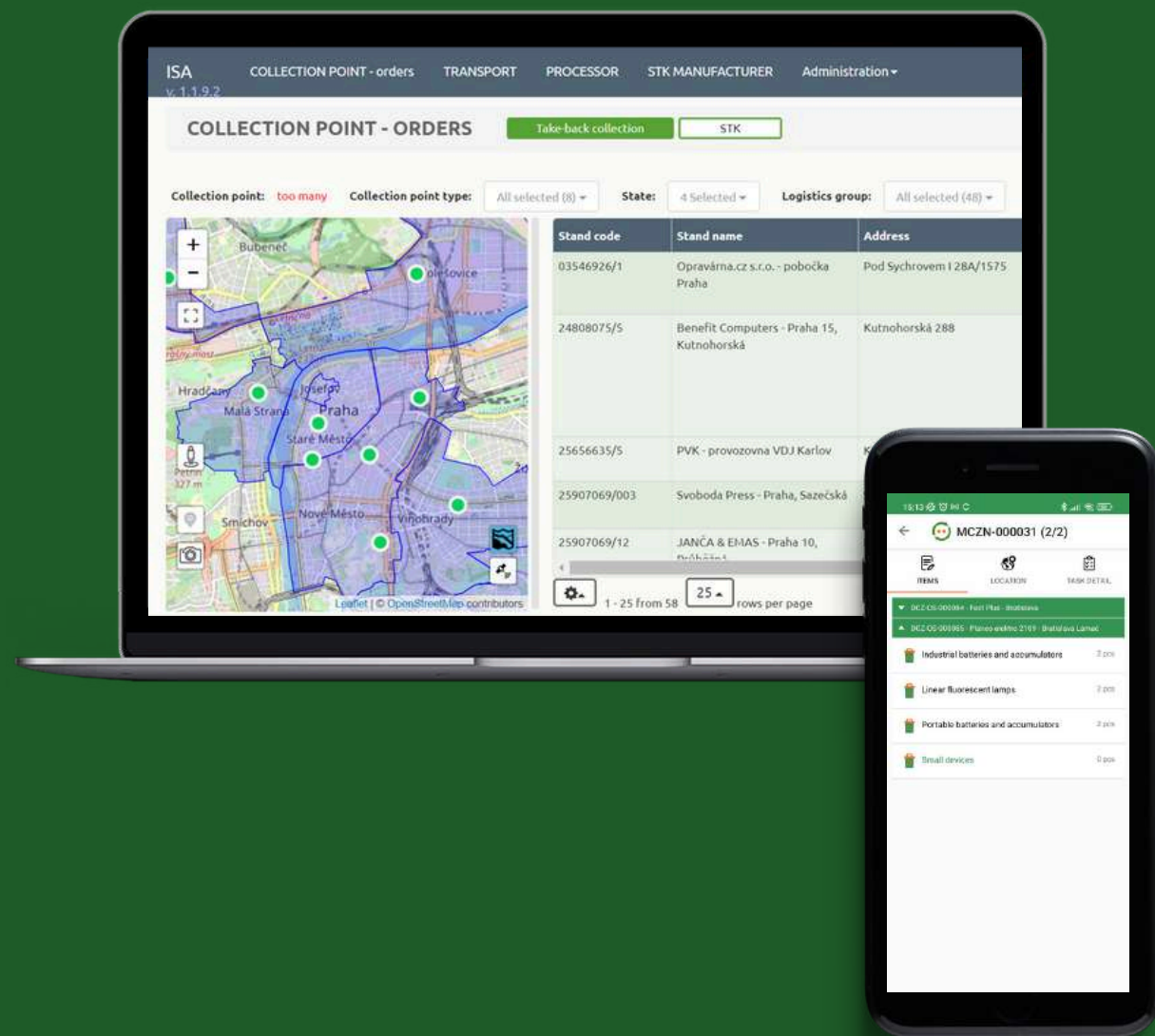
COLLECTION POINT - orders TRANSPORT PROCESSOR STK MANUFACTURER Administration

COLLECTION POINT - ORDERS Take-back collection STK

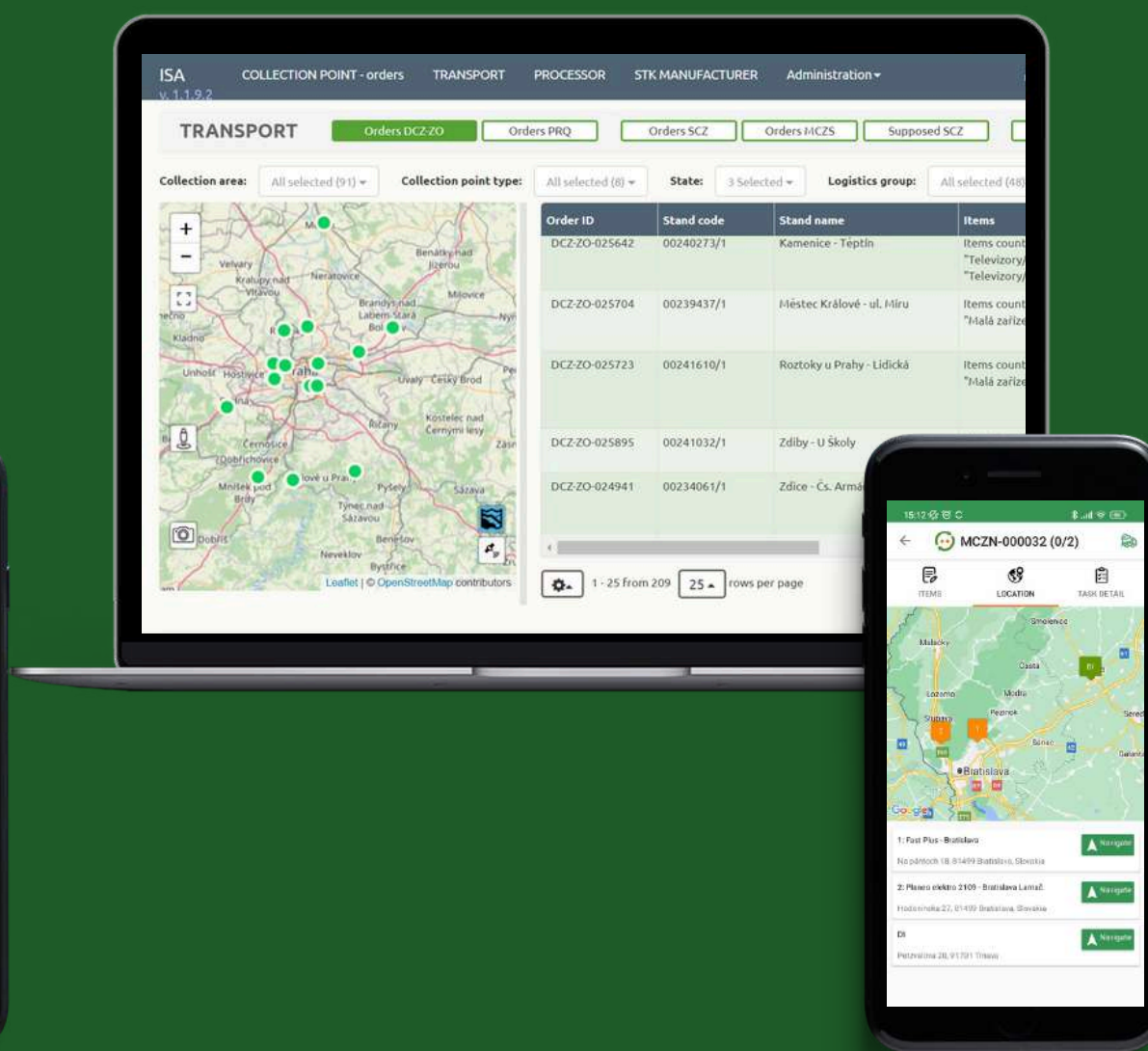
Collection point: too many Collection point type: All selected (8) State: 4 Selected Logistics group: All selected

Stand code	Stand name	Address
03546926/1	Opravná.cz s.r.o. - pobočka Praha	Pod Sychrovem
24808075/5	Benefit Computers - Praha 15, Kutnohorská	Kutnohorská 2
25656635/5	PVK - provozovna VDJ Karlov	Ke Karlovu 299
25907069/003	Svoboda Press - Praha, Sazečská	Sazečská 560/8
25907069/12	JANČA & EMAS - Praha 10, Průběžná	Průběžná 84/2

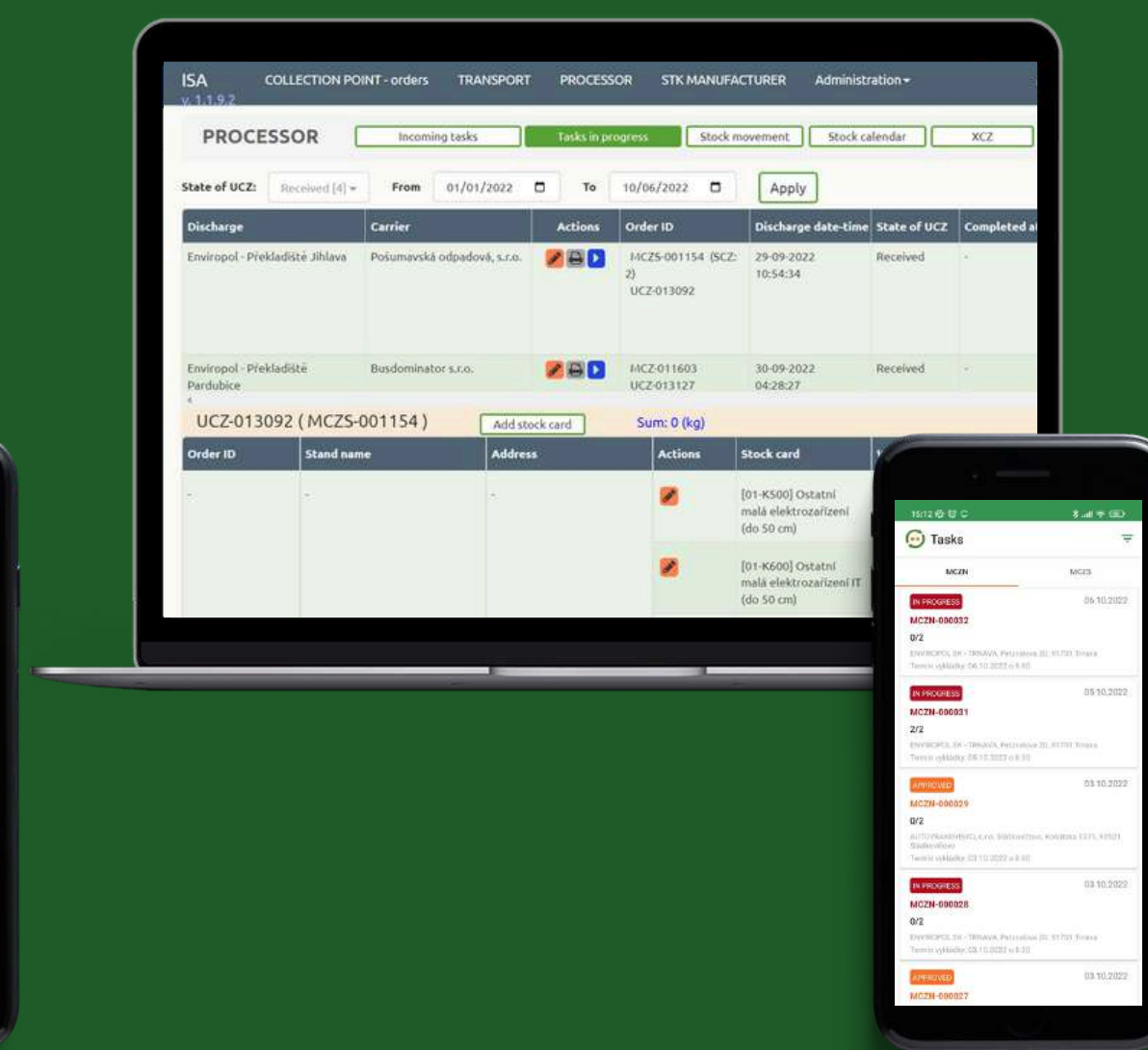
1 - 25 from 58 25 rows per page



Collection Point
Portal & Mobile App



Logistic Partner
Portal & Mobile App



Processing facility
Portal & Mobile App



Nationwide WEEE collection in

Numbers

44.5T

of collected e-waste

22K

active collection points

14.4K

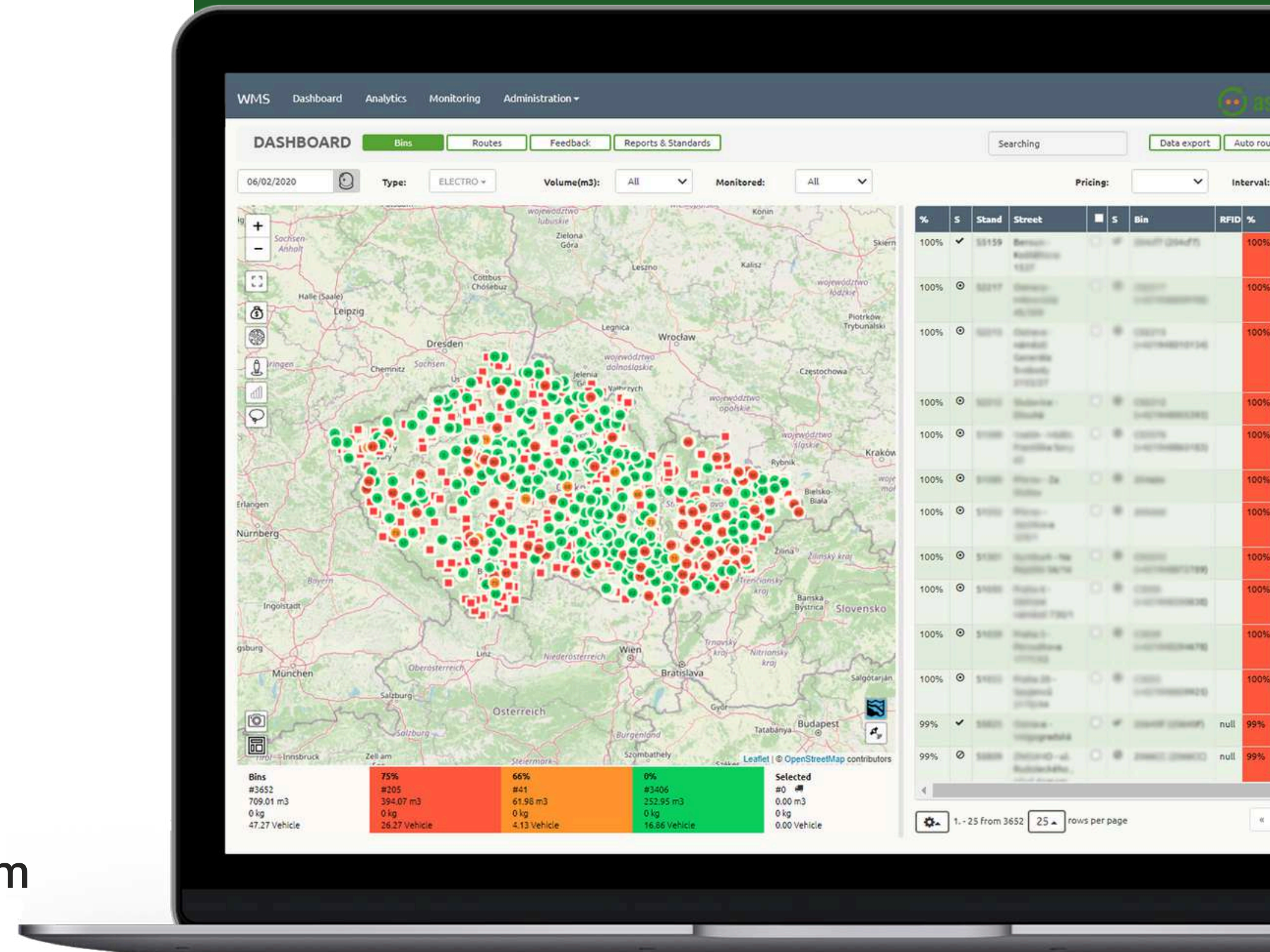
system users

4.4K

collection street bins

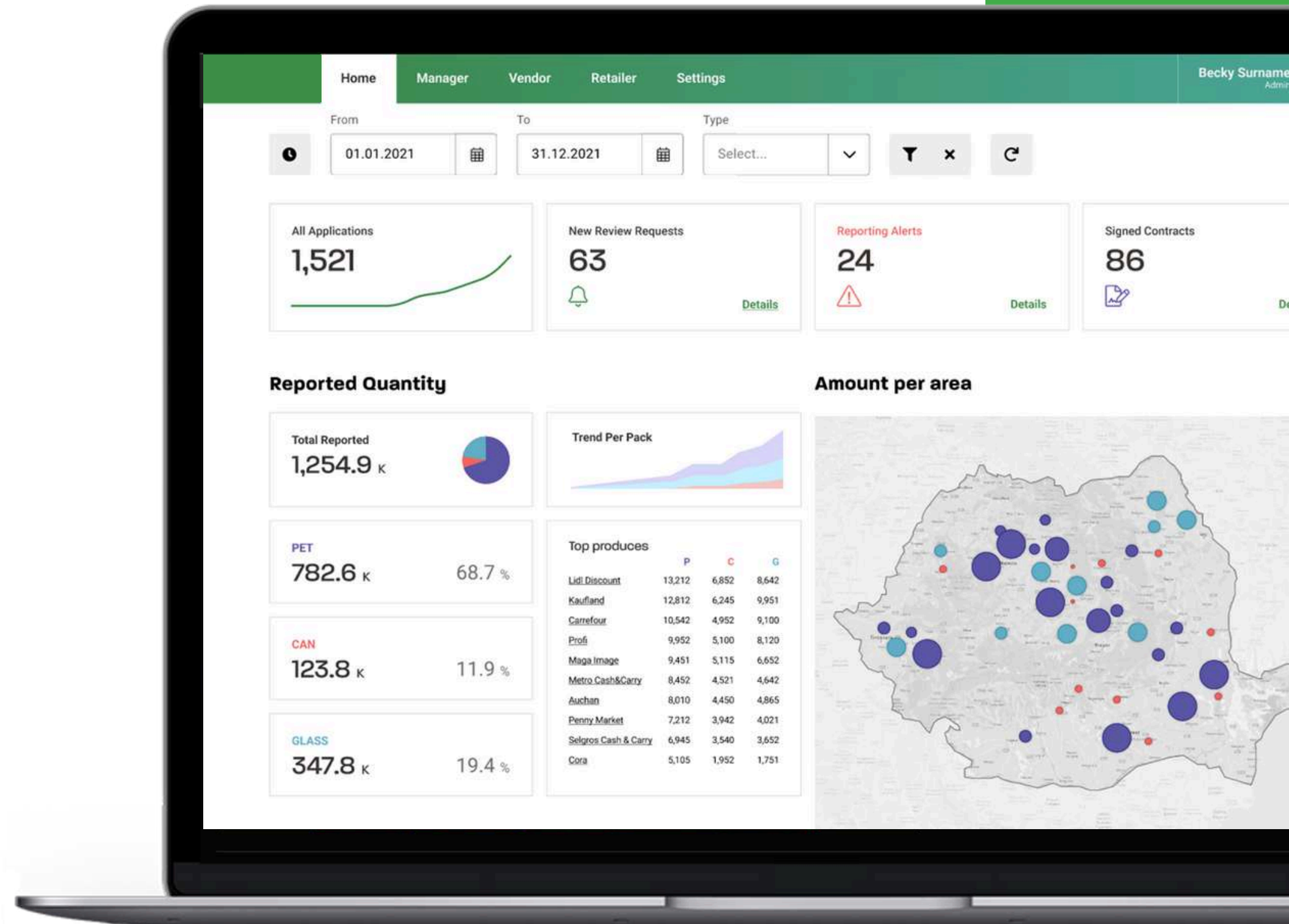
3.3K

orders in the system
on average



Pre-Deposit Return Scheme (DRS)

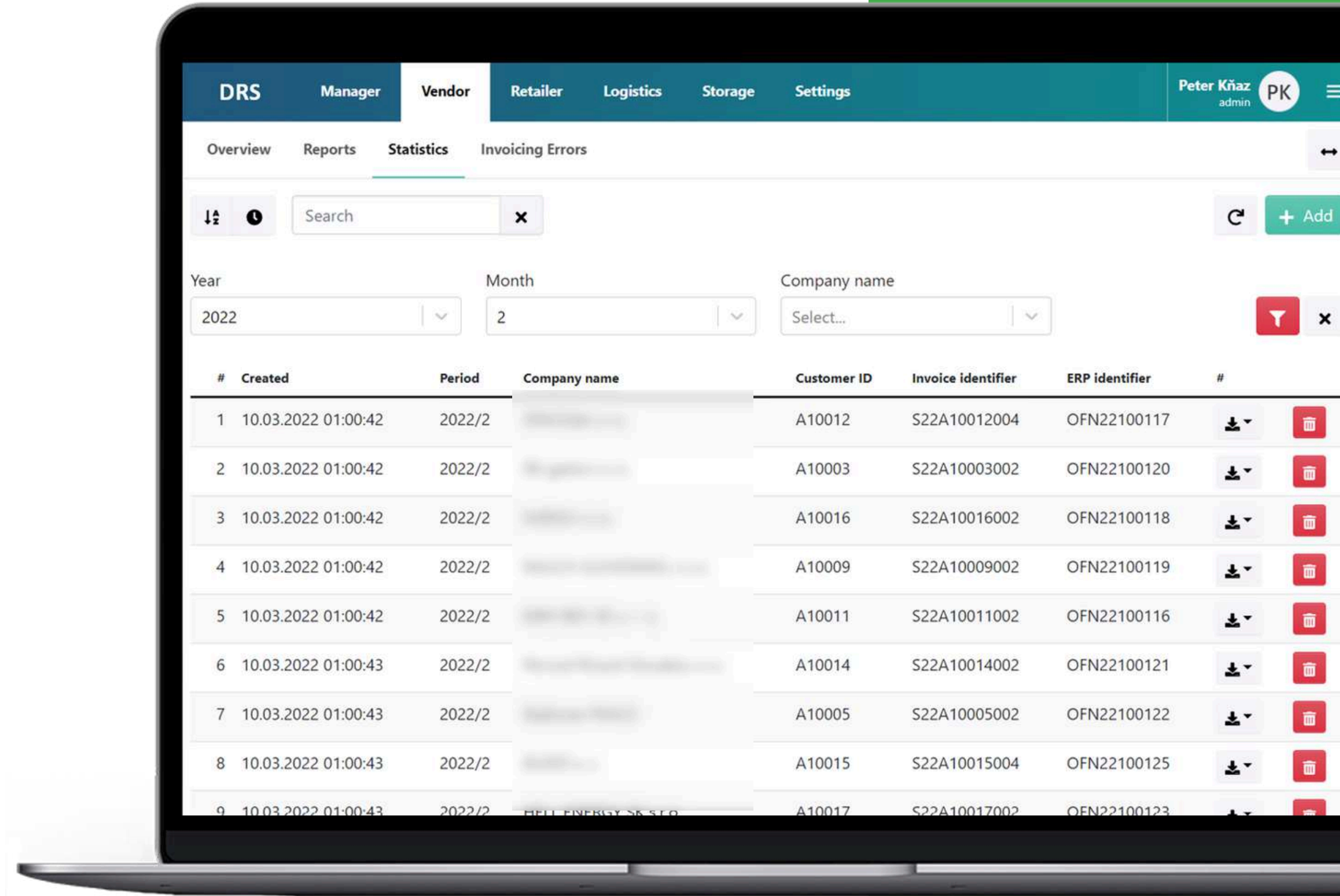
- Market-mapping tool preceding the implementation of DRS which includes reporting and contracting
- Real-world structured data from all participating entities
- Take into account the specifics of your market
- No unexpected costs
- Scalable and flexible solution
- Automated contracting saves time for both the operator and the entities involved



Our solution

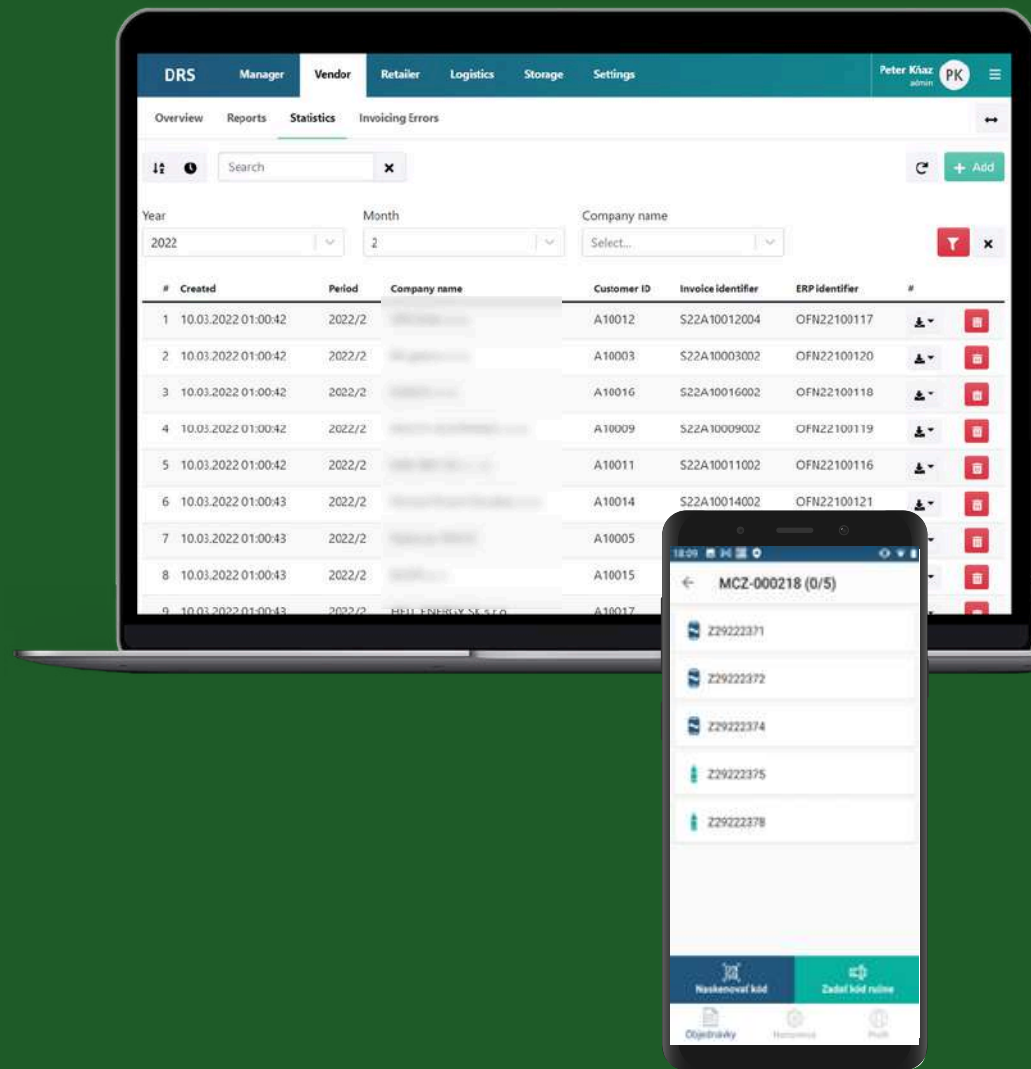
Deposit Return Scheme (DRS)

- The most advanced technologies to maximize the effects of deposit return schemes
- Successfully engage citizens, vendors, retailers and logistics groups
- Ensure an easy-to-use approach for all involved stakeholders
- Facilitate full digitalization through the steps
- Ensure accurate and easy data traceability
- Agnostic with any reverse vending machine

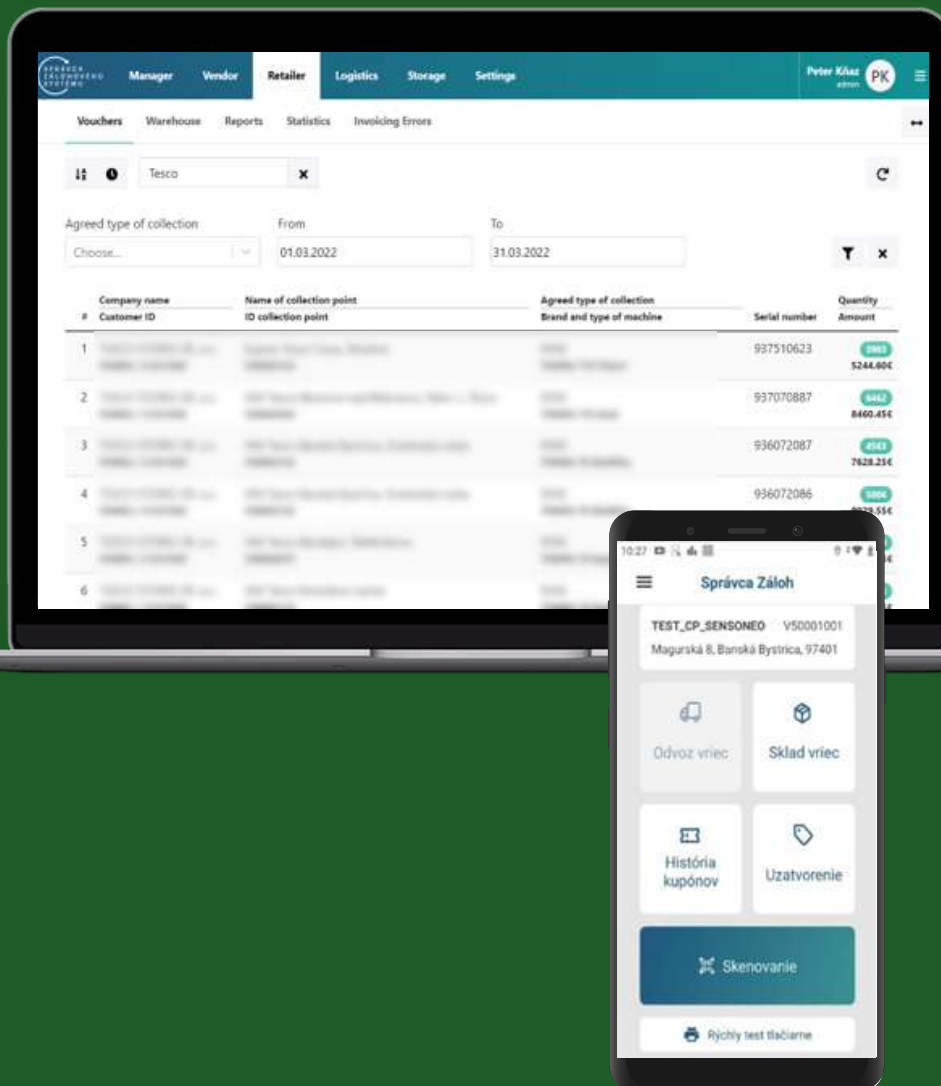


The screenshot displays the DRS Manager interface, specifically the Vendor tab. The interface includes a navigation bar with tabs for DRS, Manager, Vendor, Retailer, Logistics, Storage, and Settings. The current user is Peter Kňaz, admin. The main content area shows a table with columns for #, Created, Period, Company name, Customer ID, Invoice identifier, ERP identifier, and #. The table contains 9 rows of data, all created on 10.03.2022 at 01:00:42. The Period is 2022/2. The Company name column is blurred. The Customer ID, Invoice identifier, and ERP identifier columns contain specific values for each row. The table also includes a search bar, a filter icon, and a '+ Add' button.

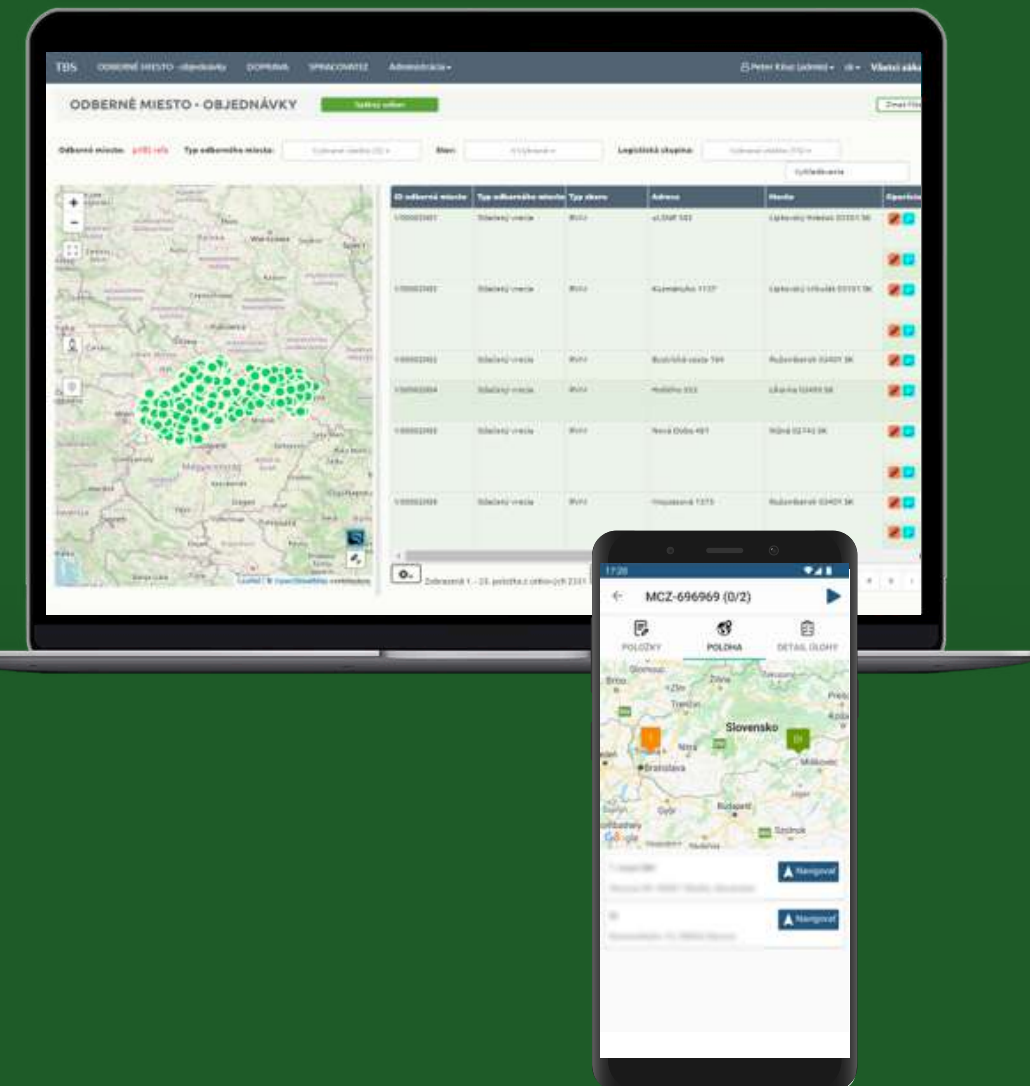
#	Created	Period	Company name	Customer ID	Invoice identifier	ERP identifier	#
1	10.03.2022 01:00:42	2022/2	[blurred]	A10012	S22A10012004	OFN22100117	[download] [delete]
2	10.03.2022 01:00:42	2022/2	[blurred]	A10003	S22A10003002	OFN22100120	[download] [delete]
3	10.03.2022 01:00:42	2022/2	[blurred]	A10016	S22A10016002	OFN22100118	[download] [delete]
4	10.03.2022 01:00:42	2022/2	[blurred]	A10009	S22A10009002	OFN22100119	[download] [delete]
5	10.03.2022 01:00:42	2022/2	[blurred]	A10011	S22A10011002	OFN22100116	[download] [delete]
6	10.03.2022 01:00:43	2022/2	[blurred]	A10014	S22A10014002	OFN22100121	[download] [delete]
7	10.03.2022 01:00:43	2022/2	[blurred]	A10005	S22A10005002	OFN22100122	[download] [delete]
8	10.03.2022 01:00:43	2022/2	[blurred]	A10015	S22A10015004	OFN22100125	[download] [delete]
9	10.03.2022 01:00:43	2022/2	[blurred]	A10017	S22A10017002	OFN22100123	[download] [delete]



Vendors & Distributors
& Importers



Retailers & Collection
Points & RVM



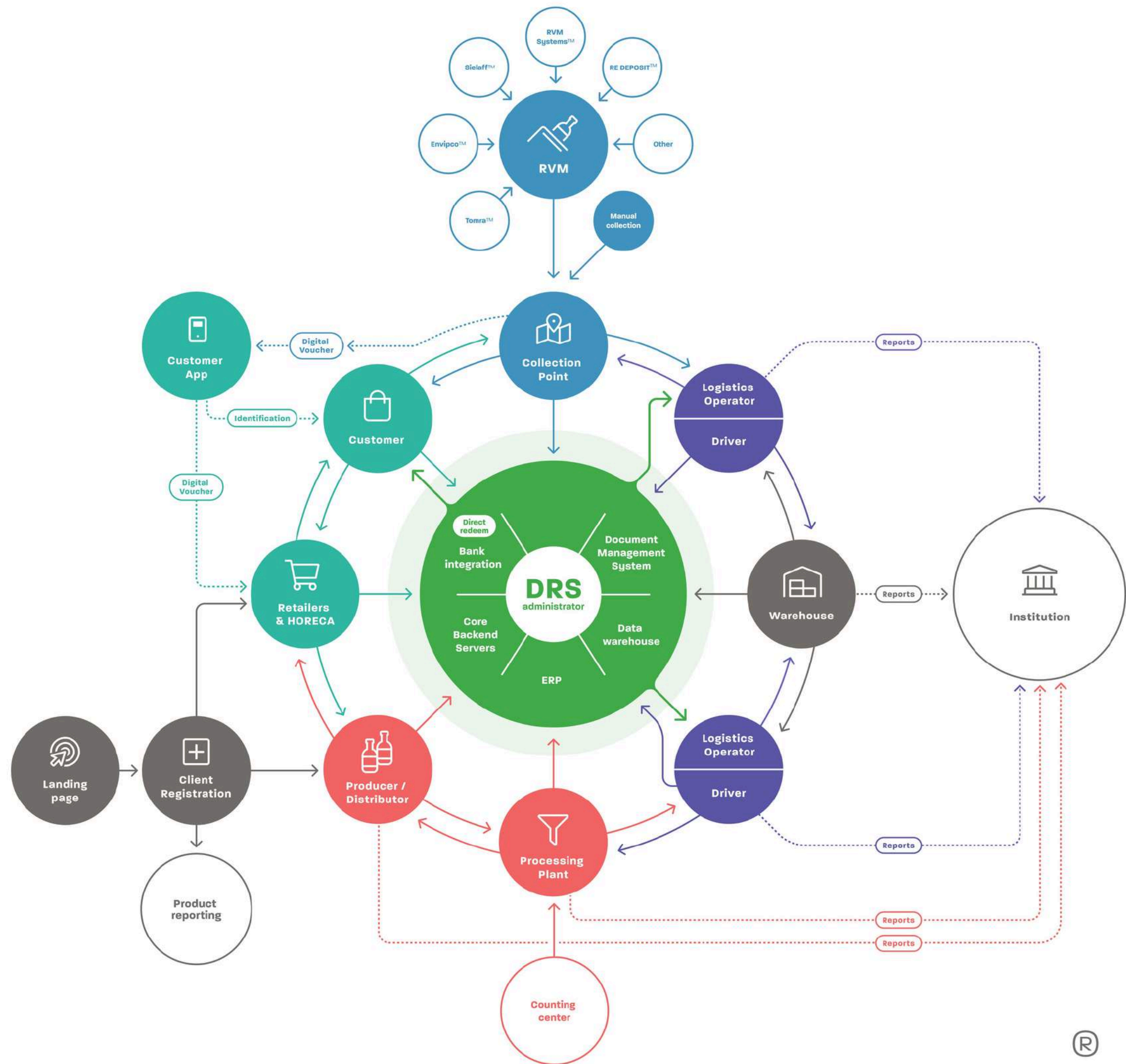
Logistic groups &
Processing facility



DRS



- 1 Collection Orders, Detail of Order
- 2 Request for Collections, Collection Detail, Route
- 3 PR
- 4 Collected Amounts, Issued Vouchers, Requests of Collections
- 5 Amounts for collection, Delivered Amount, Conflicts, Invoices
- 6 Accepted Amounts, Expedited Amounts, Stock-taking
- 7 Collected Amounts, Delivered Amount, Conflicts, Invoices
- 8 Accepted Amounts, Processed Amounts
- 9 EANs requestration, Amount put on the Market
- 10 Sold Amounts, Paid Vouchers, Invoices
- 11 Complains
- 12 Voucher
- 13 Payment for Goods
- 14 Payment for Goods
- 15 Delivery Note
- 16 Acceptance Note
- 17 Delivery Note
- 18 Acceptance Note
- 19 Deposit
- 20 Goods
- 21 PET / CAN
- 22 Containers / Packages
- 23 Containers / Packages
- 24 Containers / Packages
- 25 Packs of Containers
- 26 Material
- 27 Goods
- 28 ERP (existing client ERP or MS Business Central)



9

countries with our
DRS IT system

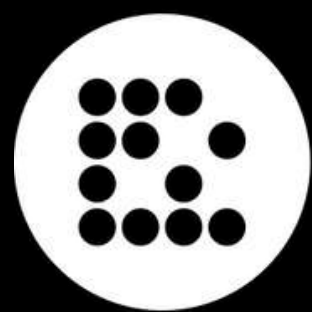


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Smart DRS

Simpler, affordable, more secure and AI-powered Deposit Return System



**Smart
DRS**

by SENSONEO

Simpler, affordable, more secure and AI-powered Deposit Return System

Strengths



- **Significantly lower fees**
- **Accepting crushed bottles**
- **No national EANs**
- **Supporting Back-to-Retail model**
- **Automated reporting**
- **Faster and more convenient returns**
- **Full traceability**
- **Ultimate fraud prevention**
- **Warehouse optimization**



Technological evolution of the system

Solution



Unique Container ID

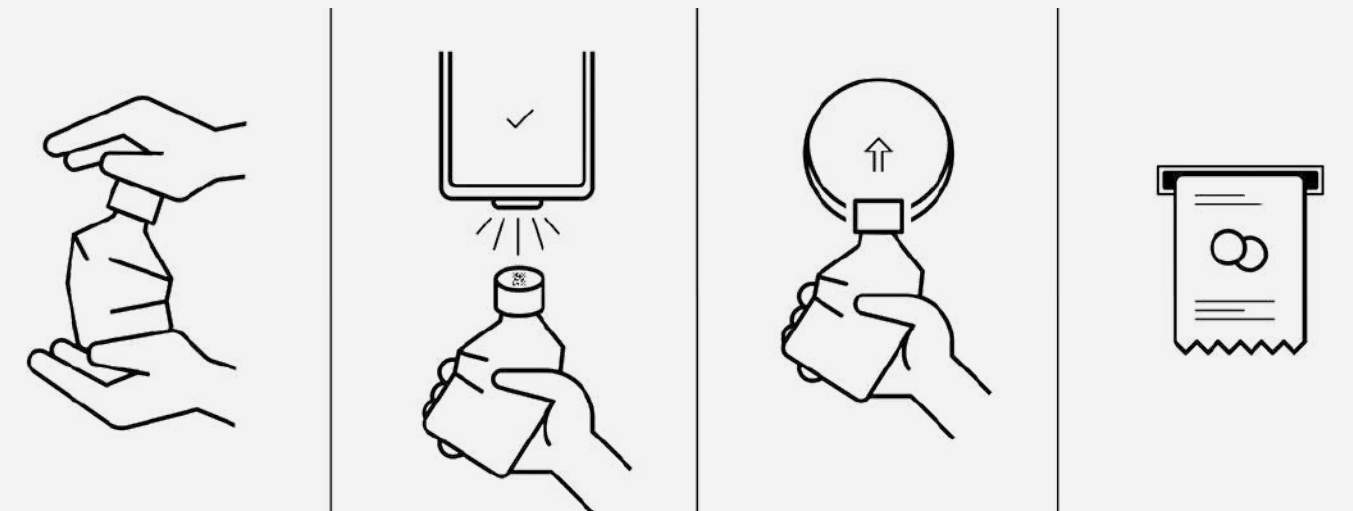
Data matrix code printed or laser-engraved on the cap or lid of the beverage packaging.

Smart Production Line

Existing production lines using non-invasive high-speed scanners to track every single beverage container and fully automate reporting.

Smart Collection Point

A lean and affordable alternative to RVMs, enabling secure, fast, and user-friendly returns.



Solving challenges of various stakeholders within the system

Expectations



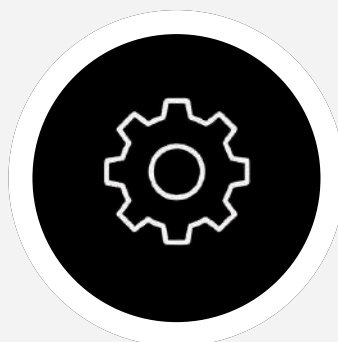
Consumers

- Ability to compress beverage containers
- Faster collection process, avoiding long RVM queues
- More convenient and accessible collection points



Retailers

- Lower investment and operational costs
- Savings on retail space
- Savings on employee time
- Increased customer satisfaction



Operators

- Automated reporting of volume placement
- Ultimate elimination of fraud
- Interoperability between national markets
- Potential use of standard waste infrastructure



Producers

- Reduction in industry fees and handling fees
- Savings on warehouse space
- Automated reporting of containers in the market
- Ability to track the lifecycle of each container

Done and active worldwide pilots

Deployments



23k+ beverage containers returned at 2 of the largest beverage producers in CEE

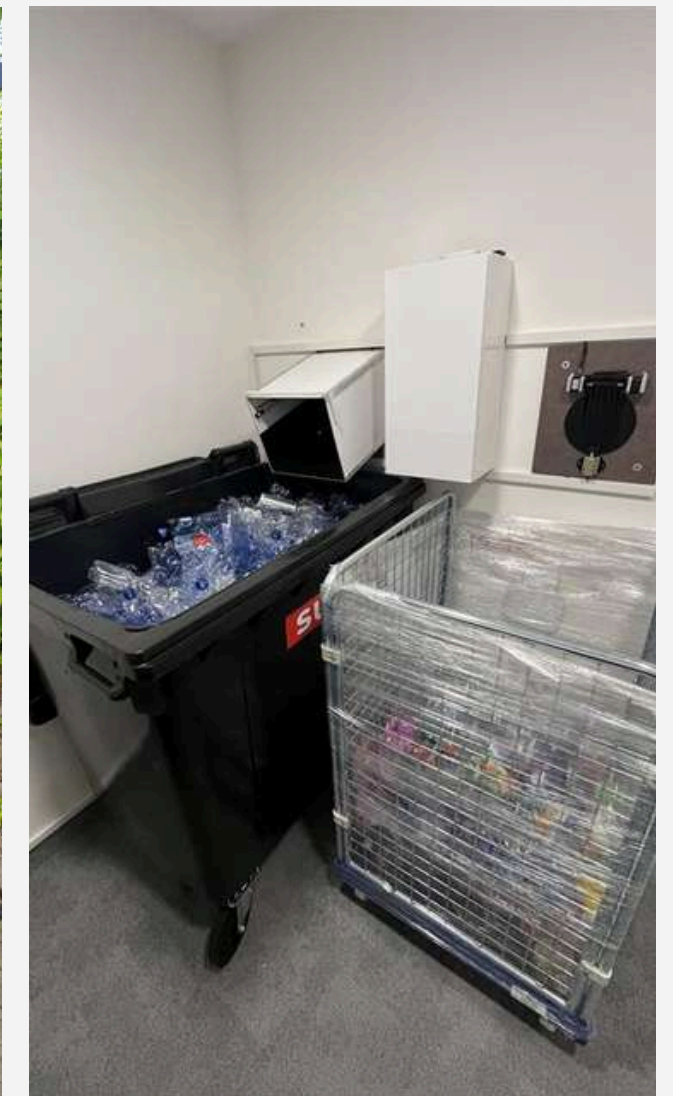
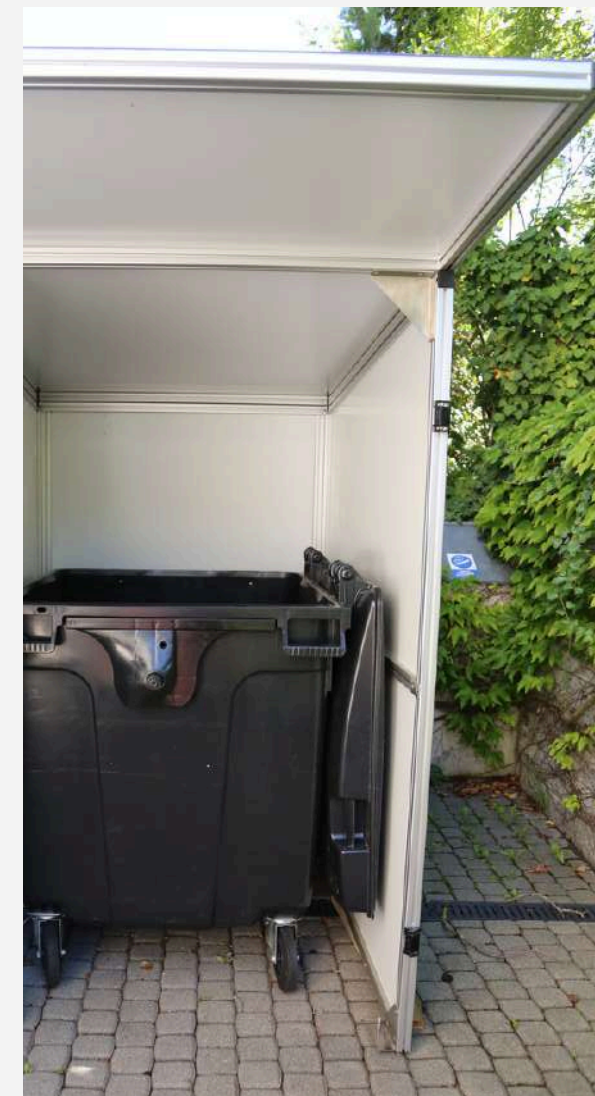
First return system for Tetra Pak in the world as schools in Singapore recycle with Smart DRS

One of the largest employers in the CEEE region is using the Smart DRS within its closed plant environment 100K+ returns monthly



Real-life deployment of the solution | Smart Collection Point

In Practice



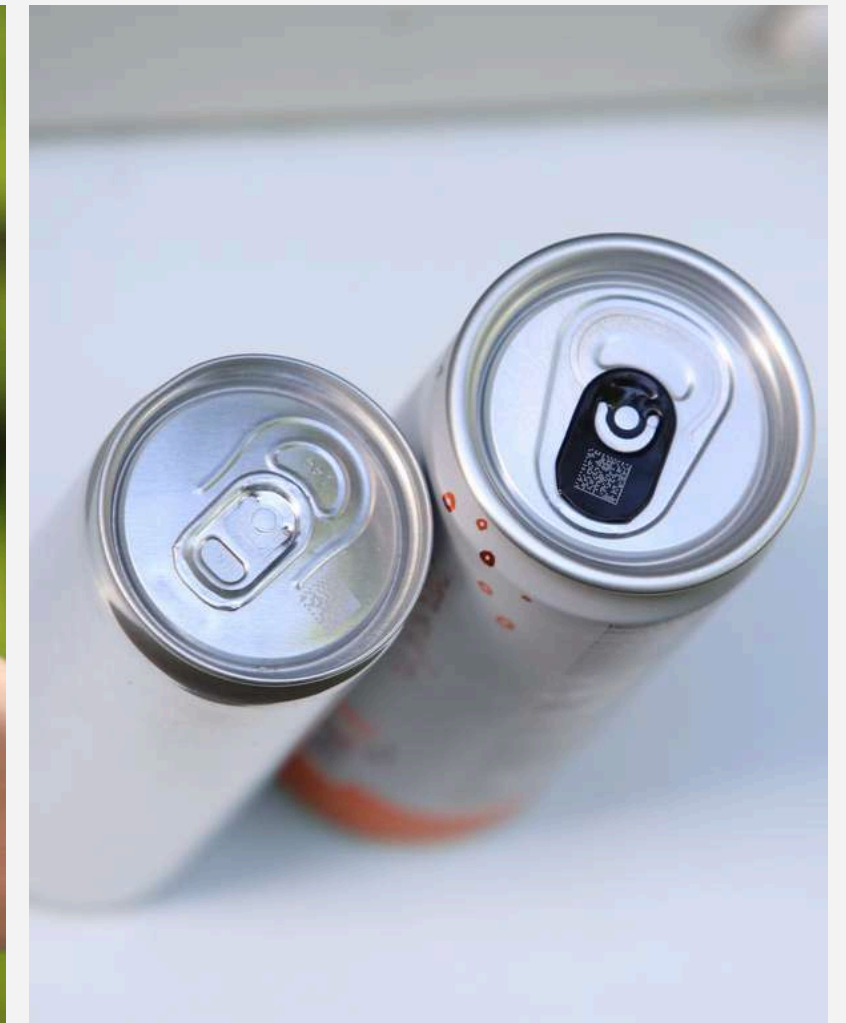
Real-life deployment of the solution | Smart Production Line

In Practice



Real-life deployment of the solution | Unique Container ID

In Practice





Key benefits in numbers

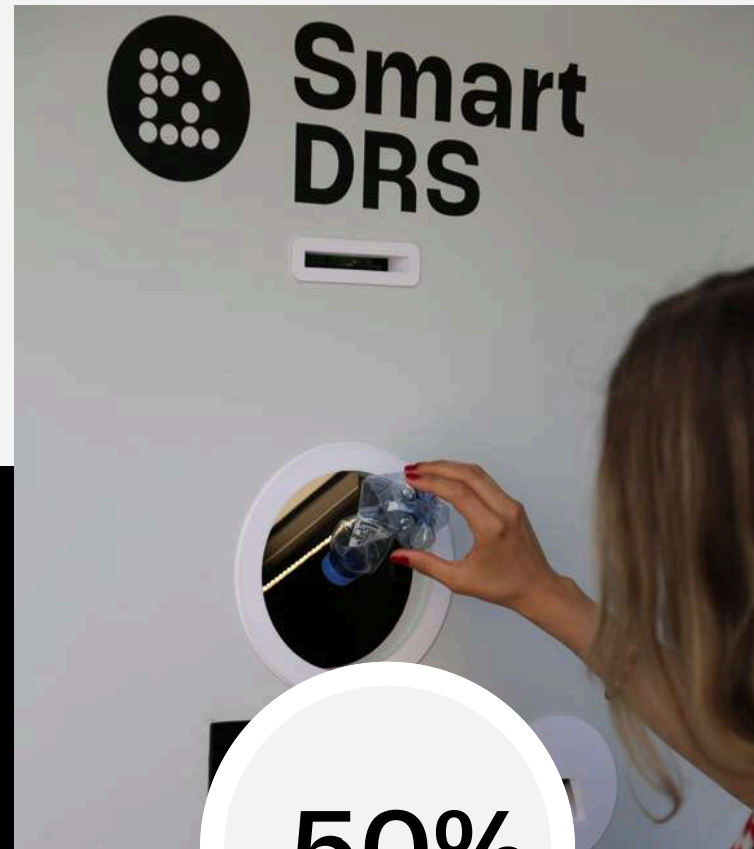
Results



-81%



-41%



-50%



-25%



-39%

Purchase or lease costs
Compared to RVMs

Operational costs
Compared to RVMs

Time of the return process
Compared to RVMs

Staff workload
Compared to RVMs

Lower costs for
Industry Fee
Compared to
traditional DRS

Key benefits in numbers

Results



-48%

Lower costs for
Handling Fee
sDRS compared to
traditional DRS



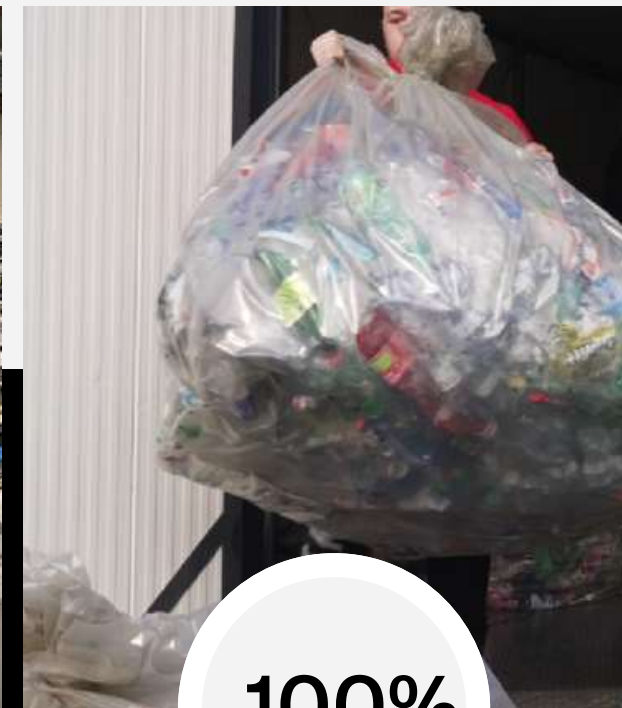
-26%

Lower costs for
Logistics
sDRS compared to
traditional DRS



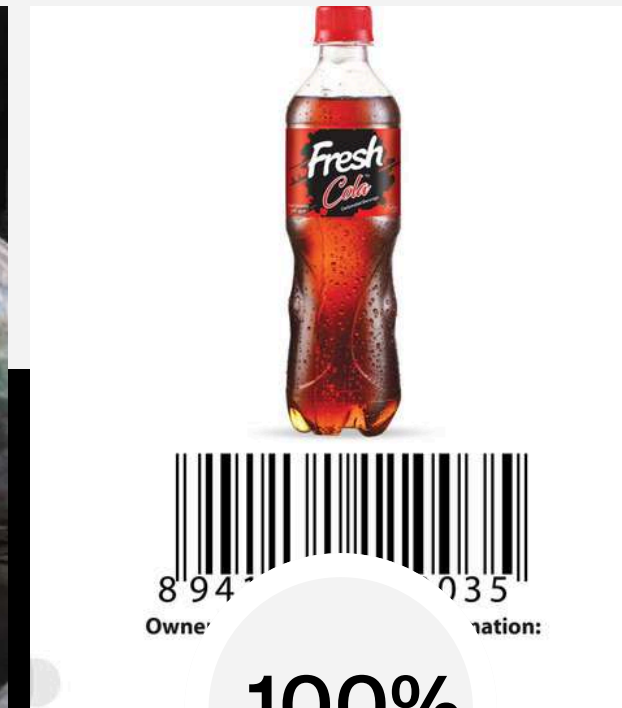
-100%

Lower costs for
Counting Centers
sDRS compared to
traditional DRS



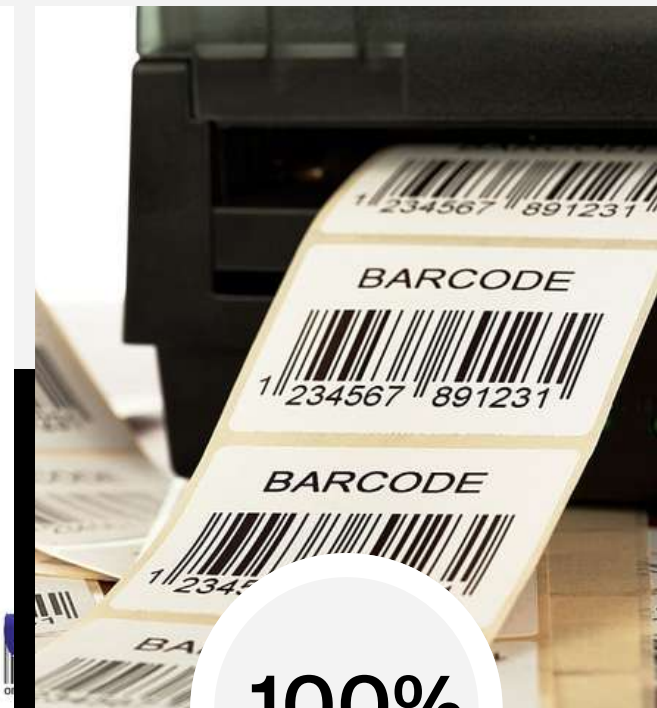
-100%

Lower costs for
Plastic Bags
sDRS compared to
traditional DRS



-100%

Lower costs for
National EAN
sDRS compared to
traditional DRS



-100%

Lower costs for
Fraud
sDRS compared to
traditional DRS

The evolution of how we return bottles and cans

Find out more at smartdrs.com

 bit.ly/videoSDRS



Meet our team



((S))

Join our story!



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