



Quamtra

Smart Waste
Management



**Waste Management solution
based on real-time data**

Wellness Telecom





SCENARIO

Currently, planning the collection of solid urban waste is based on predefined routes and experience, causing unnecessary costs and underutilization of equipment. Often empty containers are collected and full containers overloaded causing an increase in cleaning costs. Knowing the content level of waste containers is critically important.



SOLUTION

The Quamtra system optimizes collection routes by constantly monitoring the content level of waste containers. By installing sensors in the containers it is possible to receive real-time alerts for collection based on container content level, temperature variation (fires) or movement (shaking) enabling a reduction in damage liability and response time.

Our solution allows the reallocation of resources according to the real needs of the service, increasing the level of quality of the same.

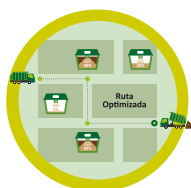


BENEFITS



Municipalities

- ✓ Operational costs reduction by up to 35%.
- ✓ Reduce collection costs by optimizing routes and fuel.
- ✓ Real time filling status of containers.
- ✓ Real time fire alarms to reduce response time and damage compensations and liability.
- ✓ Container location monitoring (optional GPS module).
- ✓ ROI < 2 years.
- ✓ Emissions reduction through optimization of routes.
- ✓ Better quality of service and street cleaning.
- ✓ Civic awareness (App).



Waste management companies / Utilities

- ✓ Easy installation and deployment.
- ✓ Remote configuration of dispositives.
- ✓ Routes and fuel optimization.
- ✓ Integrable with client waste management solutions.
- ✓ ROI < 2 years.
- ✓ Installable in wide range of existing containers in the market.
- ✓ Range of accessories to fix the device to different types of container.

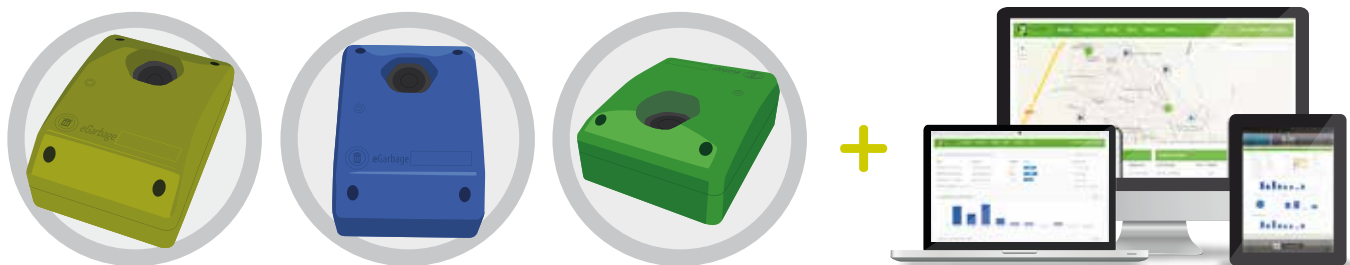


Citizens

- ✓ Improved perception about quality of service.
- ✓ Citizen participation (App).
- ✓ Traffic descongestion.
- ✓ GHG emissions reduction.



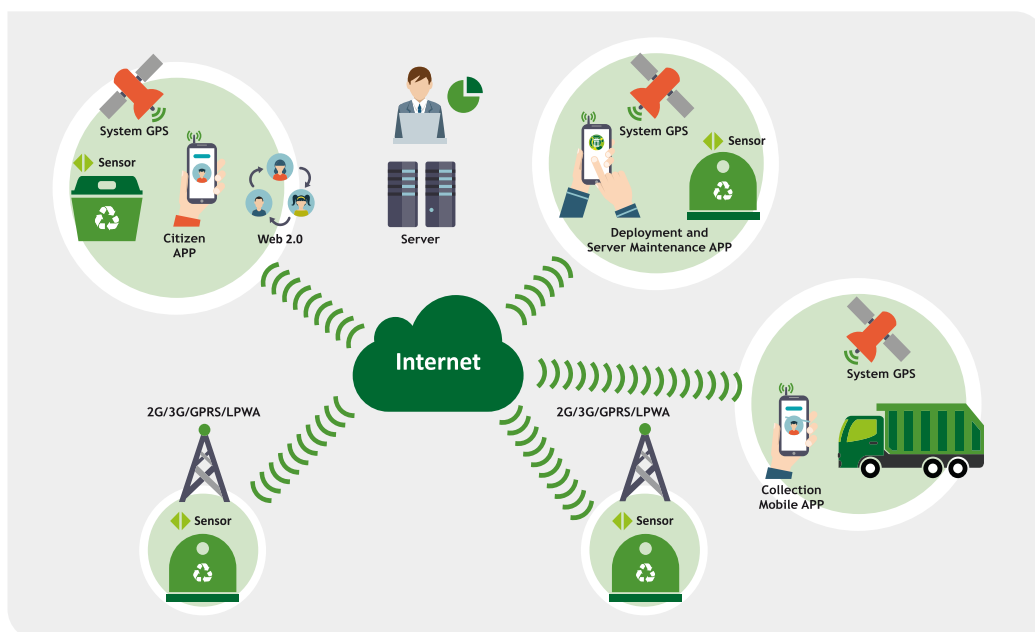
SENSING DEVICE + ON LINE MANAGEMENT PLATAFORM



WHERE CAN IT BE INSTALLED?



SOLUTION OUTLINE



Quamtra: volumetric measuring sensor for waste containers

The Quamtra solution consists of a volumetric container measurement sensor and a platform that exploits this information to show it visually and easily to the user. This monitoring device is installed inside the containers and completely autonomous and self-sufficient, it is responsible for collecting the data associated with the filling of the container as well as for detecting real-time events associated with temperature alerts and shaking, in this way each container is turned into an active and intelligent element.

OPERATION

The data is reported wirelessly (2G/3G/4G/LPWA technologies as LoRa, Sigfox, NB IoT) and stored on a Cloud Computing infrastructure managed by Wellness SMart Cities & Solutions. The measurements are stored in the Quamtra data repository and are displayed to the end user through the web service created for this purpose.

HARDWARE FEATURES

The Quamtra sensors are equipped with a case with fire retardant properties that allows attachment to the container by bolts or rivets, thus preventing its fall during the collection process. Our experience in the waste management sector allows us to adapt the devices to any model of container by designing accessories for this purpose. To withstand the conditions of the environment where it will be installed, the device has IP66 protection. In addition the material can set the colour of the case in order to merge it with the environment where it will be displayed. From the information reported by our sensors we are able to avoid overflowing the contents, avoid collecting almost empty containers, reduce the number of hours of trucks on the street, the emission of gases and, ultimately, adapt the resources according to the needs of the service.

Hardware Features Quamtra Sensor

Ultrasonic Sensors:

- 40kHz ultrasonic sensor.

Volumetric measurement:

- Beam opening sensor measurement: 30°.

Measurement range:

- 25cm - 300cm. Measuring accuracy: +/- 2 cm.

Temperature sensor:

- The device incorporates temperature alerts in real time for fire detection.

Built-in accelerometer:

- Motion and shaking detector. Sends real-time alerts of vandalism and pick-ups.

Alerts:

- Filling and container pick-up in near real time remotely configurable.
- Low signal configurable.

Dimensions (H x W x D):

- 52.75mm x 102.10mm x 145.10mm.

Wireless communications:

- 2G/3G/4G/LPWA.

Antennas:

- Indoor antenna to preserve utmost discretion when installing.

Battery:

- Lithium 3.6V. Estimated duration: 10 years*.

Case:

- IP66 fastening by rivets or self-tapping screws. Simple installation (round edges). Material easily blended into the environment. Configurable colour.

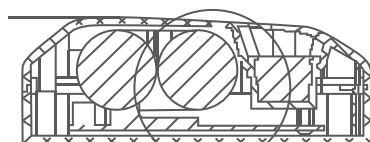
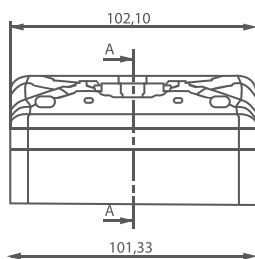
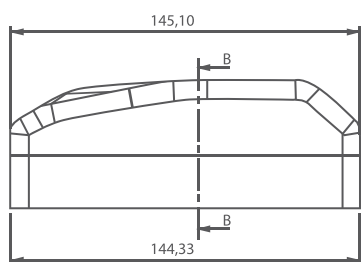
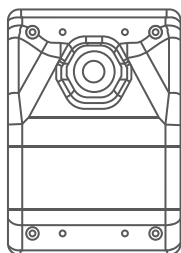
Temperature range:

- -55°C a 85°C (Optimal precision: -15°C a 75°C).

Sensor:

- Remotely configurable sensor from the server.

* Depending on send conditions.



SECTION A/A

Software Platform

- ✓ Software as a Service (SaaS).
- ✓ Cloud data repository.
- ✓ Dashboard and remote configuration of devices.
- ✓ Web application developed with latest technologies.
- ✓ Monitoring information.
- ✓ Alerts.
- ✓ Reports.



CHARACTERISTICS

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Robustness in the service measures. |  Web access (PC, Tablet & mobile). |
|  Remote setup. |  Deployment App. |
|  Automation of reports. |  Intuitive and simple interface. |
|  Integrable with client waste management solutions. |  Multiple user profiles: Reader _ Subcontractor Manager _ Administrator. |

MANAGEMENT MODULES

- | | |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|  Visual location of containers on a map. |  Alerts set up. |
|  Heatmap of containers. |  Information on one specific container. |
|  Identify fractions. |  Reports & statistics. |
|  Diagram of container fullness history. |  Routes control. |
|  Geopositioning of containers. |  Service audits. |
| |  Geolocation of containers (optional). |

How does it work?



Deployment & installation

Operational deployment carried out autonomously by the installer.



Measurement

Real time data collection through fully autonomous and intelligent sensors installed in the containers turning them into an active and intelligent element.



Communication

Quamtra sensors communicate with the web platform to send data related to the level of filling and configurable alerts. Our devices allow taking data with a resolution that can range from a few minutes to several hours. This measure is reported from these devices wirelessly through a communications solution 2G/3G/4G or LPWA. Networks widely available worldwide. Wellness Smart Cities & Solutions can provide data subscriptions if the customer wishes.



Analysis and planning

The Quamtra data repository is hosted on Wellness Smart Cities & Solutions Cloud Computing infrastructure which provides high data availability.

The application is offered in SaaS (Software as a Service) mode. This enables container content level evolution monitoring, container and route statistics exporting and optimized collection route development.

The data repository is designed with standard web technologies compatible with most management software used in the SWM (Solid Waste Management) sector to offer a broader package of waste management solutions to our customers: GPS truck tracking and control of route deviations, efficient driving, RFID container identification location...



Evolving

LPWA networks compatibility.

Quamtra

8 LIPASAM

NOGDO
AYUNTAMIENTO
DE SEVILLA

Quamtra ♥ Lipasam: Case study of successful ICT implementation for waste collection in Seville

Wellness Smart Cities & Solutions leads a European project named LIFE EWAS, as part of an international consortium of companies invested in environmental consulting and waste management. The project goal is to test "Methodologies for efficient and sustainable waste management using ICT tools that enable the reduction of GHG emissions" (Greenhouse gasses).

LIPASAM: is the municipal waste collection company that serves the city of Seville. For the last 30 years, it has been responsible for cleaning 8.7 mi² and 669 miles of roads, as well as collecting urban waste and subsequently treating it to save resources and prevent environmental pollution. It serves approximately 700,000 citizens.

The project involved implementing an ICT solution applied to waste management to achieve waste collection optimization in 3 city routes, as well as the development of a public- information and awareness platform. The waste material chosen to for monitoring was glass, although the project has tested other waste materials.

Because glass containers tend to fill in a homogenous way, it presented the best option to pilot the service experience. In the Seville's case, 268 containers were monitored, 215 side loading glass containers, 29 underground plastic, and glass containers, and 24 with different waste materials to test the device's validity.

Thanks to the data provided by the Quamtra sensors, LIPASAM managed to combine the 3 routes monitored in a single dynamic route called "EWAS ROUTE" obtaining important savings associated with the collection.

"With the information we received from the sensors and collection platform on glass containers' fill level, we were able to reduce the number of pick up rounds from 3 every 12 days, down to 1 every 7 days. This meant going from 100 rounds per year to 34, and optimized routes, going from 400 fewer hours a vehicle is on the street per year", comments José Andres Ferrete, Head of street furniture of LIPASAM. "Thanks to the application of this technology and the data provided by the sensors, our costs associated with collection have been reduced by 66%" stresses Virginia Pividal Garcia, Managing Director of LIPASAM.

Quamtra


PROMEDIO
DIPUTACIÓN DE BADAJOZ

Quamtra ♥ Promedio: A challenge for sustainable urban planning

Wellness Smart Cities & Solutions developed a project for PROMEDIO, an environmental services management consortium in the province of Badajoz, which resulted in the proposition of a series of measures to capitalize on environmental services through fuel costs savings and optimization of employee work with the use of Quamtra, the company's intelligent waste collection solution.

PROMEDIO: Wellness Smart Cities & Solutions developed a project for PROMEDIO, an environmental services management consortium in the province of Badajoz. PROMEDIO manages a total of 11,119 bins across the province altogether: 6,694 green bins for organic waste, 1,720 yellow bins for light containers and 2,705 blue bins for paper and cardboard. The capacity and type of bin used for collection varies according to the needs and characteristics of each municipality.

Current planning for the collection of solid urban waste in Badajoz focuses on predefined routes based on experience, which results in unnecessary costs. In response to the needs presented by PROMEDIO, Wellness Smart Cities & Solutions proposes Quamtra, a two-fold solution that provides remote monitoring of bin fill level and urban solid waste collection service tracking. In order to audit PROMEDIO's current urban waste collection system and implement the necessary measures to achieve savings and improved service quality, Wellness Smart Cities & Solutions proposed a project for monitoring 50 bins for 12 months.

After taking these steps, it will be possible to proceed with revising collection routes and frequency, which is projected to result in significant savings in fuel of about 5000 liters per year and the reduction of workforce is between 40% and 50% when switching weekly collection to biweekly collection; from a qualitative point of view, the most noticeable effect is the increase in citizen satisfaction and improvement in the quality and efficiency of service.

"With the Quamtra project developed by the consortium and Wellness Telecom, we have sought economic and technical optimization of collection by monitoring fill levels in a series of bins, namely Double Hook with 3,000 liters of capacity intended for the collection of paper and cardboard waste, the most suitable for control and monitoring", **Álvaro Jiménez recalls.**

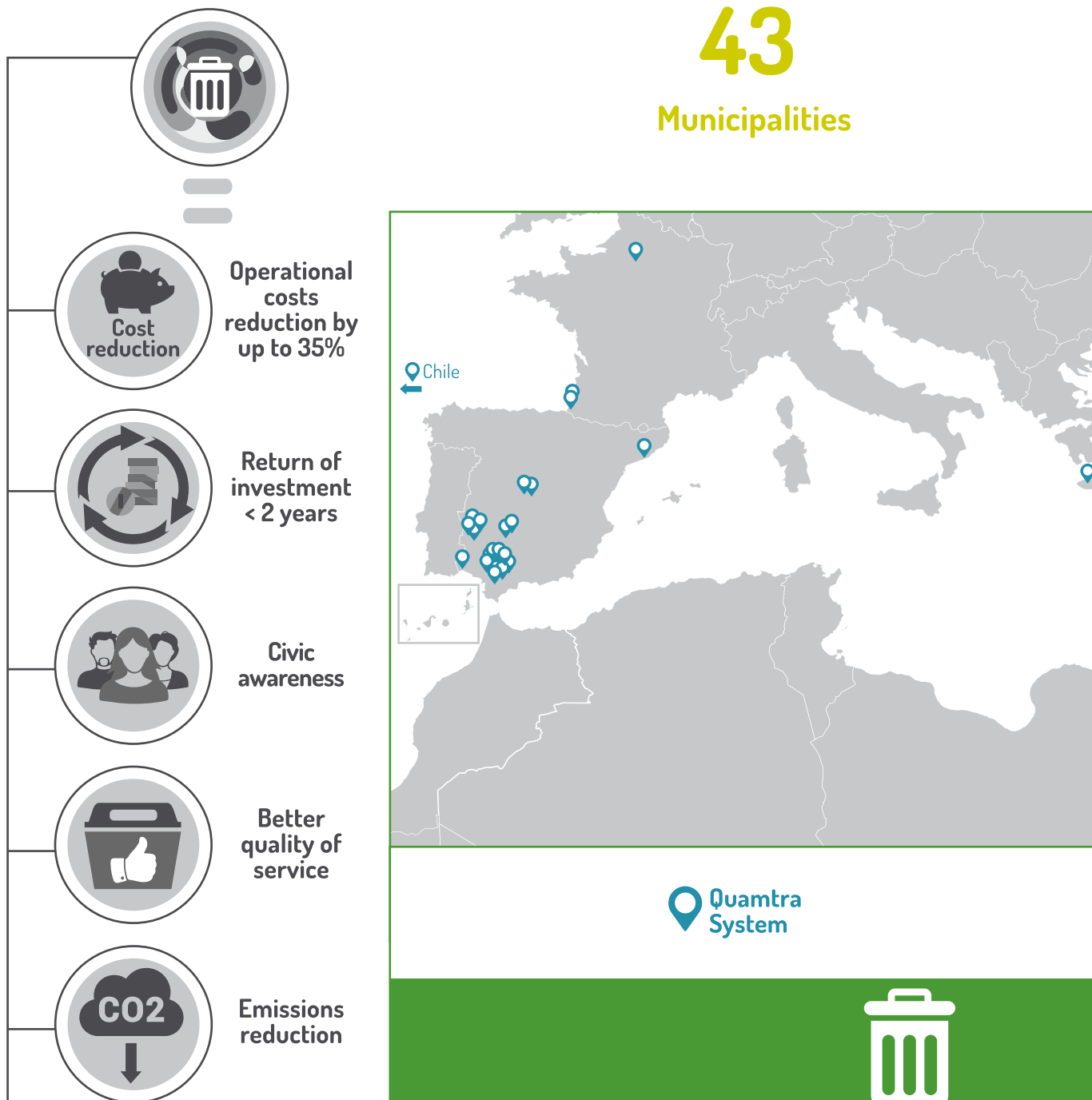
"The experience and results will lead PROMEDIO to assess the cost of implementing this project in all bins that are compatible with this fill monitoring system" **the manager states.**



Quamtra an ally in optimization of waste collection services

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Municipalities



IMPROVE THE QUALITY OF SERVICE OFFERED TO CITIZENS

We are the IoT partner for Smart City Projects

Wellness Smart Cities & Solutions is a company specialized in technological solutions for Smart Cities.

Our smart solutions based on the new paradigm of Internet of things: we devise, build and deploy solutions in both hardware and software development.

We design own intelligent infrastructures and technologies to provide and create more efficient and liveable cities.

Solutions are focused on several areas: intelligent lighting; monitoring and energy optimization; waste management; leakage management and quality of the drinking water; intelligent management of urban parking; open government and citizen participation; quality of life.

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