WHITE PAPER

From reactive to predictive.

How vision AI and multi-modal sensing are transforming how utilities monitor remote assets.

Case studies

VA SYD · Sweden

EMASESA · Spain

Waltero™

April 2026

EXECUTIVE SUMMARY

Evidence for a new operating model.

Two utility deployments show what changes when inspection becomes continuous.

For decades, utilities have relied on scheduled manual inspections to monitor remote assets — a model that is expensive, reactive, and leaves most assets without visibility between visits. This paper presents evidence from two utility deployments — VA SYD in Sweden and EMASESA in Seville — demonstrating how continuous camera-based monitoring combined with lightweight AI shifts operations from scheduled maintenance to condition-based response.

−66%

site visits

VA SYD deployment eliminated two-thirds of scheduled inspection trips.

1.2M

consumers served

EMASESA is Spain's 4th-largest water utility — continuous visibility at scale.

~15 days

to actionable data

A handful of training images per location, from install to operational insight.

THE THESIS

The combination of battery-powered sensors with embedded connectivity and ultra-light AI training collapses the cost and complexity of remote monitoring. Utilities can now deploy continuous visual monitoring at the scale of their network — not just their most critical assets. The result: fewer truck rolls, faster response, and condition data across infrastructure that was previously inspected only when something broke.

IN THIS PAPER

THE PROBLEM

The blind spot in utility operations.

Most remote assets are inspected rarely — and only when something breaks.

Utilities operate thousands of geographically distributed assets — water inlets, stormwater grates, pumping stations, meters, overflow chambers. The operating model for monitoring them has changed little in fifty years: send a van with a technician on a fixed schedule, or react when a failure is reported. Both options are costly, both leave most assets invisible between visits, and neither scales with utility ambition.

TODAY

Scheduled inspection, reactive response.

- Fixed inspection schedules drive truck rolls whether or not assets need attention
- Most issues detected only after failure — or after downstream consequences
- Field crew time dominates operating cost, scaling linearly with asset count
- Zero visibility between visits — assets can fail silently for weeks
- Preventive budgets rise faster than asset bases, with diminishing returns

THE SHIFT

Continuous visibility, condition-based action.

- Autonomous sensors capture condition data continuously — at low unit cost
- AI scores asset state directly from images, trained on a handful of site examples
- Field crews dispatched only when thresholds require it — trips drop to what's needed
- Developing issues are visible before failure — shift from response to faster intervention
- Labour scales with incidents, not assets — operations grow without proportional headcount

DEPLOYABILITY

Deploy in hours, not months.

Three pillars make Waltero fast to install — and fast to deliver value.

Most industrial IoT deployments stall on the same three points: power, connectivity, and data pipelines. Waltero removes all three as obstacles. A single device, out of the box, becomes a productive sensor the moment it is mounted — even at locations with no existing infrastructure.

01

Battery-powered

No mains power required. Install the W-Sensor where the asset is, not where the grid is. Years of operation on a single charge — supported by edge-scheduled captures and ultra-low-power architecture.

02

Gateway included

Embedded NB-IoT/LTE-M connectivity in every device. No gateway to procure, no SIM to source, no IT engagement. The sensor reports to the cloud from the moment it is activated — and bridges other on-site sensors via BLE.

03

Ultra-light AI training

A handful of images per location is enough to train the vision model for a specific asset. No labelled datasets, no ML team, no months of tuning. EMASESA's pilot was generating actionable blockage scores within two weeks of installation.

RESULT

Operational value in days, at the scale of a single asset or thousands. What has historically been a six-month integration becomes a same-week rollout.

THE PLATFORM

How Waltero works.

An end-to-end stack from sensor to insight — one vendor, one platform.

Waltero is an integrated system: purpose-built sensors, a cloud platform for fleet and data management, and AI vision models trained on small location-specific datasets. Four stages take a remote asset from no monitoring at all to condition-based operational workflows.

1 INSTALL

Mount the W-Sensor over the asset. Battery-powered and gateway-included — no infrastructure, no wiring, no IT coordination.

2 CAPTURE

Scheduled image captures combined with multi-modal data: vibration, temperature, moisture, sound, and BLE telemetry tags.

3 ANALYSE

Images and telemetry processed by AI models trained on small site-specific datasets. Mimir scores condition continuously.

4 ACT

Dashboards, alerts, and exportable data streams in Mimir drive condition-based workflows — integrated with field operations.

THE COMPONENTS

W-Sensor · Mimir platform · AI Vision · BLE gateway

W-Sensor

Battery-powered device with camera, accelerometer, and embedded NB-IoT/LTE-M. Optional BLE gateway bridges sensor tags on-site (temperature, moisture, tension, more).

Mimir

Waltero's cloud platform. Device fleet management, image and telemetry storage, AI model deployment, dashboards, alerts, exports, and integrations.

CASE STUDY 01

VA SYD

Stormwater inlet instrumented with a W-Sensor mount — one of the distributed sites that used to require scheduled truck-roll inspection.

CASE STUDY · SWEDEN

VA SYD: 66% fewer site visits.

Scheduled water-inlet monitoring across distributed infrastructure.

THE CUSTOMER

VA SYD

A Swedish regional water and wastewater utility serving multiple municipalities across southern Sweden. Operates an extensive network of distributed water-inlet facilities requiring scheduled inspection.

INSPECTION FREQUENCY

−66%

Site visits eliminated after W-Sensor deployment

CHALLENGE

Costly routine inspections, water loss, and asset downtime. Field-crew time dominated the operating budget — with most visits revealing no required action.

SOLUTION

W-Sensors deployed at scheduled water inlet facilities. Continuous camera-based monitoring via the Mimir platform replaced in-person rounds.

RESULT

Two-thirds of scheduled inspections eliminated. Faster response when issues do occur. Remote oversight of the distributed network from a single dashboard.

NEXT PHASE · PUMPS & INFRARED

VA SYD is extending the Waltero deployment beyond water inlets — adding vibration sensing on pumps and infrared cameras — to bring the same continuous visibility to rotating equipment and assets that are in the dark.

CASE STUDY 02

EMASESA

Las Aseñas — W-Sensors being installed at a stormwater inlet in EMASESA's service area. Continuously observable from a remote, hard-to-reach site, replacing scheduled field visits.

CASE STUDY · SPAIN

EMASESA: CSO visibility at scale.

Spain's 4th-largest water utility ran a 15-day pilot of continuous grate monitoring.

1.2M	4th	15 days
consumers served	largest utility in Spain	pilot · Feb 2026

CHALLENGE

EMASESA operates thousands of distributed water assets across the Seville metropolitan area. Stormwater grates are regularly blocked by debris — wet wipes, litter, organic matter — with significant flooding consequences when blockages go undetected. Manual inspection by field crews is expensive, infrequent, and fundamentally reactive: problems are discovered when something already went wrong, not before.

THE PILOT

Two representative locations were chosen to stress-test different use cases — back-flow plus grate monitoring at Felipe González, and outlet-collection lifecycle at Las Aseñas. Multiple camera angles, multiple sensor configurations, and a first-iteration AI blockage model — trained on a handful of site images — were in place within weeks of device shipment.

LOCATION 1

Felipe González

Back-flow monitoring + grate surveillance with narrow and wide-angle lenses.

LOCATION 2

Las Aseñas

Outlet collection bags + back grid — full blockage lifecycle captured.

EMASESA · LOCATION 1

Felipe González.

Continuous visibility of back flow and grate blockage.

Three W-Sensors were installed to cover both the back-flow overflow wall and the grate area. Two camera configurations were trialled on the grate — narrow and wide lens — to understand which angle best supports automated scoring.

DEPLOYMENT

SENSOR 1

Back-flow

Monitoring the back-flow overflow wall, including visible water flow direction.

SENSOR 2

Grate · narrow

Narrow-angle lens for high-detail visibility of debris accumulation.

SENSOR 3

Grate · wide

Wide-angle lens for full-context view of the grate and its surroundings.

IN MIMIR

List view, detail view, and map view all available in a single pane. Sensor readings, telemetry, and image streams accessible in one platform — with filtering, alerting, and export built-in for integration with EMASESA's operational workflows.

AI BLOCKAGE SCORING

First AI model trained on a small set of site-specific images. Each frame receives a 0–100 blockage score, which Mimir translates into four operational bands:

No blockage	Low	Medium	Severe
0–10	11–40	41–70	71–100

> *Training required just a handful of location-specific images. Within the 15-day pilot, the model was producing continuous severity scores EMASESA could act on remotely.*

Las Aseñas.

Capturing the full blockage lifecycle — in one location, in 15 days.

At Las Aseñas the pilot was structured to observe the complete operational lifecycle: a blockage forms, the field team is dispatched to clean, and the post-cleaning state is verified — all via continuous sensor data.

DEPLOYMENT

SENSOR 1

Outlet collection bags

Narrow-angle lens monitoring the bag assembly that collects debris removed from the flow. Visibility into both fill-level and condition.

SENSOR 2

Back grid

Narrow-angle lens monitoring the secondary back grid. Captures material that passes the primary collection stage.

WHAT WE OBSERVED

During the 15-day pilot, Las Aseñas moved through the complete operational lifecycle — all of it visible continuously through Mimir, without a field visit:

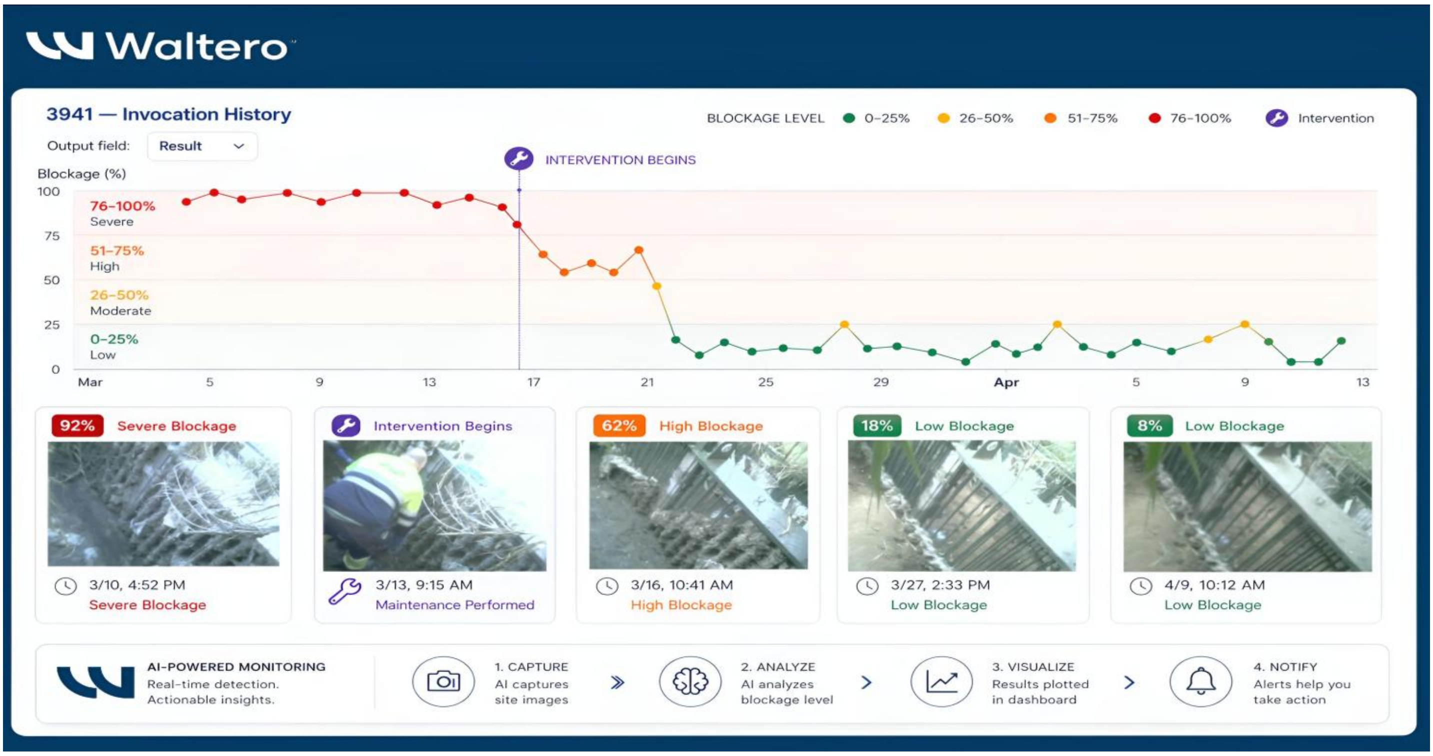
SEVERE blockage detected → **CLEANING** performed → **MEDIUM** blockage → **NO BLOCKAGE** confirmed

THE OPERATIONAL PROOF POINT

EMASESA's team confirmed cleaning effectiveness remotely — without dispatching a crew for verification. This is the shift: from field trips to confirm what was done, to platform-based evidence of what actually changed.

Reading the blockage in the data.

AI blockage score over the pilot window — from sustained severe, to cleaning, to restored baseline.



1 BLOCKAGE FORMED

Score plateaus at 90–100 for ~10 days as debris accumulates on the grate, visible in the sensor frame.

2 CREW DISPATCHED

EMASESA field crew cleaned the grate. Score dropped from 80 to 0 within hours — the event is fully visible in the data.

3 BASELINE RESTORED

Score settles into a stable 0–30 range — normal debris movement, no intervention required. The grate is observable, continuously, without a site visit.

Reactive to condition-based.

Shifting how utilities schedule, dispatch, and respond.

Both case studies illustrate the same underlying change. Visibility stops being a function of how often someone shows up, and starts being a function of what the sensor is seeing right now.

REACTIVE · BEFORE	CONDITION-BASED · AFTER
Inspections on fixed schedule	**Sensors report condition continuously**
Trucks roll whether or not needed	**Trucks roll only when condition requires**
Issues found when reported / after failure	**Issues visible as they develop**
Response time measured in days	**Response time measured in hours**
Labour scales with asset count	**Labour scales with actual incidents**
Visibility: zero between visits	**Visibility: continuous, 24/7**

> *66% fewer inspections at VA SYD — not by cutting corners, but by cutting empty trips. The same operating principle unlocks scale at EMASESA, where manual coverage is not physically possible.*

WHAT'S NEXT

Beyond vision.

Vision, sound, vibration, telemetry — unified on one device, one platform.

Vision is the opening chapter. The W-Sensor is architecturally a multi-modal platform: a BLE gateway that bridges additional sensors on-site, and an accelerometer and audio pipeline that extend monitoring beyond the camera's field of view.

VISION

Cameras

Grates, meters, displays, tank levels, visible asset condition. Trained on a handful of site images.

SOUND

Acoustic signatures

Pump motors and electrical assets. Anomaly detection from operational sound.

VIBRATION

Accelerometer

Rotating machinery, pump jacks, critical asset condition via the built-in accelerometer.

TELEMETRY

Connected sensor tags

Level, flow, distance, radar, temperature, vibration, movement and more — via wired or wireless tags.

GATEWAY

BLE bridging

The W-Sensor bridges other on-site sensors to the cloud — one install, many data streams.

PLATFORM

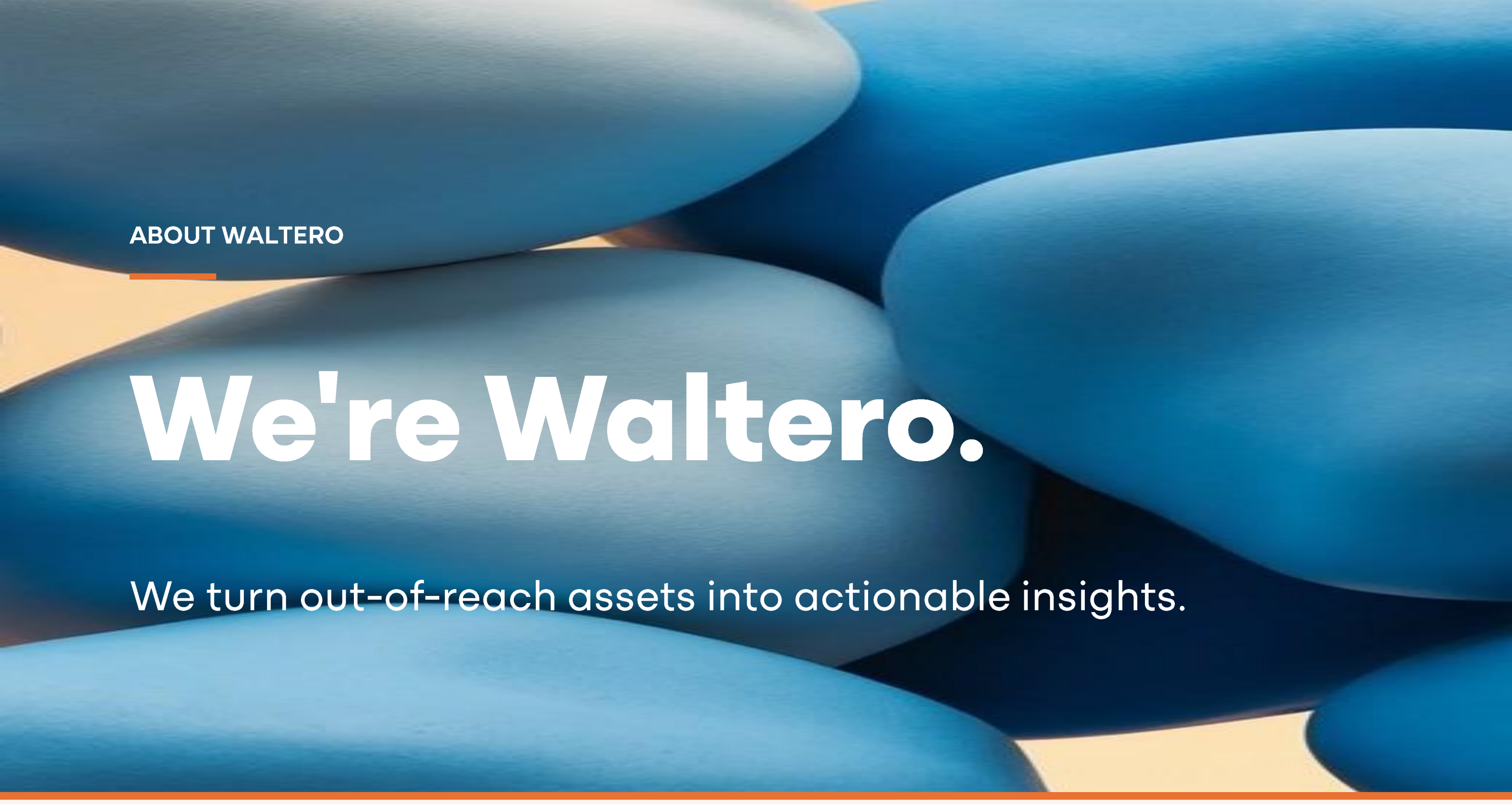
Sensor bridging

All modalities in one platform. Dashboards, alerts, exports treat the sensor as a single source.

NEXT STEP · EMASESA · RÍO PUDIO

One sensor. Three signals.

A W-Sensor monitoring the sieve of the trash screw via camera — combined with sound and vibration signatures of the motor. From a single battery-powered device.



ABOUT WALTERO

We're Waltero.

We turn out-of-reach assets into actionable insights.

OUR PROPOSITION

Battery-powered. Built-in connectivity. Zero infrastructure.
Deploy fast, see value immediately, and operate smarter and more sustainably.

HEADQUARTERS
Lund, Sweden

CUSTOMERS
Utilities, municipalities,
and industries worldwide

GLOBAL OFFICES
Austin · Helsinki · Singapore

TEAM
Engineers, innovators, problem-solvers

CERTIFICATIONS
ISO 9001 · ISO 14001

PLATFORM
W-Sensor · Mimir

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