PELLO - Smart Sensors and AI

Facilitating Efficient Waste Collection

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In-Field Waste Management

In Bin Sensor combined with an extensive
Cloud system driven by AI

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Our Vision: Smart Waste Management

Develop an in Bin Sensor coupled with an AI system for:

- Accurate fill level
- Accurate AI contamination detection
- GHG reduction
- Real Sustainability #'s
- Significant Operations optimization

Found that:
Smart Waste Management is Hard

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Why Do we say Hard?

Been there done that – in the REAL world for the last 8+ years.

- Experience running numerous sensors that did not work out (see photo of some of them below)
- Deployed 7000+ other manufacturer's sensors that in the end also did not allow for Smart Waste Management.
  - But we know what is needed
  - And we Know what has been missed

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What's Needed or Been Missed?

- **Accurate Data**
  - Single sensors (ultrasonic, or laser TOF) are problematic - show full or empty but who knows that if you cannot "see" the bin ?
  - Optical only (camera or laser) - also fail when dirty

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PELLO M300 sensor ultrasonically measures 3 zones at once

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What's Needed or Been Missed?

- **Consistent Data Reporting**
  - bins do not "move"
    no connect = never connect

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PELLO M300 sensor allows for an external antenna for low signal areas

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- **Durability**
  - Built for purpose
  - Optics much more affected than Ultrasonics

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PELLO M300 ultrasonic sensor has always made a fill measurement

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- **Contamination Detection**
  - With Photos – by eye or AI

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PELLO M300 sensor has color camera and integrated AI

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What's Needed or Been Missed?

- **Automation**
  - Manually check a couple of thousand bins daily?

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PELLO has integrated automatic notifications

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What's Needed or Been Missed?

- Cloud based open platform with:
  - Individual access by level &
  - API integration capability for 3rd party sensors

- Integrated optimization & cutting edge AI tech

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PELLO has access by admin level and allows individual access to single bins

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Smart Waste Management Solved

The PELLO System

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PELLO Advanced Technology for Smart Waste Management

Our Secret?

- Unique cellular based multisensor
- Multiple ultrasonics, Camera, AI
- Real Waste Management experience

DDW M300
In Bin Sensor

wAIste™

- Cloud based open platform
- Cutting edge tech with AI

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... A Smart Waste System

- Real-time fill level monitoring
- Efficient pickup scheduling,
- Instant notifications
- Precise bin location tracking,
- Seamless integration
- Cutting-edge AI models to:
  - optimize waste reduction,
  - Build useable solutions through high accuracy

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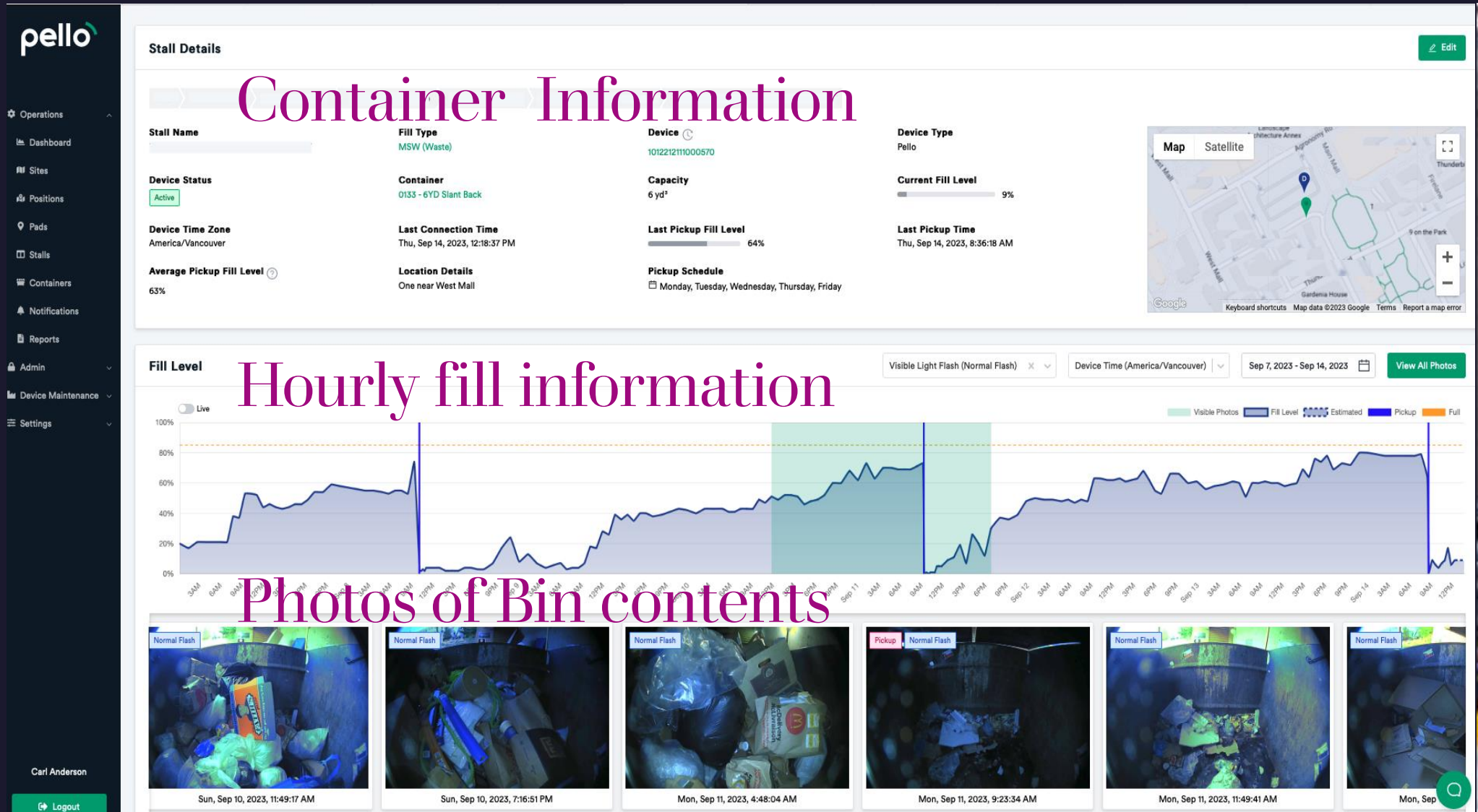
A Smart Waste System

Container View

Container Information

Hourly fill information

Photos of Bin contents



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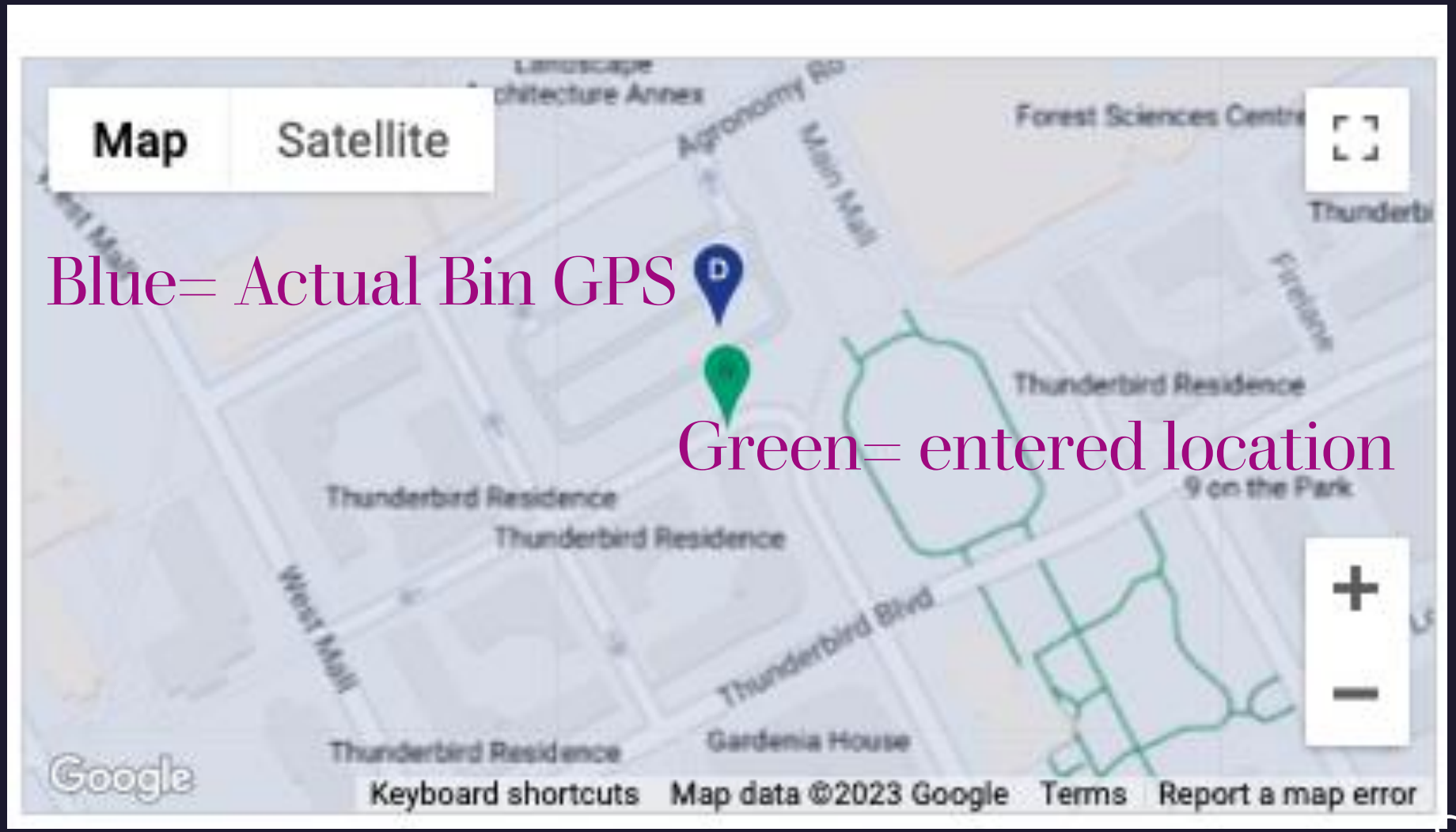
Quick looks - Location

Blue=Actual GPS location



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Quick looks – Fill Level

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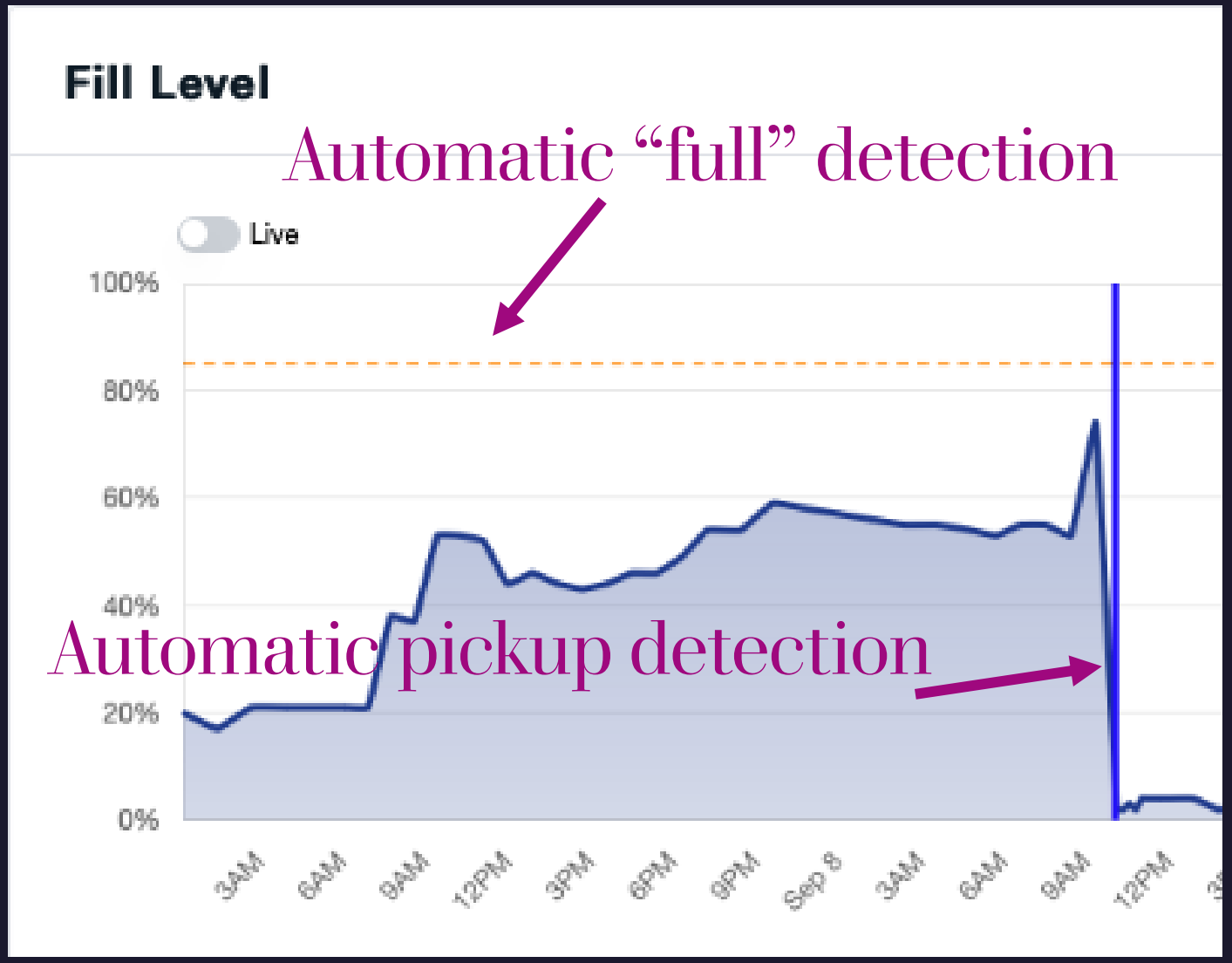
Quick looks – Edge Automation



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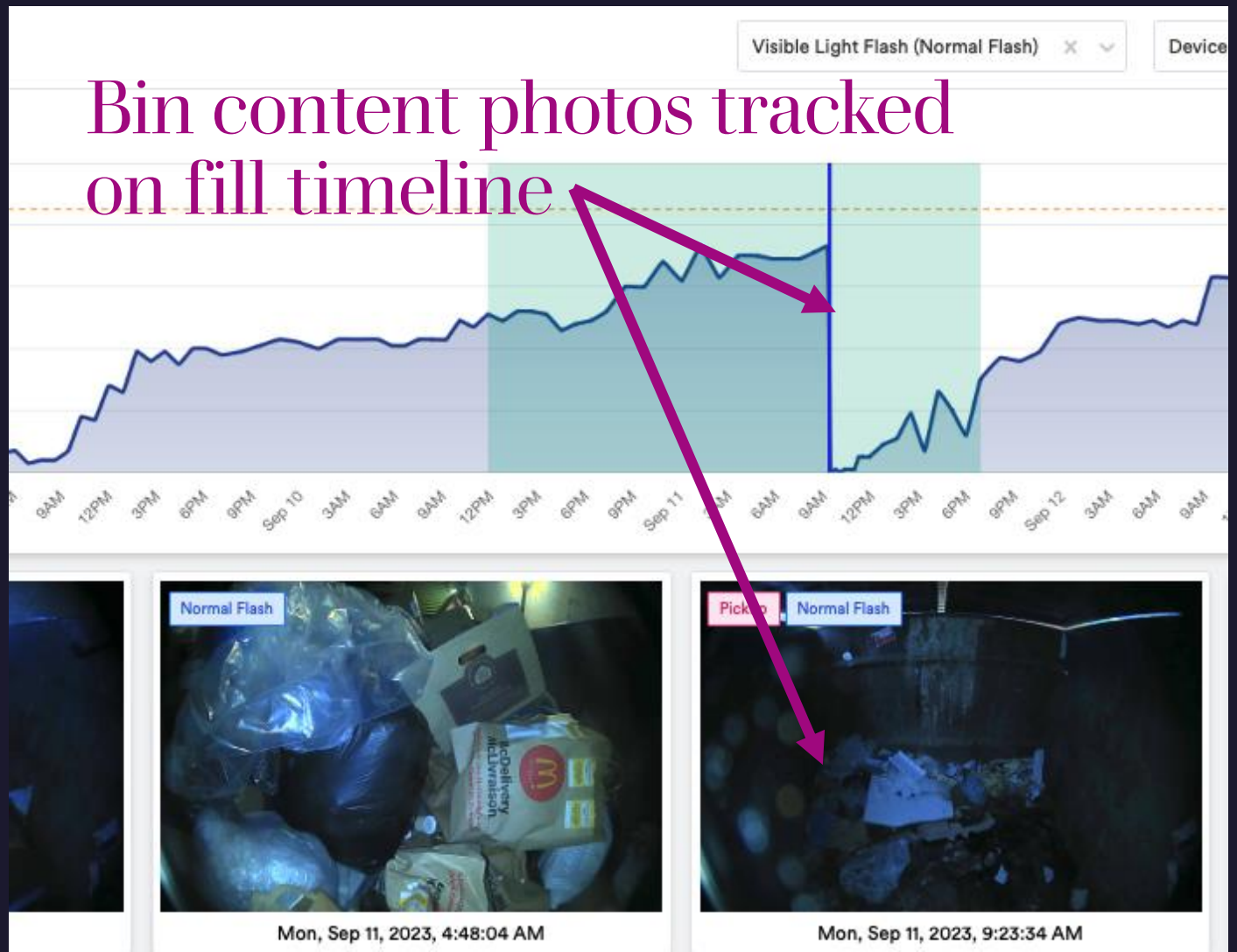
Quick looks – Photo Timeline

Photos tracked on fill timeline



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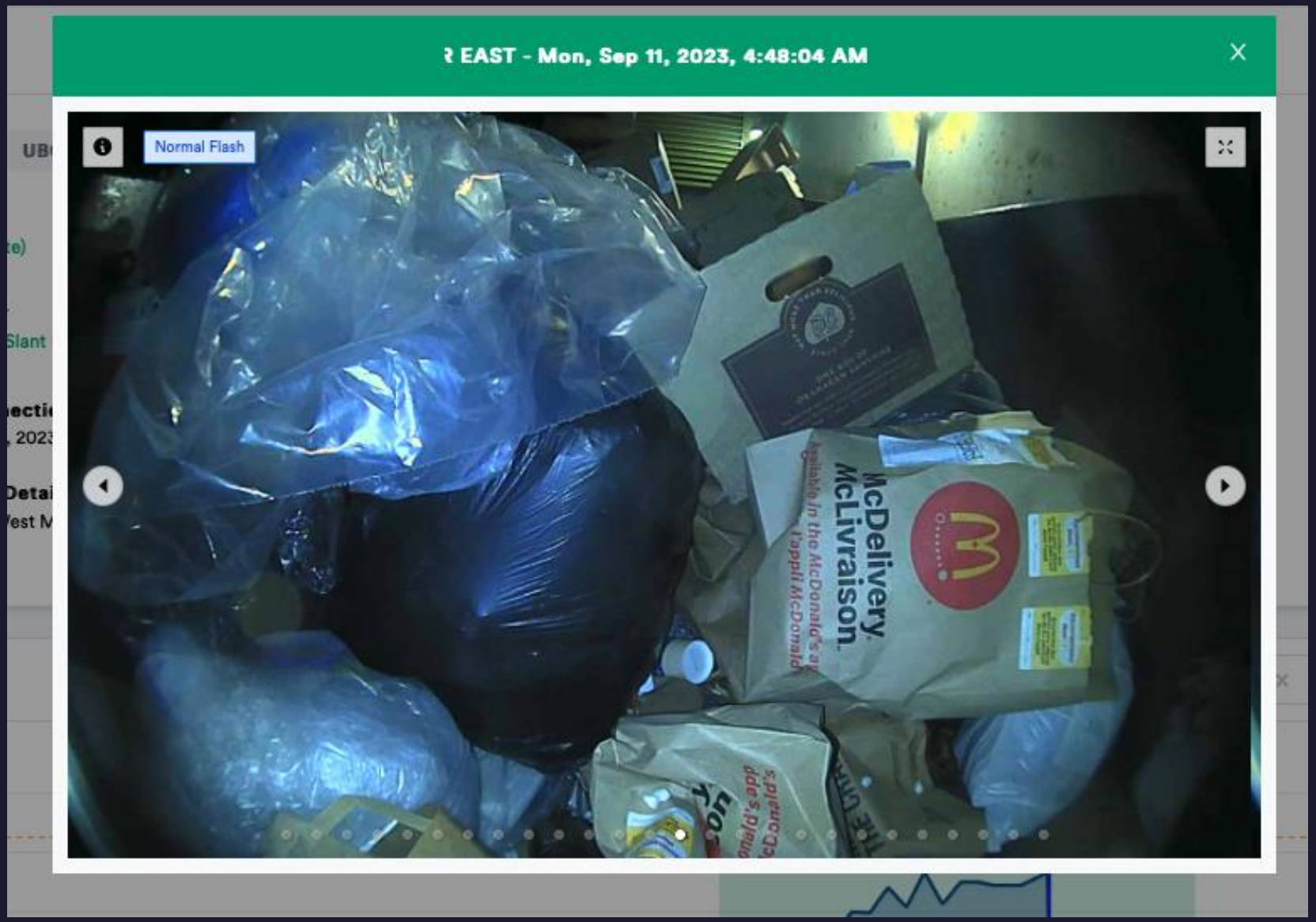
Quick looks – Photo Detail



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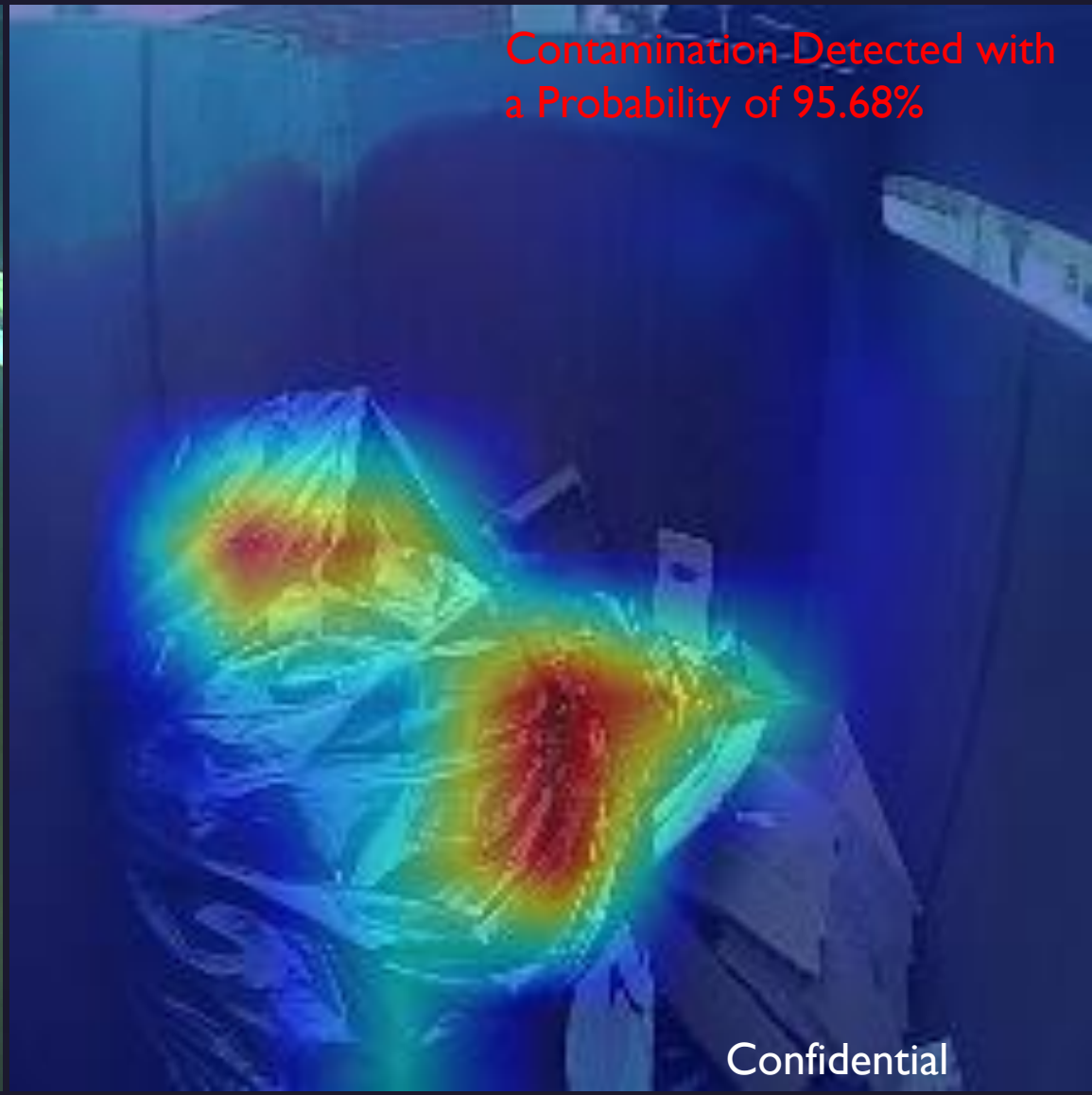
Plastic Contamination Detection in Recycling Bins with 95% accuracy



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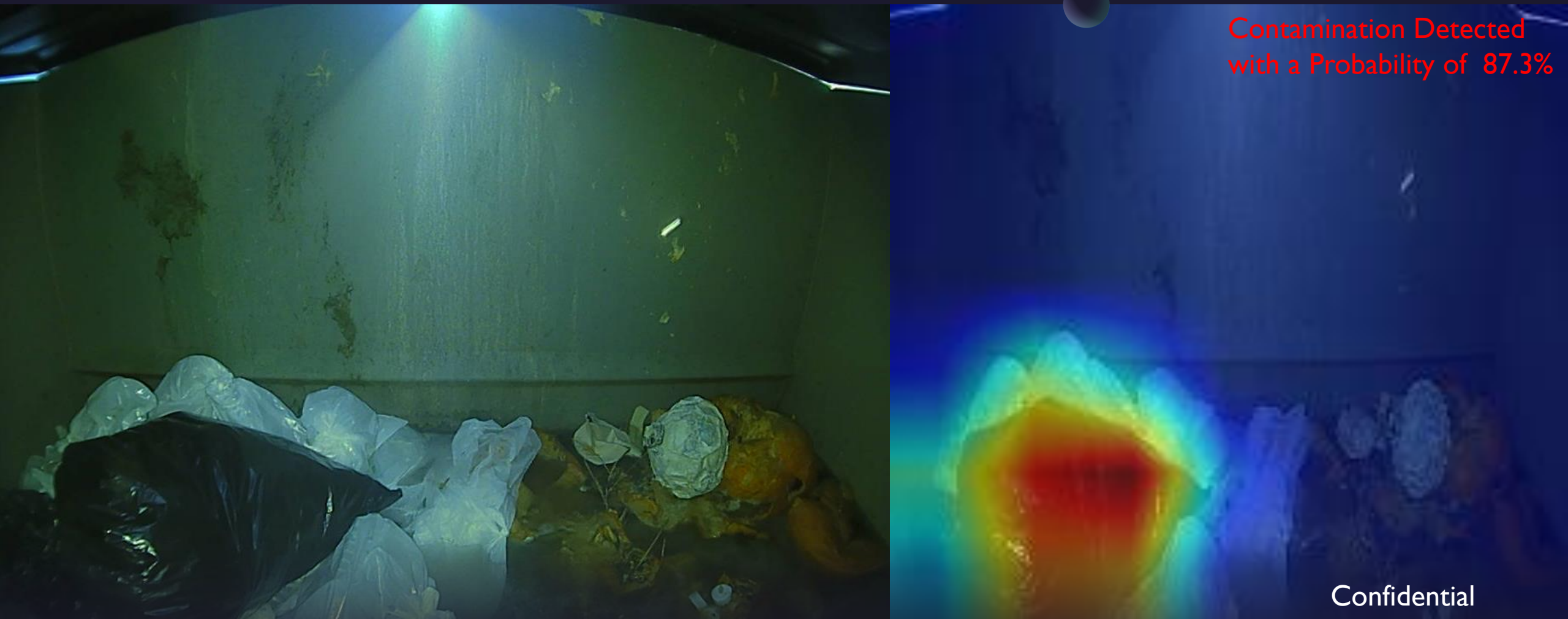
Plastic Contamination Detection in Organics Bins with 89% accuracy



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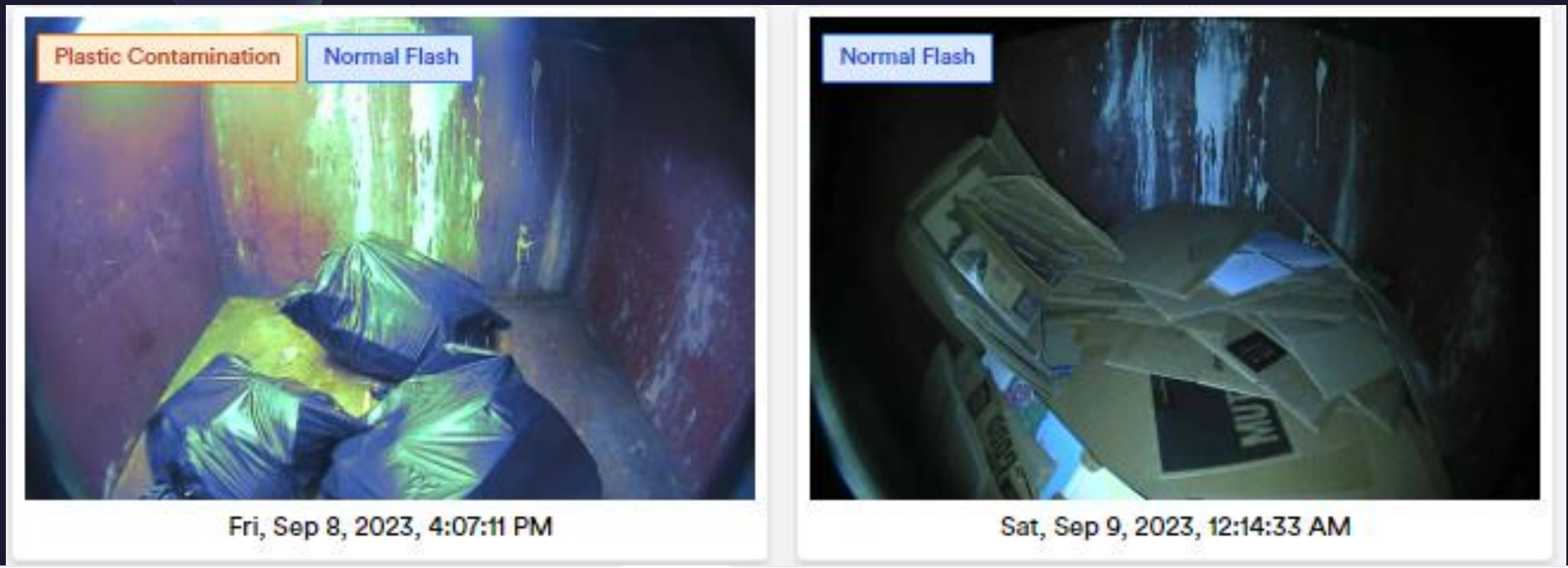
Plastic Contamination Detection Notifications



app.hellopello.io/notifications?notificationsFilters=eventType&notificationsLimit=100&notificationsPage=1&notificationsSort=event.time...

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Home / Notifications

Notifications

View Notification Settings

Operations
- Dashboard
- Sites
- Positions
- Pads
- Stalls
- Containers
- Notifications
- Reports

Admin

Filters 1 | Local Time (America/New_York) | Sep 14, 2023 - Sep 14, 2023 | Contamination Detected | Export

Upload Time	Device Time	Event	Fill Level	Resolved	Resolved Time	Stall	Device
Thu, Sep 14, 2023, 4:30:39 PM	Thu, Sep 14, 2023, 4:30:33 PM	Plastic Contamination	12%			WSC004645_30000_OCC	101137230100042
Thu, Sep 14, 2023, 4:24:27 PM	Thu, Sep 14, 2023, 4:24:13 PM	Plastic Contamination	59%			WSC001116_100000_OCC	1012212111000228
Thu, Sep 14, 2023, 4:24:27 PM	Thu, Sep 14, 2023, 4:24:20 PM	Plastic Contamination	59%			WSC001116_100000_OCC	1012212111000228
Thu, Sep 14, 2023, 4:08:00 PM	Thu, Sep 14, 2023, 4:07:31 PM	Plastic Contamination	12%			WSC002528_30000_OCC	101137230100041
Thu, Sep 14, 2023, 4:08:00 PM	Thu, Sep 14, 2023, 4:07:39 PM	Plastic Contamination	12%			WSC002528_30000_OCC	101137[illegible]010004
Thu, Sep 14, 2023, 2:12:24 PM	Thu, Sep 14, 2023, 2:12:19 PM	Plastic Contamination	0%			WSC001333_73750_OCC	101137230100036

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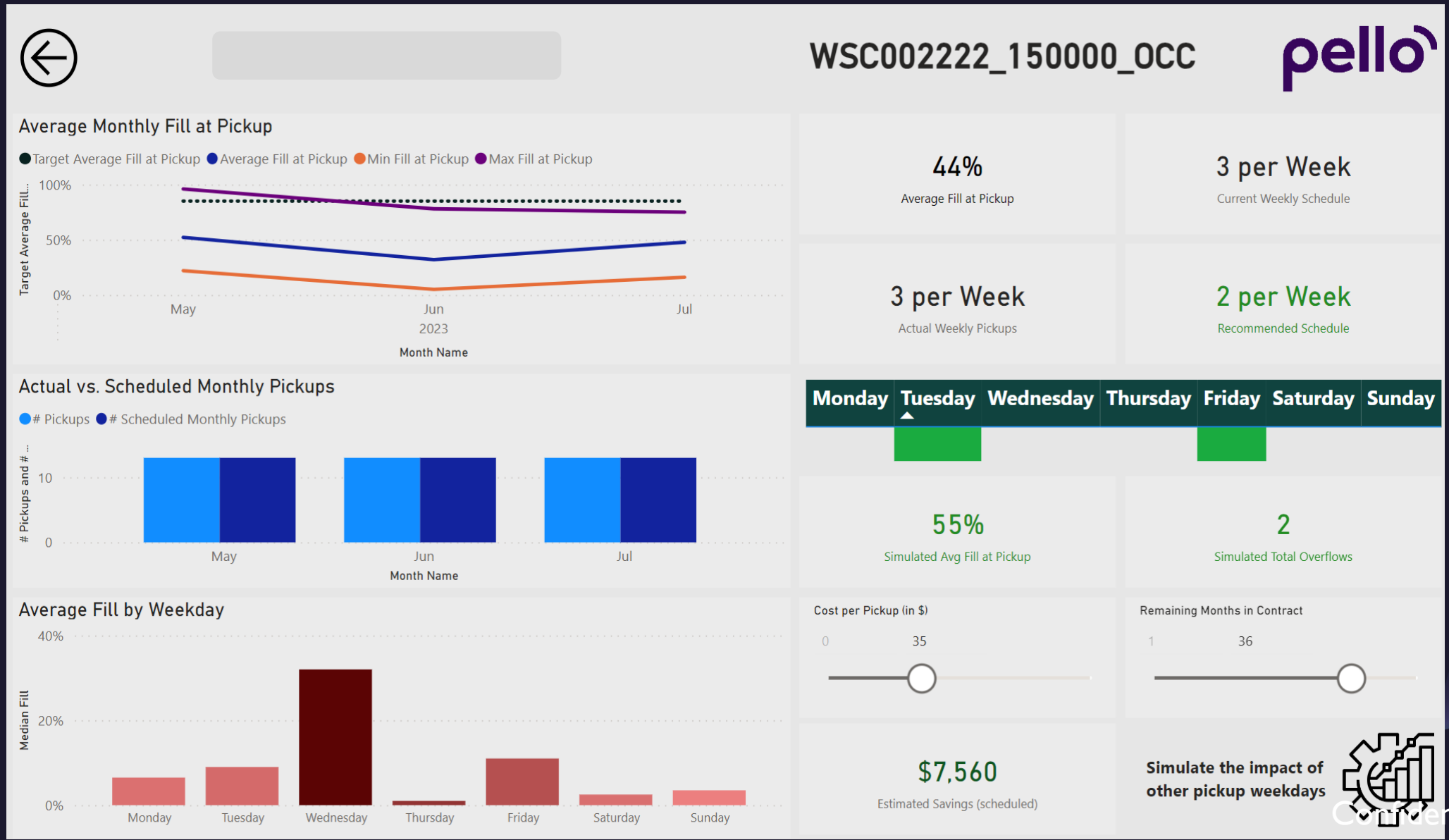
Bin Optimization for reducing cost and GHG emissions



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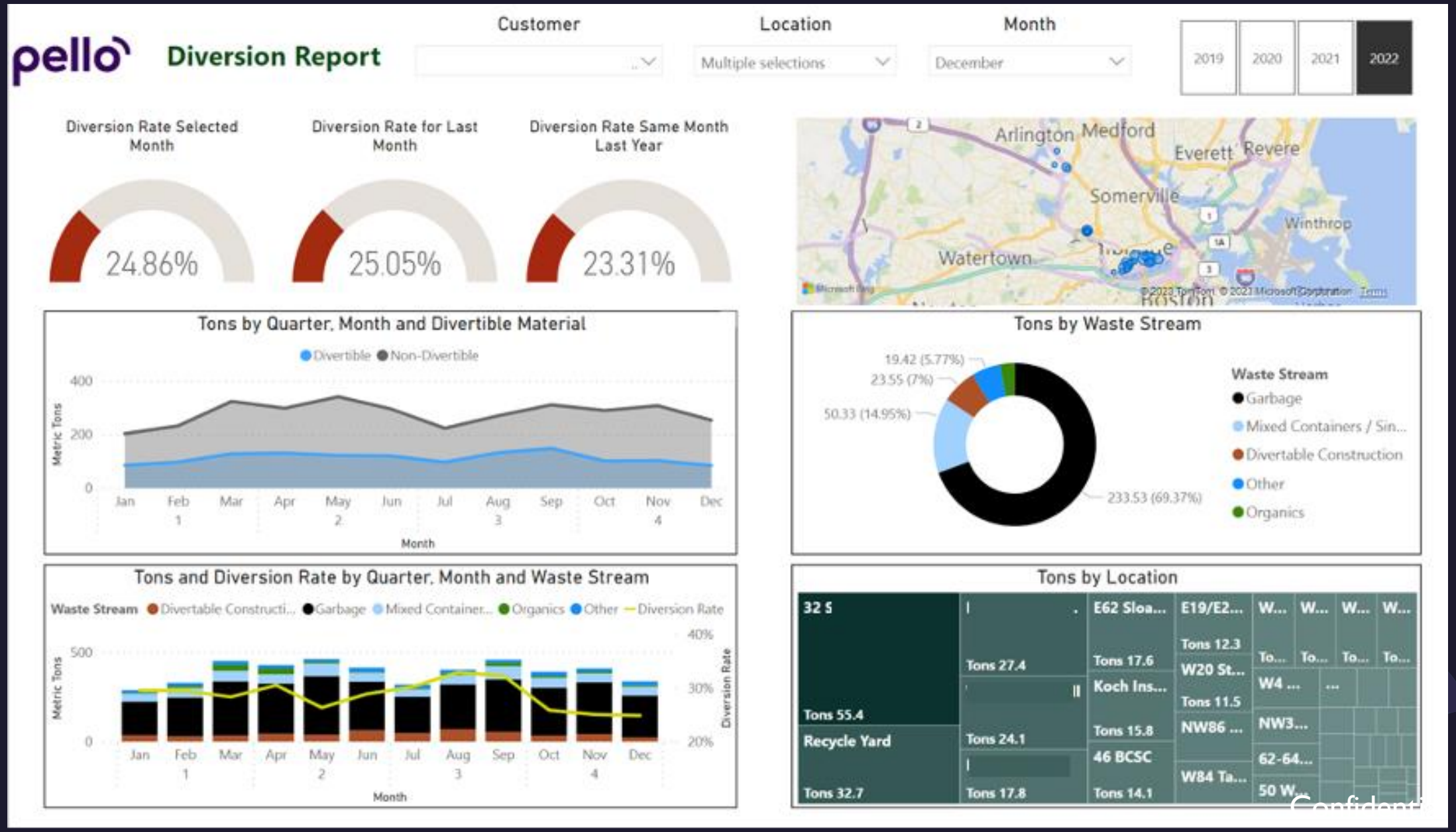
Real Sustainability reporting



Thank you

Adding Visibility to Smart Waste
for a Greener, Cleaner World