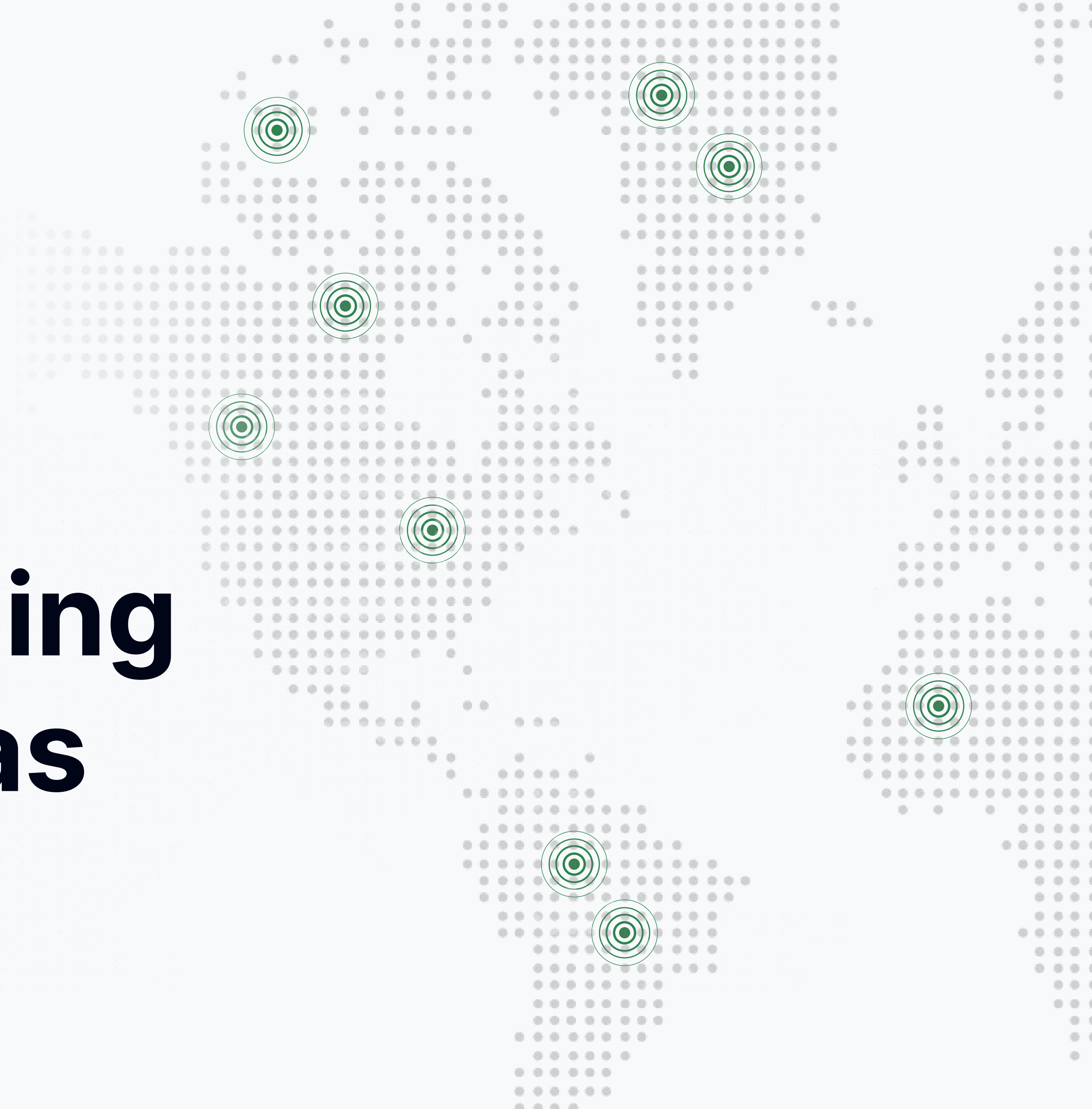




Transforming Residential Recycling Through **AI** in Texas





BACKGROUND

A Growing Challenge in Residential Recycling

WasteVision AI's client, a mid-sized municipality in Texas, with a rapidly growing population and an expanding residential base, has long prioritized sustainable waste management. However, like many municipalities across the country, they faced significant challenges in maintaining the quality of its recycling stream.

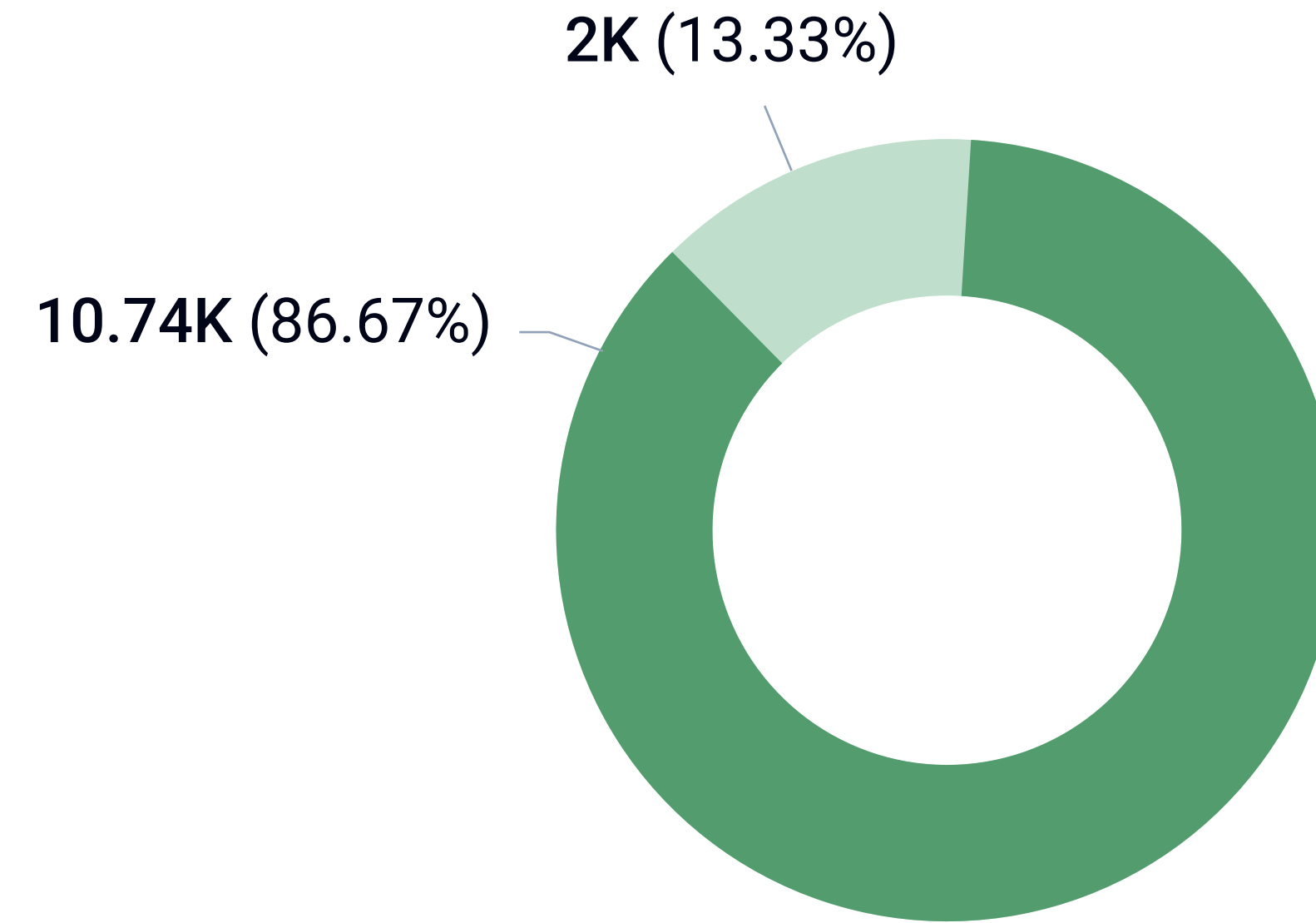
Two persistent contaminants, plastic bags and yard waste, posed the greatest threat to the city's recycling efforts. Plastic bags, the most common recycling contaminate in the US, cannot be recycled. Yard waste, while organic, is non-recyclable in standard recycling streams and contaminates otherwise recoverable material.

If the percentage of contaminants in a recycling load exceeds a threshold, the recycling facility will be unable to recycle the load. When this occurs, the facility will have to send large quantities of recyclable material which has been mixed with the contaminants to the landfill. As a result, recycling facilities will increase prices and even begin refusing to accept loads from some haulers who frequently bring overly contaminated loads.

Participation Rate



- Participating Houses
- Non-Participating Houses



Generator Analysis

Total Contaminations



A Data-Driven Solution to Waste Contamination

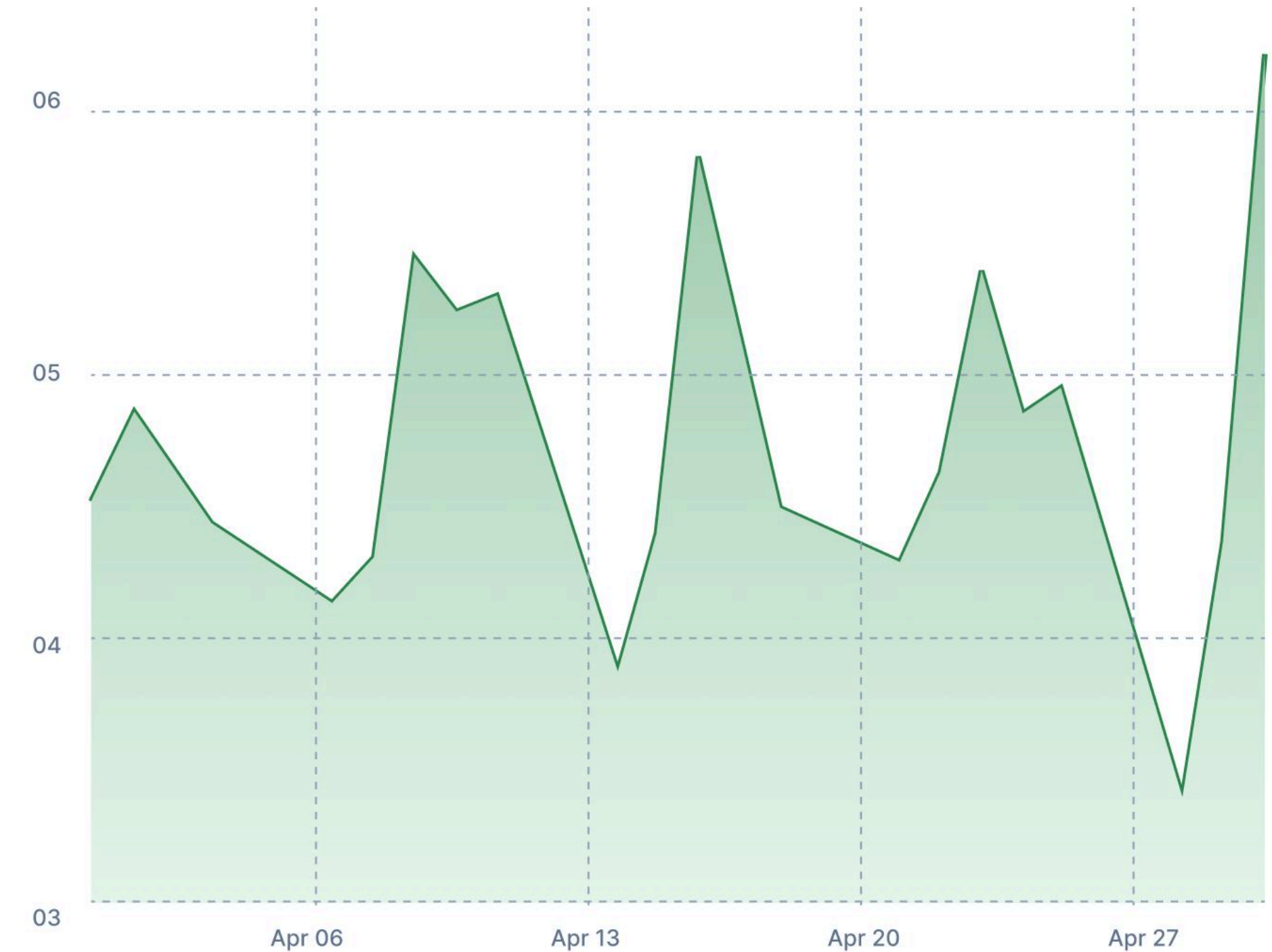
Traditional methods for managing contamination rely heavily on removing contamination once it arrives at the facility. This is both time-consuming and resource-intensive. These approaches provide no visibility into contamination patterns, making it impossible to identify problem areas or residents. These methods treat the symptoms rather than addressing the root cause by effectively engaging residents with targeted education.

The municipality needed a solution that could:

- Identify contamination accurately at scale at the point of collection
- Provide actionable data to their sanitation and recycling teams
- Enable a targeted, cost-effective public education strategy
- Reduce operational costs associated with contamination handling

Set-Out Rate

Several factors contributed to the success of this initiative:



WasteVision's AI-Powered Contamination Detection System

To meet these goals, the municipality partnered with WasteVision AI, deploying an innovative, technology-driven solution that integrates artificial intelligence into their daily waste collection operations.

AI Camera Systems in Truck Hoppers

WasteVision AI's advanced AI-powered camera systems were installed inside the hoppers of the municipality's waste collection trucks. These cameras continuously captured images of waste materials during collection operations.

Utilizing advanced **computer vision models**, the system was trained to detect specific contamination types, with a focus on:

- **Plastic bags** - including single-use grocery bags and other film plastics
- **Yard waste** - such as leaves, branches, and grass clippings

The system automatically processed images in real time, flagging contaminated loads and associating contamination events with specific addresses and routes.

Targeted Resident Outreach Campaign

Armed with this rich, granular data, the municipality initiated a **highly targeted public education campaign**. Rather than sending generic recycling guidelines to all residents, the city focused efforts on those households and neighborhoods where contamination was consistently identified.

The City sent **personalized postcards** to residents with repeat contamination incidents. These postcards were designed to:

- Inform the resident that contamination was detected at their address
- Clearly specify the type of contamination (plastic bags or yard waste)
- Encourage residents to improve their recycling habits with positive messaging

Seamless Data Integration with PowerBI

One of the key differentiators of the WasteVision solution is the ability to **seamlessly integrate** data with operational dashboards. Using WasteVision's **PowerBI Connector**, contamination identification data was automatically synchronized with the City's daily route data and set-out rates.

This integration enabled the municipality's sanitation team to:

- View **contamination rates by neighborhood, route, or even household**
- Track **set-out rates**, providing insights into resident participation levels
- Identify **high-priority areas** for intervention and educational outreach

Why It Worked

Key Factors for Success

Several factors contributed to the success of this initiative:

- **Real-Time Data:** Continuous, automated contamination detection eliminated delays and blind spots in identifying problem areas
- **Data-Driven Decision Making:** Integration with PowerBI allowed for actionable insights and precise targeting
- **Personalized Communication:** Residents responded more positively to specific, customized feedback compared to generic mass messaging
- **Scalable Technology:** The system can easily scale to cover more routes or extend to other types of contamination if needed

Technologies Deployed

- **WasteVision AI Camera Systems:** Real-time image capture and contamination identification using edge computing
- **WasteVision PowerBI Data Connector:** Seamless data integration enabling dynamic, actionable reporting dashboards
- **Custom Resident Outreach Platform:** Data-driven tools to manage targeted educational campaigns

🚫 Plastic Bags Found In Your Bin

Dear Resident Name,

Help our community keep recycling clean and green

✅ RECYCLABLE

Paper

Cardboard

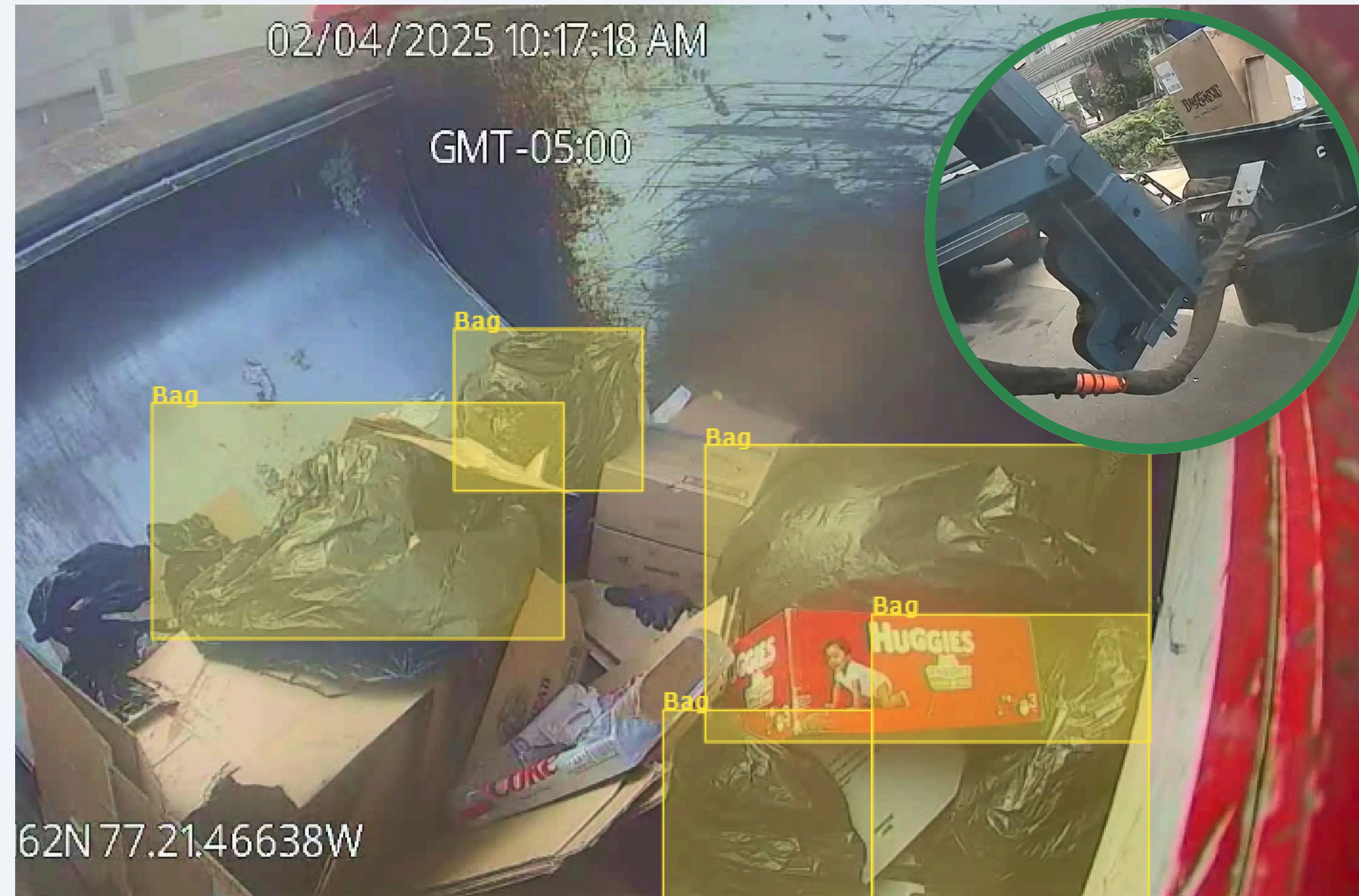
Cans

❌ NOT RECYCLABLE

❌ Plastic bags

❌ Yard Waste

❌ Food Waste



♻️ Reduce Plastic Waste

Instead of using plastic bags, please consider using reusable grocery bags. Alternatively, kindly drop off used plastic bags at grocery stores where they can be recycled!

CONCLUSION

A Model for the Future of Smart Waste Management

The municipality's pilot project with WasteVision AI demonstrates the transformative potential of artificial intelligence and data analytics in municipal waste management. By combining real-time contamination detection with targeted public education, the municipality was able to:

- Achieve significant reductions in contamination rates
- Improve operational efficiencies
- Foster greater resident engagement and awareness

This project serves as a model for other cities looking to modernize their recycling programs and meet sustainability targets. With AI-driven insights, municipalities can move from reactive to proactive waste management, driving long-term environmental and economic benefits.

