Mobile Tools for Addressing Contamination

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Greensboro’s Recycling Program

- Greensboro adopted single-stream automated collection in 1993, first on East Coast
- Strong resident commitment to recycling
  - 68% set-out rate
  - 420 lbs of recycling per household per year
  - 23% recycling rate
The Contamination Problem

• Older program comes with legacy issues
  • Residents never had bins, no direct feedback
  • Confusing cart colors
• Budget reductions eliminated several inspector positions
• Lack of program data
• No incentive to reduce contamination
The Contamination Problem

- Contamination is more than just a recovery issue
- Significant safety hazards for MRF workers
Types of Contamination

Wishful Recycling

Education

Recycling Cart as Trash Can

Inspections and Enforcement

Ways to Address Contamination
Greensboro’s New Efforts

- Revamped education and outreach
  - Rebrand recycling program
  - Direct mail recycling guide and every-other-week calendar
  - New education tools: website, mobile app, education van
Greensboro’s New Efforts

- Overhaul of Inspections program
- Previously: one inspector to 82,000 households
- How to increase inspections without additional staff?
  - Recycling truck drivers have the opportunity to examine every set-out
  - Need to equip them with the proper tools

Fact: We only have data on 5% of Greensboro.
Mobile 311 for Inspections

- Mobile Workforce
- Customizable App
- Cloud Data Hosting
- Custom Website
- Customizable Data
- Work order System
- Enables GIS analysis
Contamination seen seconds after being dumped into a truck through the dash-mounted Hopper Camera.
Mobile 311 App – Custom Screens
Implementation

- Mobile 311 application piloted in Greensboro recycling trucks by ReCommunity Recycling
- Pilot study showed that contamination, including repeat offenders, can be identified and addressed using Mobile 311 and truck hopper cameras

30% households flagged once

22% households flagged twice

11% households flagged three or more times
HOW TO REDUCE CONTAMINATION
Using Mobile GPS Technology

1st Violation
• Driver pins an address for having contamination (using GPS locator) using simple tablet interface mounted on the dashboard
• A work order is automatically emailed to the City Code Inspector to bring recycling information to the household

2nd Violation
• Driver pins a second violation on an address.
• A work order is generated for the City Code inspector to issue a warning that container will be removed if another violation occurs.

3rd Violation
• Driver pins the same address a third time.
• A work order is generated for City Code Inspector to remove the container and no longer service it.

Data analysis (Mary or Alex)
Data analysis (Mary or Alex)

STOP

Source of contamination is removed.

EXPECTATION
Set expectation for operators to use tools. Integrate into operations. Expect residents to use the container properly.

ADMINISTRATION
Create strong internal policy and procedures to address issues and complaints. Give all levels of operation clear directives and rules.

CONVICTION
Systemically adapt the conviction that users do not have the right to contaminate the recycling program.
Changing Inspector’s Workflow

- Eliminate pen and paper recordkeeping
- Able to access real-time data regarding skips, etc
- Ability to plan inspection activities in advance, looking at previous weeks’ skips and issues
Results

- In a 6 month period:
  - 1342 skipped carts
  - 1669 instances of contamination (not skipped)
  - 6248 instances of bagged recyclables

Map: Skipped Recycling Carts
Future Uses for Data

- Direct mail postcards or letters to residents with contamination issues
- Establish hard data on neighborhoods and areas with persistent issues
- Provide justification to remove service, or possibly fine in the future
- Target specific contaminants, e.g. plastic bags, polystyrene foam
- Use data for competitions, incentive programs
- Generate solid data on staffing needs, allow us to right-size our inspections staff
Barriers to Implementation

- Driver and inspector training, changing work behaviors
- Project management - needs a strong leader
- Cost: software license, tablets
Questions?

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