

Mobile Tools for Addressing Contamination

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Greensboro, NC

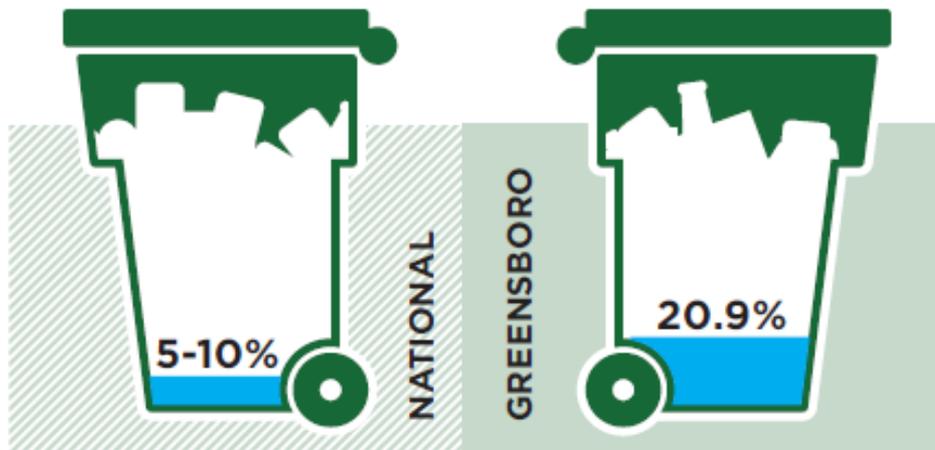
Greensboro's Recycling Program

- ▶ 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

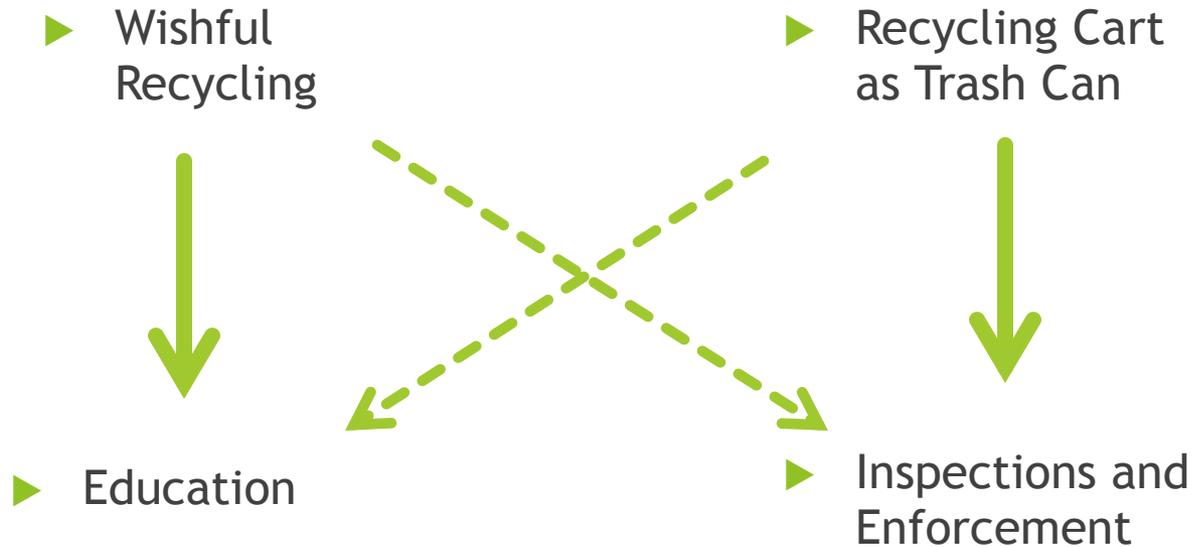
- Older program comes with legacy issues
 - Residents never had bins, no direct feedback
 - Confusing cart colors
- Budget reductions eliminated several inspector positions
- Lack of program data
- No incentive to reduce contamination



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



Types of Contamination



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 Recycling Guide

BLUE
 RECYCLING SCHEDULE

Your recycling and bulk items are collected every other week as shown below in **BLUE**.

During holiday weeks, collection days may change:
THURSDAY, JANUARY 1 - NEW YEAR'S DAY
 Thursday collection on Wednesday, December 31
 Friday collection on Thursday, January 1
MONDAY, JANUARY 19 - MILK JELLY DAY
 Monday collection on Tuesday, January 20
 Tuesday collection on Wednesday, January 21
FRIDAY, APRIL 3 - GOOD FRIDAY
 Thursday collection on Wednesday, April 1
 Friday collection on Thursday, April 2
MONDAY, MAY 25 - MEMORIAL DAY
 Monday collection on Tuesday, May 26
 Tuesday collection on Wednesday, May 27
FRIDAY, JULY 3 - INDEPENDENCE DAY
 Thursday collection on Wednesday, July 1
 Friday collection on Thursday, July 2
MONDAY, SEPTEMBER 7 - LABOR DAY
 Monday collection on Tuesday, September 8
 Tuesday collection on Wednesday, September 9
THURSDAY, NOVEMBER 26 - THANKSGIVING
 Thursday collection on Wednesday, November 25
 Friday collection on Thursday, November 26
FRIDAY, DECEMBER 25 - CHRISTMAS
 Thursday collection on Wednesday, December 23
 Friday collection on Thursday, December 24
■ City of Greensboro Holidays

JANUARY 2015							FEBRUARY 2015							MARCH 2015							APRIL 2015									
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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



Had
FACT: WE ONLY ~~HAVE~~ DATA ON 5% OF GREENSBORO

Contamination is Visible



Contamination seen seconds after being dumped into a truck through the dash-mounted Hopper Camera



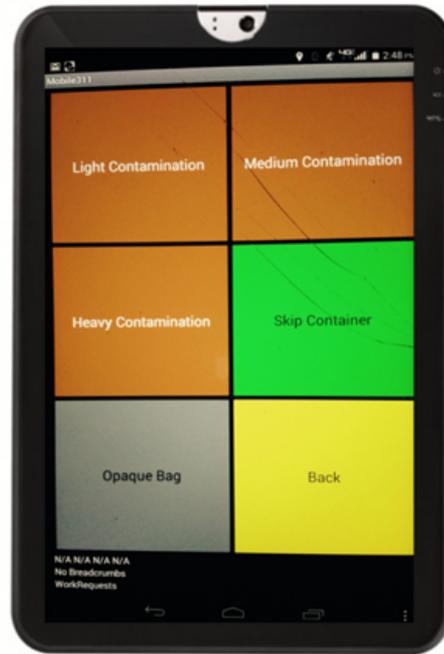
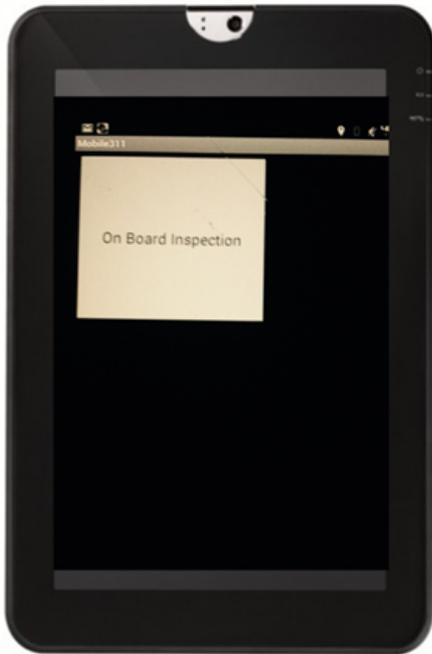
Mobile 311 by Facility Dude for Inspections

- ▶ Mobile Workforce
- ▶ Customizable App
- ▶ Cloud Data Hosting
- ▶ Custom Website
- ▶ Customizable Data
- ▶ Work order System
- ▶ Enables GIS analysis

The image displays two screenshots of the Mobile311 Work Force System. The top screenshot shows a web-based GIS interface with a map of a city area. The left sidebar contains a filter menu with categories like 'Date Range & Priority', 'Work Items', 'Statuses', 'Employees', and 'GIS Data'. The bottom screenshot shows a '753 Work Items' table with columns for ID, Priority, Change Status, Address, Sheet Name, Work Type, Date Reported, Picked By, Modified By, Last Modified By, Time Open, Photo, Description, Comments, Account ID, GIS Layer, Latitude, Longitude, Type1, and Type2. The table lists several work items with details such as 'Heap Contamination' and 'Heap Contamination' at various addresses.

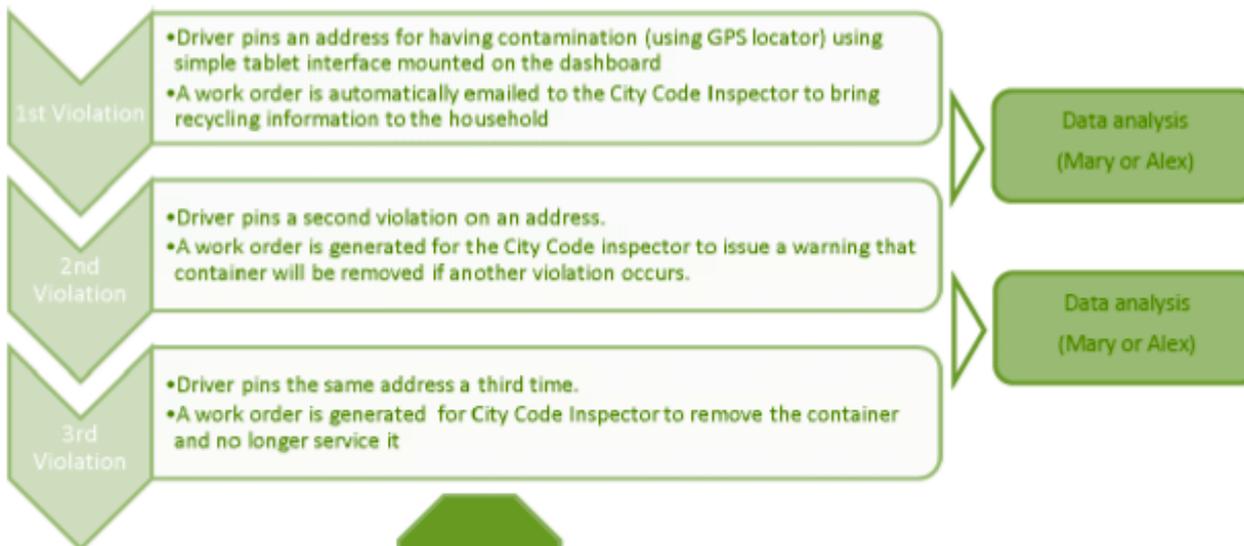
ID	Priority	Change Status	Address	Sheet Name	Work Type	Date Reported	Picked By	Modified By	Last Modified By	Time Open	Photo	Description	Comments	Account ID	GIS Layer	Latitude	Longitude	Type1	Type2
124561	5	New	417	48	Heap Contamination	3/18/2015	RR_Admin	2:34:51	RR_Admin	2:34:50		Take out foam container				36.8794883333333	-76.7688033333333	Blank	Blank
124562	5	New	3538	LUTHERMAN ST	Open Bag	3/18/2015	RR_Admin	2:35:46	RR_Admin	2:34:54						36.8792966666667	-76.7684833333333		
124563	5	New	291	MARSHALL ST	Slip Container	3/18/2015	RR_Admin	2:34:23	RR_Admin	2:33:39		strip metal clothes				36.8754288888889	-76.7682056666667		
124564	5	New	215	MARSHALL ST	Heap Contamination	3/18/2015	RR_Admin	2:35:51	RR_Admin	2:35:54		add clothes				36.8754288888889	-76.7682056666667	Blank	Blank
124565	5	New	311	N BOONER ST	Heap Contamination	3/18/2015	RR_Admin	2:33:59	RR_Admin	2:33:52						36.8754283333333	-76.7688033333333	Blank	Blank
124566	5	New	215	MARSHALL ST	Heap Contamination	3/18/2015	RR_Admin	2:32:36	RR_Admin	2:32:34		clothes, putting up sign on address instead of here				36.8754288888889	-76.7682033333333	Blank	Blank

Mobile 311 App – Custom Screens



HOW TO REDUCE CONTAMINATION

Using Mobile GPS Technology



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.

Implementation

- ▶ Mobile 311 application piloted in Greensboro recycling trucks by ReCommunity Recycling for 3 months in the most contaminated routes
- ▶ Pilot study showed that contamination, including repeat offenders, can be identified and addressed using Mobile 311 and truck hopper cameras



30% households
flagged once



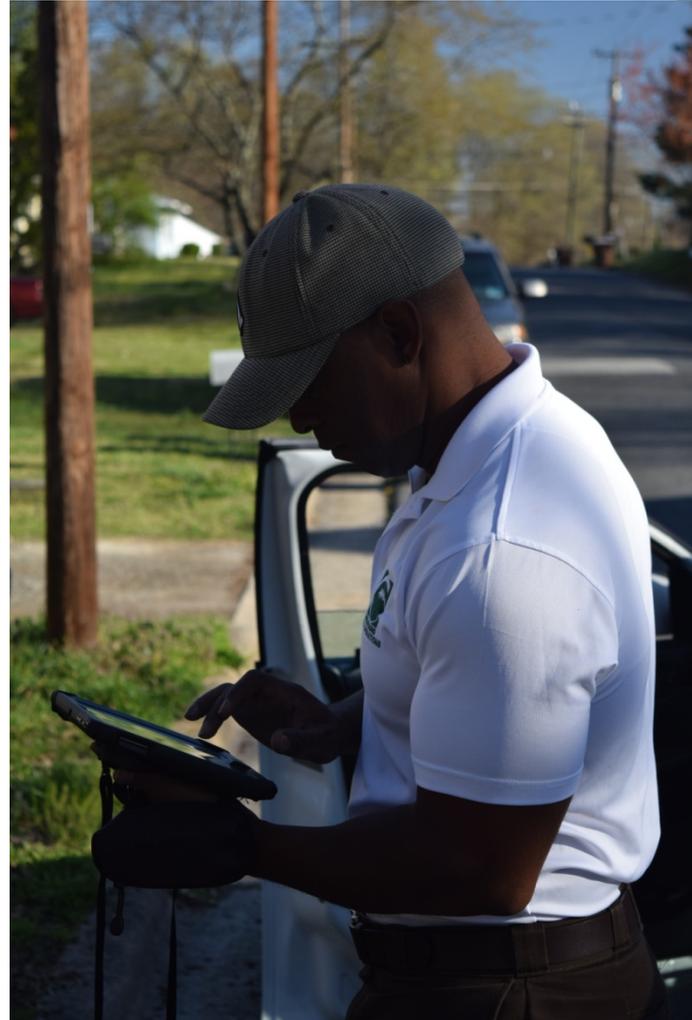
22% households
flagged twice



11% households
flagged three or
more times

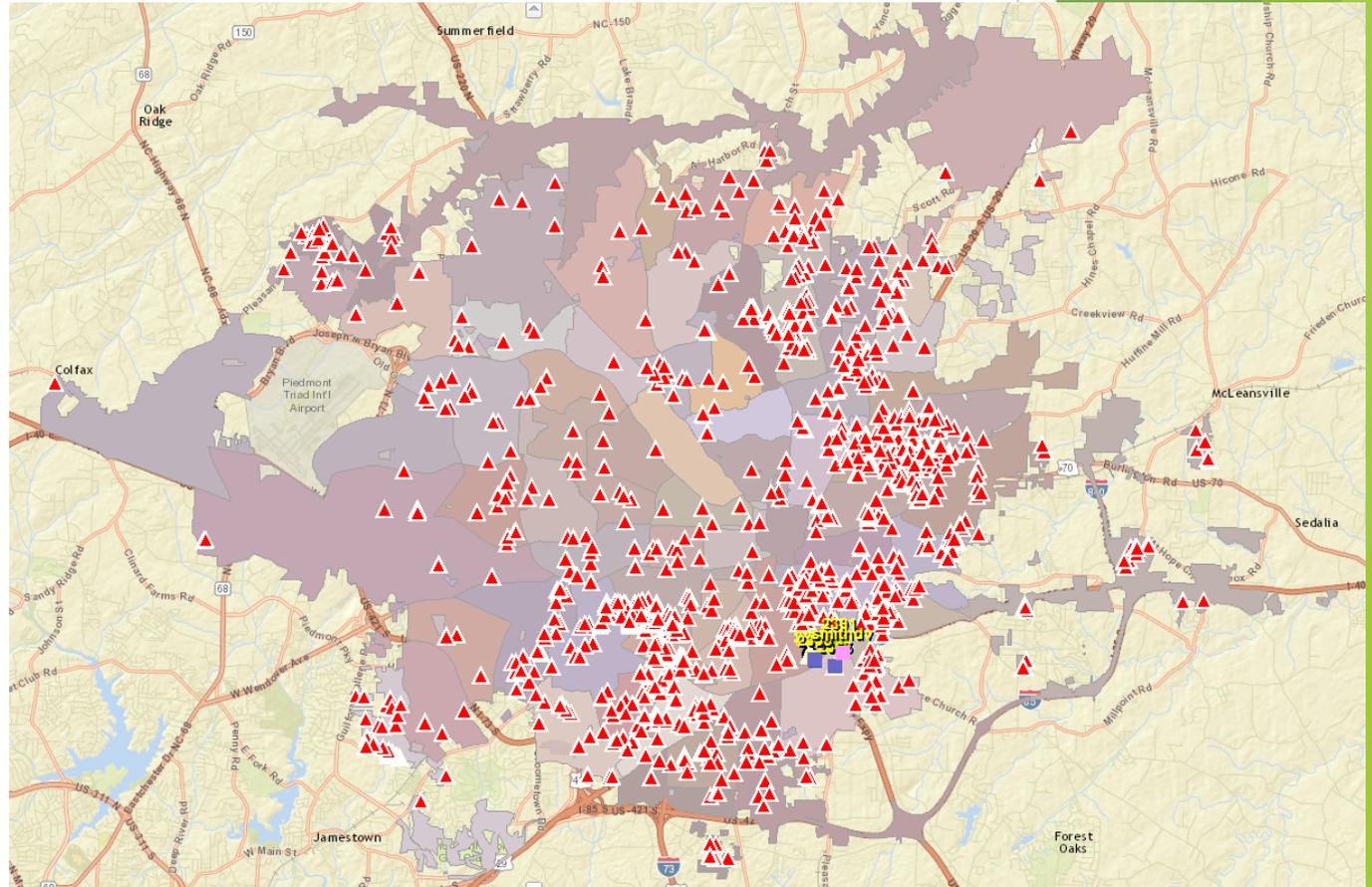
Changing Workflow

- ▶ Eliminate pen and paper recordkeeping for inspectors and vehicle operators
- ▶ Reduced radio use in trucks
- ▶ Able to access real-time data regarding skips, etc
- ▶ Ability to plan inspection activities in advance, looking at previous weeks' skips and issues
- ▶ More efficient procedures



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



Demonstration



Questions?

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