



# How2Recycle: Cleaning up Orlando's Multifamily Recycling Stream

City of Orlando



## Project Scope

- Focused on the successfulness of the How2Recycle label at reducing contamination when applied to a reusable tote bag with educational material.
- 13 properties and 2033 units
  - Mid-rise, High-rise, Garden-style
  - Apartment, condo
- Combination of different containers
  - Dumpsters, 95gal carts
- Minimum 3-week audit before and after tote distribution

# Brief Historical Context

- The City had just implemented a mandatory recycling ordinance for all commercial and multifamily properties
- The City was conducting labeling pilots to determine which label was most effective
- The City was conducting residential cart tagging projects
- The City was approached by The Recycling Partnership regarding the How2Recycle label and its application in a multifamily setting



- Conduct a baseline audit to determine extent of contamination
  - Data collection using GoCanvas
  - Pictures taken of each container
- Maintain uniformity between residential and multifamily
  - Used RQI and other indices.
    - CSI
- Distribute tote bags
  - Bilingual: English / Spanish
- Conduct a follow-up audit to determine change in contamination
  - Site visits take place on the day before collection
- Survey distribution
  - To include non-participating properties

7:06

How 2 Recycle

Contamination

☐

Bagged Recycling

☐

Bags/plastic film

☐

Food

☐

Styrofoam

☐

Metal

☐

Tanglers

☐













Other

Notes

New Photo


100%

New!

RQI Scale																
# categories of contaminants	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
RQI	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Recycling quality																
	Good															Bad

# Educational Material

## HOW TO USE THIS RECYCLING TOTE:

- 

**1.** Collect your accepted recycling materials in this tote
- 

**2.** Empty tote in recycling container
- 

**3.** Refill and repeat

Congratulations! Today you are receiving the tools you need to recycle successfully! This tote lists recyclables accepted locally and comes with a helpful magnet for your refrigerator. Know what to throw so you can waste less and recycle more.



Find out more about what you can recycle at [orlando.gov/recycle](http://orlando.gov/recycle).

Type the name of a waste item and we'll provide information on recycling or disposal.

**Thank you for your recycling contribution!**



## LOOK FOR THE How2Recycle LABEL

Use this recycling tote to collect and carry to your collection bin

Recycle the following items:



**Cans**  
empty and rinse



**Glass**  
empty and rinse



**Paper**  
flatten cardboard boxes



**Plastic Bottles & Containers**  
empty bottles and containers and replace cap



**NO!**  
Not in your recycling.



**Yuck**  
No Food or Liquid  
(empty all containers)



**No To-Go Containers**



**No bags, No trash.**  
(do not bag recyclables)



**No Batteries**

### Store drop-off only



**Plastic Bags and Wrap**  
cannot go in curbside recycling  
- take to store drop-offs

## RECYCLE



Learn more at [orlando.gov/recycling](http://orlando.gov/recycling)





# Cart labeling

## KNOW BEFORE YOU THROW!

¡ASEGÚRESE ANTES DE BOTAR!

Include only these items in your recycle cart:

Solo recicle:



**PLASTIC**  
Bottles and containers labeled #1 - #5  
Caps stay on  
Envases y botellas #1 - #5, con tapa



**GLASS**  
Bottles and jars  
Remove lids  
Botellas y jarras, sin tapa



**METAL**  
Tin, aluminum, steel and empty aerosol cans  
Lata, aluminio, acero y latas vacías de aerosol



**CARDBOARD**  
Flattened boxes  
Cajas desarmadas



**PAPER**  
Newspapers, paper bags, junk mail, sheets of paper and drink cartons  
Periódicos, bolsas y hojas de papel, correo basura y cajas de jugo

**DO NOT place these items in your recycle cart:**

NO coloque en su recipiente para reciclar:



Don't bag your recyclables.  
Leave items loose.  
Bolsas, ponga sus artículos sueltos



No plastic bags or film plastic  
Plástico para envolver



No styrofoam (packing materials, egg cartons, to-go containers)  
Poliestireno (material para empacar, envases para llevar comida, cartones de huevos)



No household garbage  
Basura

**RECYCLE RIGHT, ORLANDO!**

¡ORLANDO RECICLA BIEN!

Learn more recycling tips at [orlando.gov/recycling](http://orlando.gov/recycling).  
Más consejos para reciclar en [orlando.gov/recycling](http://orlando.gov/recycling).














CITY OF ORLANDO  
SOLID WASTE

IL-0000-348 APR19

# Recycling Quality Index (RQI)

**RQI** : is a numerical value that is inversely related to the quantity of categories of contaminants that the residents have in their recycling cart and is directly related to their recycling quality

**Application:** Measure the change after any type of intervention is applied within a neighborhood

# categories of contaminants	0	1	2	3	4	5	6	7	8	9	10
RQI	10	9	8	7	6	5	4	3	2	1	0
Recycling quality											
	Good					Bad					

Engelwood Recycling Stu...

Address

Residence number not visible

Location

Capture Location

Barcode

Capture Barcode

Cart ID

New Photo

Capture Photo

50%

Next

go canvas

Lake Nona Recyclin...

Contamination

- ☐ None
- ☐ BR-Bagged Recycling
- ☐ PB-THIN-Thin plastic bags
- ☐ PB-THICK-Thick plastic bags
- ☐ FPI-Flexible plastic items
- ☐ FW-Food waste
- ☐ PP-Paper products
- ☐ SF-Styrofoam
- ☐ YW-Yard Waste
- ☐ TE-Textile
- ☐ ME-Metals that are not a can

50%

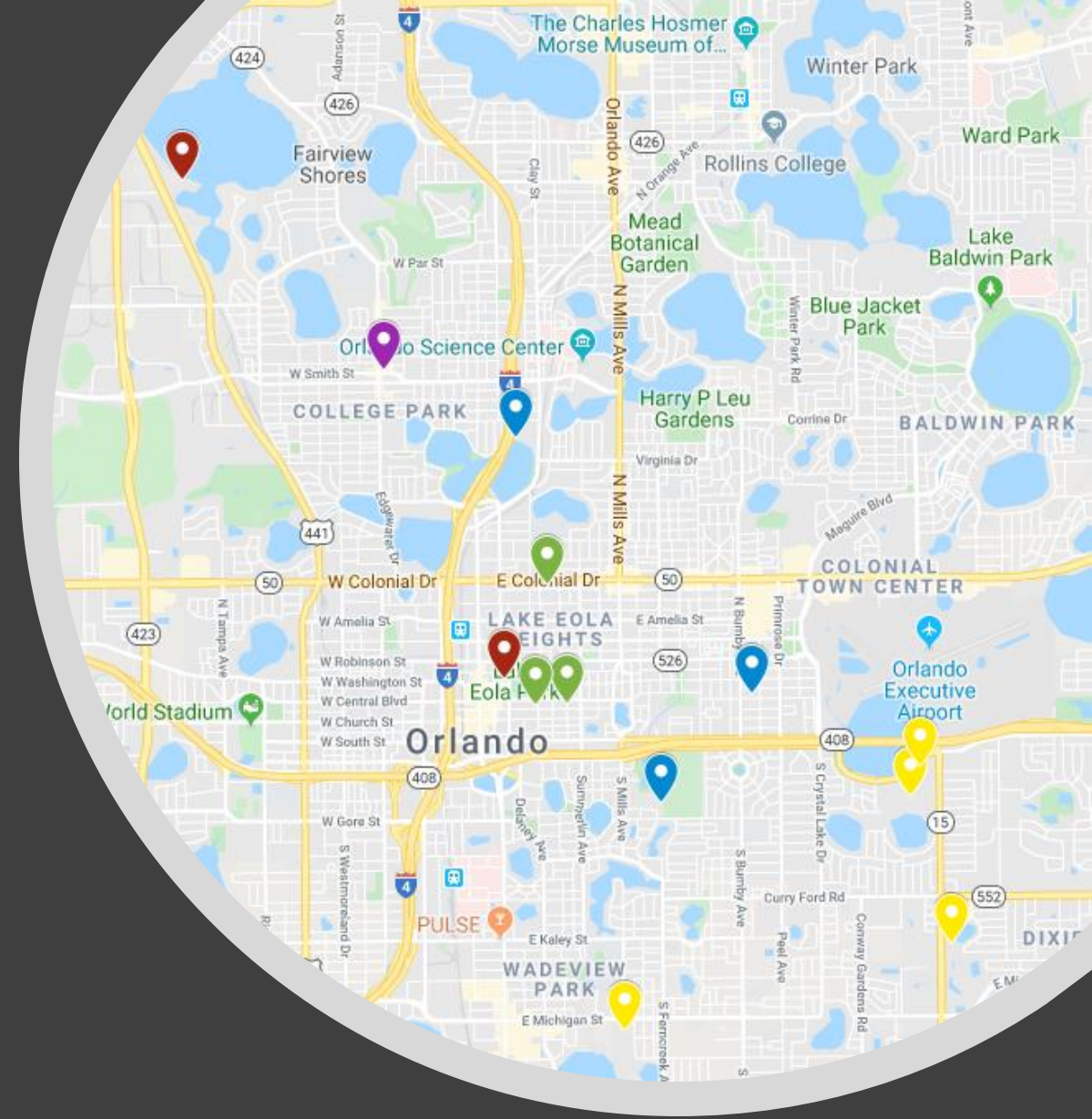
Next

# Data capture



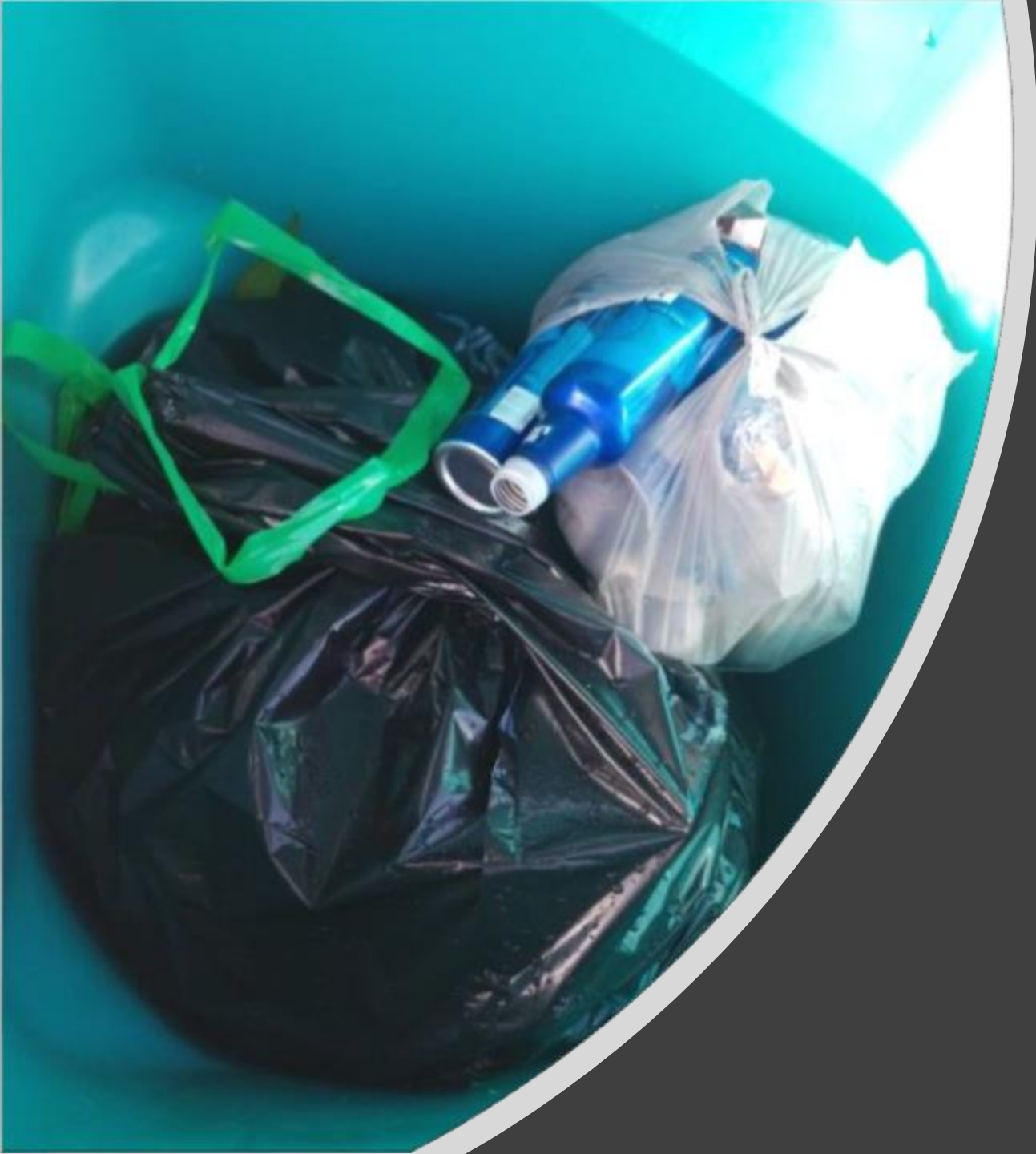
# Map of Participating properties in Orlando

- Garden Style
  - Dumpster
  - Cart
- High-Rise
  - Dumpster
  - Cart
- Mid-Rise
  - Cart



# Contamination categories

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Bagged  
recycling (BR)



Plastic bags-thin (PB-THIN)





Plastic bags-thick (PB-THICK)



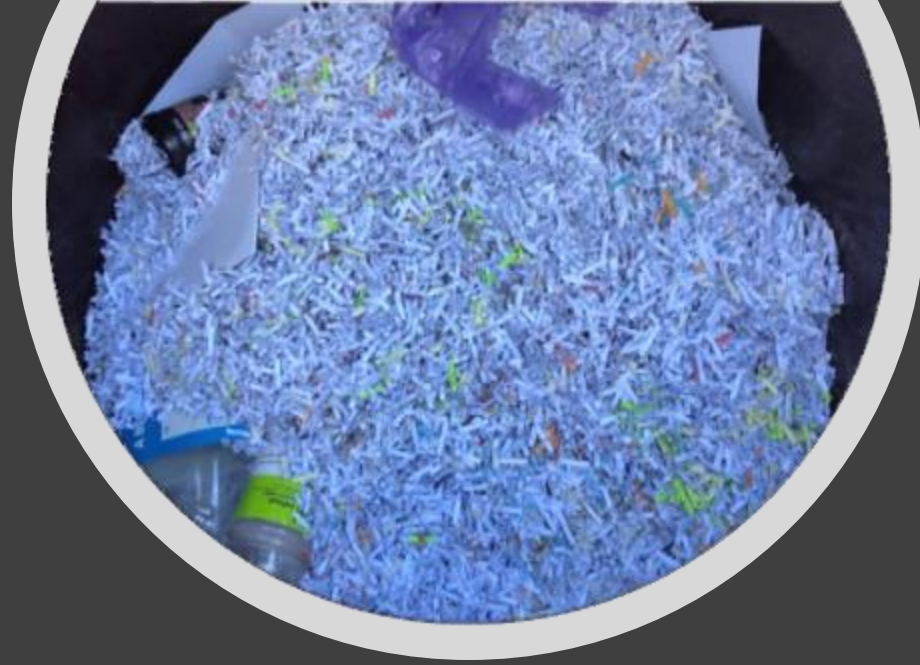


Flexible plastic items (FPI)

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Food waste (FW)





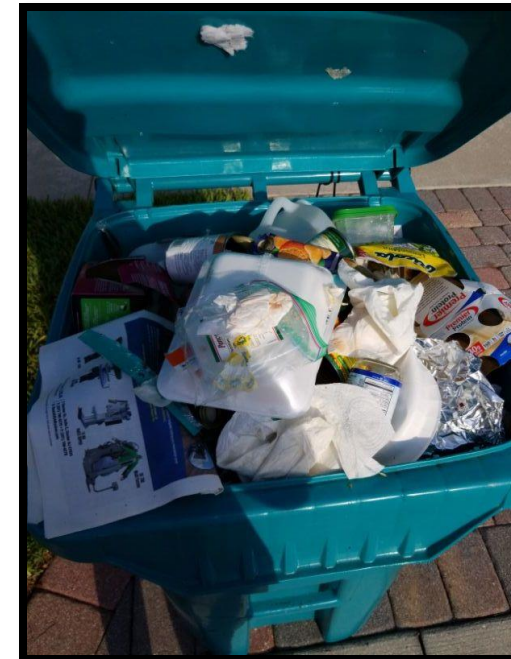
Paper products (PP)





Cardboard (CB)  
(Dirty or wet)

# Styrofoam (SF)





# Yard waste (YW)







Textile (TE)

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Metal items that are not a can (ME)

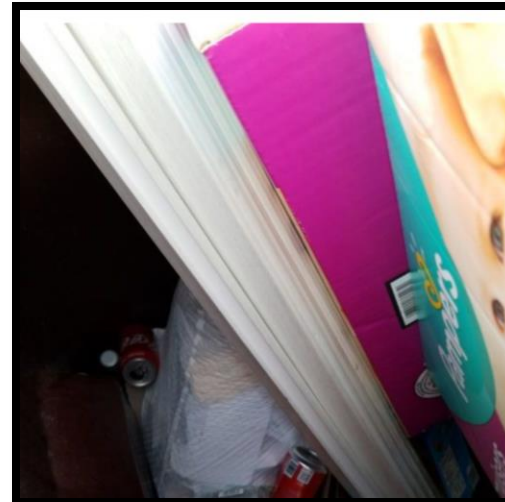
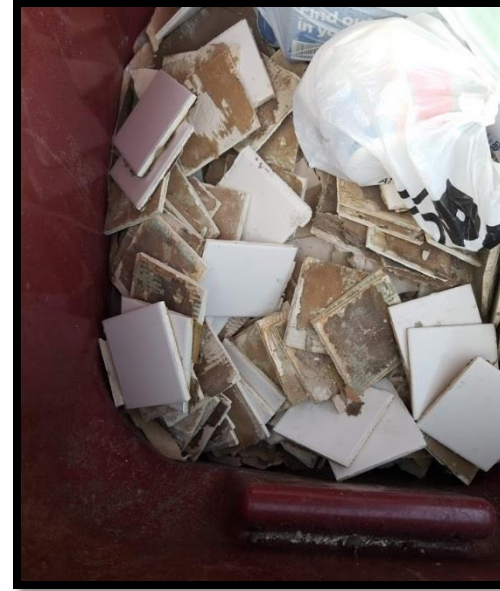




Tanglers (TA)

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# Construction debris (CD)





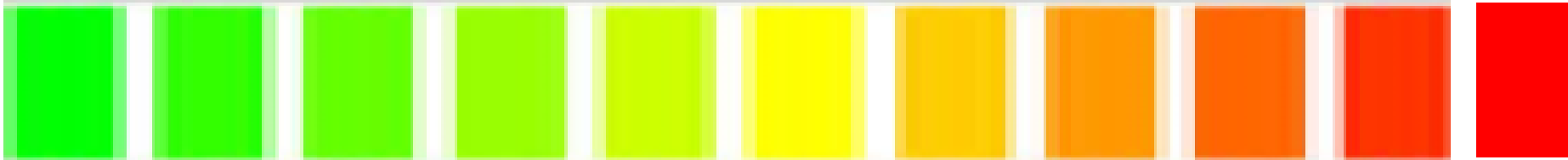


Household garbage (HG)

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# Flexibility of the RQI

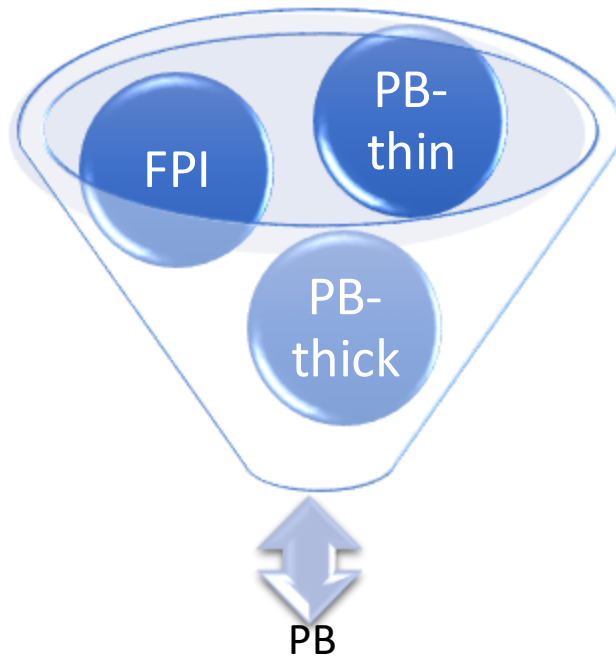
## RQI Scale

# categories of contaminants	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
RQI	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Recycling quality	 <div style="display: flex; justify-content: space-between; width: 100%;"> <span>Good</span> <span>Bad</span> </div>														

# Flexibility of the RQI categories

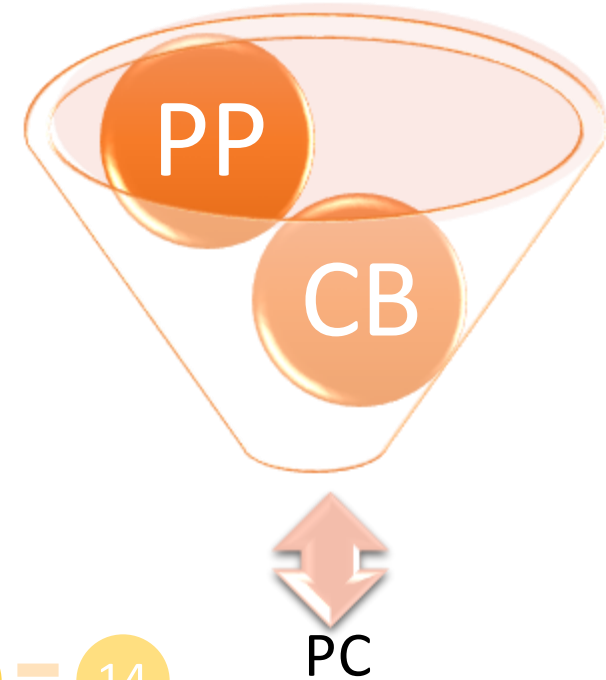
## 10 categories

- NC
- PB
- SF
- FW
- YW
- TE
- PC
- HG
- ME
- CD



## 14 categories

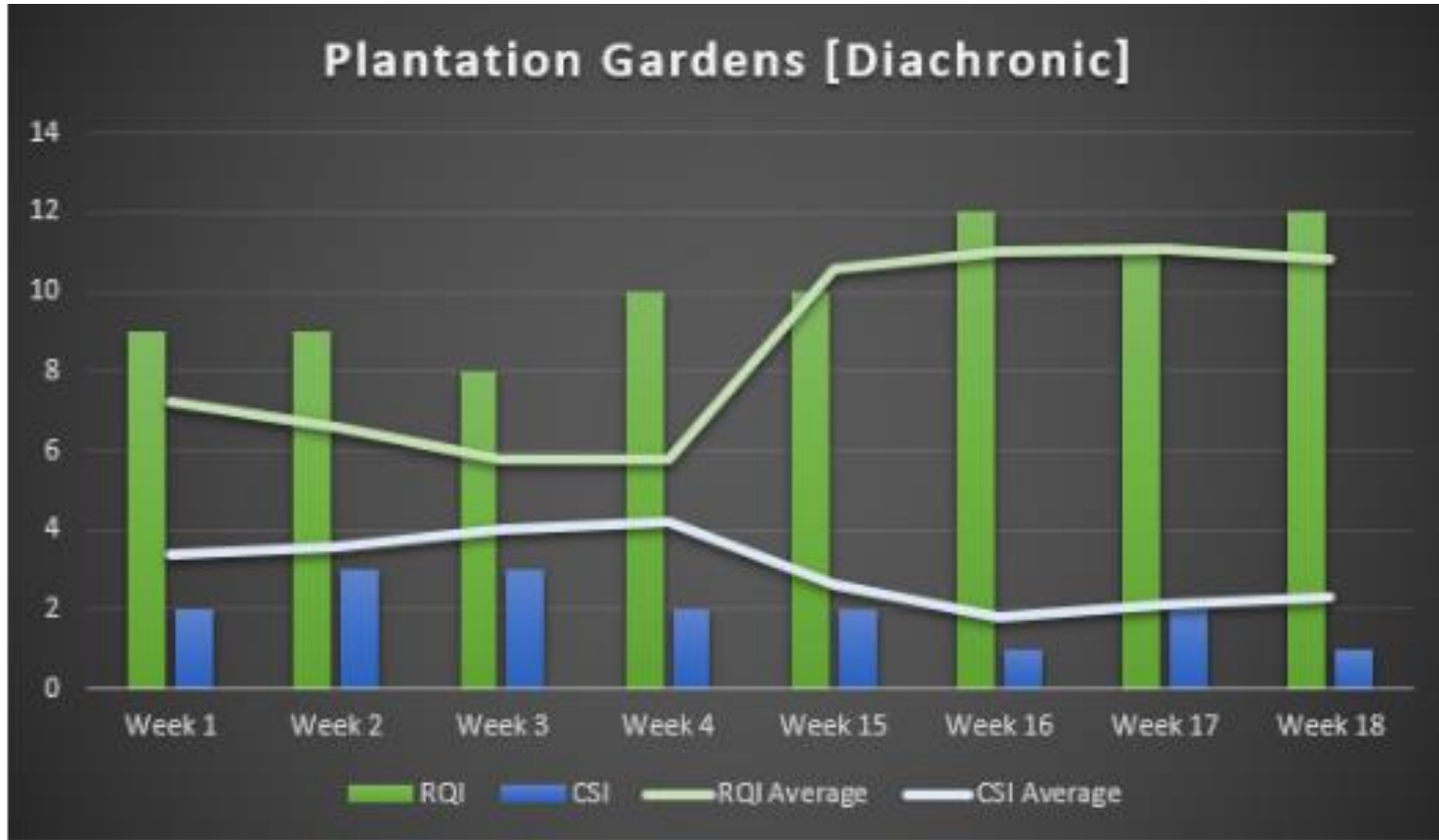
- NC
- PB-THIN
- PB-THICK
- FPI
- SF
- FW
- YW
- TE
- PP
- CB
- HG
- ME
- CD
- TA



$$13 + TA = 14$$

# Data interpretation and Results

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This represents 1 of 13 properties and shows the change in recycling behavior from PHASE 1 (weeks 1-4) to PHASE 2 (weeks 15-18). The shift in the graph represents tote bag distribution and usage by multi-family residents. It is important to use a long-term measurement (diachronic) as remedial strategies will fade over time in a multifamily setting.

In this instance, the property overperformed when compared to project averages – meaning they recycled better.

## Comparison of auditing phases

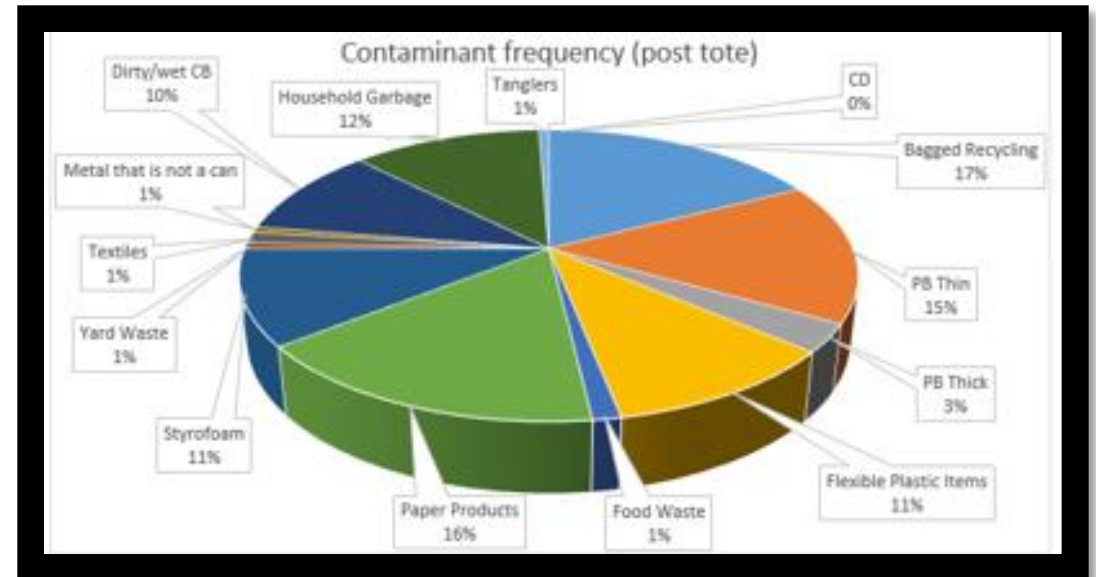
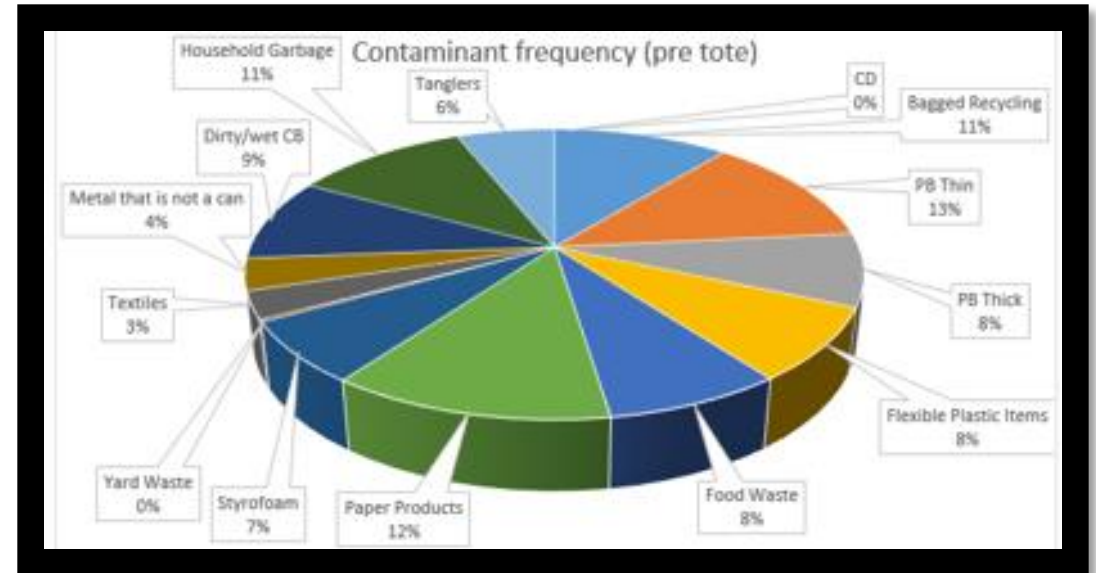


# Changes in contamination makeup

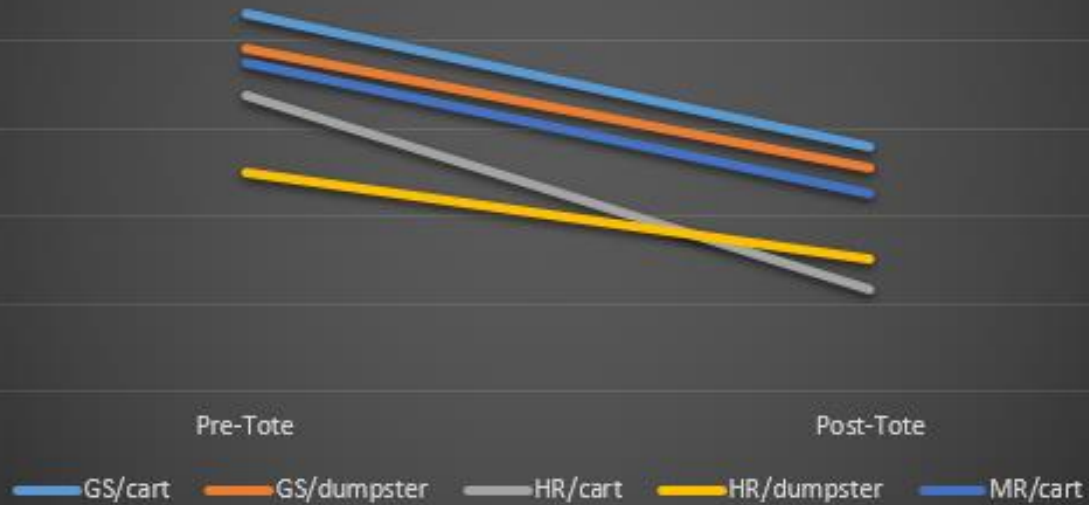
These charts show the change in contamination makeup based on the number of times documented from one phase to the next.

The contaminant most reduced due to the education intervention was tangles.

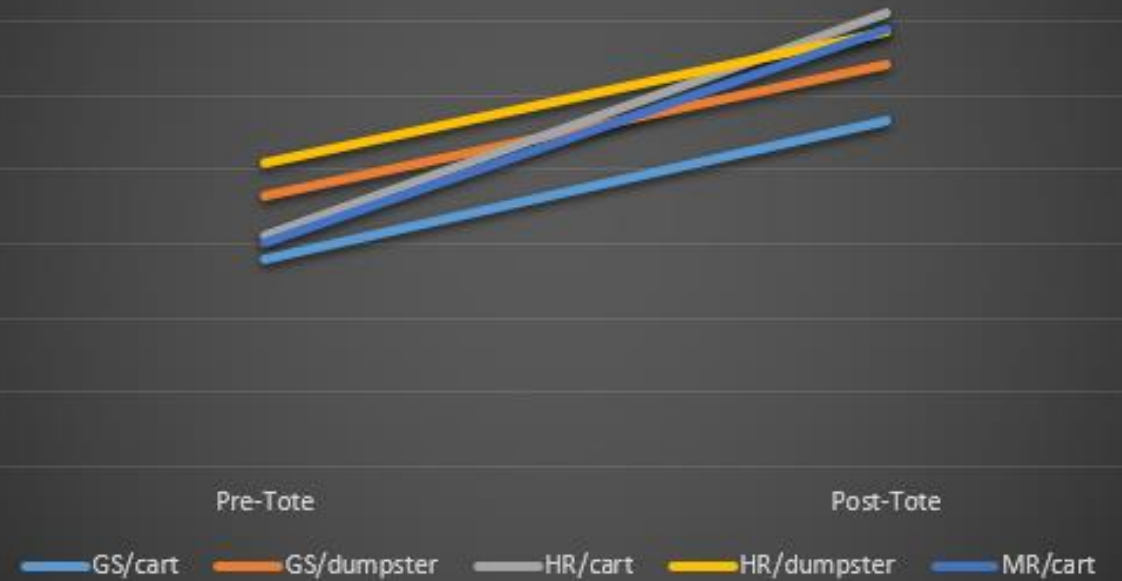
Note: it does not represent the total number of each contaminant, but rather how many times it was documented per audit. For example, if one recycling cart was documented as having bagged recycling, it does not differentiate between having one instance of bagged recycling or twenty instances of bagged recycling.



Contamination Saturation Shift by Property Type



Recycling Quality Shift by Property Type



## Index shifts

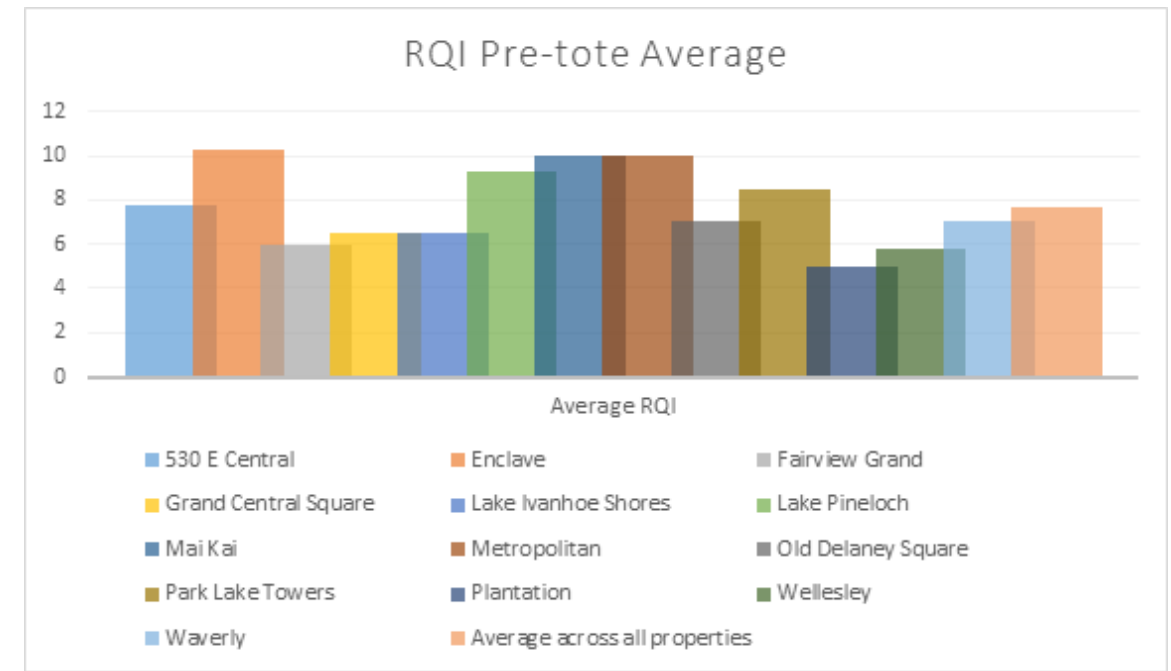
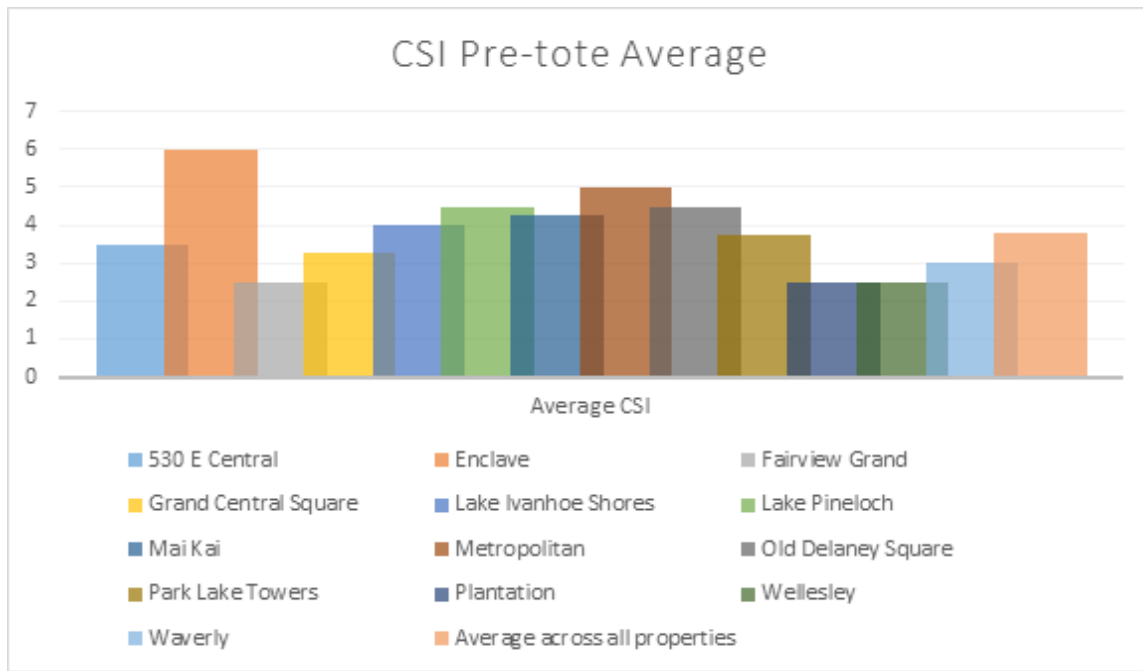
High-Rise properties with carts (grey) exhibited the highest success rate with the How2Recycle label. Every property improved after the recycling education intervention.

# What the RQI does NOT show

- The “depth” of contamination
- The frequency of single contaminants
- Capture rate comparisons



# RQI provides legitimacy to other indices



# Things to Keep in Mind

## Transient residency

- 50% of Orlando residents live in multifamily housing
- 40%-50% of apartment leases are NOT renewed annually.
  - Remedial strategies (including use of RQI) must be long-term.

## Point source ambiguity

- Unable to determine where contamination comes from
- Centralized location of recycling containers
- Containers available 24/7

## Insufficient yardage

- .5yd/ single family household
- 6yd for multifamily property of 250+ units
  - This disparity leads to greater and more diverse contamination



The How2Recycle label was effective at changing recycling behavior at all properties regardless of variable pairings

High-rise properties with carts exhibited the greatest change in recycling quality

RQI can be adapted to multiple scenarios and can be easily applied in a way to gauge recycling behavior change

Supplementing RQI with volume measurements (such as CSI) is strongly recommended in a multifamily setting

## Recap



# Contact Information

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