

# University Heights, OH

## Observations and Recycling Recommendations

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# Project Objective

To identify implementation options to cease delivering bagged recyclables to a material recovery facility (MRF).

Options should be:

- Customer-friendly
- Employee-respectful
- Environmentally-conscious



# Project Purpose

## Economics

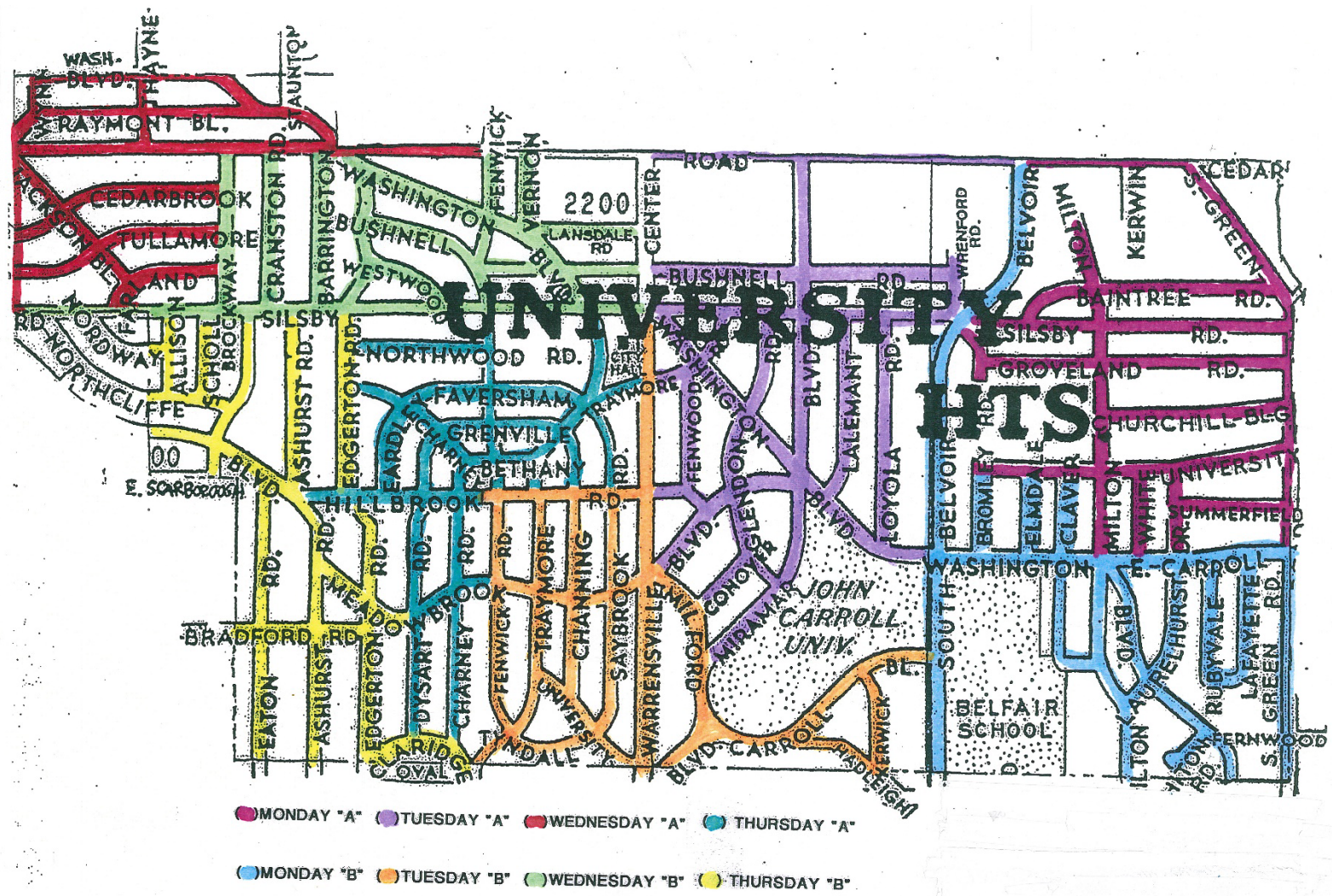
\$72.20/ton  
Loose  
Recyclables

\$105.92/ton  
Bagged  
Recyclables  
(Only one bidder)

## Performance

32%  
Households  
Participate  
(National average is 72%)

139  
lbs /year/household  
(National average is 440)





# Observations



**Cardboard in Trash**



**3 to 6 Households Fill  
Kubota**



# Observation Statistics

On average, a Kubota driver manually picks up **3 to 4 times** this every day





# Observations



**Large Setouts on Monday**



# Observations



**High Curbside Setout on  
Certain Days/Streets**



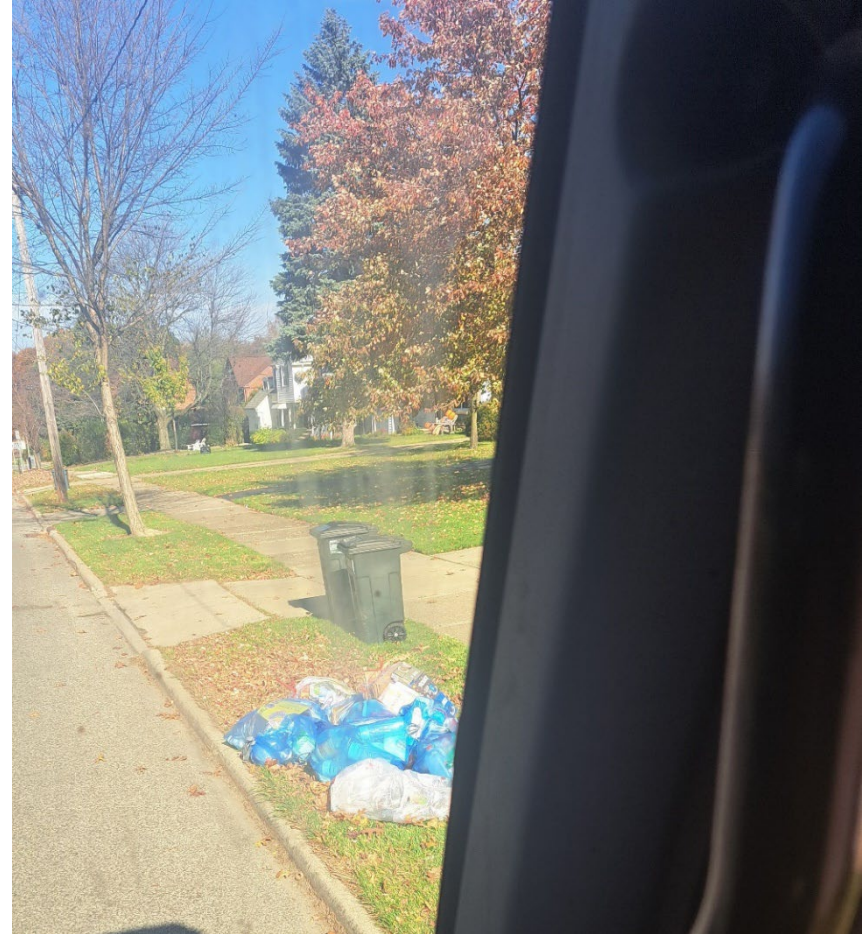
# Observations



**Loose (Unbagged) Trash**



# Observations



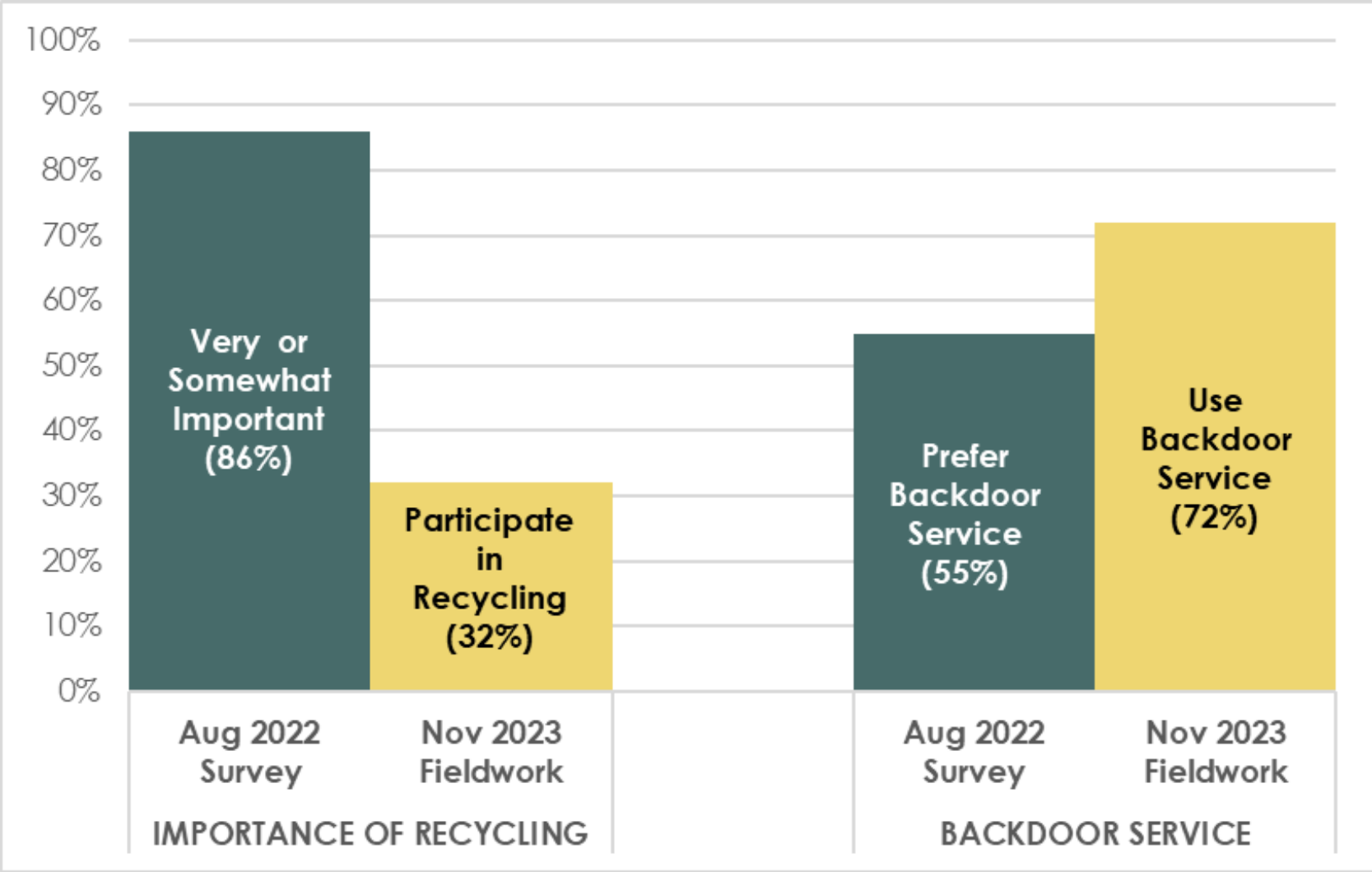
**Limited Setout of Blue Bags**



# Observation Statistics (Waste and Recycling)

Route	Households Serviced Before Kubota Was Full	Percent Backdoor	Minutes per Household	Overall Recycling Participation
Mon PM	3.9	16%	1:20	21%
Tue AM	5.1	87%	1:12	53%
Tue PM	6.6	80%	1:06	24%
Wed AM	7.2	90%	1:23	23%
Wed PM	7.4	71%	1:17	13%
Thurs AM	6.2	83%	1:06	26%

# Survey Results vs Actual Behavior





# Options Considered

- **Shaker Heights Model: Backdoor Collection Using 5-Gallon Recycling Buckets**
- **Backdoor Service Using Bins With/Without Subscription**
- **Backdoor Service Using Carts Without Subscription**
- **Curbside Service Using Carts**
- **Split Blue Bag System**

# Some Modeling Assumptions

- **Participation**

- Existing Recycling Participation = 32%
- National Average Recycling Participation = 72%
- Cleveland, OH Recycling Subscription= 46%<sup>1</sup>
- SCS used Ranges of 32% - 75%

- **Bins and Carts**

- Bins can be Lifted Manually, Carts cannot be Lifted Manually
  - Automated Cart Transportation from Backdoor Considered

- **Recycling Collection Service Used to Model Options**

- Kubota = \$24,000
- Trash/Recycling Packer Truck = \$350,000 (new)  
\$60,000 (used)
- Kubota/Truck Driver Annual Salary = \$80,000 (inc benefits)
- Annual Fuel Cost Kubota/Truck = \$2,500 / 31,000

<sup>1</sup>Ren Brumfield, Cleveland Recycling Coordinator



# 1. Shaker Heights Model

- Provide residents with one or more 5-gallon buckets upon request
- Driver does not collect and leaves notice of how to recycle if buckets are heavily contaminated
- City screens recyclables again at their transfer station
- **University Heights Resources Needed:**
  - Transfer Station
  - Split-body Kubota
  - Split-body packer truck



## 2. Backdoor Service Using Bins with Subscription

- Provide residents one 18-gallon recycling bin
- **32% - 72%** will subscribe based on observations vs survey data
- **University Heights Resources Needed:**
  - 1,350 – 3,030 bins
  - 1-2 Kubota/driver per day
  - 0 -1 additional recycling packer truck per day



### 3. Backdoor Service Using Bins Without Subscription

- Provide residents one 18-gallon recycling bin
- **All 4,200** homes serviced
- **University Heights Resources Needed:**
  - 4,200 bins
  - 4 additional Kubotas/ drivers per day
  - 1 additional dedicated recycling packer truck





## 4. Backdoor Service Using Carts with Subscription

- Provide homes 35-, 64-, or 96-gallon carts upon request
- Kubota brings carts to curb
  - August 2022 survey indicated only 3% preferred this method
  - Service time per home could double (over 2 minutes/home)
- **32% - 72%** will subscribe based on observations vs national average
  - Cleveland: 46% subscription rate



## 4. Backdoor Service Using Carts with Subscription (continued)



## 4. Backdoor Service Using Carts with Subscription (continued)





## 4. Backdoor Service Using Carts with Subscription (continued)

- **University Heights Resources Needed:**
  - 1,350 – 3,030 carts
  - 2-4 Kubotas/drivers per day
  - Kubota retrofit needed to deliver carts to curb
  - Additional packer truck for recycling
  - Cart tippers for packer trucks
  - Helper on each packer truck

## 5. Curbside Carts via Subscription

- Provide free 35-, 64-, or 96-gallon carts upon request
- Residents would roll the cart to the tree line
- The recycling packer would be retrofitted with tippers
- Service time per stop will be about 25 seconds
- **University Heights Resources Needed:**
  - 1,350 – 3,700 carts
  - 1-2 cart tippers
  - May need additional helper



## 6. Split Blue Bags

- Continue existing service EXCEPT bags are split open before emptied into recycling packer truck and City provides blue bags
- Need receptacle on recycling packer truck to dispose of leftover blue bags
- **University Heights Resources Needed:**
  - Method/equipment to split blue bags
  - Distribute blue bags
  - Additional Helper if Recycling Quantity Substantially Increases





# Pros & Cons by Recycling Collection Method

MODEL	Requires Resident Behavior Change	Provides Cardboard Capacity	Driver Can Limit Contaminants	Improves Collection Efficiency	Protects Against Vectors & Precipitation
2 Backdoor Service Using Bins with Subscription	√		√	√	
3 Backdoor Service Using Bins <u>Without</u> Subscription	√		√		
4 Backdoor Service Using Carts with Subscription	√	√	Partially	√	√
5 Curbside Service Using Carts	√	√	Partially	√	√
6 Split Bag System			Partially		

# Pros & Cons by Recycling Collection Method

MODEL	Capital Cost (Bins/Carts, Kubotas, Trucks)	Annual Cost (Labor & Fuel)
2 Backdoor Service Using Bins with Subscription	\$87K - \$540K	\$83K - \$276K
3 Backdoor Service Using Bins <u>Without</u> Subscription	\$353K - \$643K	\$441K
4 Backdoor Service Using Carts with Subscription	\$229K – \$668K	\$276K – 441K Plus Retrofitting Kubotas
5 Curbside Service Using Carts	\$121K - \$222K	\$80K - \$160K
6 Split Bag System	System to Collect Bags & Contamination	\$0 - \$80K

# General Recommendations

## Optimize Source-Separated Cardboard Drop-Off



## Reduce Contamination



## Improve Safety





# Thank you!

Questions/Comments