



UPDATE ON
**DATA COLLECTION FOR
RECYCLING AND WASTE DIVERSION PROGRAM
EVALUATION**
CITY COUNCIL WORK SESSION

July 17, 2023



Project Activities

Data Collection

- MRF Contamination Study
- Waste Composition Study
- Curbside Collection Study
- Stakeholder Engagement

Initial response to recommendations

- Increasing diversion
- Improving participation
- *Evaluating performance*

Technical documents

- Waste generation projections
- *Conceptual design*
- *Cost analyses*

Data Collection

Largely complete



MRF Contamination Study



Designed to evaluate the quality and the contents of the recyclables delivered to the recycling facility



Also served to confirm the findings of the MRF Evaluation conducted separately



Results: the material the MRF is producing is of high value, but it is failing to capture a lot of recyclable material.

Residential Containers (Bottles, cans, and jugs)

Residential Curbside Container Results	% Composition (Weighted Average)
Plastics	30.5%
Glass	38.1%
Metals	13.4%
Paper	2.5%
Contamination	15.5%
Film Plastic	4.5%
Remainder/Coated Plastic	2.0%
Remainder/Coated Paper	0.0%
Residue	7.8%
Fines	1.3%
Grand Total	100.0%

- 82.0 % was correct recycling, and 18% was incorrect recycling
 - Outthrows (wrong bin)
 - Contamination (“wishcycling”)
 - Residue (trash)

Residential Paper Recycling

Residential Curbside Container Results	% Composition (Weighted Average)
Paper	95.0%
OCC / Kraft	59.0%
ONP	1.2%
High-Grade Paper	2.2%
Mixed Paper	18.3%
Boxboard	14.3%
Outthrows	0.3%
Contamination	4.7%
Film plastic	0.1%
Remainder/coated plastic	0.0%
Remainder/coated paper	1.3%
Residue	3.3%
Grand Total	100.0%

- 95% of the samples were correct recycling
 - Outthrows (wrong bin)
 - Contamination (“wishcycling”)
 - Residue (trash)

Other findings

- The extremely high quality of the residential curbside material supports the theory that contamination and residues at the MRF primarily come from the drop off centers and/or commercial recycling bins
- The recycling program is losing quality tons to the aging MRF.

Waste Composition Study



Designed to evaluate what proportion of the material delivered to the landfill could have been recycled, reused, or otherwise diverted from the landfill.



Used a stratified, weighted sampling plan to improve the confidence and reliability of the statistically valid data.



Result: About 21% of all the “trash” was recyclables, 35%+ could have been diverted in other ways.

How it works

We identified 46 material types, and categorized them into 6 classes:

- Targeted curbside recyclables
- Recyclable at City facilities
- Recyclable at Private Facilities
- Recyclable but no regional markets
- Processible organics
- Not currently recoverable

Sorters processed 44 samples, each about 200 lbs. Roughly one-third were residential and two-thirds institutional, commercial, or industrial (ICI).

Each material type was weighed to determine composition. A statistical analysis was performed to calculate the mean composition for each of the material categories and for each material stream in the study.

Table 2-3 Material Categories, Groups & Recyclability Class

Material Group and Category	
PAPER	GLASS
Corrugated Cardboard/Kraft Paper (Uncoated)	Clear Glass Containers
Newsprint	Brown Glass Containers
High-Grade Office Paper	Green Glass Containers
Mixed Recyclable Paper	Remainder/Composite Glass
Compostable Paper	E-WASTE/HOUSEHOLD HAZARDOUS WASTE
Remainder/Composite Paper	Electronic Waste
PLASTICS	HHW
#1 PET Bottles/Jars	C&D/BULKY
#1 PET Non-Bottle Containers	Wood-Clean Untreated
#2 HDPE Natural Containers	Wood - Painted/Stained/Treated
#2 HDPE Colored Containers	Drywall/Gypsum Board
Clean Film Bags	Asphalt, Brick, Concrete & Rocks
Clean Industrial/Commercial Film (non-bag)	Carpet & Carpet Padding
Contaminated Film/Other Film	Other Construction & Demolition Debris
#3-7 Plastic Containers	Bulky Items/Furniture
#6 Expanded Polystyrene	Tires
Bulky Durable Plastic Products	Mattresses/Box Springs
Remainder/Composite Plastic	OTHER
METALS	Fines
Aluminum Cans - Non Magnetic	Textiles - Clothing
Other Aluminum (foil, pans, etc.) - Not Magnetic	Textiles - Non-Clothing
Tin/Steel Containers - Magnetic	Shoes/Belts/Leather
Other Ferrous - Magnetic	Disposable Diapers & Sanitary Products
Other Non-Ferrous - Not Magnetic	Other/Non-Classified
ORGANICS	
Food Waste	
Yard Waste	
Remainder/Composite Organic	
Recyclability Class	
Targeted Curbside Recyclable	Recyclable but No Regional Markets Exist
Recyclable/Managed at City Facilities	Processible Organics
Recyclable at Private Facilities	Not Currently Recoverable

Lost recyclables in the waste

All Sources

- 21.1% was recyclables

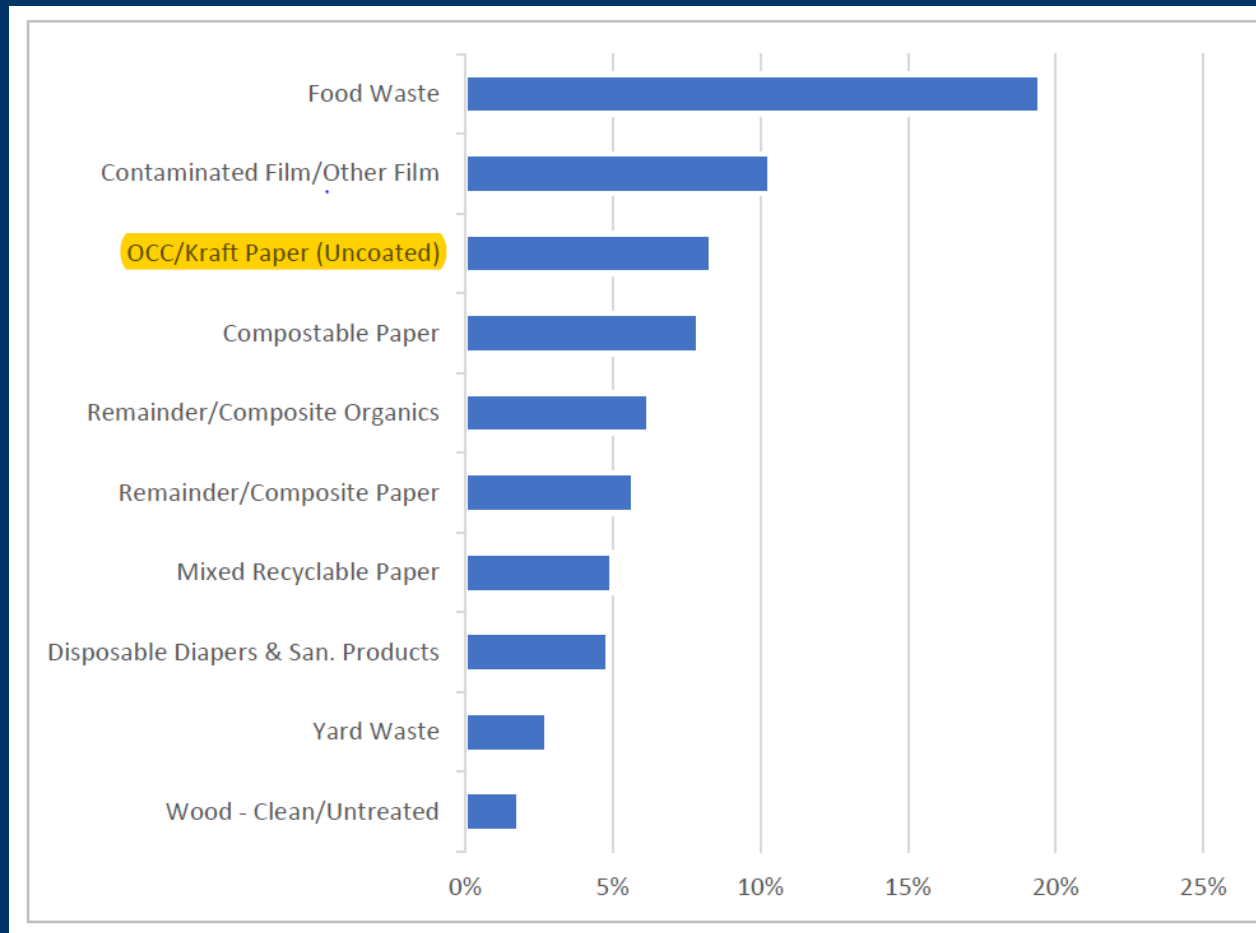
Residential generators

- 14.9% was recyclables

Commercial generators

- 24.7% was recyclables

#1 Lost recyclable: Cardboard!



Top 10 Composition of Waste Delivered to Landfill

Materials that could have been recovered

Clean film & film bags

#6 Expanded polystyrene
(Styrofoam)

Bulky durable plastics

Scrap metal items

Food waste

Yard waste

Electronics

HHW

Clean untreated wood

Carpet & padding

Tires

Mattresses

Textiles & Shoes

All Sources

- 19.5% food waste
- 16.1% other recoverables
- Total: 35.6% wasted

Residential generators

- 19.9% food waste
- 17.6 other recoverables
- Total: 37.5% wasted

Commercial generators

- 19.3% food waste
- 15.2% other recoverables
- Total: 34.5% wasted

Curbside Collection Study



Designed to estimate a participation rate—what percentage of households routinely put material at the curb



On two separate collection days, counts how many customers set out recycling.
Does not capture identifying data!



Was reconsidered when recycling collection was suspended in the middle of the study

What we learned

- During the initial 2-week period, curbside set-outs seemed fewer and smaller than expected in an EOW program.
- We learned that many people use the drop-off center on their “off week” or as needed.
- This meant counting curbside set-outs would likely not be the whole picture of participation.
- When recycling collection was suspended, the project team decided we would not continue that effort.
- What we did learn is that future service changes will have major impacts on the set-out rates and the route efficiencies.



Stakeholder engagement

- Open House in March
- Meetings with City Council members
- Meetings with City agencies
- Open House in May
- This Pre-Council!
- BeHeard Survey



BeHeard Survey



Designed to ask high-level questions about people's use of the current programs



Found that respondents were generally positive about the current method of recycling, but a lot of people want weekly back. Many people indicated they go to the drop off centers between collection days. They were divided about carts.



Several comments indicated some misinformation about the MRF.

Recommendations

*Project team has discussed initial
recommendations,
RRT is writing up the possibilities*



Increasing Diversion: New materials

These are materials that are recyclable in other communities but apparently not in or near Columbia currently.

Some will be straightforward to implement, requiring little more than education, space, a container, and a contract.

Others will involve new operations, capital investment, and sophisticated marketing—but we are benchmarking best practices across the U.S. and in the Midwest.



~825 tons



~1,700 tons



~1,600* tons



~950 tons



TBD

Potential impact on diversion

If we could divert from landfill...

- 10% of disposed EPS: 80 tons
- 50% of disposed bulky plastic: 850 tons
- 20% of disposed clean wood: 320 tons
- 10% of disposed carpet: 95 tons

Potentially 1,345 new tons!

Encouraging community diversion

These are materials that might have been diverted from landfill to community programs, but for whatever reason were not.

The City and the Solid Waste Utility can support these programs by creating awareness and promoting them with education.

For most of these materials, there is no need to develop new programs.



~600 tons



~200 tons



~2,100 tons



~90 tons



~800 tons



~2,600 tons

Potential Impact on Diversion

If we could divert from landfill...

- 5% of disposed plastic bags: 30 tons
- 5% of disposed industrial plastic film: 10 tons
- 10% of disposed scrap metal: 210 tons
- 60% of disposed e-waste: 54 tons
- 25% of disposed tires: 200 tons
- 75% of disposed textiles: 1,950 tons

Potentially 2,454 new tons!



Improving existing recycling programs

We have estimated that as much as \$2 million worth of recyclables are thrown away in a year.

Put another way, pound for pound, more recyclables are thrown away than put into the City's container and fiber recycling programs.

The ICI sector accounts of 64% of waste generated in Columbia, but 74% of disposed recyclables—likely mostly accounted for by the 12% of the ICI waste stream which is cardboard.



~18,079 tons



~170 tons



~1,900 tons



~6,242 tons

Improving existing programs

- Create renewed and vigorous outreach and education programs for both residential and ICI customers.
- Explore use of “slot boxes” for cardboard at commercial customers.
- Place restricted-opening containers at drop-off centers; evaluate viability of phasing out one of more if/when weekly service can resume.
- Expand current HHW service schedule.
- Discontinue plastic bags for yard waste, promote yard waste drop off center.
- Explore food scrap drop-off at Farmer’s Market and educational offerings.

Potential Impact on Diversion

If we could divert from landfill...

- 50% of wasted ICI cardboard: 3,300 tons
- 50% of wasted residential recyclables: 2,335 tons

Potentially ~5,600 new tons targeted materials diverted and recycled, up from ~13,000 most years.



Improving Curbside Participation

- The project team is discussing a method to collect dual stream curbside recyclables using a cart and a single-body truck.
- The concept builds on a methodology used in many cities whereby two different streams are co-collected in one cart and one truck.
- This would preserve the quality of dual-stream recycling while incorporating the benefits of carts and automated collection.

Technical Documents

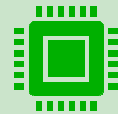
The “meat” of the meal



We will see...



Waste generation projections and some modeling of increased diversion



Quantitative information about the programs we talked about in the previous section



Conceptual design for a replacement dual-stream MRF and a nearby convenience center



Cost information (operating and capital) for all recommended actions

What's next?

We are using data combined with best practices and benchmarking to evaluate the potential for Columbia.

The recommended changes and programs we just discussed are being written up, qualitatively and quantitatively.

We're starting on the design items.

We also will be developing performance measurement techniques which are meaningful and realistic.



What's next?

Examples of what-ifs:

If collection routes were efficient, with re-routing or automated collection or both, how would it impact the service level?

If weekly collection returned, would neighborhood recycling drop off centers still be needed?

If the neighborhood drop-off centers were closed, would that improve contamination at the MRF?

What's next?



Continue write-ups and analysis, documenting them in draft report



Produce conceptual designs and cost information



Discuss with staff, produce final report, present to City

Kate Vasquez,
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THANK YOU!
LET'S TALK

