

ReUse Innovation Center Feasibility Study
Waste and Repair Materials Flows and Opportunity Assessment

Executive Summary

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Introduction

Our goal in this project being diversion of waste, we have examined the current information available on waste materials flows in Ulster County. Advantages of increased waste diversion locally include reduction of fuel use and emissions, reduced transportation costs, reintegration of materials into the circular economy and potentially related opportunities.

UCRRA's analysis of their waste stream gives an idea of the percentages of waste types and materials in the stream. Our goal is not to reproduce this analysis but to characterize the waste stream in terms of opportunities for waste diversion that are best accomplished by a Reuse Innovation Center.

2018 UCRRA Waste Stream Totals

Material	Total (tons)	Percent of waste stream
MSW	101,379	66.45%
C&D	31,970	20.96%
Biosolids	3,686	2.42%
Single Stream	6,423	4.21%
Old corrugated cardboard	1,553	1.02%
Food Waste	3,537	2.32%
Mixed News	1,051	0.69%
Wood Chips	1,169	0.77%
Commingled	526	0.34%
Brush	459	0.30%
E-Waste	304	0.20%
Glass	496	0.33%
Total	152,553	100.00%

Approach

The team reviewed the most recent annual reports provided to DEC by UCRRA, additional data gathered by the Legislature's Zero Waste Implementation Plan initiative, and additional diversion data provided directly by UCRRA.

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In terms of fuel and related emissions, as stated in UCRRA's Local Solid Waste Management Plan, "Based on UCRRA's current average MSW tonnages of 100,000 tons per year and an average of 32.5 tons of waste being loaded per long trailer to Seneca Meadows Landfill, it would require 3,077 trips to dispose of the material. [Assuming] trucks averaging 5 miles per gallon and a cost of \$2.75/gallon of fuel.. a cost saving of \$580,000 would be immediately recognized per year by disposing of MSW locally with the County."

While an RIC would obviously not stop the need for trucking waste, depending on the degree of diversion possible, it could help. Besides that, materials kept in the local economy would potentially decrease, at least modestly, trucking in of goods for commercial purposes.

Dave Bennink conducted one site visit to the New Paltz Transfer Station and four visits to UCRRA's main facility: a tour with the team and UCRRA staff/ board; a Saturday morning observing public visits to UCRRA during a four-hour period; a day on the tipping floor photographing activities, materials and evidence of diversion; and a walk-around with UCRRA's Executive Director to assess possibilities for use of the adjacent, undeveloped property.

Data visualization intern Ariana Henry analyzed reports of adjacent counties and the major transfer stations in the region to create materials flow diagrams out of Ulster County, and around and out of the Mid-Hudson Region. The goal of this analysis was to see aggregated opportunities for waste diversion through regional collaboration.

Observations:

Tipping Floor Observations and Analysis by Dave Bennink

Dave spent four hours on the tipping floor, from 8:45 to 1 pm on a weekday. While the MSW is very dirty and unlikely to be usable, the waste from haulers, C&D businesses and similar self-haulers contained valuable items. It is understood that this is a brief period of observation and in a larger, well-funded study for this purpose a longer time could be spent, but for an initial survey he feels he could extrapolate a general estimate of diversion opportunity.

Given that he spent 4 hours and the transfer station is open 9 hours a day, he extrapolated based on his time spent to what might be diverted in a 9-hour period. He compiled his findings in a spreadsheet (Ulster Station Tipping Floor Data.xlsx), in which he estimated value and highlighted items, weight, and value and noted key item values. "Key items" are those with particularly high value per item that would best go toward support of a diversion program (e.g., french doors that could be resold, vs. low-value clothing items that would likely be given away to a charitable organization).

During the 4-hour shift he identified 5,695 lbs of divertable material valued at \$2,396, with key items valued at \$1,385. Extrapolating to 9 hours, this would be 12,826.58 lbs. of divertable material valued at \$5,391, with key items valued at \$3,116.25. Based on this information, 1 year could see 4,000,000 diverted and \$900,000 of materials - if one hard working employee was on the floor while open. \$900,000 is rounded down + counts the value of 'key items' or items of significant value or ease of sale/moderate value. 4,000,000 pounds= 5695 lbs/4 hrs - 12827 lbs/9 hrs - 312days x 12827= about 4 million pounds of debris - costs the UCRRA \$150,000 or \$75/ton to get to Seneca Hills. 4 million is about 1.5% of the total. Two people might have diminishing returns,

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like \$4500 per day and 20,000lbs diverted - (that is potentially 6,240,000 lbs and \$1,404,000 in value). 6,240,000 lbs would cost the UCRRA \$234,000 to send to Seneca Hills.

Dave states: "I think it's possible that 20K pounds could be saved if there were 2 ppl. 6 x 52 x 312, 3120 tons that could be diverted for reuse and recycling if you had 2 people, but that's out of 131,000 tons. So 2.4% of the total volume could be diverted with 2 people. The reason I think that's worth it is, according to them, if I diverted 3,120 tons from their transfer station, it would save them \$234,000 of hauling in garbage fees. With insurance and medical, if employees cost 75000 yr each, 150K, but saving 234K, so that's a savings."

He notes that there was no time during which he was idle, with piles continuously available on a day that was described to him as possibly a bit slow, but certainly not more than average in terms of volume of incoming dumping. He estimates he was able to spot about 75% of the divertable materials considering that as it's dumped, material is often immediately covered by more material.

He also observed glass/mirrors that arrived intact being smashed by dumpers who were in a hurry to get their delivery made and were unaware of any reason not to destroy them. If more than one person were working on diversion, one could be talking to the dumpers and potentially avoiding this situation, thus diverting more. A second person could also be intercepting deliveries as they arrived at the center but before they got to the tipping floor, also increasing the likelihood of preserving valuable divertables.

Since many of the deliveries were from repeat or regular visitors, they could be coached in pre-sorting/handling to increase diversion further.

Observations from Analysis of UC-provided diversion data

There seems to be very little wood being diverted compared to what may be possible.

Re: Aluminum: not sure why some fields are 0 or missing throughout this chart (as provided)?

"UCRRA diverted totals" - need clarification on what this includes.

There was a significant increase in inbound tickets from 2019 to 2020 (2021 appears incomplete?) as well as C&D, indicative perhaps of increasing potential diversion and savings opportunities.

Repair opportunities

The Repair Cafe of the Hudson Valley and Catskills network of coordinators and volunteers, representing approximately 41 active local projects, was surveyed to identify the most common items brought in for repair.
list

The issue of working with local repair businesses in a non-competitive manner was also discussed with this group. Local cafes have developed a variety of ways of working with small repair businesses. Sometimes these proprietors volunteer as RC fixers to promote their businesses. Sometimes Repair Cafes opt not to include repair of items that are not easily "do-it-yourself" in order to prevent erosion of local business' customer base. These considerations can be sorted out in a way that minimizes competition and maximizes synergy between commercial repair businesses and volunteer Repair Cafes.

Opportunities for diversion

Sustainable Hudson Valley’s team conducted a literature review and several interviews in order to identify the widest possible range of program possibilities for materials diversion and reuse-based industries. We considered a subset of the materials in the initial waste characterization, focusing on those with the greatest likelihood of contributing to the County’s goals of landfill diversion, climate benefits, and economic viability of a business ecosystem at the Reuse Innovation Center. The following is not an exhaustive list, but a series of examples.

1. Summary of diversion/ reuse opportunities - identifying basic types. (Note: references in this table to what is currently being done in a ReUse Innovation Center generally refers to the Bellingham, WA facility.)

Materials type	Repair/ resale of products and components	Recycling based manufacturing	“Craft” repurposing/ upcycling/reuse	Processing (compost, digestion, pyrolysis)
Plastics		x melt and reform; already separating; sending off to recyclers. The % not being used, RIC could consult on educational efforts and business waste evaluations to help increase %. Others can create recycled containers, blended with new plastic, for ex.	x Ex, someone that made blocks for building. Also, Suprina Troche, puts plastic in wood chipper and creates mosaic art. Theoretically, we could create our own product out of recycled plastic - several steps down the road.	
Paper		x already happening every day; no aspirations for us to duplicate this function, but theoretically could produce a product of some kind. RIC could conduct Education and business waste eval to increase reuse.	x didn’t see a “creative reuse” store in UC. Teachers would re-use (not recycle). Paper could be used in this way.	
Metals	x RIC goal - to have welding capacity on site.	x now metal recycled by West Kingston Recycling,	x Ex remanufacturing, creating reused wood	

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	Repair and resell.	shipped, melted down, made into new products. Very common. RIC efforts would involve business waste evaluations and other diversion programs. From the tipping floor, 10s of 1000s a week could be saved. Doesn't get contaminated that easily.	and metal tables or other furniture at RIC.	
Glass		X e.g. pozzolan for low C concrete; glass tiles from melted and reformed glass, many others.	x Currently sell a lot of products made of glass. Windows, glass blocks, jars, glasses, etc. As is. Sometimes can combine with reclaimed wood, for ex frosted glass, for some nice products.	
Food scraps/ yard waste				composting pyrolysis to biochar anaerobic digestion. Wood is a part of this process, generated by decon, wood business in RIC could feed scrap wood for composting process to composting business. If we were able to grind, we could sell directly to composting biz. Vs. having to pay to get rid of wood recycling.
Clean wood	x Now has a repair station in RIC for wood,	x prob w recycling wood, it's ground up and sent to the	x This is the biggest opportunity as an industry - to gather and	x see above

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Materials type	Repair/ resale of products and components	Recycling based manufacturing	“Craft” repurposing/ upcycling/reuse	Processing (compost, digestion, pyrolysis)
	<p>which is a common repair/resale scenario.</p>	<p>lumber mill and burned to dry new wood. Vs. composting example above. Trex. Building blocks from plastic and wood for outdoor use for ex. Caveat: how long would this take to break down?</p>	<p>resell wood. Reclaimed wood furniture, remilling operations and making flooring, stair treads, etc. Many ex. Huge part of what we do and also a huge part of landfill.</p>	
<p>Textiles</p>	<p>x RIC in WA has a group that fixes textiles; new clothing is very cheap though.</p>	<p>x there is a type of insulation made of denim. Probably not something RIC could do on site.</p>	<p>x Upcycled clothing from scraps.</p>	
<p>Furniture</p>	<p>x ex. refinishing before sale.</p>	<p>Couches - see Other, mattresses - theoretically?? might not be profitable. ReUse Consulting has no experience with real world examples, rare. However, we found online: 7 Rivers Recycling, LaCrosse, WI video https://www.youtube.com/watch?v=vS9ts-egvls Caveat: research needed on this business and model; mattresses would have to be diverted before mixed with household waste; large space and investment needed. Condition is key to reusability/recyclability.</p>	<p>x At RIC, they sell as is now. But could re-cover couches with new fabric.</p>	

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Materials type	Repair/ resale of products and components	Recycling based manufacturing	"Craft" repurposing/upcycling/reuse	Processing (compost, digestion, pyrolysis)
White goods/ appliances	x ReUse Consulting has an appliance repair person in Dave's county; they send him a lot of washers/dryers and he sells. He is going to start selling in the RIC showroom.	x metal is recycled, we would not grind up etc. We could break it down for parts. We could collect metal in our recycling center and make sure it gets to recyclers.	x If it works, resell it as is. Big part of the reuse industry.	
Vehicles	x Bellingham has an auto repair place	x specialists in vehicle recycling. They get paid by scrapyards. Kars for Kids.	used vehicle sales.	ICE to EV conversion (though this has nothing to do w/tfr station or diversion of waste stream for UC per se)
C & D debris* in addition to above categories, bricks, plastic, tyvek building paper, etc	x ex, clawfoot tubs; they refinish. Plastic pipes, cut off the bad end for ex. and use.	x concrete, bricks, cardboard, sheet rock, all get recycled into new products. The typical RIC role has been to sort so it can be recycled, rather than manufacturing. Ex, concrete recycling facility will receive it and use it for roads. Transfer sta. already grinding up and reusing. There are specific C&D recycling facilities. Taylor in Orange Cty.	x in addition to above glass, wood etc - sheet rock, pipes, unused rolls of building paper, etc are resold. Just some examples. Sometimes added to upcycled products. Build sheds out of reclaimed materials.	x The wood component.
<i>Scrap metal</i>		x	x	
Electronics	x fix computers with parts for ex.	x previously, disassembled parts and stored to use for repairs or sold parts to people building	sold working used electronics as is.	

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		<p>their own computers at home. 75% of electronics were sent to a co. specializing in electronics recycling.</p>		
<p>Other - mattresses , tires</p>		<p>mattresses break down and wood metal and textiles out, reclaim metal, recycle wood, recycle textiles into for ex absorbent pads used for oil spills & etc. (Used to make playgrounds from tires, but too much metal is in them now so this is no longer appropriate.) Most ppl take tires to tire stores, which send them to the recycler for you. Shoe soles?</p>		

Other Considerations:

Feedback from reuse businesses and deconstruction specialists has consistently brought up the issue of the lack of specialized skill regarding diversion of reusable material in deconstruction. Training would be of use.

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