

**HW Problem 6:****SOLUTION****2005**

Determine the relative size of containers to be used on the divertables collection vehicles that could be implemented as part of Scenario C. Assume that collection is once per week. The amount of material collected, out of each 100 pounds generated, is given below.

Material	lb/100 lb gen.
paper	5.0
cardboard	1.2
plastic	0.8
yard waste	9.9
glass	1.8
steel cans	1.0
aluminum cans	0.3

This is the amount of material collected by the recycling and drop-off programs, out of 100 lb of MSW generated.

- a. Determine the loose volume of compostable and recyclable material collected, in cu-ft to 2 dec. places, per 100 lb of MSW generated. Also determine the compacted amount of yard waste, plastics, and metal collected per 100 lb of MSW generated, if they are compacted to 50 % of the loose volume.

Material	lb/100 lb gen.	specific weight lb/cu-yd	cu-ft out of 100 lb MSW gen	compacted cu-ft out of 100 lb MSW gen.
1	2	3	4	5
paper	5.0	150	0.90	
cardboard	1.2	85	0.38	
plastic	0.8	110	0.20	0.10
yard waste	9.9	170	1.58	0.79
glass	1.8	330	0.14	
steel cans	1.0	150	0.18	0.09
aluminum cans	0.25	270	0.03	0.01
Total	19.9		3.4	

**Calculations**

Column	Description
1	Materials description
2	lb collected out of 100 lbs generated, given
3	specific weight, given
4	$27 \times \text{column 2} / \text{column 3}$
5	for compacted materials only, $\text{column 4} \times 50 / 100$

In both parts b. and c., present the relative sizes using the value "1" for the smallest container.

b. Determine the relative size of the containers for a collection vehicle collecting only recyclables. Assume that the containers are used for: paper and cardboard, plastic and metals, and glass.

Container	Volume of Material cu-ft	Relative size
Paper and Cardboard	1.28	8.9
Plastic and Metals	0.40	2.8
Glass	0.14	1.0

c. Determine the relative size of the containers for a collection vehicle collecting both recyclables and yard waste. Assume that the recyclables are assigned to containers as in part b. Also assume that yard waste and plastic/metals are compacted to 50 % of the loose volume.

Container	Volume of Material cu-ft	Relative size
Paper and Cardboard	1.28	8.9
Plastic and Metals	0.20	1.4
Glass	0.14	1.0
Yard Waste	0.79	5.5