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6-1990

# Recommendations for Recycling Shelter Design Changes

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## Citation Details

Blake, Gerald F. and Storz, Lynne, "Recommendations for Recycling Shelter Design Changes" (1990).  
*Center for Urban Studies Publications and Reports*. 119.

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**Recommendations for  
Recycling Shelter  
Design Changes**

Multi-Family Recycling  
Program

July 27, 1990

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This Research was Funded by the City of Portland  
Bureau of Environmental Services

PSU Recycling Education Project

- 4) in the future, what options in equipment would best serve them in terms of ease in servicing, tenant ease, hauler safety, durability, and cost.

### **Equipment Currently Used for Recycling Pick-Up**

MDC, McInnis, and Heiberg currently use pick-up trucks that hold various containers to store materials. Often, two people are sent out to service the recycling systems. The trucks must off-load to interim containers or go back to the yard up to 10 times a day. Salvi has outfitted an older, larger, flatbed type truck with containers for each material and must empty 1 1/2 times during the day. Trashco has purchased a new state-of-the-art recycling truck, but still uses a pick-up truck in hard-to-service areas. All haulers must hand unload from the project's containers, in part, due to a lack of handles and the weight of containers, but also because the volume of newspaper creates overflow and the hauler must clean up the area of loose newspapers.

### **Equipment Planned for the Next 6 Months to 1 Year**

All haulers plan to make equipment purchases within 6 months to a year. McInnis is considering a recycling truck that could be adapted for automated roller cart emptying. Trashco is going to purchase a small hook truck. MDC is in the process of renovating a side-loader geared towards newspaper and cardboard collection. Salvi and Heiberg are purchasing flatbed trucks and trailers to haul containers. Purchases are being made to allow the hauler the flexibility to standardize pick-up across both residential and commercial accounts.

## **Improvements to the Current Multi-Family System**

Haulers' feedback on the materials collected at the shelters showed that most preferred glass to be sorted: clear, green, and brown. The extremely low amounts of aluminum collected at each site suggest that the material be dropped from the program. One hauler (MDC) suggested that aluminum be dropped in favor of plastic milk jugs.

All haulers suggested new containers made of metal or heavy plastic be used in place of the fiber barrels. The containers need to be small (less than 32 gallon) in order to address weight issues, and have handles for ease in servicing. Trashco, in particular, feels that the 25 gallon container is a good size and has purchased some to place in our shelters as a test. The containers must have holes in the bottom to allow for liquids to drain out.

Each of the haulers surveyed found the current newspaper containers were grossly inadequate. All felt that a 1-3 yard container would allow adequate storage for twice a month service or even a minimum of once a month at small complexes. This would coincide with the servicing schedule of the other recyclable materials contained in the shelters. It was estimated that one 1 1/2 yard container would serve an apartment complex of less than 10 units in size at once a month pick-up, and for 10 to 25 unit buildings at a twice a month pick-up.

## **Future Equipment Options**

The equipment options for future Multi-family recycling efforts should be viewed in a short-term and long-term time frame. The equipment reviewed included fiber or plastic barrels, plastic bags and metal racks, recycling baskets, specialized newspaper containers (1-3 yard dumpster), roller carts, and the existing metal shelters. These options were rated in terms of time/labor efficiency,

hauler safety, tenant ease in using the system, durability, and cost of the container. Each equipment option was rated on a 1 – 5 point scale, with the most positive score being a 5, while the lowest rating was scored a 1.

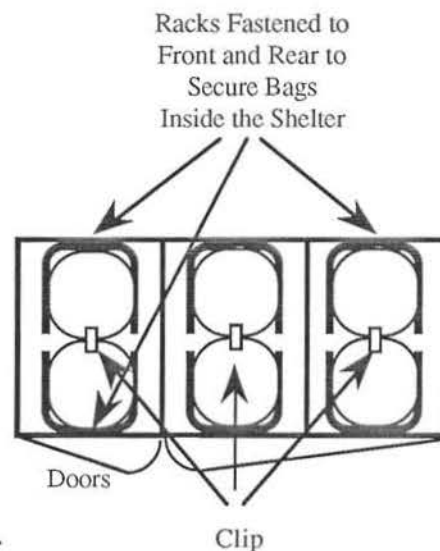
Table 1  
**Options for Changes for Recycling Equipment**  
 (1 – 5 Scale; 1 = Low 5 = High)

Options	Hauler Ease	Tenant Ease	Hauler Safety	Durability	Cost per Item
Shelters	4	5	4	5	300.00
Fiber Barrels 32 gal	2	5	2	2	2.00
Bags / Racks	4	4	4	3	2.00
Plastic Barrels 32 gal	4	5	4	4	30.00
Roller Carts 60 - 90 gal	5	5	4	4	70.00
Recycling Baskets	3	3	4	2	5 – 7.00
Special News Containers	5	5	4	5	300.00

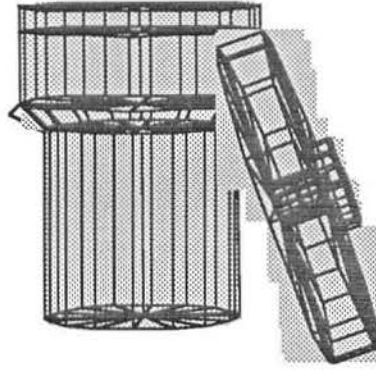
Short-Term Equipment Changes

The shelters were seen as a positive step in the beginning stage of the multi-family recycling effort, and won approval because they provide a centralized location. Depending on the containers used in the shelters, the time/labor efficiency level would be moderate to high when servicing most materials. The efficiency level decreases substantially with the fiber barrels because they lack handles and can become too heavy for hauler safety. The containers should be replaced with more manageable metal or plastic barrels with handles or the plastic bag and rack system.

Three of the haulers felt the woven plastic bag and rack system is efficient in terms of time/labor costs. Safety is a feature built into the bag system because the weight is controlled by the bag size. The bags are durable and last about 6 months. The cost is fairly low at about \$2.00 per bag and \$8 to \$12 per rack. The bags can be used in the existing shelters with little modification required. A rack can be attached to the rear and front walls of a shelter so that two bags (clipped together in the center) are used to collect each material. If the shelter design was modified so the length of the unit increased by 12 inches, three to six bags of recyclables can be stored in the shelter, increasing the length of time between servicing. Managers or tenants also can be recruited to change the bags between servicing. However, bags were seen as only a short-term solution. As growing participation in recycling increases the volume of recycling materials collected, the bags will no longer provide adequate storage.



A durable plastic barrel with handles costs about \$30. Haulers expressed concern about overly large containers (over 35 gallons) that result in time spent hand-unloading and also pose a safety hazard because of the weight. A smaller size (25-32 gallons) reduces the efficiency loss.



The single plastic basket that would be distributed to each tenant, was an unpopular equipment option. Although the cost is low, all of the haulers expressed misgivings about the container. The comments centered around the efficiency loss involved in handling each container, of litter occurring if service was delayed in some way (equipment breakdown), and the perception that these baskets would “walk away” at an alarming rate.

The specialized 1 – 3 yard container for recycling newspaper was overwhelmingly supported because it increases time/labor efficiencies by mechanized dumping. The increased size allows for fewer servicing stops to be made to each complex. Even Heiberg Sanitary, the only hauler who would unload the paper by hand, preferred this container to smaller barrels. Cost is high for the container, but so is the durability. Using this container allows for placing it in a centralized location for easy tenant and hauler access. This container was seen as both a short and long term equipment purchase.

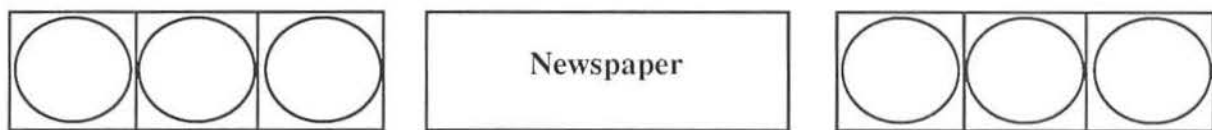
#### Long-Term Equipment Changes

Each hauler felt that in the long-term the best option for equipment will be the roller cart. The cost for a 90 gallon cart is between \$60-\$70 and \$55-60 for the 60 gallon cart; the lifespan of the roller cart is estimated at several years. At the present time, technology is the biggest hurdle to

using the roller cart. There is not yet a truck that has been adapted to mechanically empty the carts into multiple bins on a recycling truck.



The variety of systems in use make decisions concerning equipment difficult, although several conclusions can be made. The current shelters will be more efficient if small plastic or metal containers are substituted for the existing fiber barrels. These containers will provide adequate storage for the 3 types of glass (clear, green, and brown), tin, and aluminum. For the present time, the extra space can be used for cardboard or for customizing the shelter to fit the needs of the complex (for example more clear glass storage). In the future, the space can provide storage for other mandated curbside materials, such as plastic milk jugs. A 1 – 3 yard container should be added to prevent further problems with overflowing newspaper barrels which cause a decrease in participation in the recycling effort.



**Recommended Configuration for Multi-Family Recycling Systems.**

The average apartment building will require 2 shelters and 1 newspaper container to adequately service tenants



Several haulers stated that they would like more direction from the City before making investments in equipment. If the systems set up by the City require equipment that can be used to service both residential and multi-family (commercial) accounts, economies of scale will occur followed by better service. Roller carts should be seriously considered for any future recycling projects.



Anticipated increases in the volume of recyclable materials will justify the equipment investments made by haulers to service the roller carts. A barrier to using roller carts is the lack of technology at present to mechanize the service. Currently, the equipment used by the haulers reflects the labor intensive systems that are in place.

All the haulers made comparisons to the Seattle recycling program. In their minds, just the “avoidance” of fees paid per ton at the landfill is not enough incentive for increased recycling participation on their part. They would like to receive an actual recycling rebate per ton of recycled materials from the City, similar to Seattle’s \$50 subsidy. This would help to recover the labor and equipment costs incurred by recycling services.

In conclusion, the recommendations for shelter design changes are as follows:

- Separate glass into clear, green, and brown.
- As other materials become mandated for curbside pick-up, drop aluminum from the project.

- Replace the fiber barrels with more manageable and durable plastic or metal barrels.
- Use 1– 3 yard specialized containers for newspaper storage.
- As technology permits, promote roller carts or the equivalent available technology to standardize pick-up in both residential and commercial accounts.
- Consider using the bag and rack system in the shelters to reduce costs and modify the shelter to provide more storage space for full bags.