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THE ADVANTAGES OF A BAG-BASED RECYCLING SYSTEM

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ADDRESSING THE MUNICIPAL SOLID WASTE CRISIS ... LOCAL RECYCLING PROGRAMS

According to the National Solid Waste Management Association's (NSWMA) Special Report on Recycling in the States -- Update 1989, "38 states plus the District of Columbia enacted more than 120 recycling laws through September [of 1989]."

The NSWMA reports that seven of these states (Connecticut, Maine, New Jersey, New York, Pennsylvania, Rhode Island and Washington), plus the District of Columbia, have legislated mandatory source separation. Numerous other states have recycling legislation pending. Many states have delegated the responsibility for choosing, implementing, and managing a recycling program to local governments, on either a county or municipal basis.

The objective these communities must meet -- reducing the amount of solid waste disposed of in landfills -- is clear. But, the range of choices and methods for implementation of a recycling program is varied.

The importance of choosing the appropriate system cannot be underestimated: experience has shown that the success of any recycling program depends upon participation, capture rates, quality of materials collected and practical economics.

TYPES OF RECYCLING SYSTEMS

There are two common methods of recycling -- curbside pick-up and centralized drop-off of recyclables by the residents.

Research has shown that curbside pick-up of recyclables is the most desirable system because it achieves higher participation rates. Specifically, a report published by the Illinois Office of Solid Waste and Renewable Resources and the Illinois Department of Energy and Natural Resources stated that while drop-off recycling programs typically achieve a 5% - 20% participation, curbside collection may achieve a 70% - 80% participation. It also stated that "there is a direct relationship between convenience for the homeowner and effectiveness of the curbside program."

Since higher participation rates indicate that curbside recycling is preferred to centralized drop-off, one of the key issues facing municipal solid waste managers is determining the best curbside recycling system for their communities.

THE FIRST BRANDS POSITION: BAG-BASED RECYCLING WORKS BEST

First Brands Corporation believes that bag-based recycling is the best curbside system because it takes into consideration the needs of the consumer, the residential hauler (if applicable) and the municipality, resulting in the simplest yet most advanced system for recycling. For a recycling system to achieve long term success, it must address the needs of all these important groups.

First Brands believes that for recycling to be successful in the United States, the recycling system chosen must be "resident-friendly." Since most consumers already use plastic bags as their preferred method of trash containerization, the convenience of bag-based recycling

encourages more consumers to recycle more recyclable material. This conclusion is not only based on research conducted on recycling and on bag-based systems, but also on the First Brands history of more than 25 years of successfully manufacturing and marketing GLAD Trash Bags.

Here are ten reasons why First Brands Corporation believes bags are well suited for your recycling program:

1. *Consumer Convenience* - Bag-based recycling promotes the storage of recyclables in kitchen area, allowing the resident to separate recyclables conveniently at the source of generation. Alternative recycling methods -- such as rigid containers (bins) -- are cumbersome, and, according to First Brands research conducted in Canada, are stored outside the kitchen by 98% of residents, an obvious inconvenience.

2. *The "One-Way Carry" of Bags* - In a bag-based recycling system, residents make a one-way trip to the curb -- they do not have to return a container to the storage area after trash pick-up. Additionally, bags offer substantial time/motion savings to the waste hauler because bags do not have to be returned to the curb by sanitation workers. One study projected the savings as 27% for a one-man/one-truck system and 20% for a three-man/one-truck system, without any curbside sortation by sanitation workers.(1)

3. *Maximizing Participation Rates* - The use of bags encourages more residents to recycle. Independent research commissioned by First Brands Corporation has shown that 66% of the respondents stated that a bag-based recycling program would encourage them to recycle more, due to the convenience the program offers.(2) Further, the research revealed the majority of negatives associated with recycling relate to the storage and transferring of recyclables -- specifically the storing of recyclables, transferring .pa

recyclables to the storage area, and returning the recycling container to the storage area, as shown below:

ANNOYING ASPECTS OF RECYCLING

How Annoying Is	Very/Somewhat
- Storing Recyclables Before Bringing to Recycling Container	43%
- Taking Recyclables to Storage Area	43%
- Returning Recyclable Container to Storage Area	34%

Because bags can be stored in the kitchen (versus in the garage or mudroom for bins) the "annoying aspects" of recycling will be minimized with bag-based system.

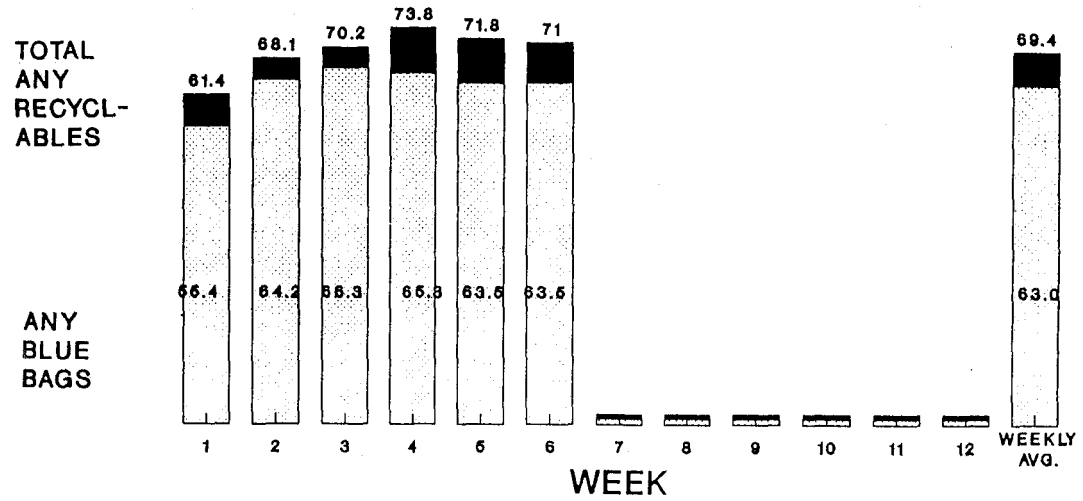
Due to the high level of convenience to the consumer in a bag-based system, participation rates in First Brands opinion will be maximized. A First Brands Corporation Bag-Based Pilot program in Canada achieved a cumulative participation rate of an exceptional 87% in the first four weeks of the program which equals the reported levels for bin-based systems after the first eight weeks of pick-up. (3) With bags, everyone can recycle ... including the elderly and children ... because the bags can be carried easily. By contrast, bins are cumbersome and require two hands to carry.

A bag-based program stated on April 10, 1990 in Danbury, Connecticut has demonstrated the ease and convenience of the system. After six weeks of the program weekly participation rate in averaging 69%, as illustrated on the following page:

DANBURY RECYCLING PROGRAM

WEEKLY PARTICIPATION

% OF ALL HOMES



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4. *Maximizing Capture Rates* - Bags are easily available and affordable and residents are able to expand the number of bags used for recycling depending on the particular need, i.e., how much waste each household generates.

   The use of rigid containers (generally a 14 gallon container) limits the ability of the residents to conveniently increase the volume of recyclables being disposed of (e.g., after a party, a special occasion or a holiday event) because the container are of a fixed or given size. In addition, rigid container programs have not addressed differences in family size or changes in the volume of recyclables generated by a household.

5. *Meeting The Needs of Multiple Dwelling Units* - Bags are ideal to address the special recycling needs of multiple dwellings and apartment buildings. Residents avoid storage problems associated with plastic bins and can set out their bagged recyclables the same way as regular trash. Additionally, plastic bins in hallways may be considered fire hazards in some cities (i.e., Pittsburgh) and their use would not be a viable option.

6. *The Bags, Themselves, Are Recyclable* - The GLAD Bag-Based System envisions the bags themselves as part of the recycling program. First Brands Corporation is developing debagging technology that mechanically opens the bags, debags the recyclables, and directs the recycling bags into a separate stream which allows for the capture and accumulation of the bags for later reprocessing and recycling.

7. *Bags Contain the Recyclables* - A bag-based recycling system reduces the sanitation problems associated with the elements of wind, rain or snow and with insect infestation that can be associated with rigid container usage. Specifically, since rigid containers are open-topped, recyclable materials are subject to spillage. Bags, on the other hand, can be easily and securely tied.

8. *Bags Enable the Municipality To Utilize Existing Resources* - Because the sortation of all recyclables can be done at a sortation facility, a bag-based recycling system does not require new dedicated vehicles or the addition of sanitation pick-up crews. Rather, the collection of bags could be done with existing equipment and crews. Further, a built-in distribution system exists to make the bags available at traditional retail outlets -- grocery, hardware and mass merchandise stores. Therefore, the municipality need not incur purchasing or distribution costs of the bins.

9. *Bags Minimize Start-Up Costs* - Because a bag-based system can utilize existing equipment and crews and product distribution channels, the municipality and/or the hauler incurs minimal "Start-Up" or "Upfront" costs to initiate a curbside recycling program.

10. *Bags Are 20% More Efficient* - In Table I on the following page, a comparison of collection costs is shown for plastic bags versus rigid containers using a community mode of 18,000 households. The 20% efficiency gain in collection is reflected in the relative collection costs of plastic bags versus rigid containers. This is based on the following assumptions: (1) that rigid containers would be supplied by the municipality, but ultimately paid for by the resident in the form of taxes (2) the plastic bags required for a bag-based system would be purchased by resident at retail stores (3) of the required recycling plastic bags, 80% of the purchases would simply replace bags already being purchased by resident for the disposal of regular household waste.

In a bag-based system, the plastic bags, themselves, can be recycled and can be collected at the sortation facility. Although the bags can be opened manually, an ideal system would utilize a mechanical bag opener ("debagger") at the sortation facility site. Systems employing debagging devices are under development and actual field testing is scheduled for July, 1990. The anticipated cost for a debagging machine is estimated to be $50,000. **NOTE:** This economic feasibility study is only intended to offer a prototypical example of relative costs of a bag-based recycling system versus a rigid container system. Actual costs will vary depending on differing local factors and community size.

TABLE I

COMPARISON OF PROTOTYPICAL COSTS: BAG-BASED VERSUS RIGID CONTAINER COLLECTION FOR A HYPOTHETICAL COMMUNITY OF 18,000 HOUSEHOLDS BASED ON ASSUMPTIONS ON FOLLOWING PAGE

	COLLECTION COSTS PER	
	BINS	BAGS
COMMUNITY SIZE, HOUSEHOLD(1)	18,000	18,000
PICK-UP EFFICIENCY SECONDS(2)	30	24
TRUCKS REQUIRED	5	4
TRUCK UTILIZATION, % FULL (3)	68%	85%
WAGES & BENEFITS (ONE PERSON CREW) (4)	$234,900	$187,920
AMORTIZED TRUCK CAPITAL COST (5)	40,000	32,000
TRUCK OPERATING EXPENSES (6)	8,850	8,250
TOTAL COLLECTION COST, $	283,750	228,170
TOTAL COLLECTION COST, $/TON (7)	86	69
CONTAINER COSTS (8)		
AMORTIZED START-UP,$	10,395	
ANNUAL, $	19,278	13,920
TOTAL COST TO MUNICIPALITY	$313,423	$228,170
TOTAL COST TO CONSUMERS (TAXES PLUS PURCHASES)	$313,423	$242,090

ASSUMPTIONS

COMPARISON OF BAG-BASED SYSTEM VERSUS RIGID CONTAINERS

(1) Once a week pick-up, five day operation. Weekly participation rate is set at 44%, with a 98% cumulative participation rate.

(2) Time for travel plus pick-up in seconds per pass-by. Based on bag/can time/motion studies with municipal solid waste of 20%, depending upon crew size. This analysis excludes curbside sorting for both bags and bins. (Curbside sorting with a rigid container system widens the gap in favor of bags containing commingled recyclables.)

(3) Truck capacity of 30 cubic yards used for a total of 792 set-outs per day at 1.75 cubic feet per set-out. For both systems, collection time is limited. Collected volumes can be reduced (by approximately 30 %) by using a two-compartment truck for collecting paper and commingled recyclables with light compaction (1.5 psi) of the commingled compartment.

(4) Wages are $15/hour and $18/hour for the driver and mechanic, respectively, plus 35% for benefits. Mechanic's time set at 200 hours/truck/year.

(5) Truck costs at $80,000 with 10% straight line amortization per year.

(6) Truck expenses set at $0.50/mile and $50/truck/month.

(7) Total of 1,647 tons collected based on 17 lb/set-out.

(8) Bins are provided by municipalities at $4.00, plus 10% for initial distribution, amortized at 10%/year. A 20% annual make-up is assumed with an overhead of 2%. It is assumed that 80% of the required bags will displace bags currently in use for municipal solid waste by resident.

THE GLAD "BLUE BAG" SYSTEM FOR RECYCLING

First Brands Corporation, makers of GLAD^{R} Plastic Bags, believes that it has developed the ideal bag for recycling -- GLAD Handle Tie^{R} Recycling Bags. The GLAD Handle-Tie is convenient for tieing, lifting and carrying, and the bags are ideal for sorting, for curbside collection, and for trash pick-up vehicles. Because separation of recyclables from regular trash is done in the kitchen, First Brands Corporation has determined that the traditional 13 gallon bag is the best size bag.

First Brands Corporation conducted extensive product development and consumer research to develop GLAD Handle Tie Recycling Bags. The resulting product, a transparent blue bag, was identified by customers as the most distinctive of the colors tested. The research showed there was a very strong consumer preference for a colored bag (versus clear) due to the "privacy issue." While consumers want to do their part in recycling, they don't necessarily want their neighbors to see the materials they are recycling.

This critical piece of consumer learning resulted in GLAD developing a recycling bag that gives the consumer the necessary level of privacy , but is transparent enough so that when the hauler picks up the recycling bags he can easily determine (from 4 feet away) that proper recyclables have been discarded by the resident. However, from a distance (from 40 feet away), the materials in the recycling bags cannot be identified, providing the necessary level of privacy. This is the First Brands "4/40 rule."

Probably most important for the municipal manager is that there is a built-in distribution network for the recycling bags already established - through retail outlets such as grocery, mass merchandise and hardware stores. The blue bag will complement residents' normal

shopping and purchasing habits, causing little perception of burden. In addition, the municipality will not be required to enter the "bin business" (i.e., diverting their attention from regular concerns to order, distribute and replace bins). Rather, the municipality can utilize readily-available private sector resources.

THE BLUE BAG RECYCLING PROGRAM CAN WORK FOR YOUR COMMUNITY

First Brands currently has more than 20 programs underway in the United States and Canada. The results of these demonstrate the advantages of bag-based recycling over rigid containers.

Highlights include:

- Cumulative participation rates of 87% after four weeks have been achieved, which equals the reported levels for bins after eight weeks.
- Capture rates for a participating group increased 33% over a group participating in rigid container program.
- Weekly participation in our Danbury program has been as high as 74%.
- Residents are discarding approximately 1.3 bags of recyclables per week.

First Brands is continuing to conduct research, and is interested in receiving input from municipal managers in order to develop programs that can be tailored to meet every municipality's needs. First Brands has a team of experts waiting to help serve you. Please call Brent Haney at (203) 731-2422 to discuss the implementation of a program for your community.

FOOTNOTES

(1) New York City Department of Transportation Study, 1965.

(2) Research and Forecasts, March 1990 Study.

(3) First Brands Corporation, Winnipeg, Manitoba Pilot Program.

(4) First Brands Corporation Economic Estimates, 1990.