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RECYCLING ASSOCIATES INC.
Recycling Implementation Specialists

Plastic Recycling Collection: National Reach Study

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Purpose

The purpose of this project is to determine the types of rigid plastics that are collected—curbside or municipal drop-off—in the U.S. for recycling and to document the percentage of the population that has access to recycling various types of plastic. Rigid plastic includes plastic packaging such as bottles, tubs, cups, containers and trays; it also includes products such as storage boxes, toys, bins and boxes. This data will give us a better understanding of the progress toward the goal of curbside collection of all rigid plastics nationwide. The data will also provide the information that will allow us to achieve our objectives of ensuring access for recycling in those areas clearly underrepresented and to address the issue of providing clear, consistent education to ensure successful plastic recycling programs.

Acknowledgement

Moore Recycling would like to thank the Plastics Division of the American Chemistry Council (ACC) for funding this project.

Methodology

We began our study by taking a look at how the U.S. population is comprised. Using the 2008 U.S. City and County Populations from the U.S. Census Bureau, we determined that over 62% of the total U.S. population resides within the nation's incorporated cities, and the remaining population is in the unincorporated portions of our country. To break it down further, 53% of the population is found in cities with a population of 10,000 or more, 9.4% in cities with a population less than 10,000, and the remaining 37.6% resides within the unincorporated areas.

In creating this methodology we looked at two other recycling access studies done in the US - The 2008 American Beverage Association Community Survey and the 2007 American Forest & Paper Association Community Survey. Both studies used the same methodology: surveying a high percentage of the most populous communities and then surveying a representative sample of the smaller communities. We used a similar methodology, but acquired the data through a different

process. Instead of contacting county recycling coordinators to gather data on each community in their respective county as ABA and AF&PA did, we gathered data from each city and county directly. Both methods of collecting data will provide a similar result.

For this study we surveyed 2,468 cities with a population of 10,000 or more—these cities make up 91% of the population of all U.S. cities over 10,000—and a random sample of cities with a population less than 10,000. We also surveyed the unincorporated portion of 800 counties, whose total population holds 70% of the U.S. population.

Using the internet and phone calls we determined which plastic materials are collected curbside in each city and county. The study was set up to first look for each community's access to curbside recycling. If a curbside program was not in place, we looked for access to other collection programs such as municipal drop-off, subscription[1] or dirty material recycling facilities (MRFs)[2]. We did not gather data for deposit programs or retail drop off programs. In addition to collection information, we also gathered readily available general information for each city and county, such as the recycling coordinators' contact information and hauler(s).

Our data collection form allowed us to record general Plastic Collection Programs (defined below) as well as Specific Material types. Specific Materials are generally included in addition to the Plastic Collection Program (e.g., "All Bottles and Containers & Specific Plastics," such as expanded polystyrene [EPS] blocks or film). They are also used for the rare program that only accepts Specific Materials (e.g., high density polyethylene [HDPE] bottles and containers only).

We recorded any exclusions to Plastic Collection Programs such as EPS, Film, or polyvinyl chloride (PVC), and other product categories such as toys, motor oil bottles, etc.

We applied the results of the 10,000 or more cities and the random sampling of small cities to their respective population segment. We applied the results from the counties surveyed to the unincorporated population.

We have results for all the Plastic Collection Program categories for each of the population segments surveyed. These results do not include the exclusions to any particular program. In order to account for additional Material Types accepted or excluded, we applied that data to the Specific Material types, i.e. PET bottles/jars/jugs, etc.

Moore Recycling identified eleven Plastic Collection Program types for this study as illustrated in the table below.

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[1] Curbside programs offered for a monthly fee to which a resident must subscribe.

[2] Curbside programs where all waste is combined and brought to a facility where recyclables are pulled from the waste.

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Plastic Collection Program Definitions

Plastic Collection Program	Definition
All Plastic	All bottles and caps, All non-bottle rigid containers (includes cups, trays, boxes, clam-shells, tubs, pots, deli containers, carton, blister), All bulky rigid plastic (includes carts, crates, buckets, baskets, toys, lawn furniture) Includes film and EPS
All Rigid Plastic	All bottles and caps, All non-bottle rigid containers (includes cups, trays, boxes, clam-shells, tubs, pots, deli containers, carton, blister), All bulky rigid plastic (includes carts, crates, buckets, baskets, toys, lawn furniture)
All Bottles and Non-Bottle Rigid Containers	All bottles and caps, All non-bottle rigid containers (includes cups, trays, boxes, clam-shells, tubs, pots, deli containers, carton, blister)
All Bottles and Non-Bottle Rigid Containers & Specific Plastics	All bottles and caps, All non-bottle rigid containers (includes cups, trays, boxes, clam-shells, tubs, pots, deli containers, carton, blister) May also include film and/or EPS
All Bottles	All bottles with a narrow neck or screw top and their caps
All Bottles & Specific Plastics	All bottles with narrow neck or screw top and their caps, plus specific plastic types May also include film and/or EPS
CRV Only	California Redemption Value (CRV) plastic beverage containers
CRV Bottles & Specific Plastics	CRV plastic beverage containers, plus specific plastic types May also include film, EPS, and/or other non-CRV plastic)
PET & HDPE Bottles Only	Polyethylene Terephthalate (PET) & HDPE bottles and caps
PET & HDPE Bottles & Specific Plastics	PET & HDPE bottles and caps, plus specific plastic types May also include film, EPS, and/or other bottles
Other Specific Plastics	Other specific plastics outside of other categories

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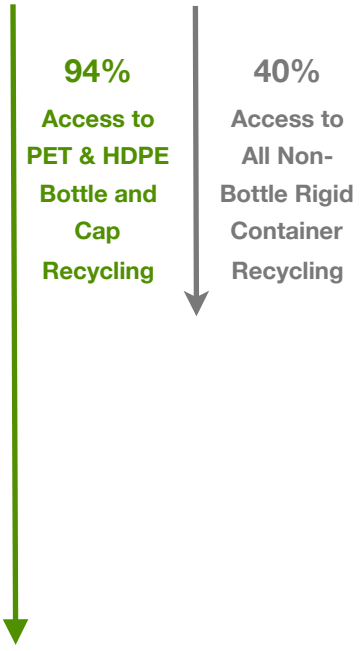
Findings

We found that at least 94% of the U.S. population has access to PET and HDPE bottle and cap recycling and about 40% has access to, at least, all plastic bottles and caps, and all non-bottle rigid containers. We identified 1,128 cities and 213 unincorporated areas of counties in the U.S. that collect all non-bottle rigid containers.

Plastic Collection Program	Percentage of US Population with Recycling Access
All Plastic	2.4%
All Rigid Plastic	13.0%
All Bottles & Non-Bottle Rigid Containers & Specific Plastics	3.0%
All Bottles & Non-Bottle Rigid Containers	21.2%
All Bottles & Specific Plastics	1.9%
All Bottles Only	12.5%
PET & HDPE Bottles & Specific Plastics	12.9%
PET & HDPE Bottles Only	26.8%
All CRV Bottles & Specific Plastics	0.1%
All CRV Bottles Only	0.2%
Other Specific Plastics	0.6%
No Plastic Program	5.4%



For more information on non-bottle rigid plastic recycling, please reference the (2009, 2008, and 2007) National Report on Post-Consumer Non-Bottle Rigid Plastic Recycling; see Resources.

The following chart indicates recycling access to Material Types. It has the Specific Plastics and the exclusions applied to the percentages. We were not able to account for some of the more general exclusions, such as “no automotive fluid/hazardous material,” from the Material Types below, but

we know that 10% of the population with access to the recycling programs above are asked not to include automotive/hazardous materials containers in their programs. Other exclusions, such as "no clamshells/take-out containers" or "no cups" were so rare as to be immaterial.

While we tracked curbside collection of film & bags, we did not include it in this report as most consumer film and bags are recycled through the over 12,000 retail drop-off programs located across the U.S.

Material Type	Percentage of US Population with
PET bottles/jugs & jars with caps	92.9%
HDPE bottles/jugs & jars with caps	93.6%
LDPE bottles/jugs & jars with caps	65.5%
PP (polypropylene) bottles/jugs & jars with caps	65.9%
PVC bottles/jugs & jars with caps	64.8%
Other bottles/jugs & jars with caps	62.7%
PET non-bottle rigid (trays/clamshells/cups)	53.7%
HDPE non-bottle rigid (cups/bowls/trays)	54.3%
PVC non-bottle rigid (blisters/clamshells)	45.6%
LDPE non-bottle rigid (tubs/lids)	47.0%
PP non-bottle rigid (cups/bowls/trays)	47.9%
PS non-bottle rigid (cups/bowls/trays)	42.9%
Other non-bottle rigid (cups/bowls/trays)	43.9%
EPS food service	23.8%
EPS packaging shapes	8.8%
Bulky Plastic (toys/buckets/crates/drums)	17.0%

Because we did not separately survey for deposit programs, it is likely that the PET bottle rate is higher than indicated. We found that in certain states, such as Maine, residents are specifically

asked not to place PET bottles into the curbside recycling program but are encouraged to collect and redeem their PET bottles through the states' deposit programs.

Observations

While collecting the data for this study we noted some interesting trends across the country in terms of materials accepted for recycling (as illustrated in the tables on pages 4 & 5), the ease in locating information, states/regions with few recycling programs and those with many programs, as well as fairly consistent terms in describing acceptable materials.

Education and Outreach

The majority of cities and counties continue to use resin codes to describe acceptable materials for recycling, which is very confusing to the public. It is unfortunately quite common to see education such as...

> *Empty Plastic Containers: any plastic container with the "1, 2, 3, 4, 5, 6, or 7" recycling number on the back or bottom. Look for the symbol on these types of containers: beverage, bleach, condiment, cleaners, cooking oil, detergent, liquor, lotion, mouthwash, shampoo, syrup, milk and water jugs, plastic lids and bottle caps, plastic food trays, yogurt and butter tubs, meat trays*

In this commonly repeated case, the use of the numbers is perplexing and unnecessary, since all plastic containers are one of these resin types and it does not affect the recyclability of the product if the code is not on the container. This type of education discourages the public from participating in plastic recycling if they believe they have to check every plastic container to see if it has a number; it perpetuates the myth that only some of the containers can be recycled, whereas, in the program above, all containers can be included.

Other public education is just incorrect. Below is an example from a website of a community in the South whose information on the types of plastic they accept in their recycling program is very confusing:

> *Plastic with #1- #9 recycling symbols. Milk and water jugs, soft drinks, soap, cleaners, bleach, mouthwash, shampoos, coffee can lids, cooking oil containers minus the oil. Rinse, remove caps and neck rings and flatten.*

The resin code separates plastics into numbers 1 through 7; there are no number 8 or 9 plastics. Eliminating the resin code in this example and only giving the description of the items that are acceptable would provide clear instruction, especially if it was accompanied by a picture with example containers.

But there are some good examples of public education: those illustrating materials accepted through photos and a brief, clear description. Here is an example from Santa Barbara County:

Providing photos, as shown in this example, and avoiding the use of the resin code, gives very clear direction to the residents participating in the recycling program. Please see the Resources section, for links to good community education programs.

Regional Differences

We found that, in general, locating incorporated county recycling collection data was much more difficult than obtaining information for the cities. As expected, the larger the city and/or county, the more easily data could be located online. Some of the states with the poorest outreach were Kentucky, Louisiana, Mississippi, Texas, Oklahoma and New Mexico for both incorporated and unincorporated areas. Both Connecticut and New Hampshire proved difficult in obtaining information about recycling for their unincorporated areas but their city information was fairly thorough. Conversely, a number of states had easy-to-find, online access to their recycling programs including California, Florida, Virginia, South Carolina, Pennsylvania, Oregon, Washington and Wisconsin. Surprisingly, recycling education information was easily found for Georgia and Alabama even though access to recycling in those states is fairly limited.

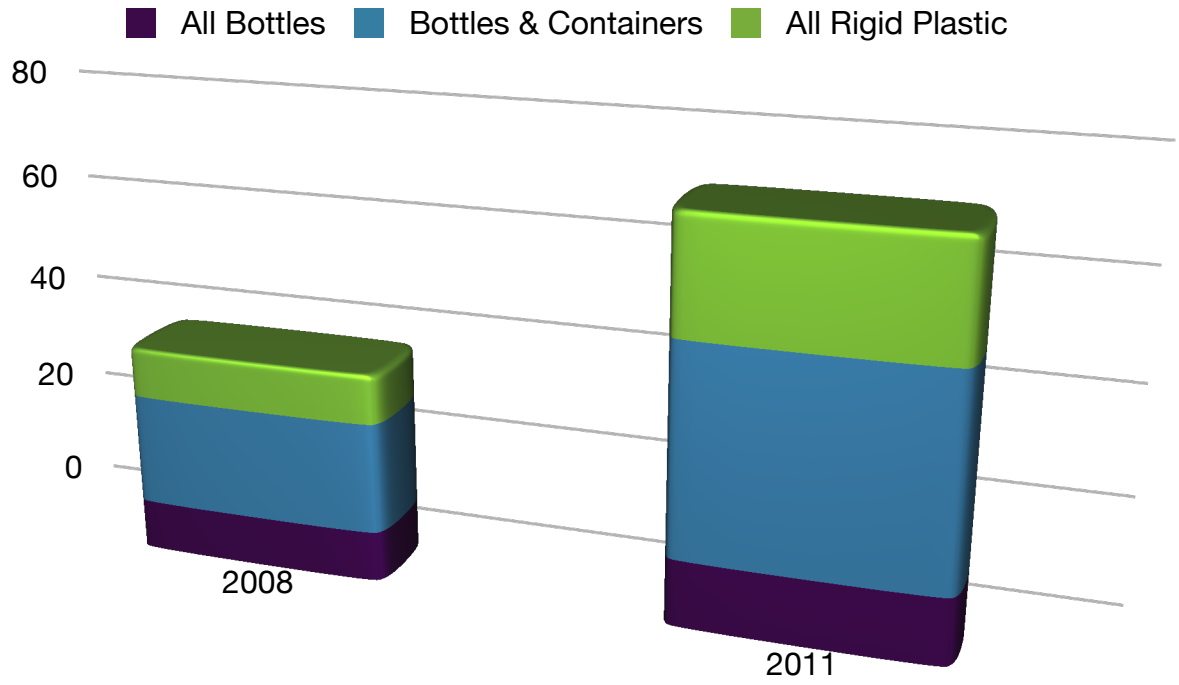
Regionally, the West Coast has the broadest access to plastic recycling. The East Coast has fairly good access to plastic recycling programs as do the states of Wisconsin, Utah, and North and

South Carolina. The states with the lowest access to plastic recycling are Arkansas, Alabama, Louisiana, Oklahoma, Mississippi and Texas.

Conclusions / Next Steps

There has been substantial growth in the collection of non-bottle rigid plastics. In November of 2008, Moore Recycling Associates surveyed the 100 most populous cities to determine what types of plastic they collected for recycling. Comparing those results with these, we find that in 2008 only 29 cities had access to non-bottle rigid plastic recycling compared to 59 today. While all the 100 most populous cities collected PET & HDPE Bottles in 2008, only 38 percent had access beyond PET & HDPE bottles compared to 71 today.

100 Most Populous Cities: Plastic Recycling Collection Programs



Clearly the results show that there is widespread access to plastic bottle recycling, yet the recycling rate for PET and HDPE bottles is under 30 percent. This means that the public and communities are not consistently taking advantage of access, along with plastic material is being lost in the collection and processing system. There is much work to be done across the country in providing the public with clear and concise information when it comes to learning about recycling programs, especially online. As mentioned above, many communities are providing clear recycling education but others continue to use the resin code or incorrect information.

There is a pressing need to develop a universal language to describe items acceptable for plastic recycling. Current city and county outreach materials leave too much room for personal interpretation, and most of it is confusing. Creating standardized outreach, such as the example from Santa Barbara County, would be invaluable and reduce the confusion surrounding plastic recycling collection. This would help increase the capture rate in those communities that do collect plastic beyond bottles.

We spent a significant amount of time in extracting data for the 3,200 plus communities across the country; much more than originally anticipated. Our previous experience in collecting this data was biannually for two years from California, which is one of the areas with readily available information. Ultimately, we were able to obtain valuable information that gives us a snapshot on how well we are doing as a nation when it comes to consumer's access to plastic recycling. Other data that might prove useful for a future rigid plastic collection study would be the collection of information for those states that have deposit programs. Having this data would allow us to illustrate a higher percentage of access to recycling for HDPE and PET beverage bottles.

Although it was not part of this report because of the differing collection infrastructure, it is also important to document the access to film and bag recycling.

Performing this study on an on-going basis will allow us to measure where the U.S. has improved in plastic collection and where we still need to focus our time and energy. The collection database is set up and refined; it has the contact information for each city and county, including the website where we found the information. We have performed the most difficult tasks of creating and populating a database to make this study run easier the next time around.

Resources

2009 National Report on Post-Consumer Non-Bottle Rigid Plastic Recycling:
http://www.americanchemistry.com/s_plastics/sec_content.asp?CID=1593&DID=11690

Plastic Market Information:
www.plasticsmarkets.org

Plastic Bag Recycling information:
www.PlasticBagRecycling.org

2008 U.S. City Populations from the U.S. Census Bureau:
http://www.census.gov/popest/cities/SUB-EST2008-4.html

2008 U.S. County Populations from the U.S, Census Bureau:
http://censtats.census.gov/cgi-bin/usac/usacomp.pl

The following are links to examples of good online recycling public education:

Fairfax, Virginia
http://www.fairfaxva.gov/RefuseRecycling/CurbsideRecycling.pdf

Richmond, Washington
http://www.wmnorthwest.com/guidelines/allinone2.htm

Portland, Oregon
http://www.portlandonline.com/bps/index.cfm?a=202138&c=44752

San Diego, California
http://www.sandiego.gov/environmental-services/recycling/yes.shtml

Nashville, Tennessee
http://www.nashville.gov/Recycle/Recycling/residential/index.asp#c1

Santa Barbara, California
http://www.santabarbaraca.gov/Recycling-Trash/pdf/Mixed_Recycling_Cart_Can.pdf