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2015-16 CENTRALIZED STUDY ON AVAILABILITY OF RECYCLING FOR BEVERAGE CONTAINERS

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BACKGROUND AND PURPOSE

This study aims to provide an accurate measurement of the availability of recycling programs in the US for beverage containers. Through the collaboration of multiple packaging stakeholders, this study shares a common methodology with measurements of recycling program availability for numerous other materials. It aims to capture the nuances of how recycling services for these materials are provided to residents in the U.S., as well as identifying opportunities for increased material recycling.

This study identifies the prevalence of recycling programs that accept beverage containers and also characterizes the type of instructions provided to residents on recycling these items. This can be used to substantiate availability of recycling claims by brands and marketers.

The data presented is not intended to represent, in and of itself, any claims regarding the recyclability of items covered in this study. Note that the liability for making a recyclability claim rests on the entity making the claim, as described by the Federal Trade Commission:

> Marketers must ensure that all reasonable interpretations of their claims are truthful, not misleading, and supported by a reasonable basis before they make the claims. See FTC Policy Statement Regarding Advertising Substantiation, 104 FTC 839 (1984). In the context of environmental marketing claims, a reasonable basis often requires competent and reliable scientific evidence. Such evidence consists of tests, analyses, research, or studies that have been conducted and evaluated in an objective manner by qualified persons and are generally accepted in the profession to yield accurate and reliable results. Such evidence should be sufficient in quality and quantity based on standards generally accepted in the relevant scientific fields, when considered in light of the entire body of relevant and reliable scientific evidence, to substantiate that each of the marketing claims is true.
>
> — Section 260.2, Guides for the Use of Environmental Marketing Claims (“Green Guides”), Federal Trade Commission, October 11, 2012.

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- Carton Council (CC)
- Glass Packaging Institute (GPI)
- National Association for PET Container Resources (NAPCOR)
- SPI: The Plastics Industry Trade Association
- The Aluminum Association (TAA)

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DEFINITIONS

- **Availability of recycling** for this study is defined by a resident having one or more of the following services, measured separately in this study, at their place of residence:
    - Curbside recycling provided automatically to their home by public or private service providers, or
    - Curbside recycling provided on an opt-in or subscription basis to their home by public or private service providers
    - A publicly or privately operated drop-off recycling location within the municipality where the resident resides. Residents living outside the community where the drop-off is located are considered to have drop-off recycling available if their own municipality, county, or other local government directs them to that drop-off location as the appropriate recycling outlet.

  Note that the study measures **availability** of recycling, not recycling rates or recycling participation.

- **Curbside** collection of recycling means that recycling is collected from homes after residents set out materials on the side of the street. In this study it is also used to refer to programs for apartment complexes where collection containers for recycling are located anywhere in the complex.

- **Drop-off** recycling refers to a program where residents bring recyclables to a collection point away from their residence.

- **Bins** are open-top containers typically 14 to 18 gallons in capacity, used to hold recyclables for curbside collection.

- **Carts** are large wheeled containers with lids, ranging in capacity from 30 to 100 gallons. Carts used for recycling collection are most frequently 64 or 96 gallons in capacity.

- **Automatic** - In an automatic program, residents receive recycling services, including bins or carts in programs that use them, by default as part of standard waste collection services. These services may be provided by municipal employees or by a contractor.

- **Opt-in** - An opt-in program, for the purposes of this study, is one provided by a community or its contractor, in which residents must sign up and in some cases pay an additional fee to participate in recycling.

- **Subscription** - In a subscription-based program, residents hire curbside recycling services on an individual basis from their choice of private service provider. These services may be bundled with the cost of regular trash collection, or priced separately.

- **Single Stream** refers to a system in which all recyclables are commingled in one container for collection and sorted after collection at a Material Recovery Facility (MRF).

- **Dual Stream** refers to a system in which recyclables are sorted into two groups (“streams”), typically containers and fiber, for separate collection. Each stream may be further sorted at a MRF.

- **Source-Separated** refers to a system in which recyclables are sorted into three or more streams prior to collection.

- **Mixed Waste** refers to a system in which all recyclables and household trash are commingled into one container for collection. Recyclables are sorted from trash after collection at a specialized mixed waste material recovery facility.

- **Single Family** housing typically refers to a detached dwelling in which one household resides. However, in recycling programs, “single family services” are often offered to residents in buildings with up to 2-8 residential units. See the methodology section below for further discussion of this study’s approach.

- **Multi Family** refers to buildings with more than one residential unit. For recycling program purposes, the definition of multi-family may vary from one community to another. This is discussed in the methodology section below.

- **Uptake Rates** refer to the percentage of the population offered an opt-in or subscription recycling service who chooses to receive that service, by signing up, subscribing, or paying the required fees, depending on the program requirements.

METHODOLOGY

OVERVIEW

The team of researchers conducting this study reviewed details on recycling program availability for a group of over 2,000 communities representing over 50 percent of the population of each U.S. state and the U.S. as a whole. The largest communities in each state were identified and included in the sample so that at least 50% of each state's population was represented. This large community sample included approximately 1,600 communities in the U.S. The remaining population was represented by a random sample of approximately 500 smaller communities. Researchers independently reviewed public-facing recycling program information and materials and evaluated them for details on the program and items accepted. Both curbside and general drop-off recycling programs were evaluated, but the study did not cover some material-specific drop-off programs, such as bottle deposit programs or manufacturer-provided take-back locations. Each program was coded to indicate whether it was available to single-family residents, residents of multi-family housing, or both. Based on the results of the research, the research team calculated the number of residents in each community that had a recycling program available that accepted a particular material or item. The Project Team calculated the rate of availability of recycling for each commodity included in the study from the large comprehensive sample and the small random sample. The results from the small random sample were extrapolated to apply to the remaining half of the population for each state.

For more details on the study methodology, please see the main study report, *Sustainable Packaging Coalition: 2015-16 Centralized Study on Availability of Recycling.*

"AVAILABILITY OF RECYCLING" DETERMINATION FOR MATERIALS

The methodology included development of a standardized framework for evaluating how a recycling program describes its acceptance of specific materials. Identified materials were coded based on how explicitly that item is included or excluded from the program's descriptive guidelines. This metric, summarized below, was used to account for some of the variation in how recyclables are described by public programs and to reduce the variation in individual interpretation by researchers as a factor in the study. The scoring system provided a basis for the assumptions and rules that are used to determine whether recycling is available for a particular category. Note that the language shown in the framework is not all-inclusive but represents examples of descriptions used to classify materials.

Table 1: Acceptance Rating Framework and Examples of Application to Packaging Types

RATING	RATING SCALE DETAIL EXPLANATION	PET BOTTLES/JUGS & JARS	ALUMINUM BEVERAGE CANS	GLASS BEVERAGE BOTTLES	CARTONS
		Examples (Categorize based on language similar to examples shown)			
1: Explicitly Accepted (Considered Availability)	A "1" is a specific mention of the item, or a photo of a common example. For plastic refers to product form and doesn't exclude resin	Plastic bottles; #1 bottles; Plastic bottles and containers; Plastic containers; Water and soda bottles	Aluminum cans, aluminum beverage cans, metal cans, aluminum drink cans	Glass bottles, Glass jars, Food grade glass containers	Food and beverage cartons; cartons (milk, soy, juice, wine, broth, soup.); aseptic containers, juice boxes, Tetra Paks; gable top cartons; milk and juice cartons

RATING	RATING SCALE DETAIL EXPLANATION	PET BOTTLES/JUGS & JARS	ALUMINUM BEVERAGE CANS	GLASS BEVERAGE BOTTLES	CARTONS
		Examples (Categorize based on language similar to examples shown)			
2: Implicitly Accepted (Considered Availability Where Highlighted)	A "2" means that the program accepts a broader category of material that residents would presume the material belongs to.	Plastic; Rigid Plastic; Plastics 1-7	Beverage containers; cans; containers; metal	Bottles; All glass	Coated paper; coated cardboard; coated boxes; beverage boxes
3: Neither Accepted nor Prohibited	A "3" is either highly general instructions that rely on resident prior knowledge, or a specific material not being mentioned in any category. Phone follow-up was conducted to attempt to move items out of the "3" category as appropriate.	Not mentioned; All recyclables; non-specific lists like "paper, cardboard, and other recyclables"	Not mentioned; All recyclables; non-specific lists like "paper, cardboard, and other recyclables"	Not mentioned; All recyclables; non-specific lists like "paper, cardboard, and other recyclables"	Not mentioned
4: Implicitly Prohibited	A "4" does not call the item out as prohibited, but goes into sufficient detail (e.g. with photos and text) of all the items that are part of the program, that a reasonable consumer could assume that anything not listed is not allowable. An item that is part of a larger category that is prohibited.	Detailed plastic list that does not include plastic bottles	Detailed material list that does not mention aluminum beverage cans in the metal category	Detailed material list that does not include glass bottles in the glass category or does not include glass at all	Detailed material list that does not include cartons in the fiber category
5: Explicitly Prohibited	A "5" means that the material is specifically called out as prohibited in either text or pictures.	No Plastic; No plastic bottles; No #1 plastic	No cans; no aluminum cans; no metal	No glass; no bottles	No aseptic packaging; no juice boxes; no milk cartons; no wax coated milk cartons

These individual ratings were then translated to a determination of “availability of recycling”. While some materials can be assumed to be included in recycling programs if broad or implicit statements of acceptance are made, others are not assumed to be included unless the program explicitly lists them. This report includes four of the over 40 material categories evaluated using this methodology. The table below explains how and why these determinations were made for the four materials in this

report. The cut-off points for determining availability of recycling for each material were reviewed and approved by the study stakeholders.

Table 2: Determination of Availability of Recycling for Items based on Framework

RATING	CAN BE INCLUDED AS AVAILABILITY OF RECYCLING FOR MATERIAL?	DETERMINATION FOR MATERIALS IN THIS REPORT
Explicitly Accepted	Yes	Included for all materials.
Implicitly Accepted or Broader Category Accepted	Yes, if similar in shape and structure to other accepted items of the same material type such that a reasonable consumer would consider them to fall within the category; if broad categories are typically used to describe the inclusion of this item; or if item has been found to be widely accepted in previous studies, and is not known to be problematic in the MRF. No, if unlikely to be considered included in the language.	Included for: • PET bottles/jars/jugs • Aluminum beverage cans • Glass beverage bottles Broad categories are commonly used as descriptions in programs accepting these items, including *Plastics #1-#7; cans; metal containers; all glass; all bottles*. Not included for: • Cartons Programs were considered to be available for cartons only if the program included cartons explicitly. This is due to a lack of a consistent broad category to which consumers consider them to belong and is consistent with previous measurements of recycling for this item.
Neither Accepted nor Prohibited	No	No
Implicitly Prohibited	No	No
Explicitly Prohibited	No	No

FINDINGS

AVAILABILITY OF RECYCLING FOR BEVERAGE CONTAINERS

Between 55% and 92% of the US population was found to have recycling programs available for the beverage containers studied. This figure includes programs available via curbside and drop-off, and optional programs that may or may not charge a fee for participation. Note that the study measured **availability**, not recycling rates: it did **not** measure the percentage of these materials that gets recycled, but rather the availability of programs with the potential to recycle the materials.

Table 3: Availability of Recycling Programs by Material

AVAILABILITY OF RECYCLING PROGRAMS FOR EACH MATERIAL	ESTIMATED POPULATION, IN THOUSANDS, WITH PROGRAMS AVAILABLE	ESTIMATED POPULATION, IN THOUSANDS, WITH NO PROGRAMS AVAILABLE	PERCENT OF TOTAL US POPULATION WITH PROGRAMS AVAILABLE
PET bottles/jugs & jars	284,597	24,149	92%
Aluminum beverage cans	282,780	25,965	92%
Glass beverage bottles	250,893	57,853	81%
Cartons	168,625	140,120	55%

DETAIL OF RECYCLING PROGRAM TYPES AVAILABLE BY MATERIAL

Curbside recycling programs accepting beverage containers were found to be available to between 45% and 68% of the US population, depending on the container type in question, while only drop-off programs were available to another 10%-24%. Residents with both a curbside and a drop-off program available to them are included in the curbside total. Among curbside programs for beverage containers, most are automatically provided to residents, with a smaller fraction delivered on an opt-in or subscription basis.

Table 4: Recycling Program Types Available by Material

	ALL PROGRAMS	CURBSIDE RECYCLING PROGRAMS				DROP OFF PROGRAMS ONLY
		ALL CURBSIDE	AUTOMATIC/ UNIVERSAL	OPT IN PROGRAMS	SUBSCRIPTION PROGRAMS	
	(Population, in thousands, with programs available/Percent of US population)					
PET bottles/jugs & jars	284,597 92%	209,464 68%	165,927 54%	18,178 6%	25,359 8%	75,133 24%
Aluminum beverage cans	282,780 92%	209,552 68%	166,043 54%	18,091 6%	25,418 8%	73,228 24%
Glass beverage bottles	250,893 81%	188,632 61%	148,980 48%	15,488 5%	24,164 8%	62,261 20%
Cartons	168,625 55%	139,135 45%	118,648 38%	8,869 3%	11,618 4%	29,490 10%

Opt-in and subscription curbside recycling programs present barriers to program participation compared to automatically provided curbside recycling services. The study found that 37% of residents provided an opt-in program and 30% of residents offered a subscription program opt to receive these services, on average across all programs. This means that of the over 20 million residents with these optional programs available for a given product, as few as 6.8 million opt to receive these services.

Table 5: Uptake Estimates for Optional Services

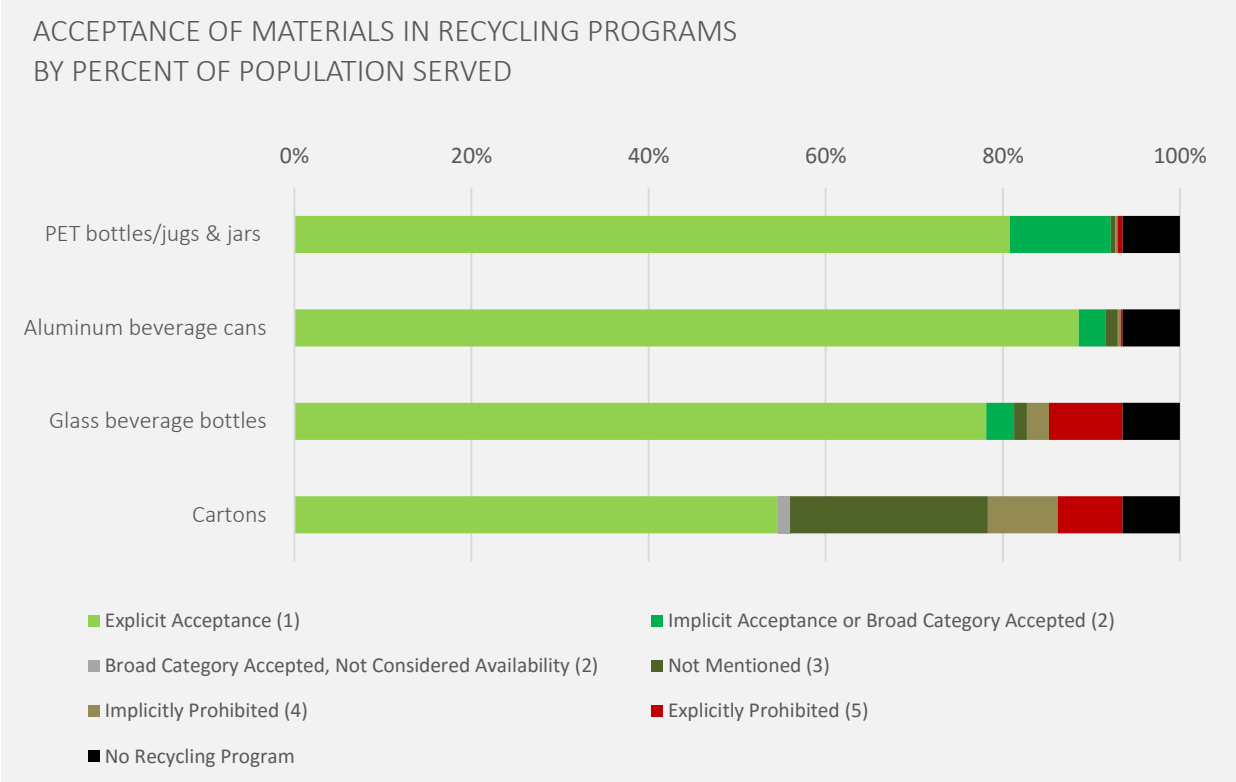
UPTAKE ESTIMATES FOR OPTIONAL SERVICES	ESTIMATED POPULATION, IN THOUSANDS, WITH OPTIONAL PROGRAMS AVAILABLE			ESTIMATED POPULATION, IN THOUSANDS, OPTING TO RECEIVE SERVICES			ESTIMATED PERCENT OPTING TO RECEIVE SERVICES[1]		
	TOTAL	OPT IN	SUBSCRIP -TION	TOTAL	OPT IN	SUBSCRIP -TION	TOTAL	OPT IN	SUBSCRIP -TION
Residents with Optional Curbside Recycling Services Available for PET Bottles	43,537	18,178	25,359	14,411	6,804	7,608	33%	37%	30%
Residents with Optional Curbside Recycling Services Available for Aluminum Beverage Cans	43,509	18,091	25,418	14,397	6,771	7,625	33%	37%	30%
Residents with Optional Curbside Recycling Services Available for Glass Beverage Bottles	39,652	15,488	24,164	13,046	5,797	7,249	33%	37%	30%
Residents with Optional Curbside Recycling Services Available for Cartons	20,487	8,869	11,618	6,805	3,320	3,485	33%	37%	30%

[1] Percent opting to receive services is a national average across all programs.

ACCEPTANCE OF BEVERAGE CONTAINERS IN RECYCLING PROGRAM GUIDELINES

The following chart shows the acceptance of beverage containers in recycling programs according to how the program guidelines describe these items. Programs that explicitly accept these items serve from 55% to 89% of the population, while in most cases a smaller fraction of the population is served by programs that implicitly accept them as part of a broader category. For cartons, there is no broad category commonly used by programs to define acceptance for this material, so only explicit acceptance was considered. Programs explicitly listing these items as prohibited serve up to 8% of the population.

Figure 1: Acceptance of Materials in Recycling Program Guidelines



STATISTICAL VALIDITY

The study combined a census approach for approximately half the US population with a stratified random sample approach for the other half. For the combined total population, the following procedure was used to calculate a margin of error for the study's findings. The standard error of proportion was calculated for the random sample using the equation $Std.error\ of\ prop. = \sqrt[2]{\frac{p(1-p)}{n}}$ where *p* is the sample proportion and *n* is the sample size. Next, a z-score was calculated to correspond to a 95% confidence interval (CI), meaning that there is a 95% probability that repeated

random samples would result in findings within the margin of error identified. The margin of error for the small random sample is equal to: *z-score * standard error of proportion*. This margin of error was applied to the population group extrapolated from the random sample, thus identifying an upper and lower bound of the population in this group with availability of recycling programs. Finally, the ratio of this band of uncertainty compared to the total population was calculated to determine a margin of error for the entire U.S. population for each of the study variables below. Note that the differences in the availability rates between some materials in this report fall within the margin of error.

Table 6: Margin of Error

VARIABLE	MARGIN OF ERROR CI=95%
Population with Programs Available for PET Bottles/Jugs & Jars	1%
Population with Programs Available for Aluminum Beverage Cans	1%
Population with Programs Available for Glass Beverage Bottles	2%
Population with Programs Available for Cartons	2%

ACCEPTANCE OF BEVERAGE CONTAINERS IN THE US

The following maps show where community programs that accept beverage containers are located in the U.S based on the direct survey results in 2015 and 2016. The maps also show the locations of communities not accepting beverage containers or not offering a program to recycle these items. The survey represents just over 50% of the U.S. population and thus the maps do not show recycling availability for all communities in the U.S.

LEGEND – ACCEPTANCE MAPS

- Program accepting specified material
- Program not accepting material

Symbols are scaled to represent community population

Figure 2: Acceptance of PET Bottles

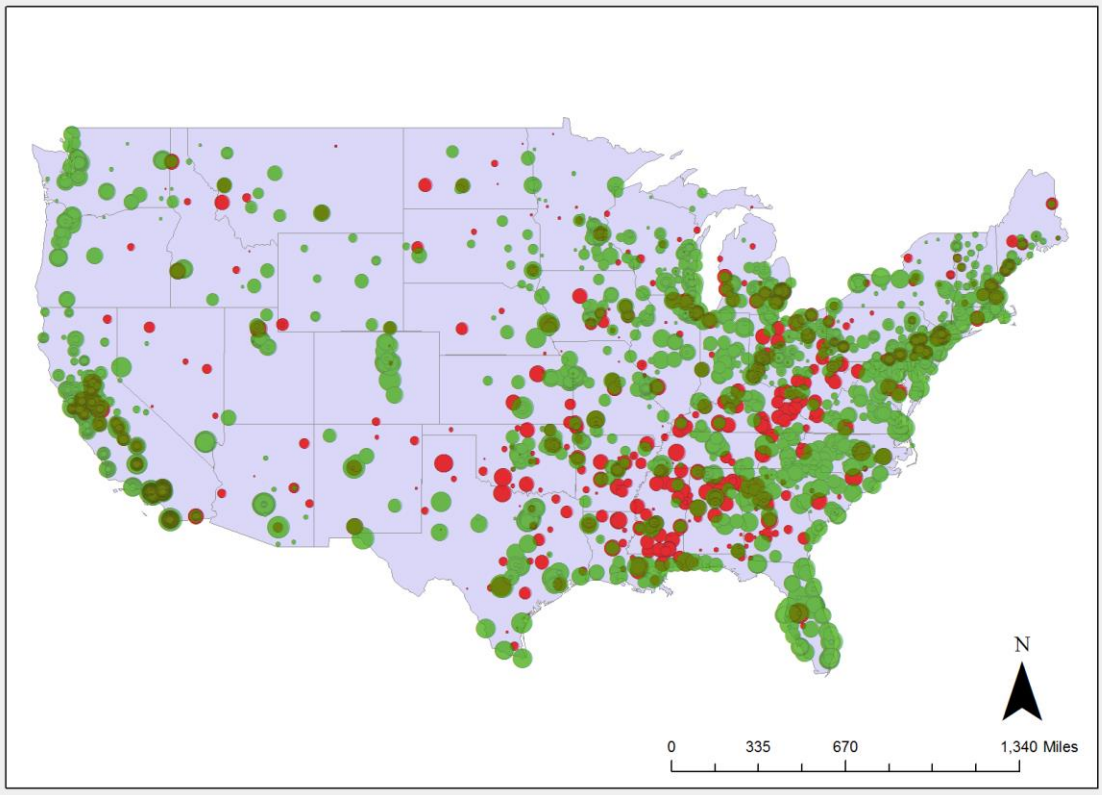


Figure 3: Acceptance of Aluminum Beverage Cans

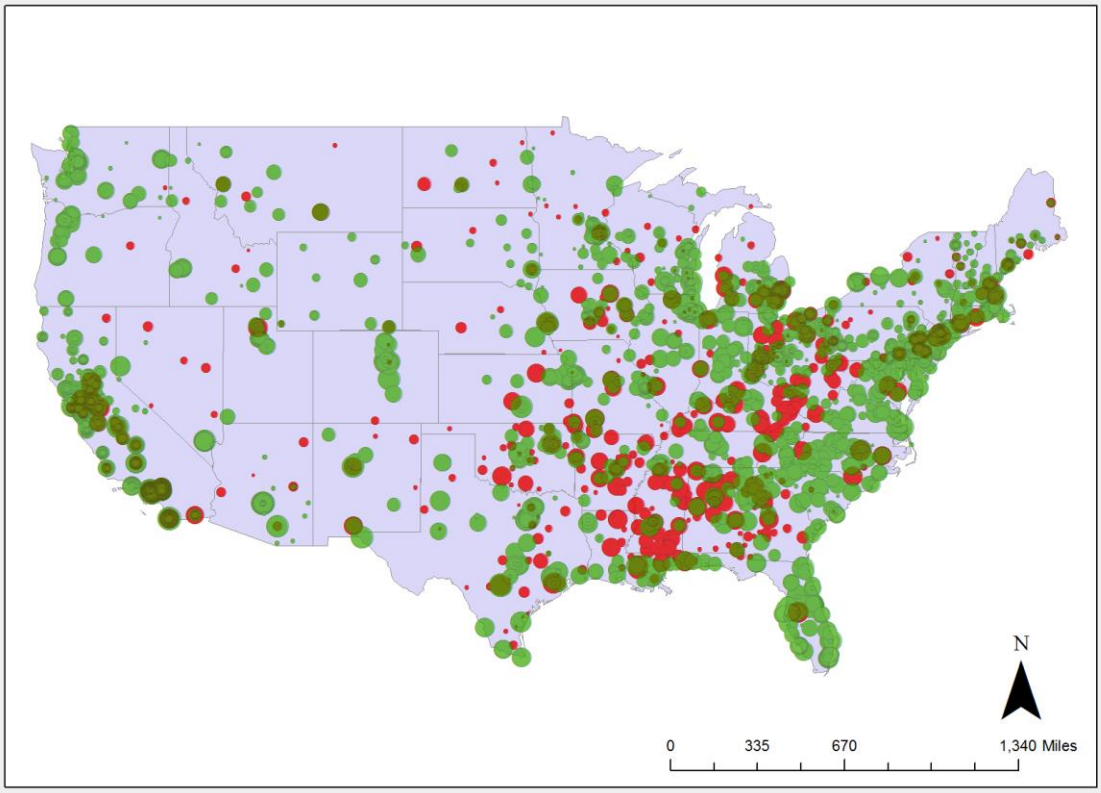


Figure 4: Acceptance of Glass Beverage Bottles

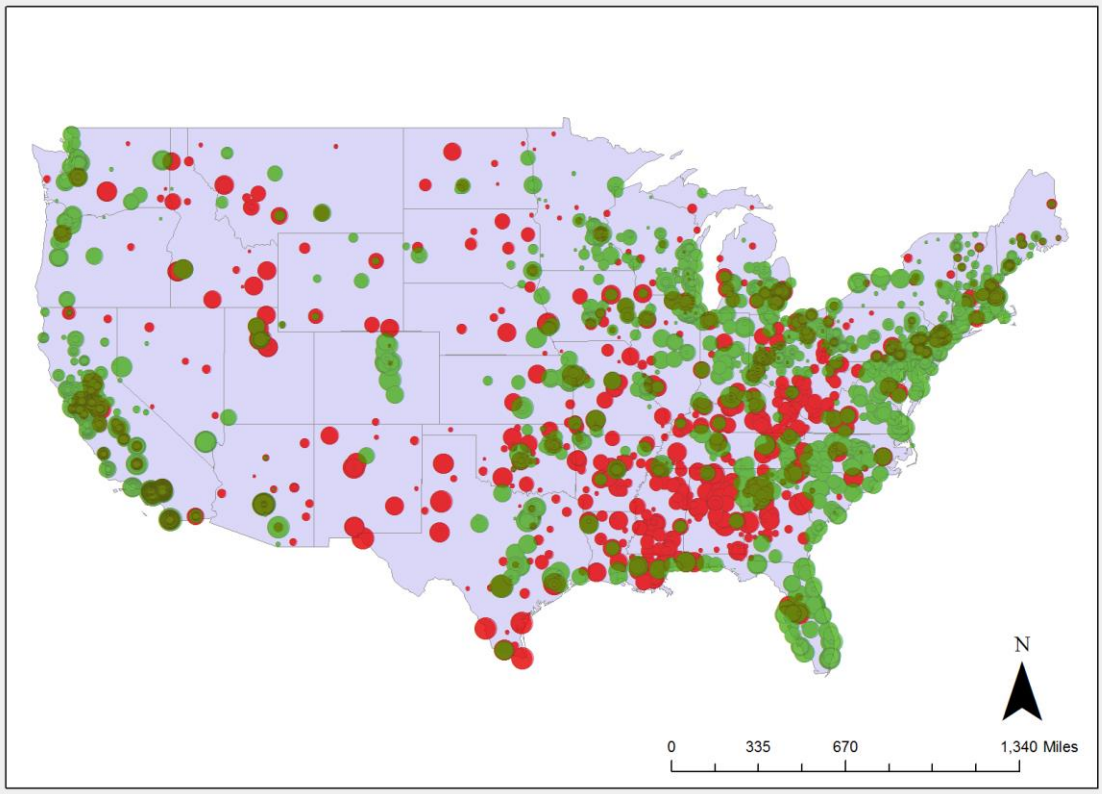


Figure 5: Acceptance of Cartons