



Addendum:

2019 West Coast Contamination Initiative Research Report

Summary of Studies

This addendum includes detailed information from all of the research conducted in 2019. Our hope is that community programs, haulers, MRFs, and other stakeholders in the recycling collection system can use these findings to inform decisions and improvements to their programs

City Survey & Interviews

Cities with populations greater than 50,000 people¹ were surveyed in California, Oregon, and Washington during the first quarter of 2019. This breaks down to 176 cities in California, 12 in Oregon, and 24 in Washington representing 65%, 40%, and 38%, respectively, of households in those states. City websites were reviewed for basic information on their recycling programs, and where possible, staff from the city, county, joint powers authority, or the hauler that administers the recycling program were interviewed for additional information and clarifications. [See the data on Page 3.](#) In addition to the follow-up interviews to answer the survey questions, The Recycling Partnership and Stephen Groner Associates also spoke with staff from 40 communities to identify challenges that recycling programs are facing. [See the data on Page 46.](#)

MRF Survey & Interviews

During the first quarter of 2019, MRFs that process residential recyclable materials collected curbside in California, Oregon, and Washington were asked to share materials that they accept, materials that are detrimental to their operation, and the top issue contaminants that come into their facility. Ninety-eight MRFs from California, Oregon, and Washington participated in the survey. In addition to the survey, The Recycling Partnership spoke with 10 MRF operators to gain a deeper understanding of what MRFs are doing to tackle contamination issues. [See the data on Page 18.](#)

Resident Survey

Residents of the cities from the city survey were also surveyed via phone by Myers Research in September 2019. 800 residents in California, 400 residents in Oregon, and 400 residents in Washington completed the survey. Survey questions covered a range of recycling topics, including the resident's knowledge, behavior, motivations, and barriers. [See the data on Page 23.](#)

Plastic Bag/Film-Specific Survey and Focus Groups

The city and MRF surveys identified plastic bags as the top contaminant in their residential recycling stream. An additional 1,319 residents were surveyed online in November 2019 by Stephen Groner Associates, OpinionWorks, and C+C to gain a deeper understanding of attitudes, behaviors, perceptions, and motivations around proper disposal of plastic bags and film. The resident survey by Myers Research showed that more residents in Southern California were bagging their recyclables and putting plastic bags in recycling. Based on these survey results, Myers Research and OpinionWorks selected 5 groups of residents in Los Angeles County in November 2019 to ask additional questions in person about recycling, with a focus on plastic bags: 1) college-educated white women; 2) Latino men and women; 3) Asian women; 4) Mexican-born residents; and 5) second generation Latino men. Additionally, Stephen Groner Associates conducted intercept surveys with 30 Latino residents in shopping malls in Los Angeles County regarding their use and disposal of shopping bags. [See the data on Page 35.](#)

Greater Portland Region Generation Study

In May 2019, back of truck samples were taken from curbside single-family residential garbage and commingled recycling at Portland, Oregon region facilities. Cascadia Consulting and More Recycling sorted each sample into 61 categories of materials. The average percentages of materials from these samples were applied to the total amount (tons) of single-family residential garbage and commingled recycling collected from the region in 2017. A per household weight for each material category was calculated by dividing these tonnages by the number of single-family households in the region. [See the data on Page 32.](#)

Multicultural Behavior Change Literature Review

In October 2019, Cascadia Consulting Group and Martha Burwell Consulting conducted a literature review of multicultural communication and behavior change strategies that have been employed in recycling, resource conservation, public health, and political engagement. Key barriers and motivators for multicultural community participation that may be relevant to behavior change in recycling education were compiled. [See the data on Page 34.](#)

¹ Population based on U.S. Census Bureau's 2016 American Community Survey 5-year estimates

City Survey

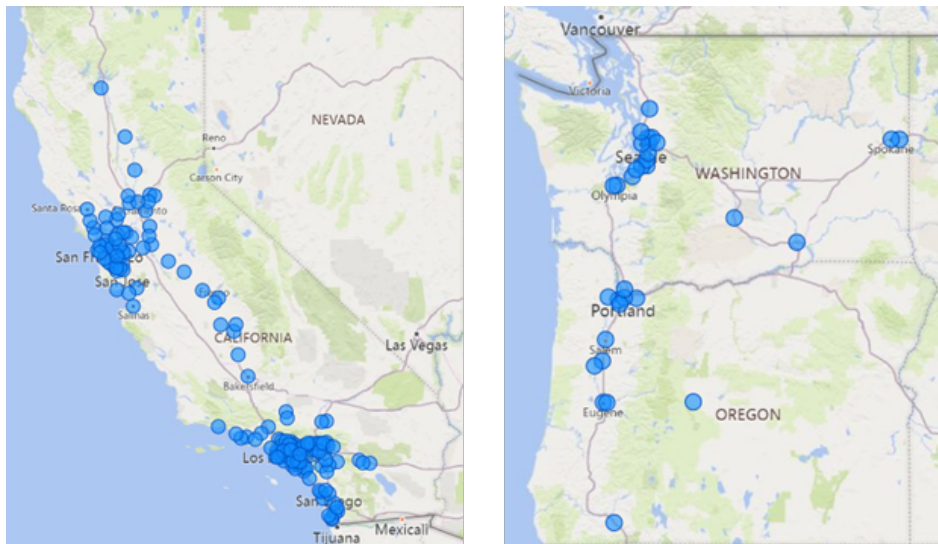
Methodology

For the city survey, cities with populations greater than 50,000 people in California, Oregon, and Washington were selected. City populations were obtained from the U.S. Census Bureau's American Community Survey 2016 estimates. The distribution of city sizes is summarized in the table below.

Figure 1: Number of cities and population represented by the city survey

	CA	OR	WA
Number of cities with population of 50,000 or more	176	12	24
Surveys completed (including partial data & web research)	176	12	24
Population represented by surveyed cities	26,610,006	1,631,937	2,850,760
Percentage of state population	69%	41%	40%
Single-family households represented by surveyed cities	6,131,980	465,476	759,328
Percentage of state households	65%	40%	38%
Distribution of cities by population			
Largest (250,000+)	14	1	1
Large (125,000 - 250,000)	33	2	5
Medium (50,000 - 125,000)	129	9	18

Figure 2: Map of cities that participated in the survey



During the first quarter of 2019, Boisson Consulting researched websites and other secondary sources for information on single-family residential curbside recycling, multifamily recycling, and drop-off recycling in selected California cities. Then, additional information was obtained from more than 100 of those cities through direct communication with city, joint powers authority, and/or hauler representatives. Oregon and Washington cities were surveyed online with follow up phone calls, where needed, by Avencore Group.

Survey Results

Figure 3: Do you have a single-family curbside recycling program?

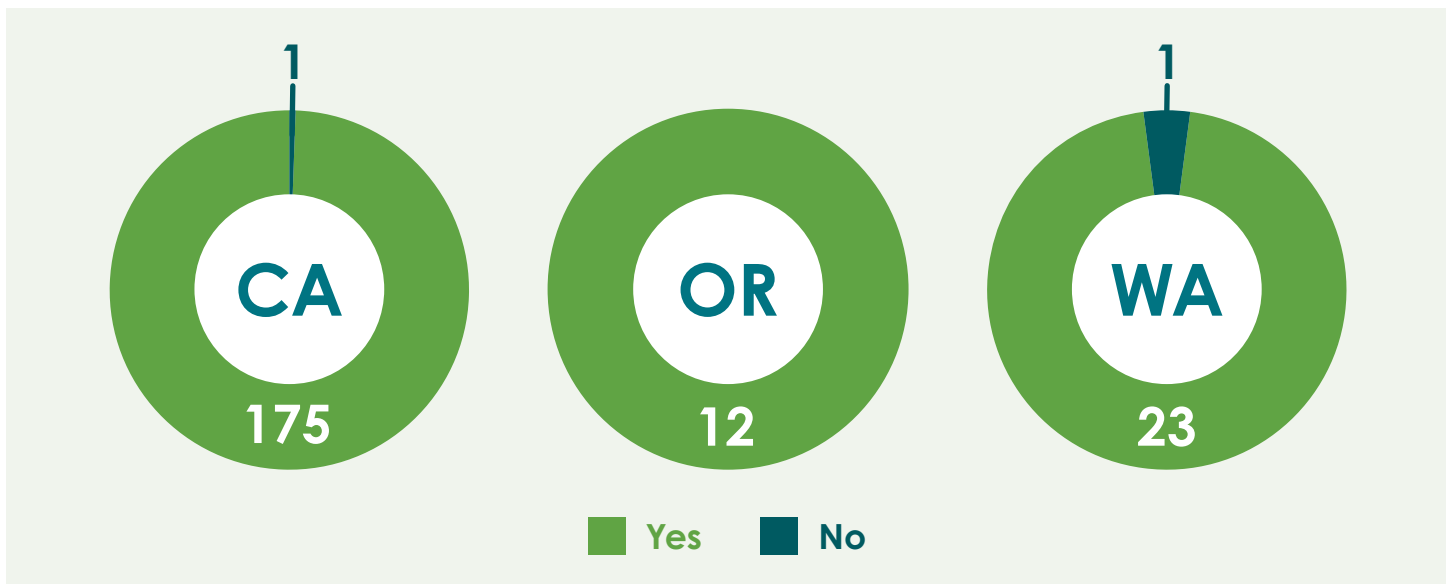


Figure 4: What type of containers are used to collect recyclables from single-family residences?

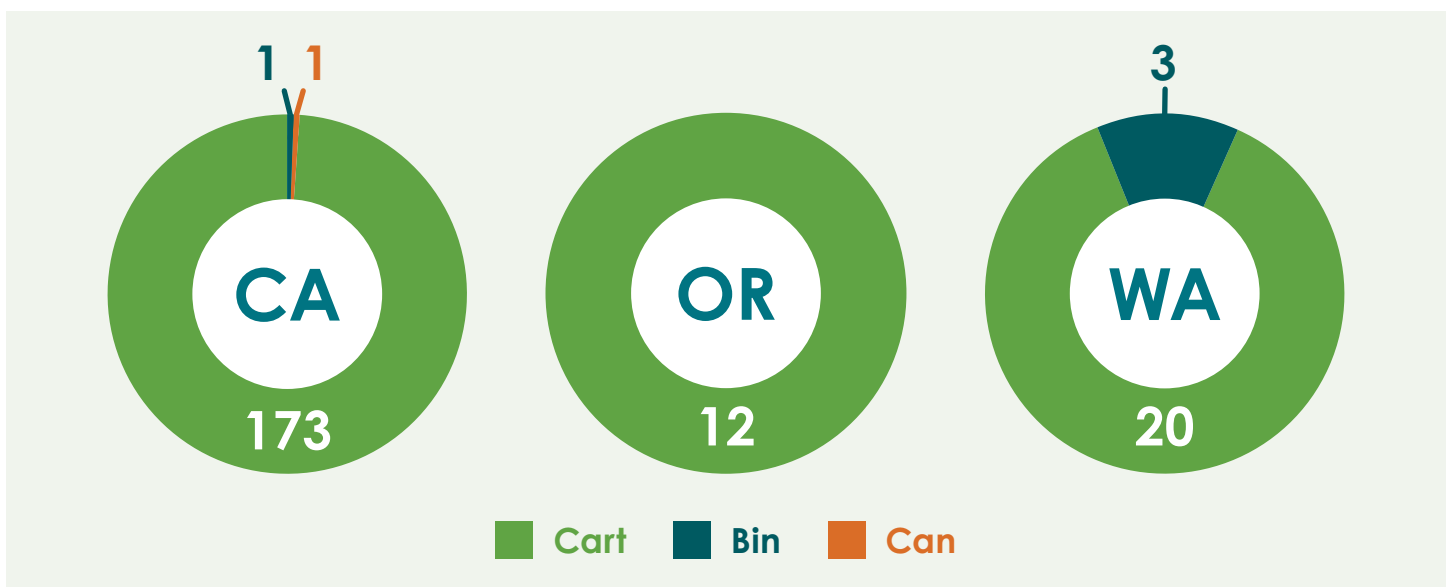


Figure 5: What cart sizes do you offer?

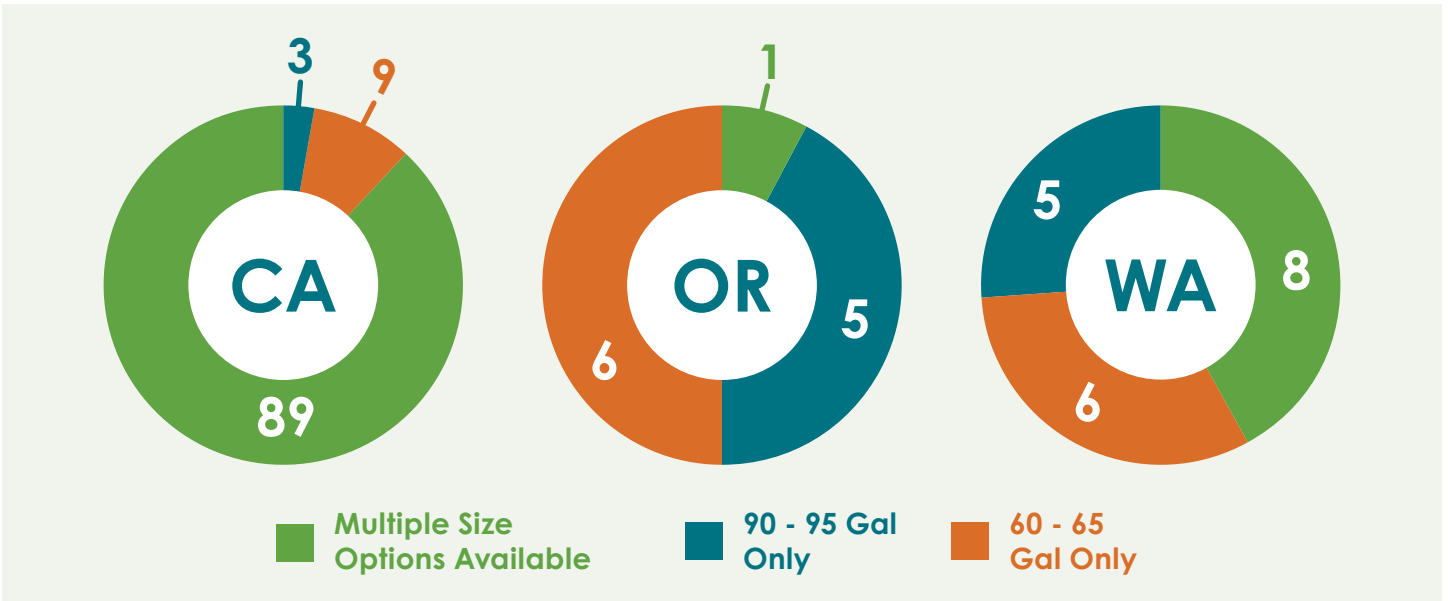


Figure 6: How frequently are single-family recyclables collected?

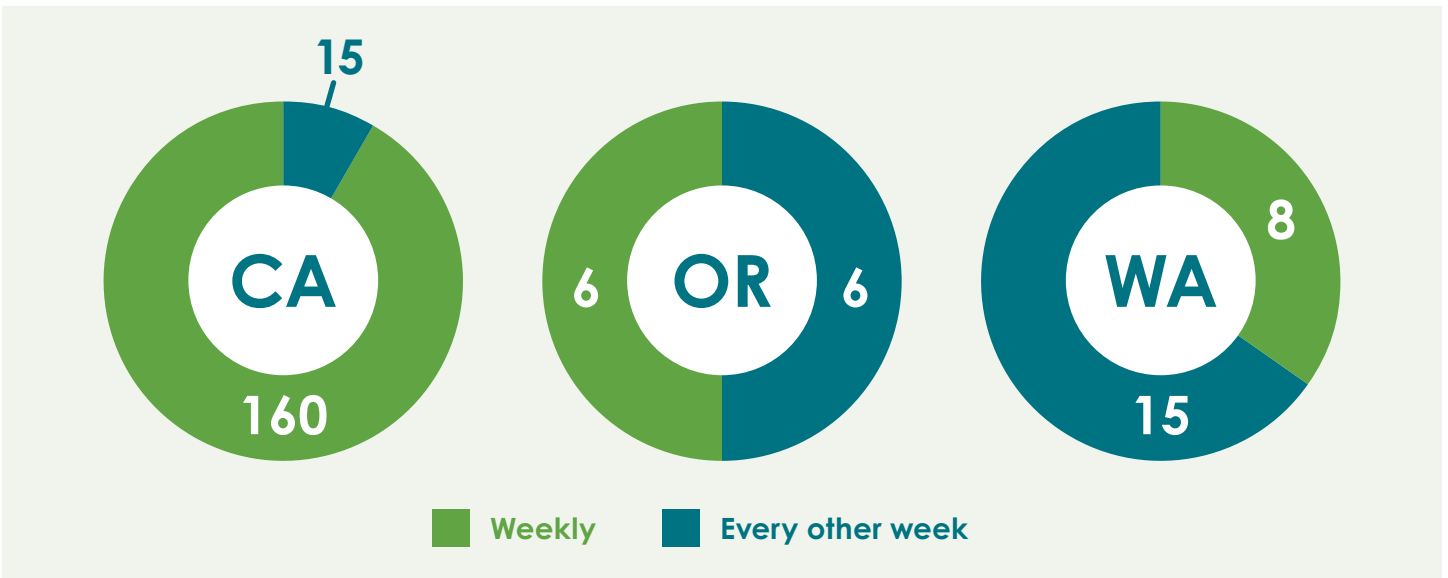


Figure 7: How are recyclables collected?

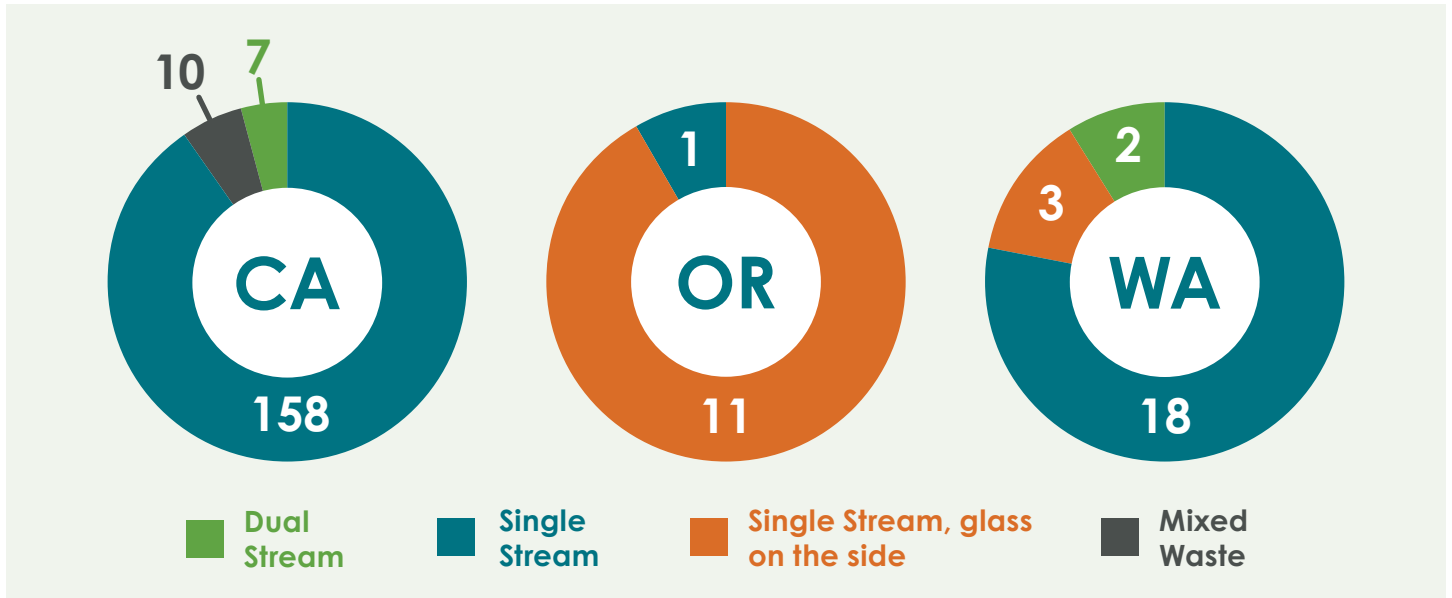


Figure 8: Who provides single-family curbside collection service?

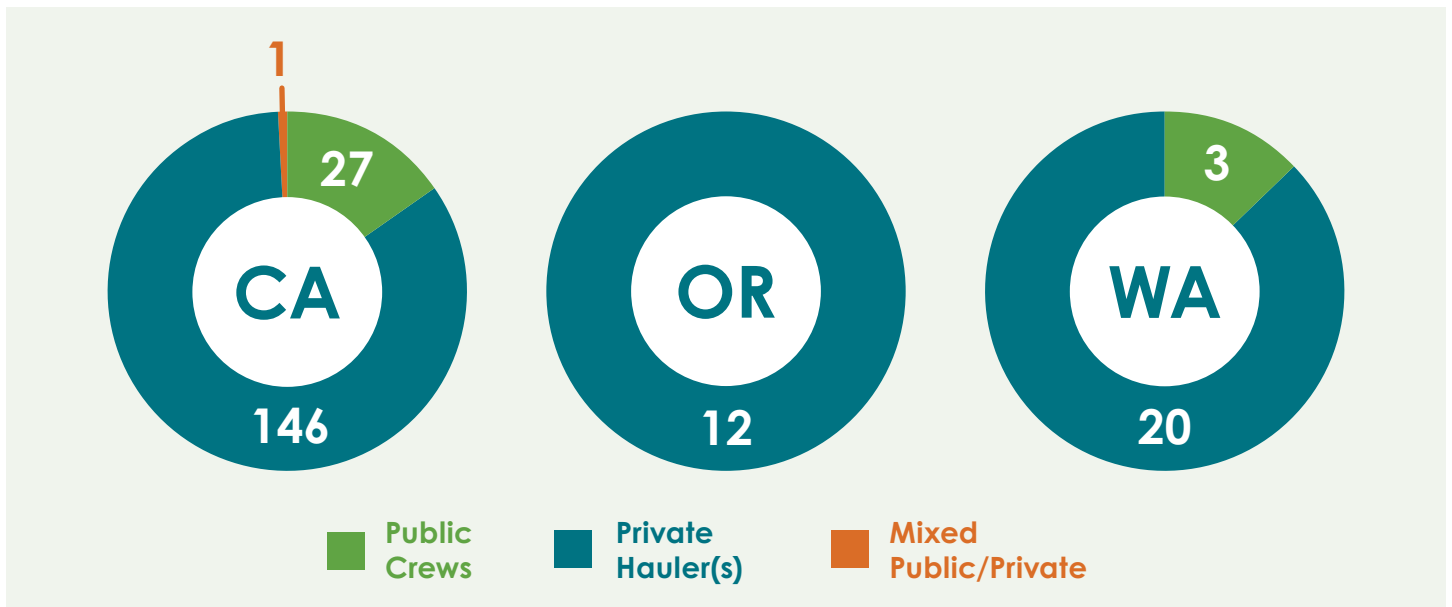


Figure 9: How are single-family households enrolled in recycling service?

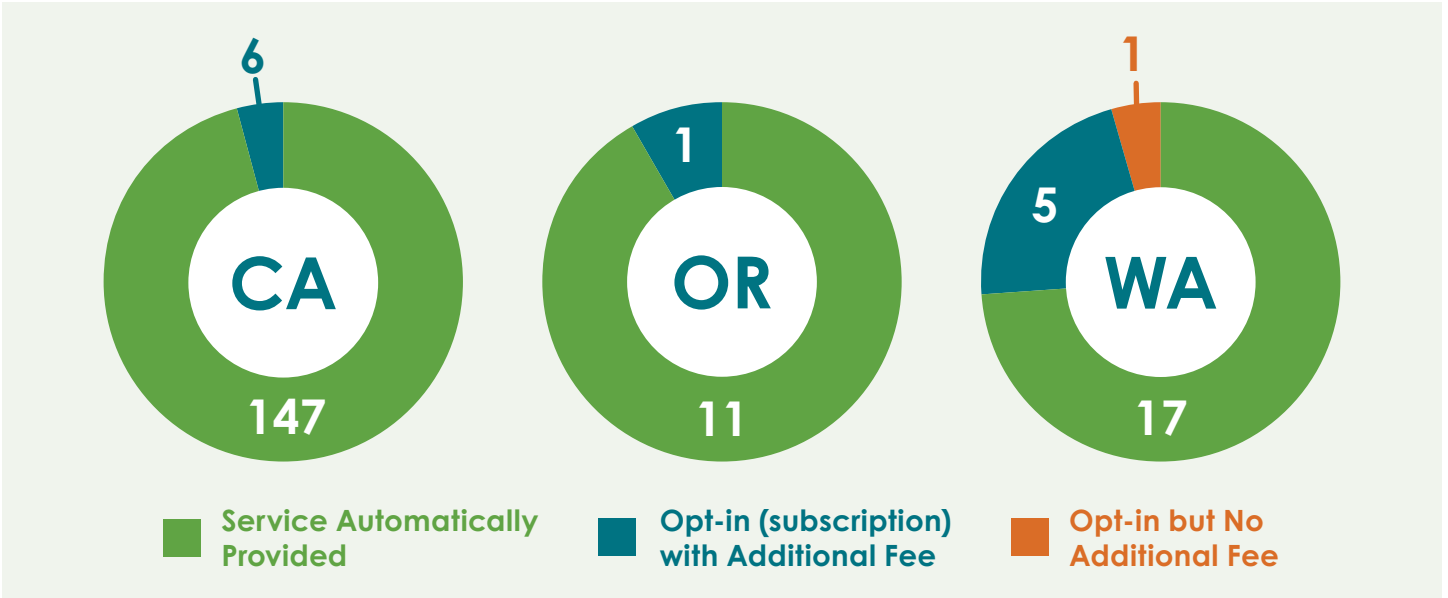


Figure 10: Who is the lead agency for the hauler contract? (CA only)



Figure 11: Is there a separate MRF contract (different than a hauler contract)? (CA only)

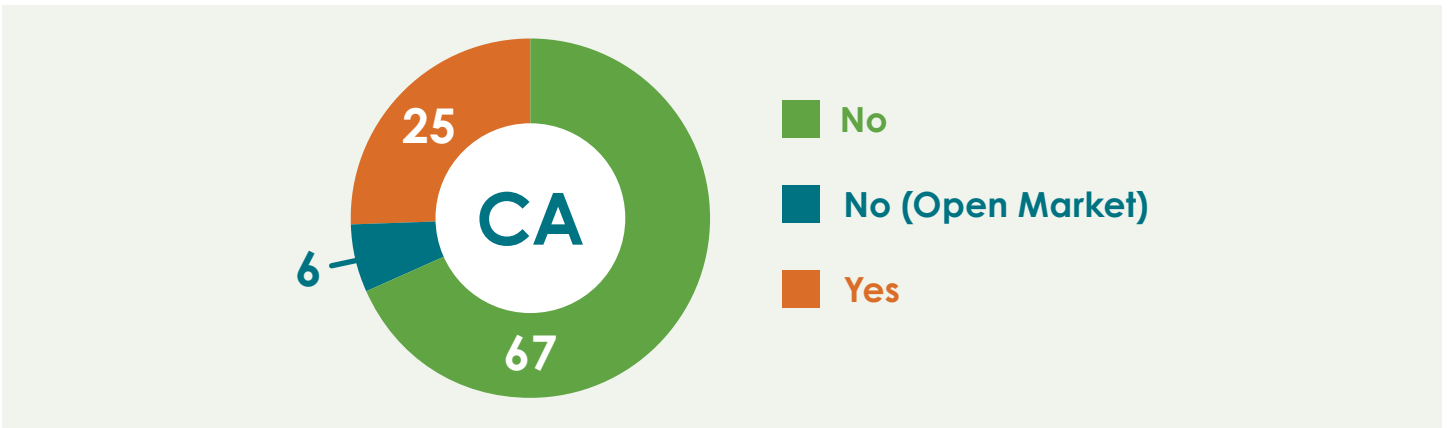


Figure 12: Who is the lead agency for the separate MRF contract? (CA only)

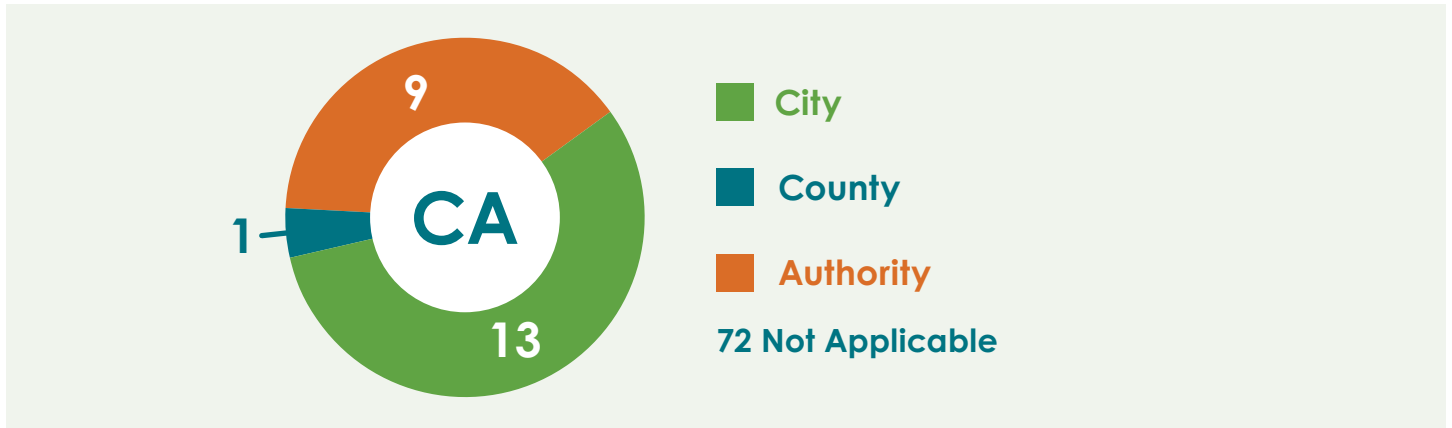


Figure 13: Have there been recent changes to your MRF contract/terms? (CA only)

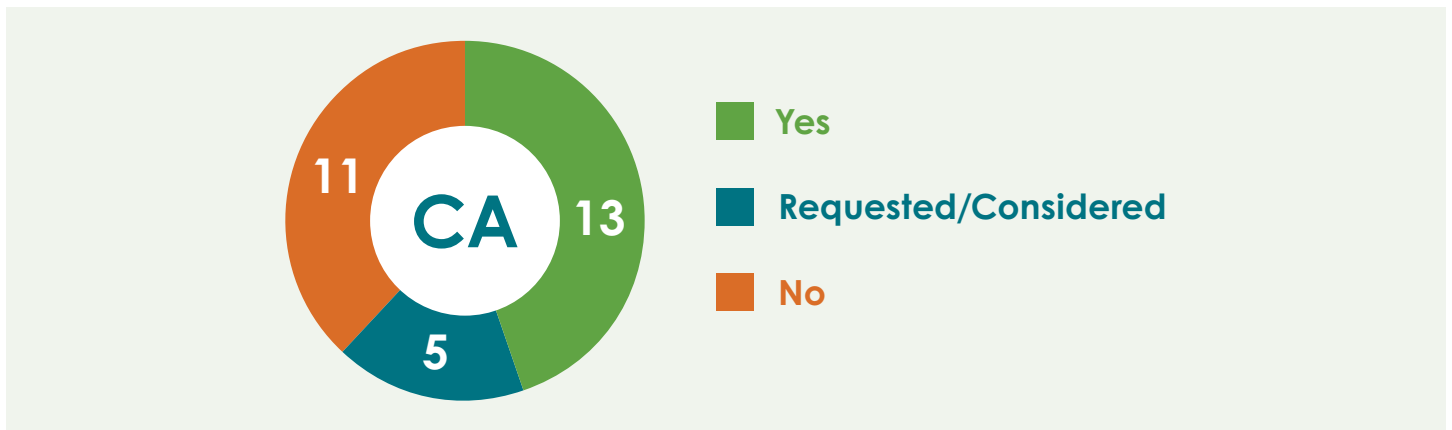
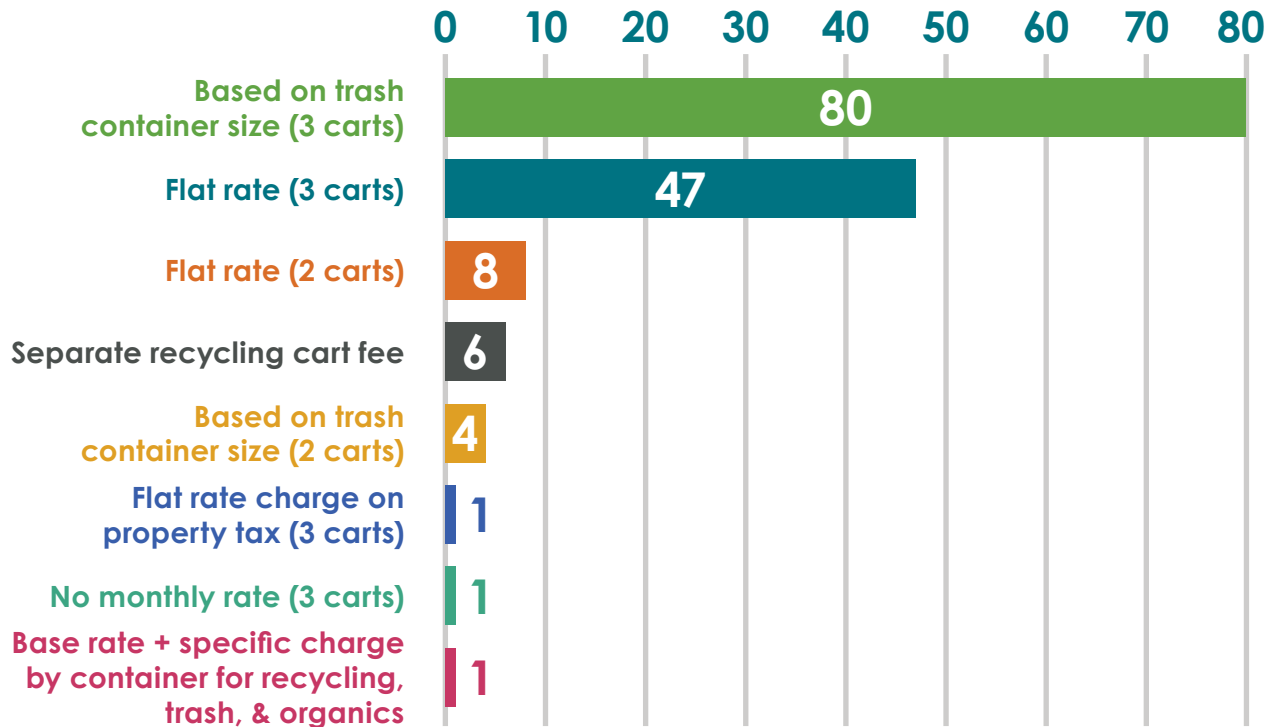


Figure 14: How are residents paying for recycling service? (CA only)



Figure 15: What is your recycling service cost structure? (CA only)



Note: 3 carts are typically trash, recycling, and organics. 2 carts may be trash and recycling or mixed waste (includes recycling) and organics.

Figure 16: How much does a single-family residential recycling service cost per month? (CA only)

Rate Structure	# of Data Points	Min	Average	Median	Max
No monthly rate (3 carts)	1	\$0.00	\$0.00	\$0.00	\$0.00
Separate recycling cart fee	6	\$1.65	\$4.29	\$4.69	\$5.90
Based on trash container size (2 carts)	4	\$15.24	\$20.38	\$21.28	\$23.71
Flat rate (3 carts)	44	\$11.06	\$23.02	\$22.10	\$40.00
Flat rate (2 carts)	6	\$16.18	\$24.47	\$25.72	\$32.76
Based on trash container size (3 carts)	70	\$10.72	\$27.63	\$26.38	\$81.43
Base rate + specific charge by container for recycling, trash, and organics	1	\$67.25	\$67.25	\$67.25	\$67.25
All Rate Structures	132	\$0.00	\$24.76	\$23.75	\$81.43

Note: 3 carts are typically trash, recycling, and organics. 2 carts may be trash and recycling or mixed waste (includes recycling) and organics.

Figure 17: What are your costs? (CA only)

	MSW Tip Fee (\$/ton)	MRF Processing Charge (\$/ton)
Minimum	\$22	-\$1
Median	\$24	\$57
Average	\$55	\$63
Maximum	\$137	\$150
# Data Points	30	10

MSW = municipal solid waste; MRF = material recovery facility

Figure 18: What is your MRF processing charge structure? (CA only)

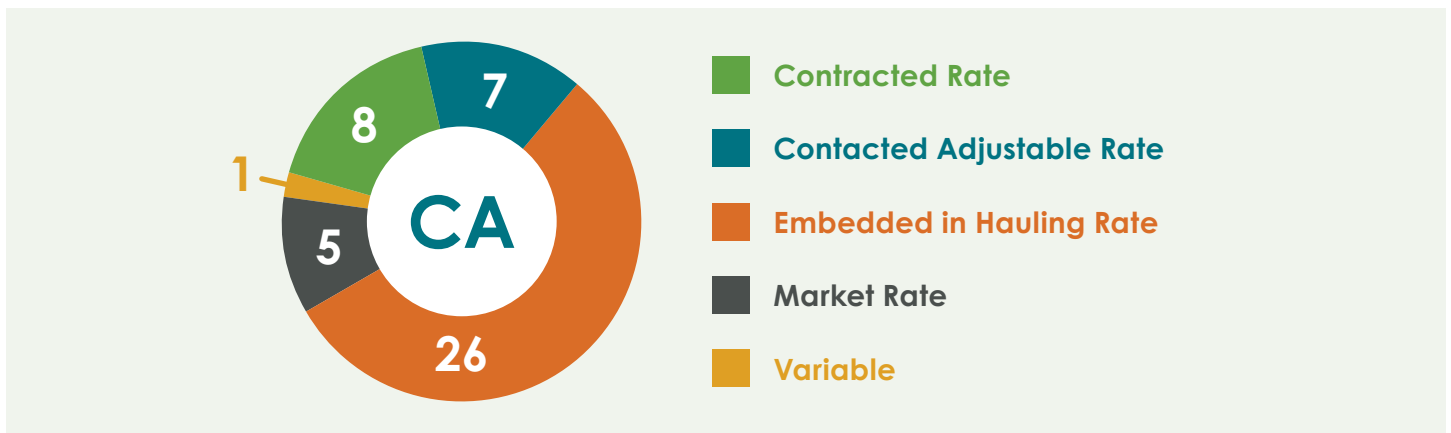


Figure 19: Do you have a revenue sharing provision? (CA only)

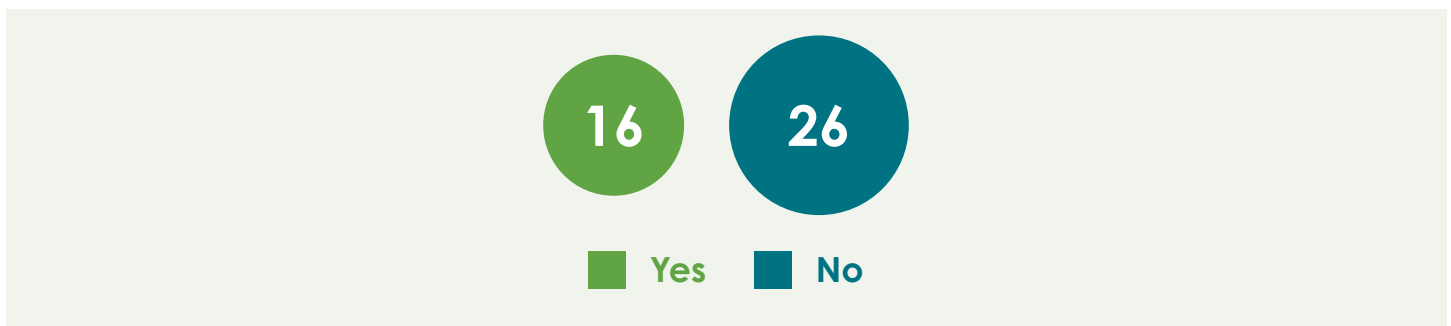


Figure 20: Amount of recyclables collected annually from single-family curbside service

Single Family lb./HH/yr.	CA	OR	WA
Minimum	375	398	404
Average	593	501	566
Maximum	1006	642	676
# Data Points	38	4	8
% Surveyed Cities	22%	33%	35%

Figure 21: What is your inbound contamination rate?

Single-Family Inbound Contamination Rate	CA	OR	WA
Minimum	8%	9%	5%
Average	20%	11%	9%
Maximum	46%	15%	20%
# Data Points	15	9	5
% Surveyed Cities	9%	75%	22%

Figure 22: What is your MRF residual rate? (CA & WA only)

MRF Residual Rate	CA	WA
Minimum	5%	6%
Average	19%	11%
Maximum	36%	15%
# Data Points	50	4
% Surveyed Cities	30%	17%

Figure 23: What is your participation rate? (CA only)

Participation Rate	CA
Minimum	64%
Average	87%
Maximum	95%
# Data Points	6
% Surveyed Cities	3%

Figure 24: What are your top contaminants of concern ?

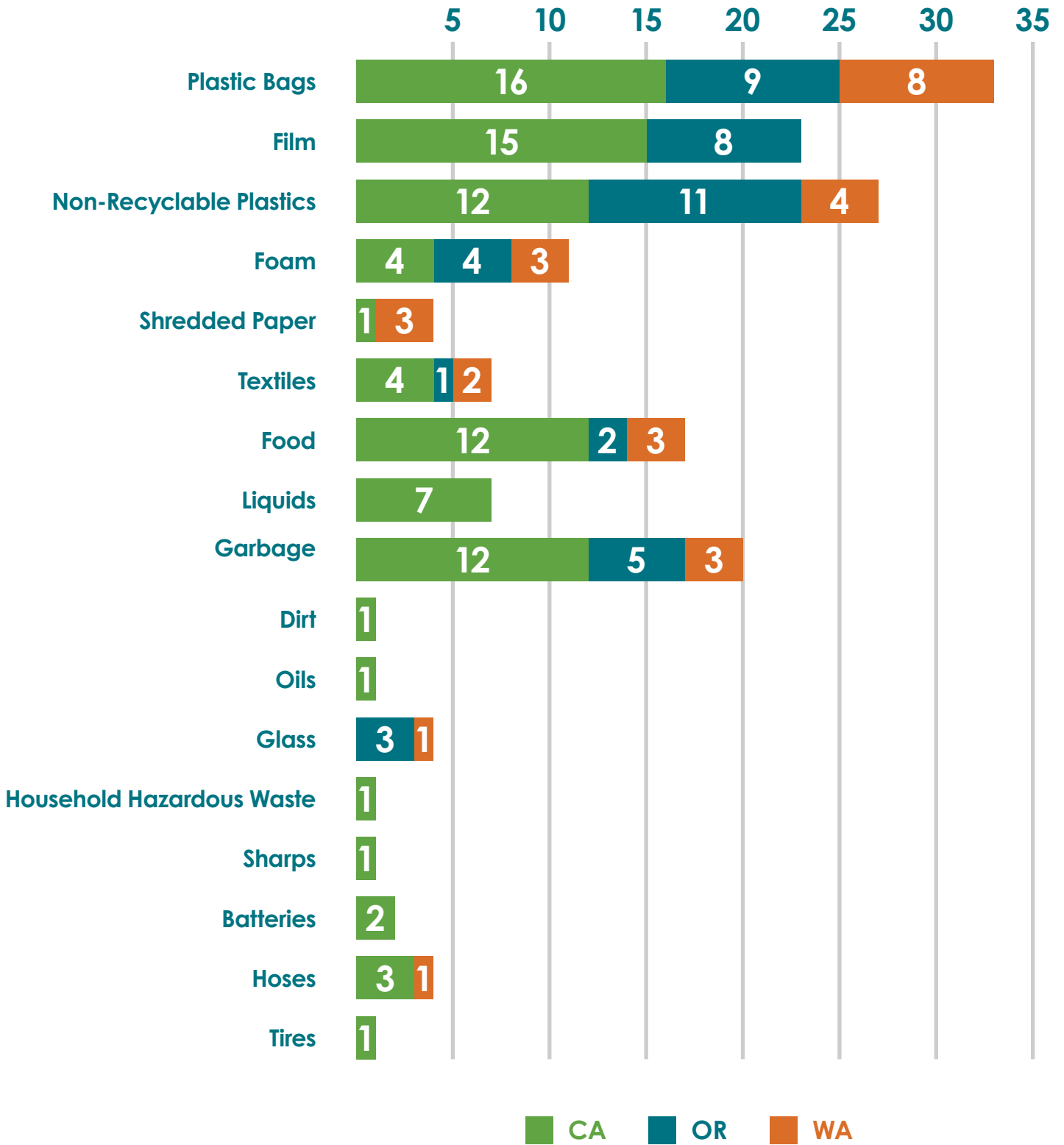


Figure 25: Have you made recent changes to your accepted materials list?



Figure 26: Who is responsible for education & outreach? (CA only)

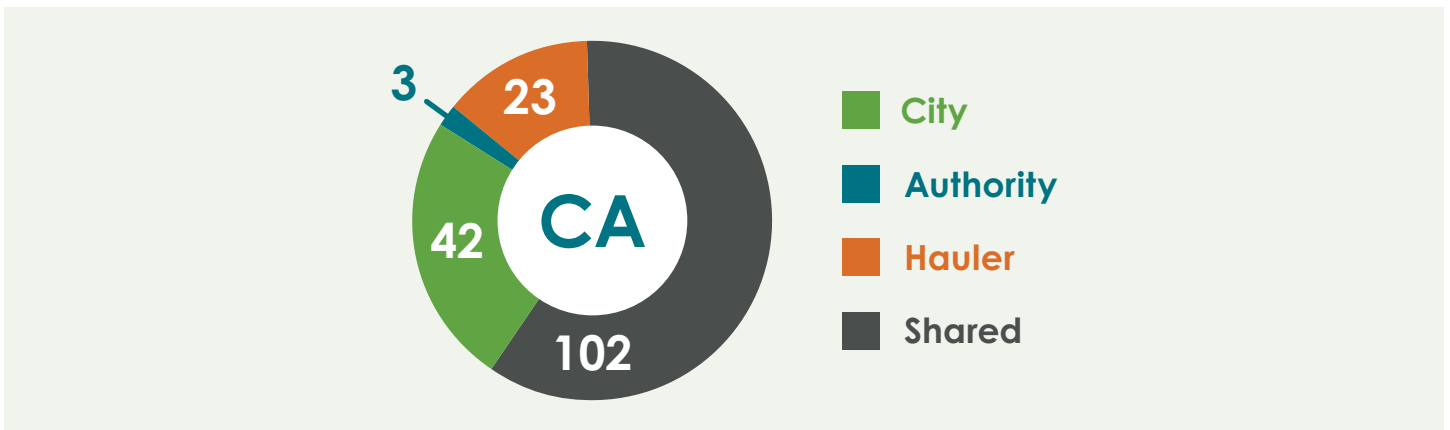


Figure 27: Do you have a contamination education program? (CA only)

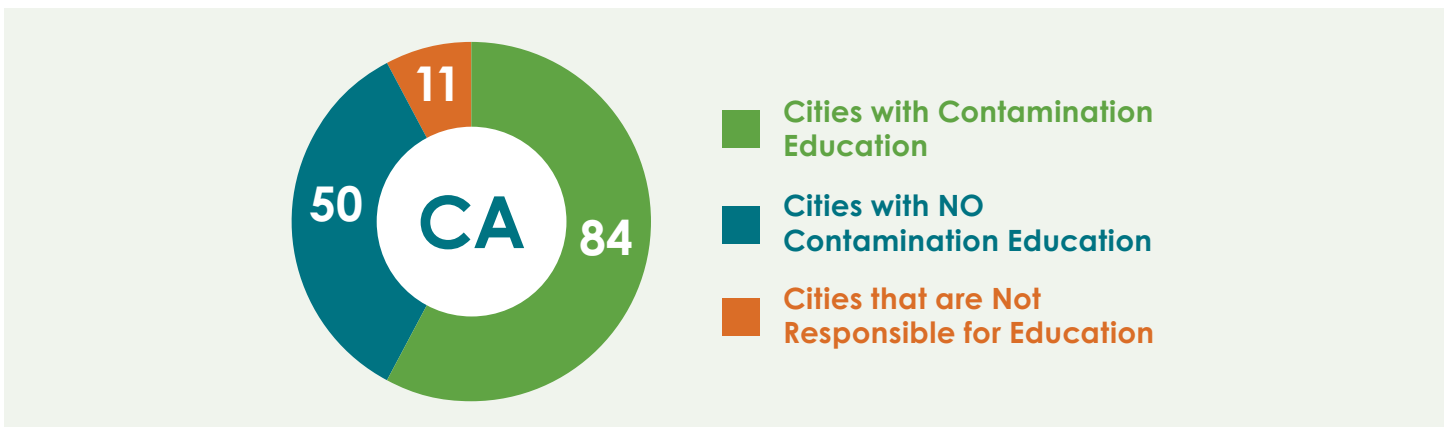


Figure 28: Have you done an anti-contamination campaign recently? (CA only)

	CA
Yes	42
Planned in Future	3
No	10

Figure 29: What is your single-family education budget?

Education Budget per Household	CA	OR	WA
Minimum	\$0.10	\$0.03	\$0.06
Average	\$2.34	\$2.34	\$3.58
Maximum	\$6.27	\$6.93	\$6.30
# Data Points	15	9	9
% Surveyed Cities	9%	75%	38%

Figure 30: Do you issue a fine for a contaminated cart? (CA only)



Figure 31: Do you have a multifamily recycling program? (CA only)



Figure 32: Who provides multifamily curbside collection service? (CA only)

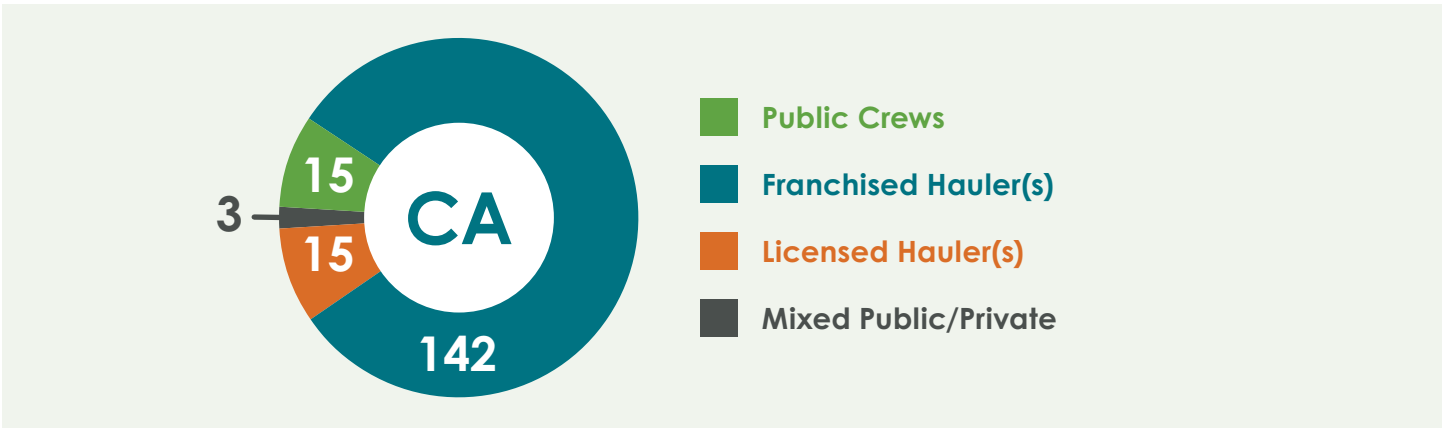


Figure 33: How are residents paying for multifamily recycling service? (CA only)

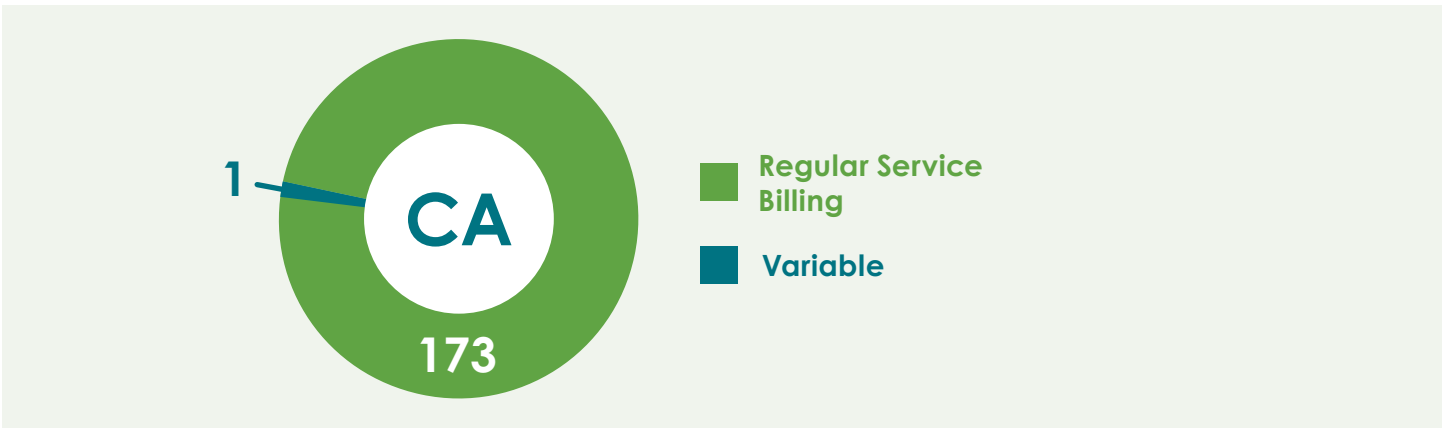


Figure 34: How are multifamily households enrolled in recycling service? (CA only)

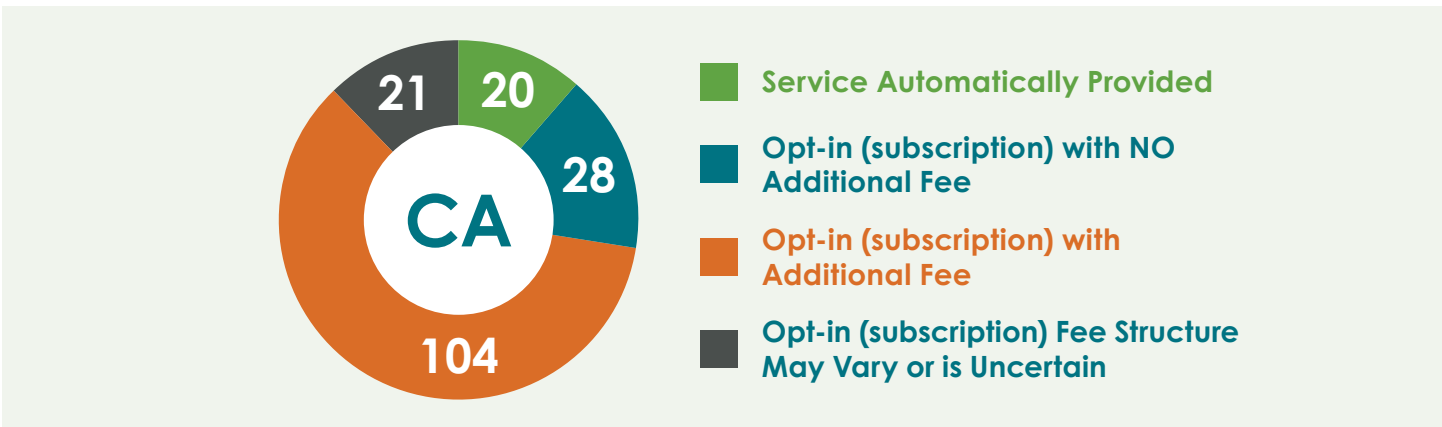


Figure 35: What fraction of your multifamily units offer recycling service? (CA only)

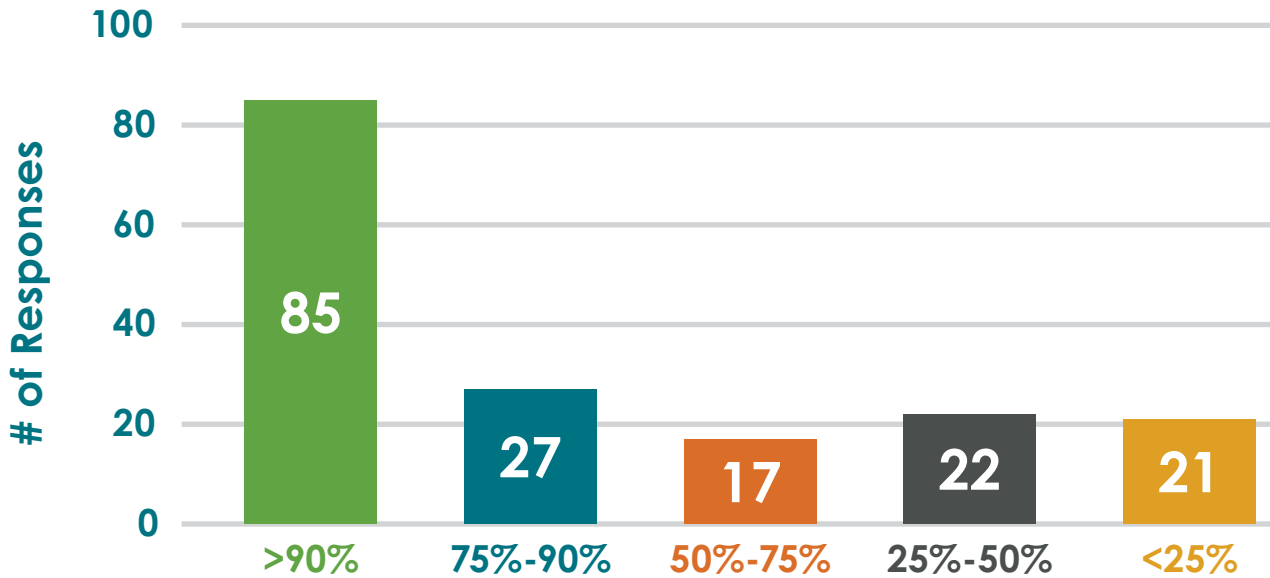


Figure 36: Do you offer recycling technical assistance to the multifamily sector? (CA only)

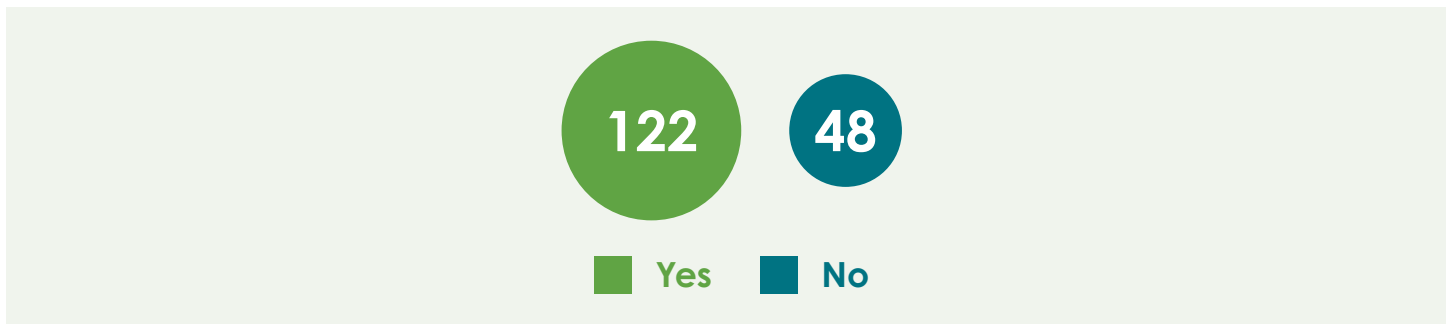


Figure 37: Amount of recyclables collected annually from multifamily curbside service (CA & WA only)

Multifamily lb./HH/yr.	CA	WA
Minimum	79	216
Average	287	370
Maximum	575	542
# Data Points	11	9
% Surveyed Cities	6%	38%

Figure 38: Do you have a drop-off recycling program for residents? (CA only)

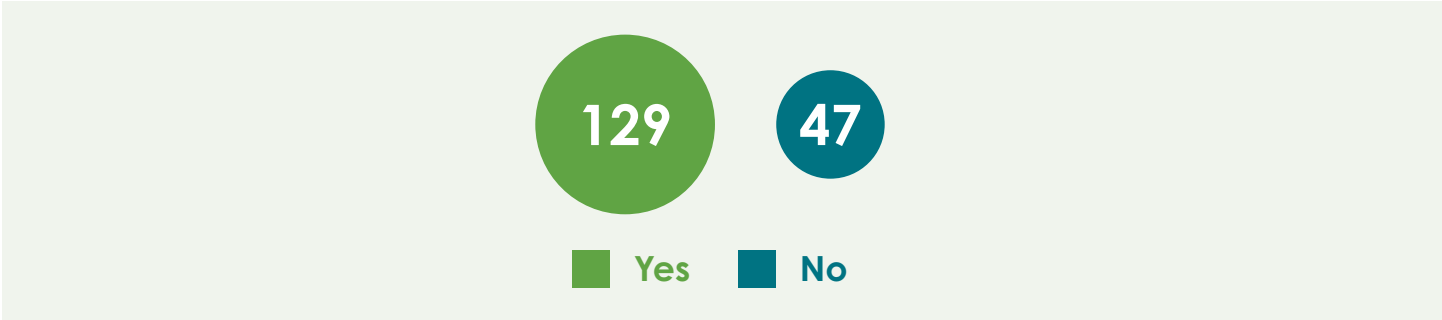


Figure 39: Amount of recyclables collected at a city's drop-off site(s) (CA only)

Drop-off Annual Tonnage Collected	CA
Minimum	3
Average	4,477
Maximum	60,383
# Data Points	25
% Surveyed Cities	14%

MRF Survey

Methodology

Material Recovery Facilities (MRFs) in California, Oregon, and Washington that process recyclables from residential curbside customers were surveyed for materials that they accept, materials that are detrimental to their operation, and the top issue items that come into their facility. More Recycling conducted the survey in California, and Avencore Group conducted the survey in Oregon and Washington during the first quarter of 2019. Follow up calls with MRFs were conducted at the discretion of the consultants. The number of MRFs that responded to the survey are summarized below.

Figure 40: Number of MRFs that participated in the MRF survey

	CA	OR	WA
# MRFs handling residential materials	80	7	11
# survey responses received	54	6	7
% MRFs that responded to survey	68%	86%	64%

Figure 41: Map of MRFs that participated in the survey

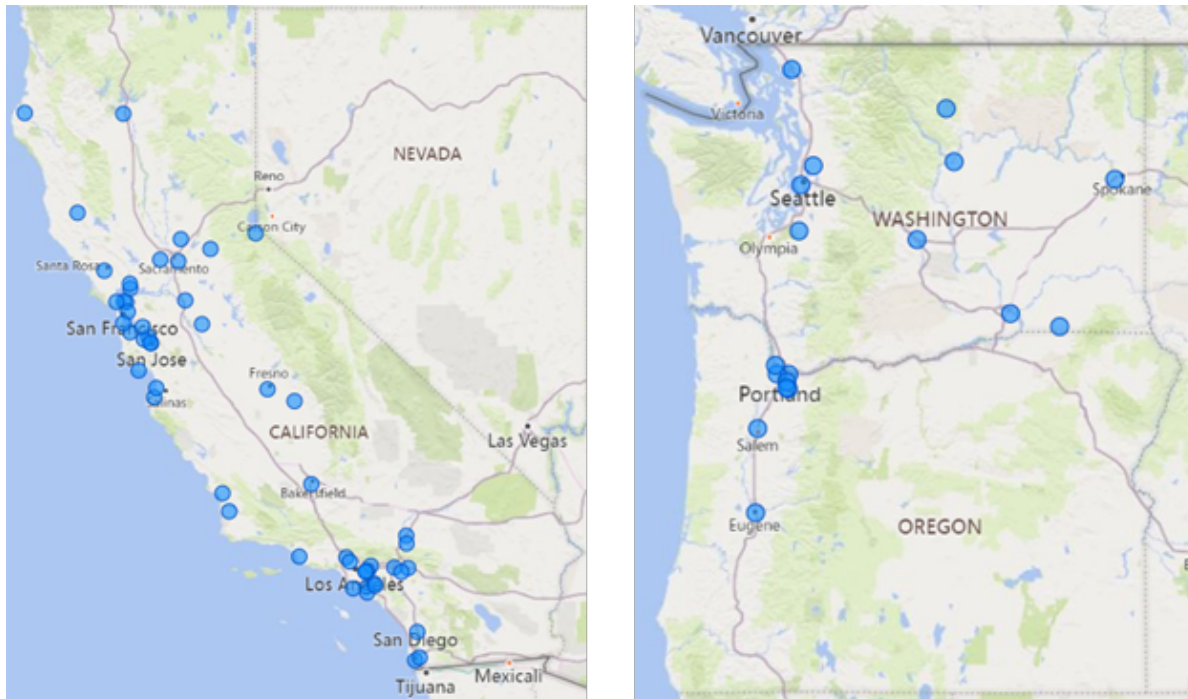


Figure 42: Number of facilities that accept materials

Material	CA	OR	WA
PAPER PRODUCTS			
Cartons	22	4	4
Cold Cups	8	1	1
Hard Cover Books	24	2	3
Hot Cups	4	0	1
Ice Cream Container	10	0	1
Mail	51	6	7
Kraft Bags	36	6	7
Magazines	51	6	6
Newspaper	53	6	7
OCC	54	6	7
Office Paper	54	6	7
Paperback Books	46	6	7
Paperboard Boxes	51	6	7
Pizza Boxes	25	3	2
Shredded Paper	42	3	2
Take-out Containers	4	0	0
Tissue Paper	15	2	2
Other Paper	1	0	0
GLASS PRODUCTS			
Bottles and Jars	54	3	4
Drinking Glass	19	1	1
Ceramics	3	0	0
Window	5	0	0
Other Glass	2	0	0
ALUMINUM PRODUCTS			
Aerosol	34	5	3
Cans	54	6	7
Foil or Foil-like Containers	45	5	3
Other Aluminum Containers	45	6	7
Other Aluminum	4	0	0

Material	CA	OR	WA
STEEL PRODUCTS			
Aerosol	33	6	3
Cans	54	6	6
Pots and Pans	35	5	4
Scrap Metal	39	5	4
Spiral Wound Container	2	1	1
Other Steel	0	0	0
PLASTIC PRODUCTS			
Bags, Wraps, Film*	7	0	1
Buckets	45	5	2
Bulky Plastic	46	0	1
EPS Foam Blocks & Shapes	6	0	1
EPS Foam Food Service & Other Containers	5	0	0
Flower Pots	33	5	3
HDPE Bottles, Jars & Containers	54	6	7
Other Containers & Packaging	23	0	2
Other Drink Bottles	27	2	3
Other Food Bottles & Jars	25	2	4
Other Household Bottles & Jars	33	4	4
Other Tubs & Lids	30	2	4
PET Bottles & Jars	54	6	7
PET Cups	24	0	1
PET Thermoforms	24	0	2
PP Bottles	35	5	5
PP Containers	31	4	6
PP Lids	31	1	4
Toys	19	0	0

*Note: These facilities only accept bagged bags, wrap, and film, not loose materials.

Figure 43: How do you describe which plastics are accepted?

	CA	OR	WA
By object shape and/or size	19	6	4
By resin type/number	51	0	3

Figure 44: Number of facilities that find the materials detrimental to their operation

Material	CA	OR	WA
PAPER PRODUCTS			
Cartons	2	0	1
Cold Cups	6	2	2
Hard Cover Books	3	0	1
Hot Cups	4	2	3
Ice Cream Container	8	2	3
Mail	0	0	0
Kraft Bags	0	0	0
Magazines	0	0	0
Newspaper	0	0	0
OCC	0	0	0
Office Paper	0	0	0
Paperback Books	0	0	0
Paperboard Boxes	0	0	0
Pizza Boxes	3	1	2
Shredded Paper	3	1	0
Take-out Containers	9	2	3
Tissue Paper	4	3	2
Other Paper	3	0	0
GLASS PRODUCTS			
Bottles and Jars	0	1	2
Drinking Glass	8	4	4
Ceramics	21	5	4
Window	21	5	4
Other Glass	4	0	0
ALUMINUM PRODUCTS			
Aerosol	10	0	1
Cans	0	0	0
Foil or Foil-like Containers	0	0	1
Other Aluminum Containers	0	0	0
Other Aluminum	1	0	0

Material	CA	OR	WA
STEEL PRODUCTS			
Aerosol	11	0	2
Cans	0	0	0
Pots and Pans	6	0	1
Scrap Metal	9	0	0
Spiral Wound Container	11	2	1
Other Steel	3	0	0
PLASTIC PRODUCTS			
Bags, Wraps, Film	31	4	6
Buckets	1	0	3
Bulky Plastic	2	0	3
EPS Foam Blocks & Shapes	8	3	4
EPS Foam Food Service & Other Containers	12	3	5
Flower Pots	5	0	3
HDPE Bottles, Jars & Containers	0	0	0
Other Containers & Packaging	4	1	2
Other Drink Bottles	5	0	3
Other Food Bottles & Jars	5	1	2
Other Household Bottles & Jars	4	1	2
Other Tubs & Lids	3	1	2
PET Bottles & Jars	0	0	0
PET Cups	4	3	3
PET Thermoforms	7	2	2
PP Bottles	1	0	1
PP Containers	1	1	1
PP Lids	1	1	1
Toys	7	0	0

Figure 45: What are your top contaminants of concern?

Rank	CA	OR	WA
1	Needles	Plastic bags/wraps	Plastic bags/wraps
2	Flammables	Needles	Needles
3	Batteries	Clothing/bedding	Tanglers
4	General hazardous waste	Glass	Food/liquid
5	Plastic bags/wraps	Tanglers & Garbage	Garbage

Resident Survey

Methodology

In September 2019, residents of the cities from the city survey were also surveyed via phone by Myers Research. 800 residents in California, 400 residents in Oregon, and 400 residents in Washington completed the survey. Questions were designed to understand general recycling behavior, motivations, and barriers as well as behaviors around specific items, both recyclables and non-recyclables.

Figure 46: Resident survey

	CA	OR	WA
Survey responses	800	400	400
# cities represented	175	12	24
AGE			
18-49	51%	55%	51%
50 and over	46%	41%	46%
SEX			
Female	53%	51%	52%
Male	47%	49%	48%
RACE			
White	39%	73%	73%
Latino	26%	9%	6%
Asian/Pacific Islander	10%	2%	6%
Black	10%	3%	3%
Native Americans	2%	1%	2%
Others	5%	4%	3%
HOME OWNERSHIP			
Own	64%	66%	67%
Rent	31%	29%	31%
HOME TYPE			
Single-Family	72%	73%	71%
Multifamily	23%	23%	27%
LIVE WITH CHILDREN?			
Yes	33%	30%	27%
No	65%	69%	73%

Survey Results

Note: Some values do not add up to 100% due to rounding.

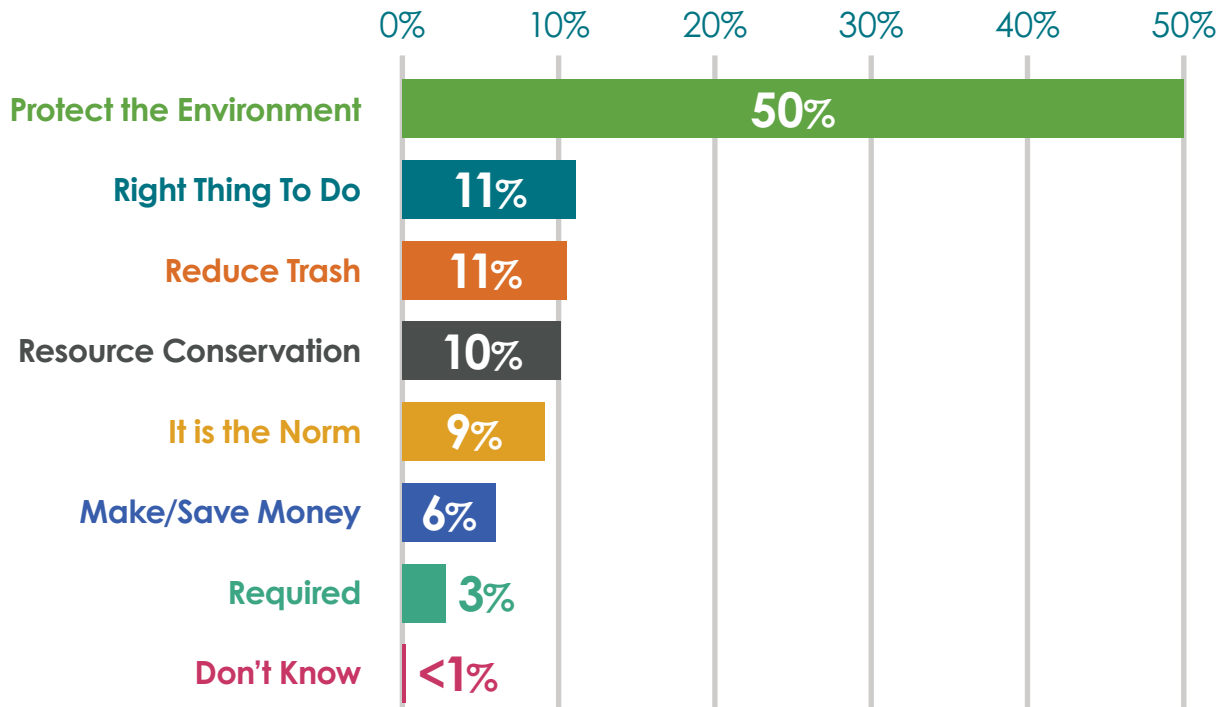
Figure 47: How important is recycling to you personally?

	CA	OR	WA
Very important	64%	71%	64%
Somewhat important	27%	24%	28%
A little important	5%	4%	5%
Not at all important	2%	1%	2%
Don't know/refused to answer	1%	1%	1%

Figure 48: Do you recycle?

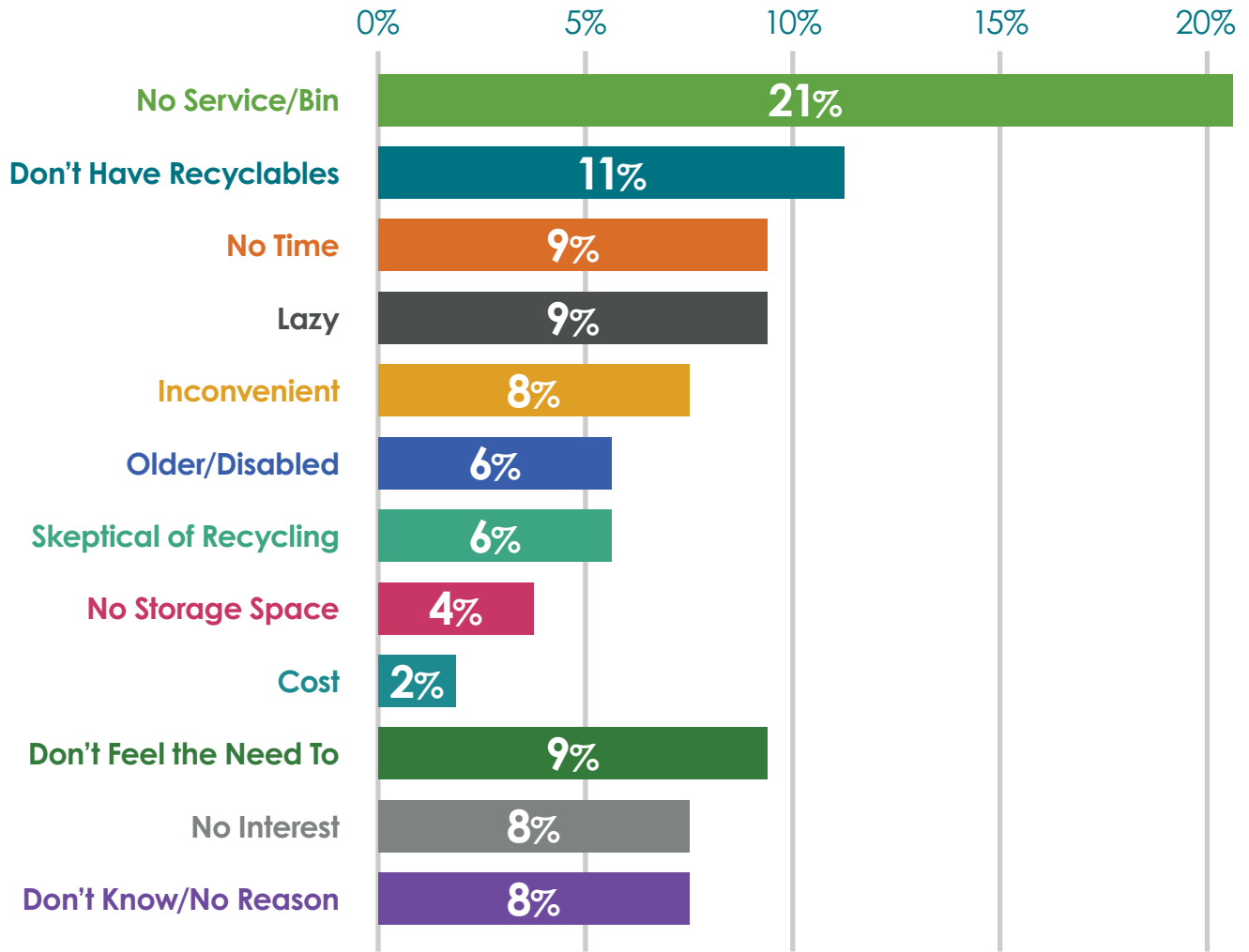
	CA	OR	WA
Yes	95%	98%	97%
No	5%	1%	2%
Don't know/refused to answer	N/A	0%	0%

Figure 49: If you recycle, why do you recycle?



Note: Answers were aggregated for all three states. Only respondents who answered "Yes" to "Do you recycle?" (Figure 48) were asked this question.

Figure 50: If you do not recycle, why do you not recycle?



Note: Answers were aggregated for all three states. Only respondents who answered "No" to "Do you recycle?" (Figure 48) were asked this question.

Figure 51: What kind of recycling services do you use for household recyclables generated in your home? (multiple answers ok)

	CA	OR	WA
Pick up at your home, apartment, or condo	88%	96%	95%
Drop off at a redemption center or recycling drop-off location	31%	14%	15%
Public containers	18%	22%	9%
Other	2%	2%	1%
I don't recycle	2%	0%	1%
Don't know/refused to answer	1%	0%	1%

Note: Responses for "Other" included work

Figure 52: Do you currently have a recycling cart or container outside your home?

	CA	OR	WA
Yes	83%	89%	87%
No	17%	11%	13%
Don't know/refused to answer	0%	N/A	0%

Figure 53: When you put items in your recycling cart or container outside, do you put them in a plastic bag, a paper bag, or do you put them in loose?

	CA	OR	WA
Plastic bag	28%	5%	13%
Paper bag	14%	26%	18%
Loose items	60%	67%	68%
It depends	5%	3%	4%
Some other way	6%	9%	7%
Don't know/refused to answer	1%	0%	1%

Figure 54: Do you have a container in your house or apartment that you use to take recyclable items to your cart or container outside?

	CA	OR	WA
Yes	71%	77%	81%
No	29%	22%	17%
Don't know/refused to answer	1%	1%	1%

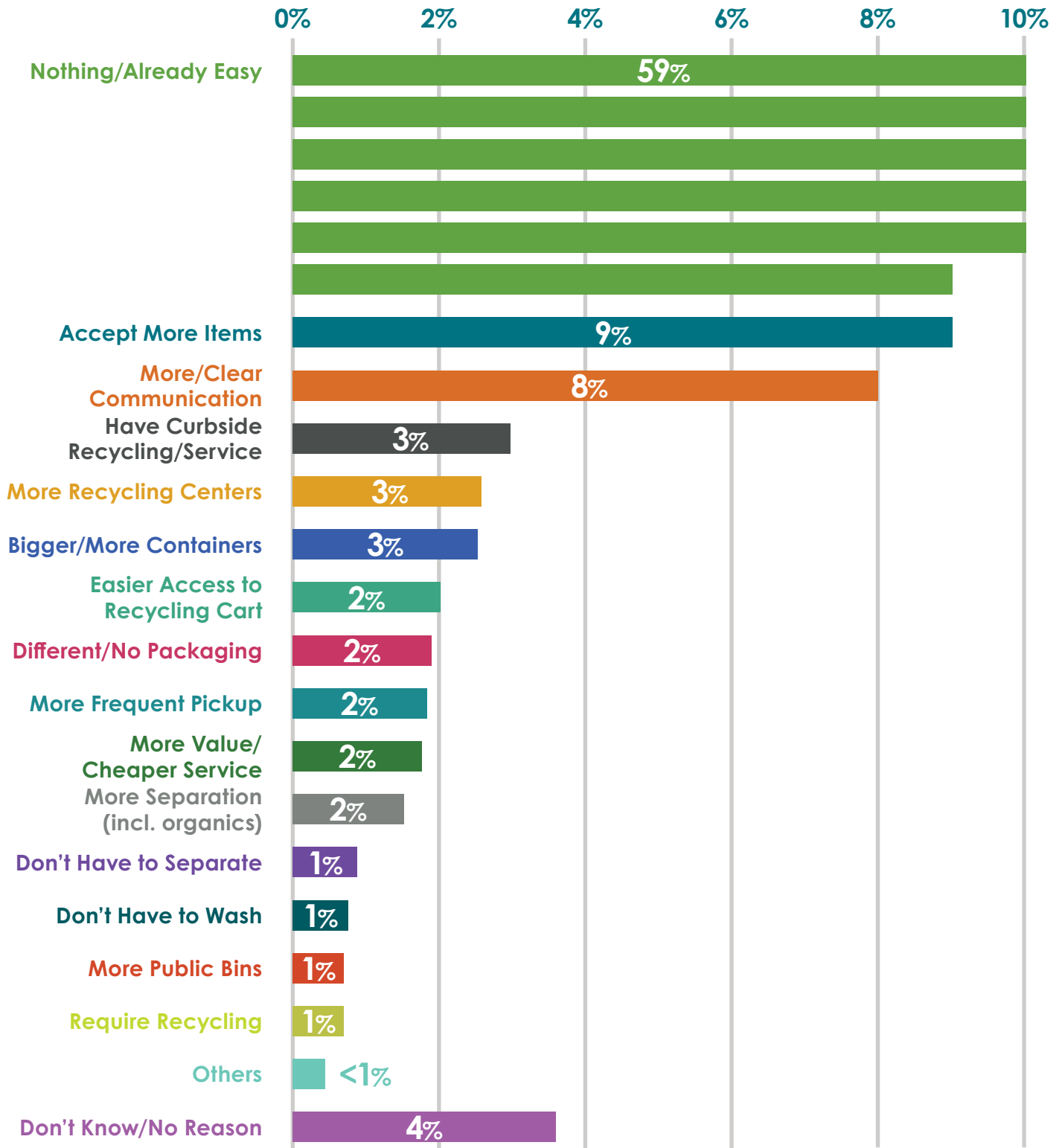
Figure 55: Are you satisfied or dissatisfied with your current recycling service?

	CA	OR	WA
Very satisfied	51%	51%	62%
Somewhat satisfied	34%	28%	27%
Somewhat dissatisfied	5%	11%	4%
Very dissatisfied	4%	5%	2%
Don't have service	3%	1%	2%
Don't know/refused to answer	3%	3%	3%

Figure 56: Would you say that it is easy or difficult for you to recycle?

	CA	OR	WA
Very easy	64%	66%	71%
Somewhat easy	24%	23%	20%
Neither	1%	1%	1%
Somewhat difficult	6%	6%	4%
Very difficult	3%	2%	4%
Don't know/refused to answer	2%	1%	1%

Figure 57: Is there anything that could be done to make recycling easier for you and your family?



Note: Answers were aggregated for all three states.

Figure 58: Respondents who recycle the following items in their recycling container/cart

	CA	OR	WA
Cardboard boxes	87%	97%	93%
Mail & other paper	75%	87%	88%
Frozen food boxes	65%	60%	67%
Aluminum cans	89%	80%	91%
Steel food cans	68%	87%	87%
Glass bottles & jars	89%	87%	88%
Plastic bottles	91%	80%	92%
Plastic containers (e.g., detergent bottles, tubs)	74%	71%	81%
Clam shells (takeout food containers)	52%	30%	43%
Plastic grocery bags	52%	29%	39%
Film plastic (product wraps)	58%	28%	40%
Flexible packaging (e.g., chip bags, pouches)	42%	23%	31%

Figure 59: Where do you dispose of plastic grocery bags?

	CA	OR	WA
Recycle at home	51%	24%	39%
In trash	22%	30%	24%
Return to store	7%	26%	22%
Hazardous waste drop-off	2%	2%	2%
Don't have/use	11%	13%	9%
Depends	1%	1%	3%
Don't know/refused to answer	5%	4%	2%

Figure 60: Where do you dispose of batteries?

	CA	OR	WA
Recycle at home	13%	11%	13%
In trash	32%	35%	35%
Return to store	11%	11%	12%
Hazardous waste drop-off	35%	31%	29%
Don't have/use	4%	4%	2%
Depends	2%	2%	4%
Don't know/refused to answer	5%	6%	5%

Figure 61: Where do you dispose of needles for insulin and other medications?

	CA	OR	WA
Recycle at home	5%	3%	3%
In trash	13%	8%	13%
Return to store	5%	6%	6%
Hazardous waste drop-off	19%	17%	15%
Don't have/use	53%	63%	58%
Depends	1%	1%	0%
Don't know/refused to answer	5%	3%	5%

Figure 62: From what you know, can you receive a deposit back for returning beverage containers to a local redemption center?

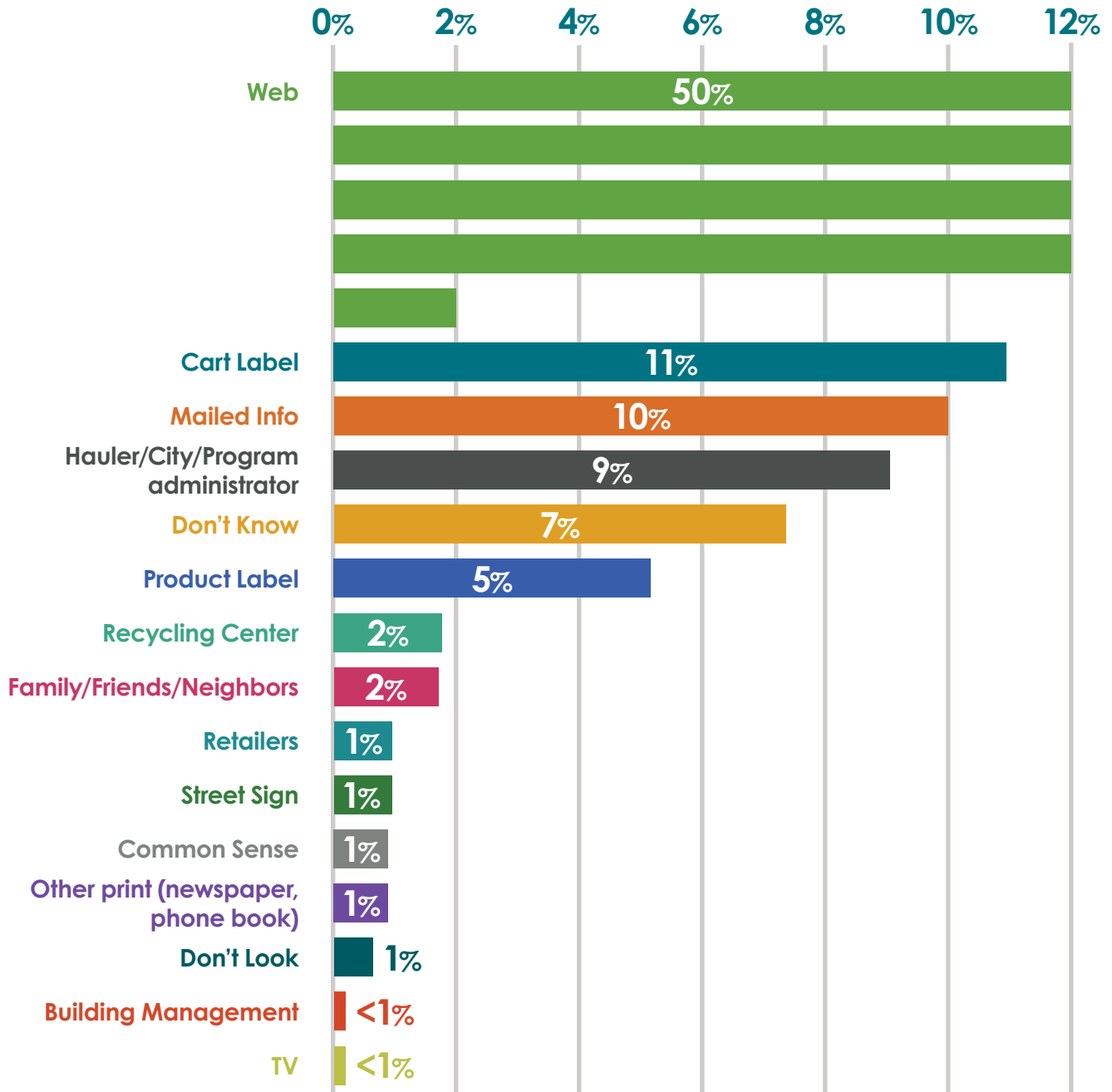
	CA	OR
Yes	72%	85%
No	21%	11%
Unsure	7%	4%

Note: Washington does not have a redemption program.

Figure 63: If you are ever unsure whether an item is recyclable or not, what do you typically do with it?

	CA	OR	WA
Recycle it	22%	15%	8%
Throw it in the trash	47%	49%	54%
Look for more information	32%	39%	39%
Don't know/refused to answer	6%	3%	4%

Figure 64: If you want information about what items to recycle, where do you generally look for it?



Note: Answers were aggregated for all three states.

Greater Portland Region Generation Study

Methodology

The Recycling Partnership co-funded a study to gather composition data for the single-family residential curbside recycling and garbage streams in the Portland metro region governed by the Metro regional government². Cascadia Consulting and More Recycling collected 32 garbage and 38 recycling samples from collection trucks entering facilities that, at the time, received the majority of residential waste in the Metro region. Each sample was sorted into 61 categories of materials. The average percentage of materials from these samples were applied to the total amount (tons) of single-family residential garbage and commingled recycling (single stream recycling without glass) collected from the Metro region in 2017. An annual per household weight (lb./HH/yr.) was calculated by dividing these tonnages by the number of single-family households in the Metro region. Combining the weight of materials found in both the recycling and garbage streams, a household generation of each type of material can be estimated. Please note that data presented here may not be comparable to past studies because of difference in study design and analysis methodology.

Figure 65: Estimated household generation of materials accepted in commingled curbside recycling

Materials	Generation (lb./HH/yr.)	% Captured in Commingled Recycling
Accepted polyethylene terephthalate (PET) #1	17	61%
Accepted high density polyethylene (HDPE) #2	15	74%
Accepted polypropylene (PP) #5	4	36%
Accepted polystyrene (PS) #6	0.01	0%
Other accepted rigid plastic	2	15%
Old corrugated cardboard (OCC)	112	95%
Mixed paper	227	80%
Aseptic & gabletop containers	7	54%
Aluminum cans	8	48%
Other accepted metals	35	36%
TOTAL	428	78%

Note: This study did not attempt to capture containers that are recycled through the bottle redemption program or the curbside glass stream (separate from commingled recycling).

² The Metro region includes the counties of Clackamas, Multnomah, and Washington and cities of Beaverton, Cornelius, Durham, Fairview, Forest Grove, Gladstone, Gresham, Happy Valley, Hillsboro, Johnson City, King City, Lake Oswego, Maywood Park, Milwaukie, Oregon City, Portland, Rivergrove, Sherwood, Tigard, Troutdale, Tualatin, West Linn, Wilsonville, and Wood Village.

Figure 66: Estimated household generation of materials NOT accepted in commingled curbside recycling

Materials	Generation (lb./HH/yr.)	% Captured in Commingled Recycling
Unaccepted polyethylene terephthalate (PET) #1	12	32%
Unaccepted high density polyethylene (HDPE) #2	2	34%
Unaccepted polypropylene (PP) #5	11	29%
Unaccepted polystyrene (PS) #6	3	20%
Other unaccepted rigid plastic	21	27%
Polystyrene (PS) foam	4	13%
Polyethylene (PE) film	28	10%
Other film & flexibles	47	5%
Other plastic	19	18%
Glass	39	51%

Note: Glass is collected separately in the Portland metro region, therefore, it is treated as a contaminant in the commingled recycling stream. Generation rate of glass presented here does not include glass that is collected in the separate curbside glass collection and the state's beverage container redemption program.

Multicultural Behavior Change Literature Review

Methodology

A report from the Brookings Institution³ states that Latino populations are highly represented in California and Asian populations are highly represented in California and Washington. It is also estimated that people who identify themselves as Latino will make the majority of California’s population by 2042, with Los Angeles, Riverside, and San Diego counties having the highest concentration of the Latino population⁴. These projections show that it is increasingly important to be able to communicate with diverse audiences.

In October 2019, Cascadia Consulting Group and Martha Burwell Consulting conducted a literature review of multicultural communication and behavior change strategies that have been employed in recycling, resource conservation, public health, and political engagement. The research started with high-level review of 100 document titles and abstracts to grasp the breadth of available research and to identify sources that are relevant enough for a deeper dive. Twenty-six articles were then reviewed in detail to identify key barriers and motivators for multicultural community participation that may be relevant to behavior change in recycling education.

Results

There is no one-size-fits-all approach to communicating with different audiences. Some key barriers and motivators found in the literature are summarized below.

Figure 67: Multicultural behavior change literature review

Barriers	Motivators
Mistrust of institutions	Contact by a trusted source/community member who share a cultural identity
Lack of specific knowledge	Regular, repeated contact
Resource conflicts (time, money)	Creating a norm for the desired behavior
Sense that the problem is beyond their control	Altruistic messaging
Language barriers	Accessible messaging (language, avoid slangs and slogans that do not translate well)
	Specific, descriptive, and appropriate language and visuals
	Variety of outreach and communication methods

The literature shows that it is important to define the audience and to understand the audience. Cultural groups are not homogeneous; there may be variations due to race, ethnicity, geography, country of origin, length of time in the region, educational background, socioeconomic status, immigration status, refugee status, and language proficiency. To encourage participation, demonstrating cultural competence, involving the community in developing outreach plan or material, and incorporating appropriate cultural context and community values are important.

³ Frey, William H. 2019. Six Maps that Reveal America's Expanding Racial Diversity: A pre-2020 Census look at the Wide Dispersal of the Nation's Hispanic, Asian and Black Populations. September 5. <https://www.brookings.edu/research/americas-racial-diversity-in-six-maps/>

⁴ Christie, Jim. 2007. California's population to hit 60 million by 2050. July 9. <https://www.reuters.com/article/us-california-population/californias-population-to-hit-60-million-by-2050-idUSN0930091220070709?feedType=RSS>

Plastic Bag/Film-Specific Survey and Focus Groups

Methodology

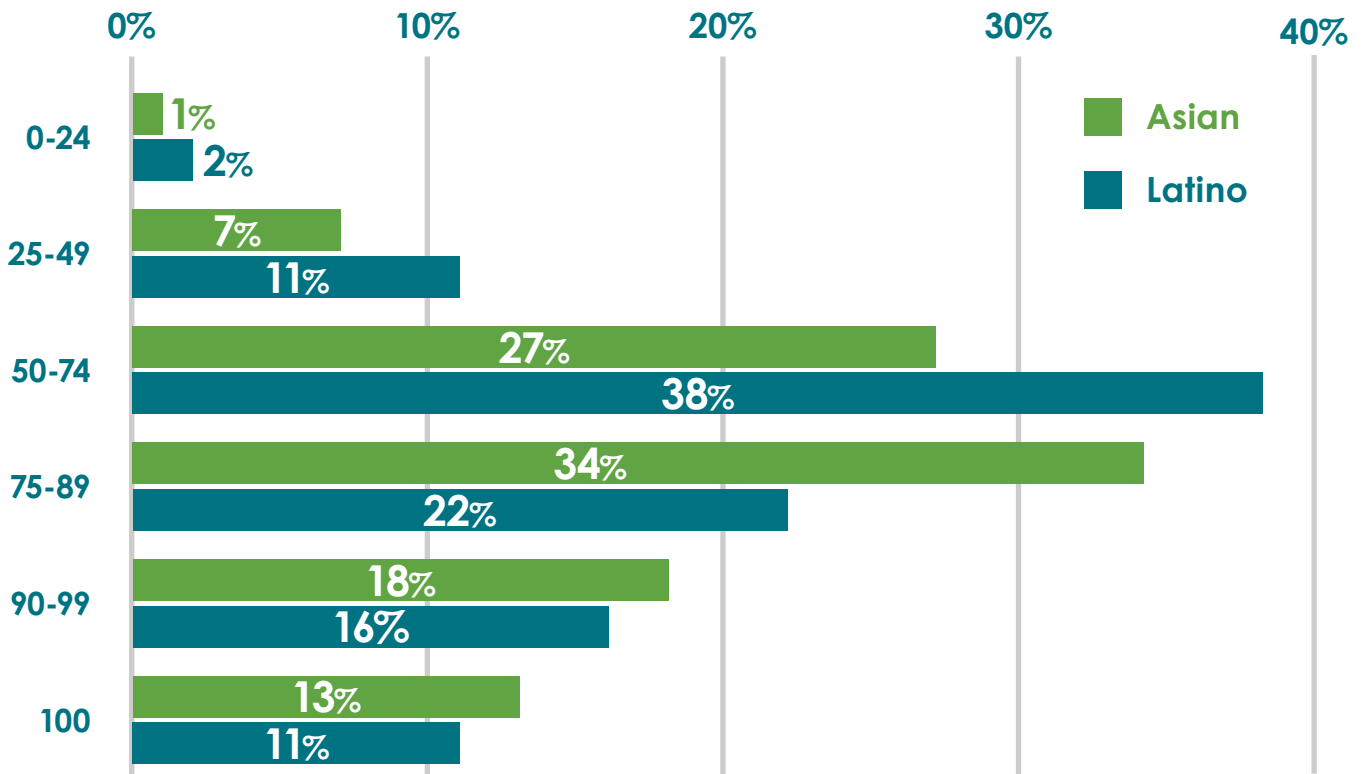
Based on the city and MRF surveys, plastic bags and film were identified as one of the top contaminants on the West Coast. To gain a better understanding of attitudes, behaviors, perceptions, and motivations around proper disposal of plastic bags and film, additional surveys and focus groups were conducted.

Three separate online surveys were conducted in November 2019 by Stephen Groner Associates, OpinionWorks, and C+C: 1) 621 residents of California, Oregon, and Washington; 2) 481 Asian or Latino residents of Southern California; and 3) 217 Latino residents of San Diego County, California. For Los Angeles County, responses to questions about plastic bags were separated for parts of the county that accept or do not accept plastic bags in their curbside programs.

The resident survey by Myers Research showed that more residents in Southern California were bagging their recyclables and putting plastic bags in recycling so Myers Research and OpinionWorks selected five groups of residents in Los Angeles County to ask additional questions about recycling, with a focus on plastic bags: 1) college-educated white women; 2) Latino men and women; 3) Asian women; 4) Mexican-born residents; and 5) second generation Latino men. In addition, Stephen Groner Associates spoke with 30 Latino shoppers in Long Beach, California about their use and disposal of shopping bags.

Survey Results

Figure 68: Household recycling self-rating (Los Angeles County)



OpinionWorks

If you were to rate your own household on a scale from 0 to 100, where 0 means you do not recycle at all, 100 means you recycle everything you possible can, and 50 is average, what score would you give your household.

Figure 68b: Household recycling self-rating average (Los Angeles County)

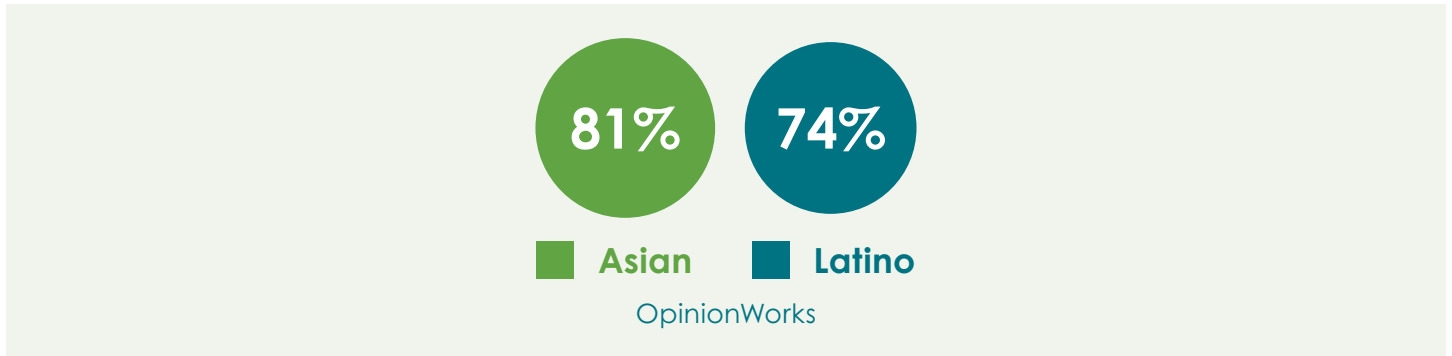


Figure 69: If you are unsure whether an item is recyclable, what do you do? (Los Angeles County)

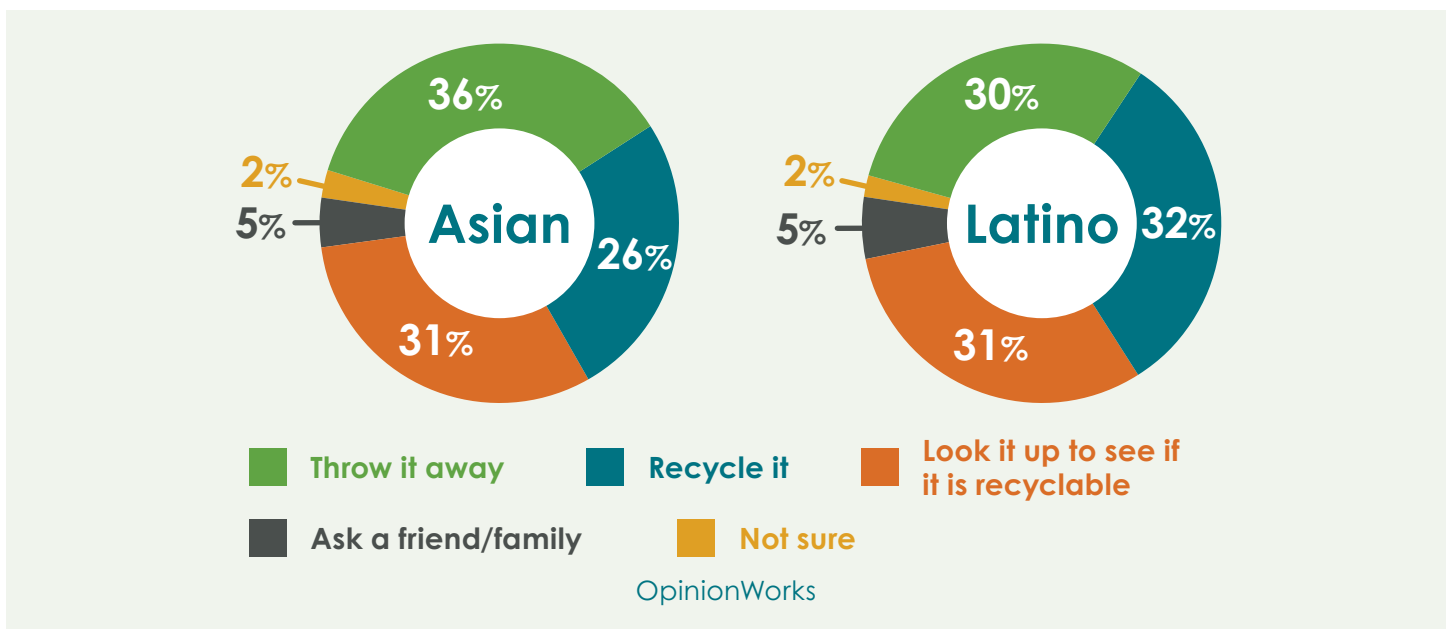


Figure 70: Does your city provide enough information about recycling? (Los Angeles County)

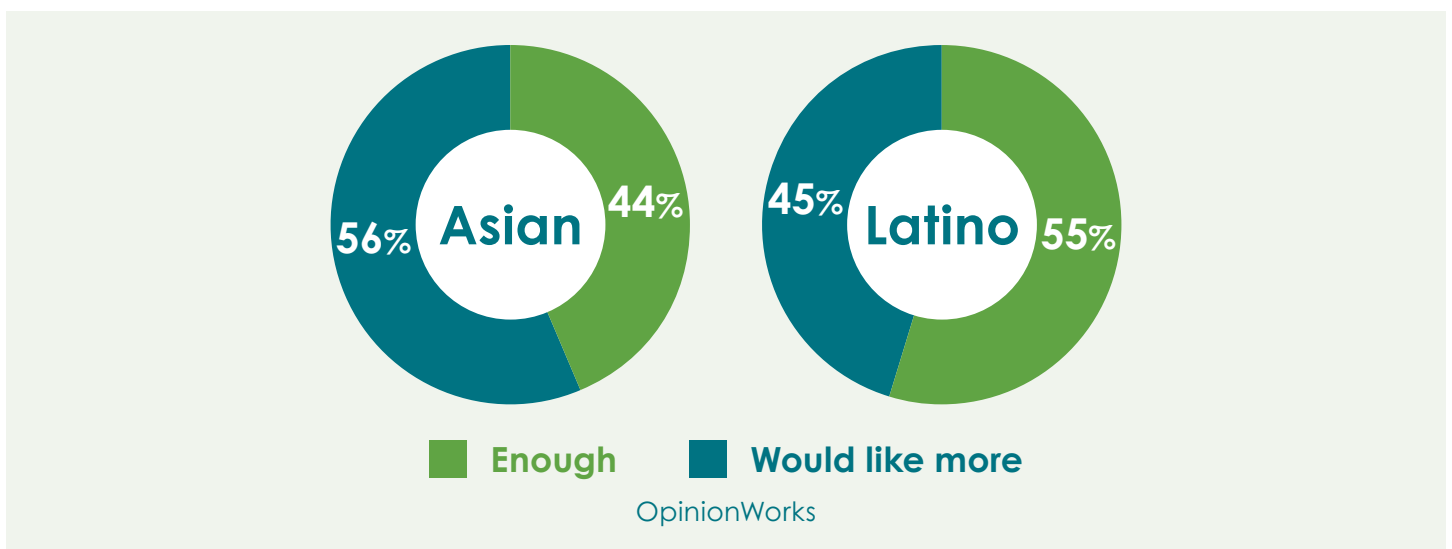


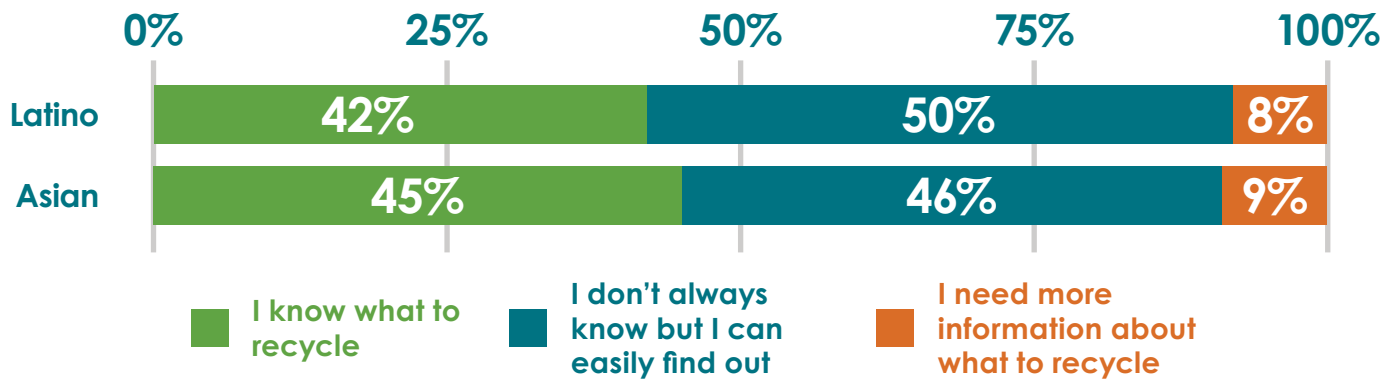
Figure 71: How useful would you find these sources of information about your recycling program? (Los Angeles County)

Information preferences	Asian in Los Angeles County	Latino in Los Angeles County
Refrigerator magnet	59%	47%
Videos (tips on recycling)	41%	54%
City website	47%	50%
Email	41%	50%
In person	35%	49%
Text reminders	32%	37%
Cart label sticker	15%	19%
Infocard	9%	18%
No preference	13%	11%
Would not use it	4%	6%

*multiple answers possible

OpinionWorks

Figure 72: Knowledge of recycling (Los Angeles County)



OpinionWorks

Figure 73: Supposed to be recycled (Asian in Los Angeles County)*

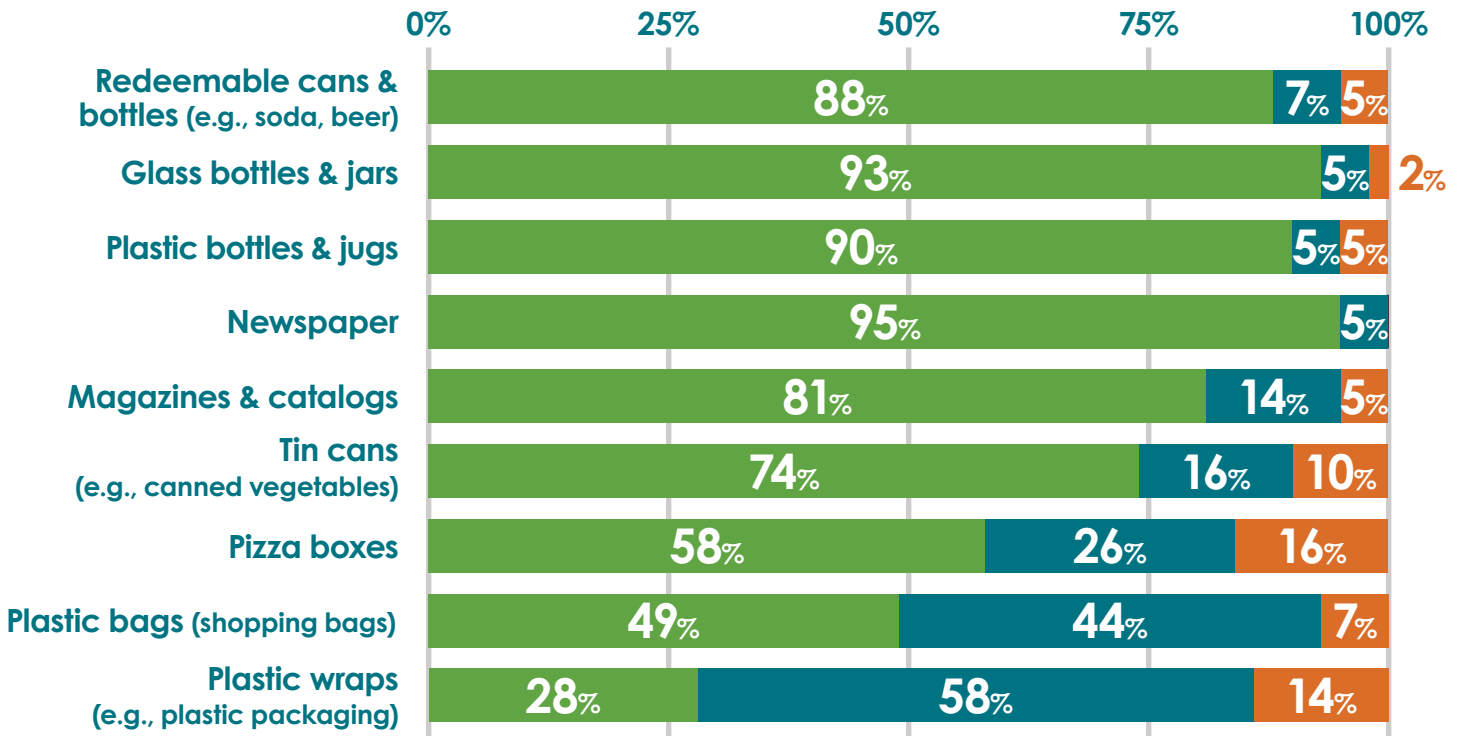
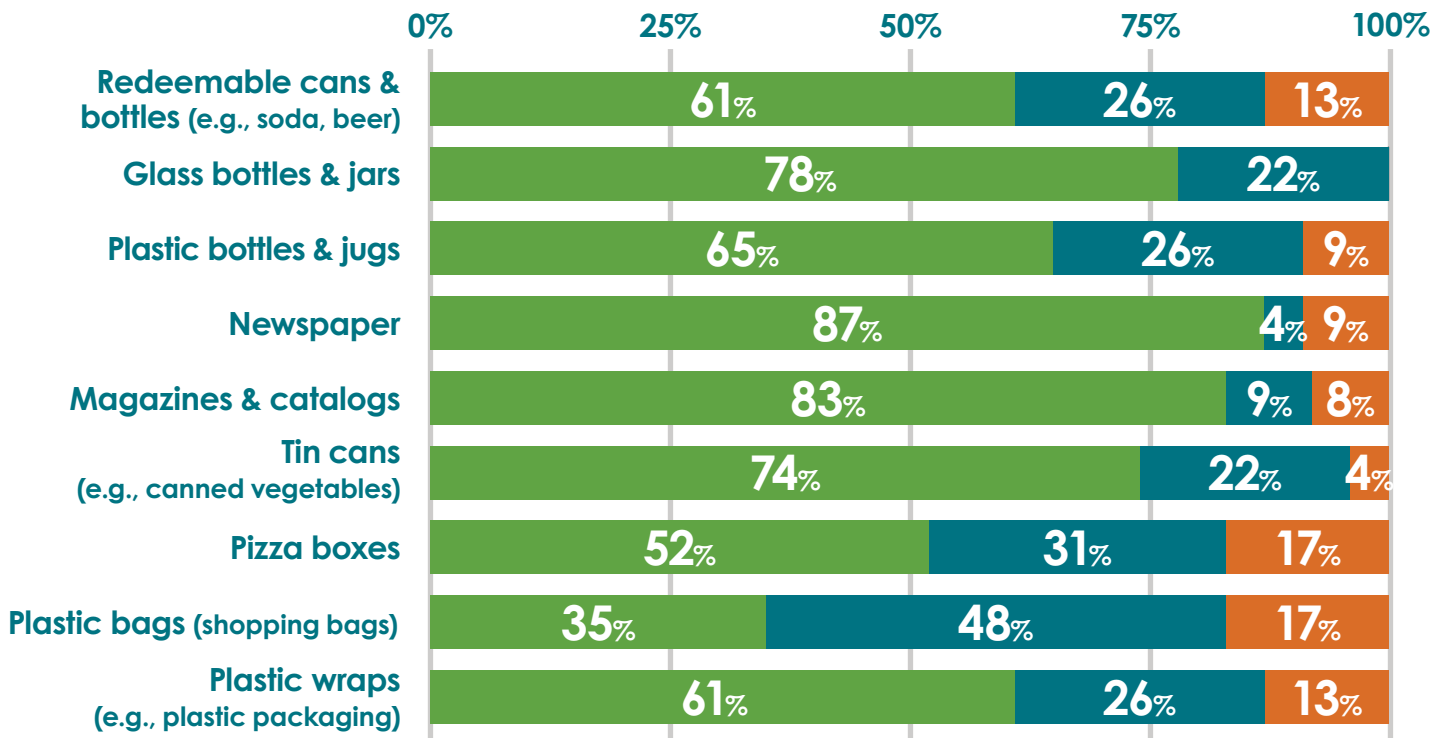


Figure 74: Supposed to be recycled (Latino in Los Angeles County)*



■ Supposed to be Recycled
 ■ Not Supposed to be Recycled
 ■ Not Sure

OpinionWorks

* Note: This population represents the unincorporated Los Angeles County and cities within the County that do not accept plastic bags in their curbside programs.

Figure 75: Supposed to be recycled (Asian in City of LA)*

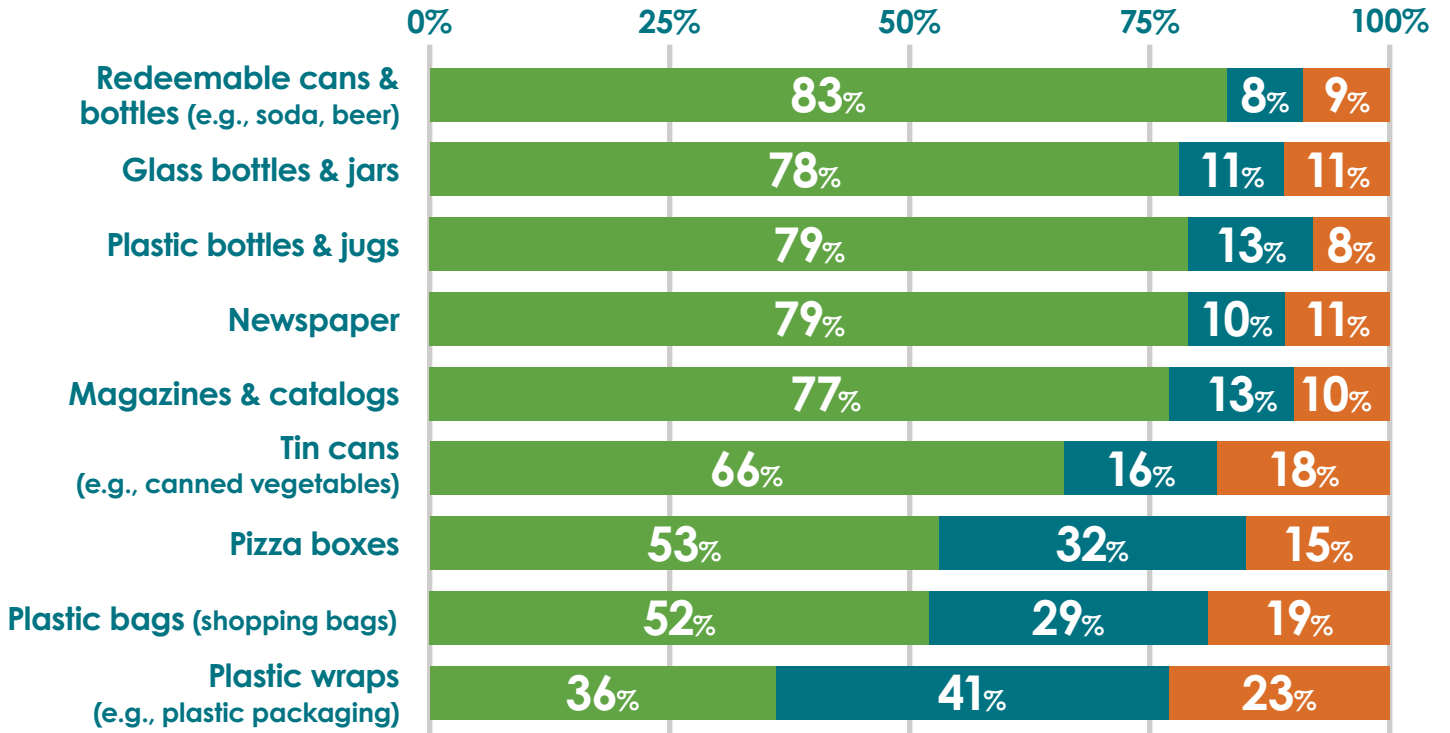
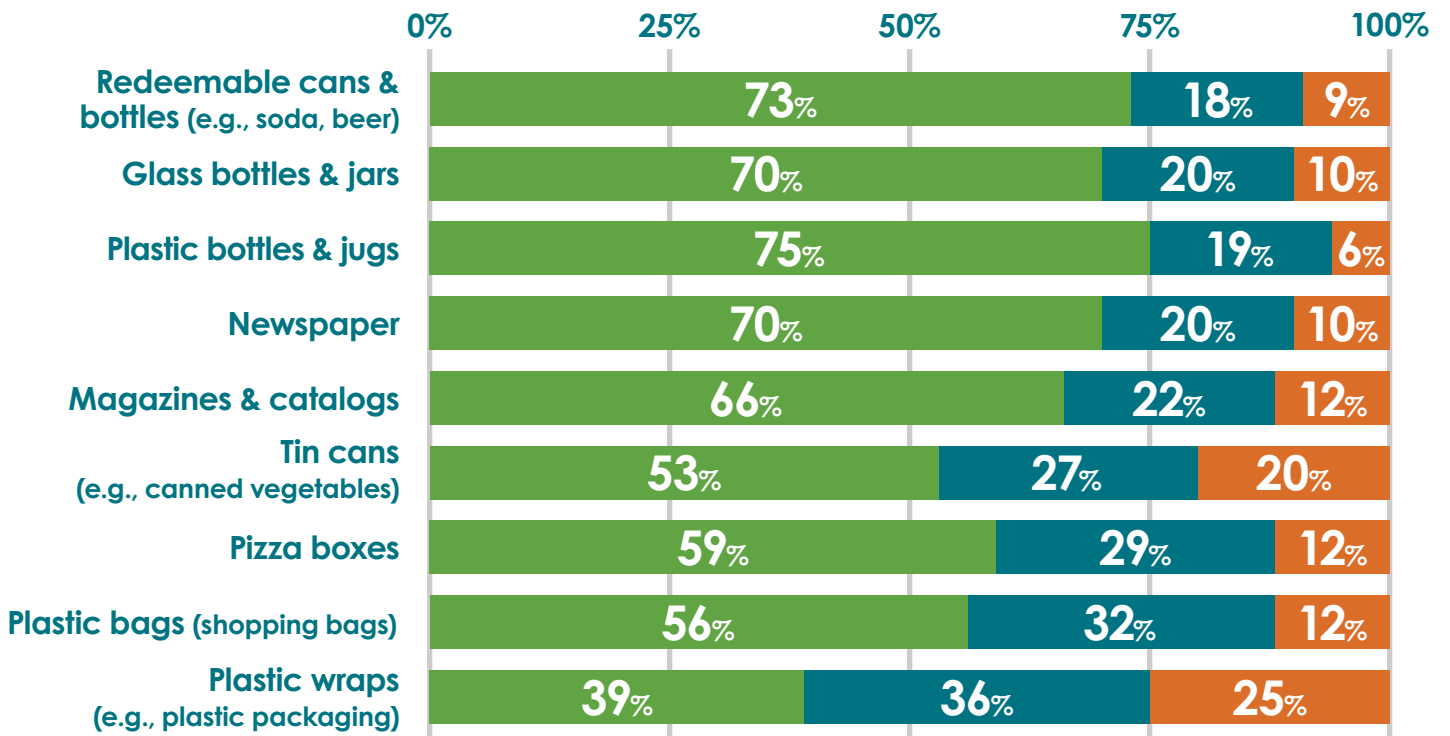


Figure 76: Supposed to be recycled (Latino in City of LA)*



■ Supposed to be Recycled
 ■ Not Supposed to be Recycled
 ■ Not Sure

OpinionWorks

* Note: This population represents the City of Los Angeles and other cities within Los Angeles County that accept plastic bags in their curbside programs.

Figure 77: Frequency of recycling (Asian in Los Angeles County)*

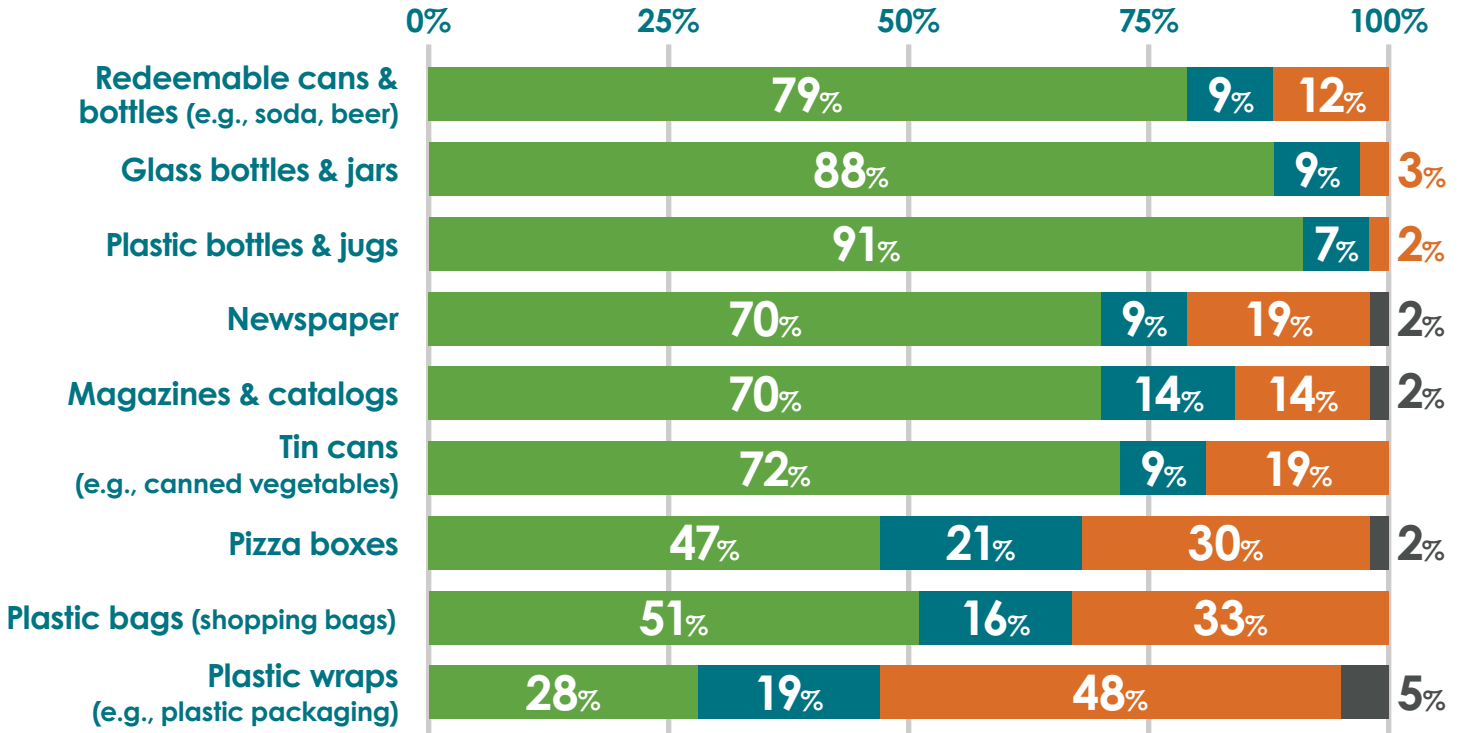
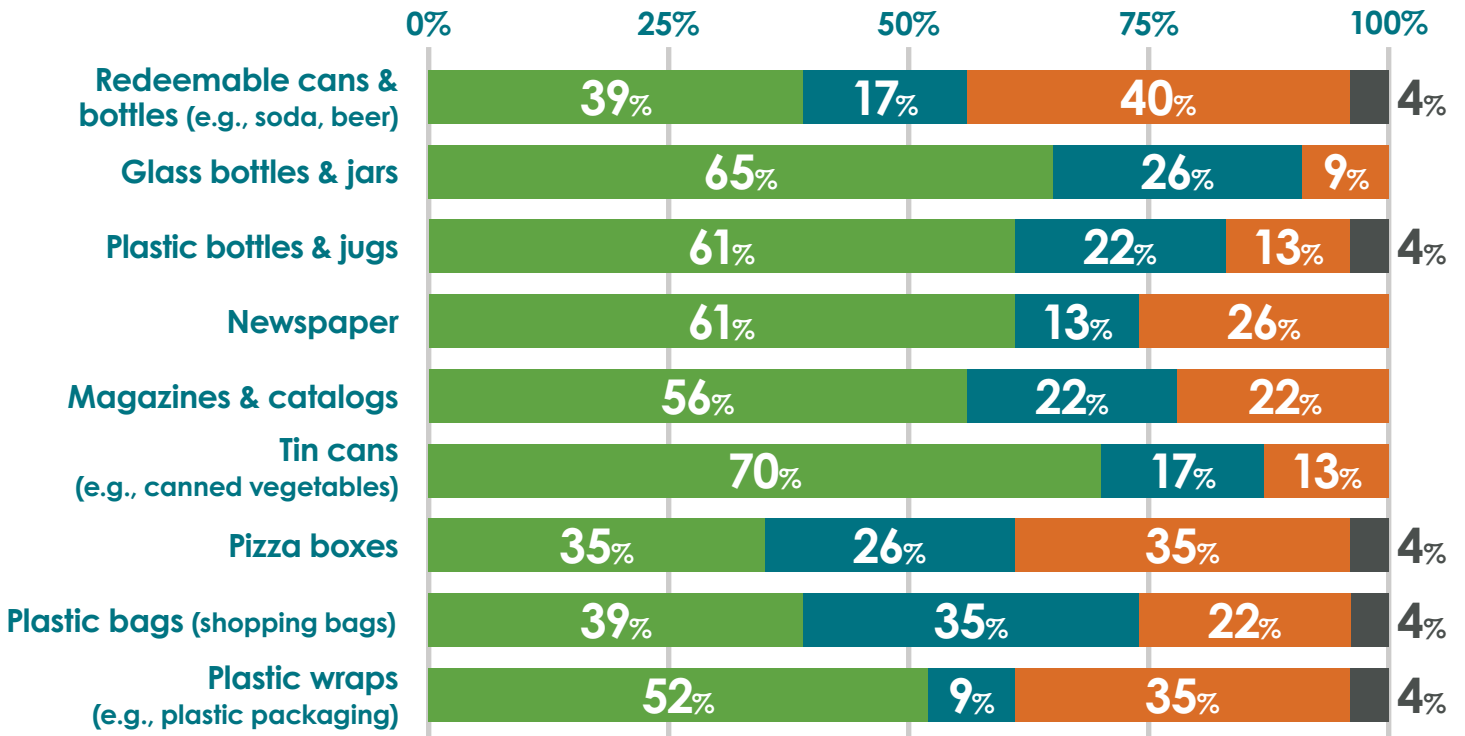


Figure 78: Frequency of recycling (Latino in Los Angeles County)*



■ Recycle Often
 ■ Recycle Sometimes
 ■ Never Recycle
 ■ Not Sure

OpinionWorks

* Note: This population represents the unincorporated Los Angeles County and cities within the County that do not accept plastic bags in their curbside programs.

Figure 79: Frequency of recycling (Asian in City of LA)*

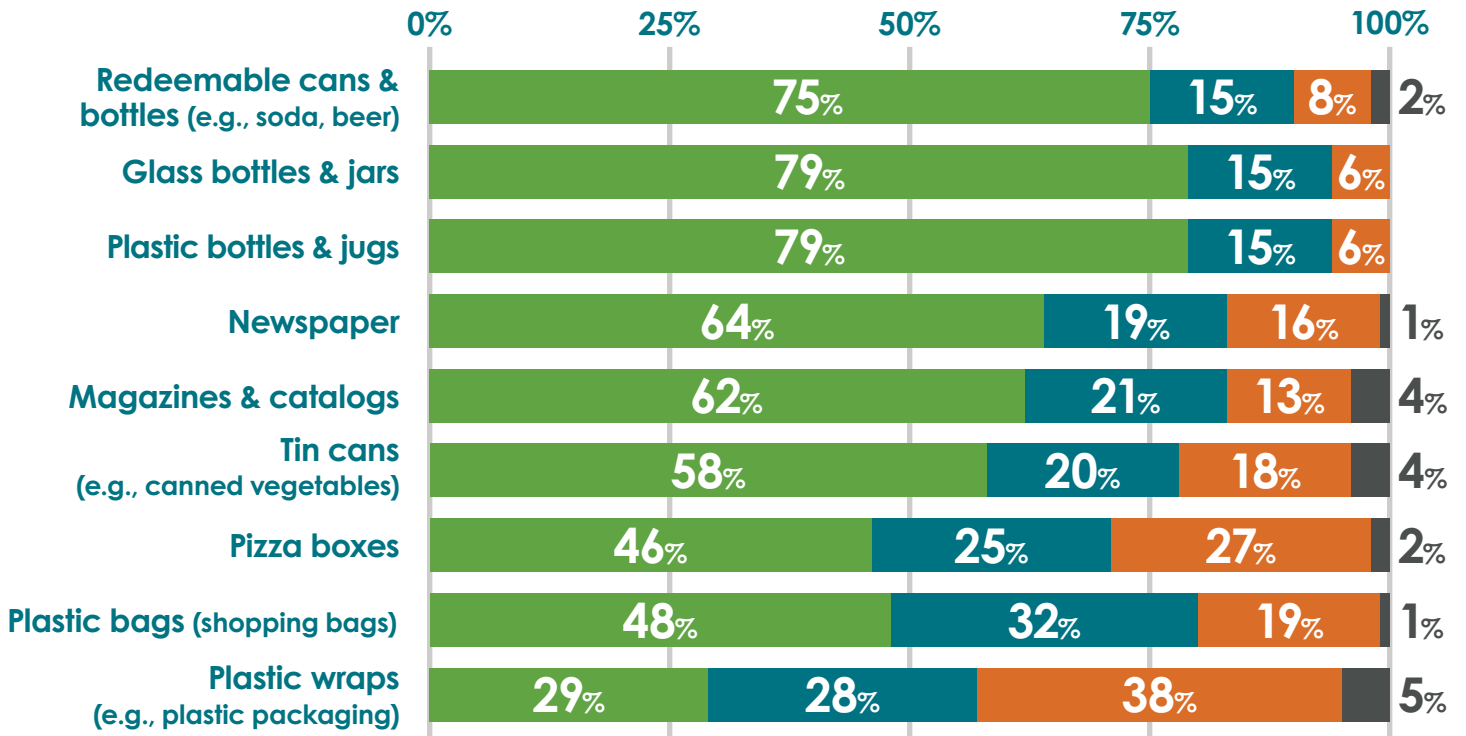
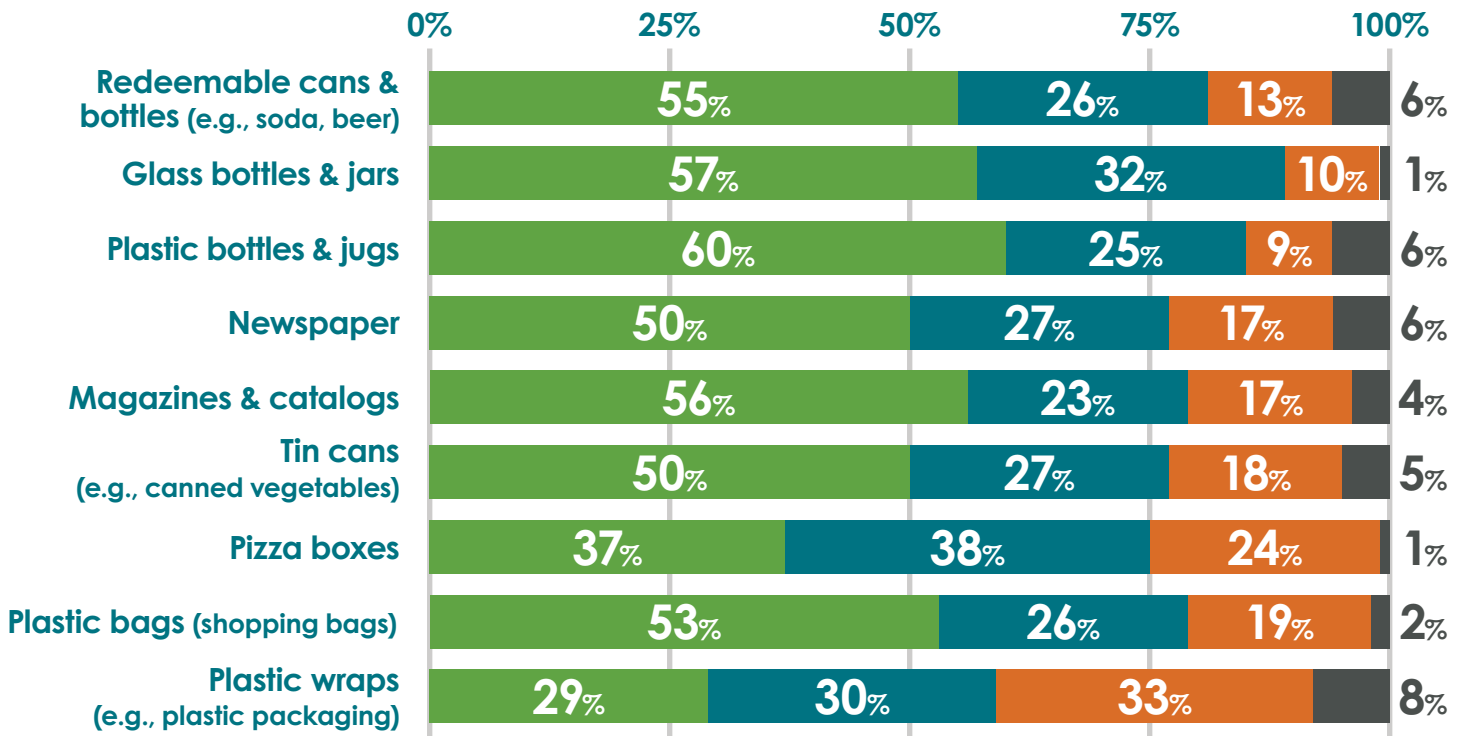


Figure 80: Frequency of recycling (Latino in City of LA)*



■ Recycle Often
 ■ Recycle Sometimes
 ■ Never Recycle
 ■ Not Sure

OpinionWorks

* Note: This population represents the City of Los Angeles and other cities within Los Angeles County that accept plastic bags in their curbside programs.

Figure 81: Are these materials accepted in curbside recycling? (Latino in San Diego County)

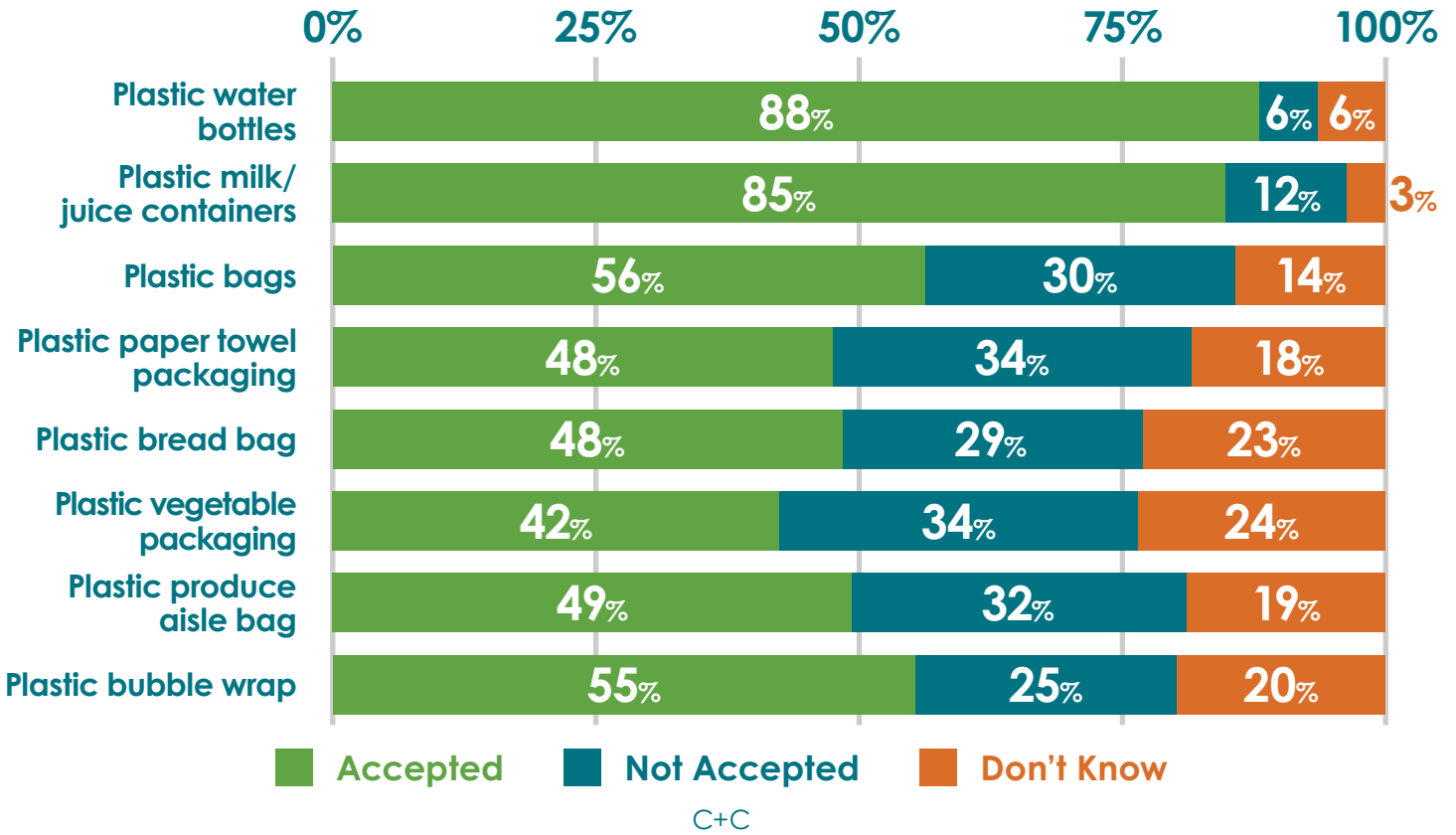


Figure 82: Knowledge about plastic bag disposal*

	Asian in Los Angeles County	Latino in Los Angeles County	Latino in San Diego County
Yes, accepted curbside	49%	35%	56%
No, cannot recycle curbside	44%	48%	30%
Don't know	7%	17%	14%

OpinionWorks & C+C

Figure 83: Knowledge about plastic bag disposal*

	Asian in City of LA	Latino in City of LA
Yes, accepted curbside	52%	56%
No, cannot recycle curbside	29%	32%
Don't know	19%	12%

OpinionWorks

* Note: The "Los Angeles County" population represents the unincorporated Los Angeles County and cities within the County that do not accept plastic bags in their curbside programs. The "City of LA" population represents the City of Los Angeles and other cities within Los Angeles County that accept plastic bags in their curbside programs.

Figure 84: Reported behavior on bag disposal*

	Asian in Los Angeles County*	Latino in Los Angeles County*	Latino in San Diego County
Recycle in recycling bin	67%	74%	24%
Put them in trash	60%	70%	20%
Bring back to store	37%	43%	24%
Reuse	86%	96%	31%

*Multiple answers possible for LA County survey but not for San Diego survey

OpinionWorks & C+C

Figure 85: Reported behavior on bag disposal*

	Asian in City of LA*	Latino in City of LA*
Recycle in recycling bin	76%	75%
Put them in trash	73%	64%
Bring back to store	44%	60%
Reuse	95%	87%

*Multiple answers possible

OpinionWorks

Figure 86: What message will motivate behavior change?

	Asian in Los Angeles County	Latino in Los Angeles County
Knowing plastic bag should not be recycled curbside	60%	61%
Want more information	35%	30%
Not sure	5%	9%

OpinionWorks

Figure 87: Likelihood of taking bags back to retail

	Asian in Los Angeles County	Latino in Los Angeles County	Asian in City of LA	Latino in City of LA
Likely	53%	52%	61%	68%
Not sure	33%	26%	31%	22%
Too much trouble	14%	22%	8%	10%

OpinionWorks

* Note: The "Los Angeles County" population represents the unincorporated Los Angeles County and cities within the County that do not accept plastic bags in their curbside programs. The "City of LA" population represents the City of Los Angeles and other cities within Los Angeles County that accept plastic bags in their curbside programs.

Figure 88: Reported behavior on film disposal

Latino in San Diego County	
Recycle it at home	48%
Put it in trash	44%
Bring back to store	8%

C+C

Figure 89: Why they put plastic bags and film in curbside container

Latino in San Diego County	
Want to recycle everything they can	63%
There is a recycle symbol on the item	56%
Assume the recycling process will sort it out	48%

C+C

Figure 90: Reported behavior on bagging recyclables*

	Asian in Los Angeles County	Latino in Los Angeles County
Bags recyclables at least some of the time	42%	56%
In paper bags	22%	14%
Sometimes paper, sometimes plastic	33%	29%
In plastic bags	44%	57%
Recycling Loose	58%	40%

OpinionWorks

Figure 91: Reported behavior on bagging recyclables*

	Asian in City of LA	Latino in City of LA
Bags recyclables at least some of the time	69%	60%
In paper bags	22%	16%
Sometimes paper, sometimes plastic	35%	18%
In plastic bags	43%	66%
Recycling Loose	31%	40%

OpinionWorks

* Note: The "Los Angeles County" population represents the unincorporated Los Angeles County and cities within the County that do not accept plastic bags in their curbside programs. The "City of LA" population represents the City of Los Angeles and other cities within Los Angeles County that accept plastic bags in their curbside programs.

Figure 92: What message will motivate behavior change?

	Asian in Los Angeles County	Latino in Los Angeles County
Knowing recyclables should not be bagged	61%	75%
Still prefer to bag recyclables	33%	25%
Not sure	6%	0%

OpinionWorks

Other observations on messaging:

- The top reason why Latino and Asian residents recycle is to help protect the environment. (OpinionWorks, SGA)
- Residents thought infocards with simple yes and no list with images were the most clear for general recycling information. (OpinionWorks, Myers, SGA)
- There is enormous potential to move the needle quickly on plastic bags/film contamination with a simple message to not put plastic bags in recycling, especially for the Latino and Asian populations in Southern California. Supporting the simple message with a reason why that behavior should be followed is effective. (OpinionWorks, Myers, C+C)
- Residents who were more knowledgeable about recycling want more information on what to do with an item instead of simply saying “do not put in recycling”. They were also more interested in what the recycled items were transformed into. (OpinionWorks, Myers)

Recycling Coordinator Interviews

Methodology

The Recycling Partnership and Stephen Groner Associates spoke with more than 40 communities to identify challenges that local recycling programs are facing and to learn from their success stories.

Summary of Commonly Discussed Topics

Top issue contaminants are:

- Plastic bags & film;
- Clamshells and single use plastics;
- Plastic not accepted by program; and
- Food/liquid contamination.

Wishcycling & confusion among residents caused by:

- Resin identification code and "chasing arrows" symbol on products;
- Packaging that come in all shapes, sizes, and composite materials containing plastic and metal; and
- Thinking that all plastics are recyclable curbside, including film, bags, and flexible plastics.

Recycling is more difficult after China's new policies:

- Residents hear news from other jurisdictions about program cancellation, material list change, or materials being landfilled and think the same is happening everywhere.
- Many haulers and cities are reluctant to make material list changes. Some programs have removed #3-7 plastics, shredded paper, and/or glass from their accepted material list.

Recycling is "free" and trash carts are too small

- Most fee structures are based on waste collection service so the true cost of recycling is hidden and fees based on trash cart size encourage the use of the smallest trash cart size.
- The recycling cart is often bigger than the trash cart so residents are putting trash in recycling when their trash carts fill up.
- Some cities are able to manage this by helping residents right-sizing their carts.

Resource gaps

- Lack of staff to operate program and educate. Many municipalities only have one recycling coordinator, part-time staff, or no staff.
- Lack of funding within municipality and competing funds with other programs (organics, commercial, other sustainability initiatives, other departments within city, etc.) limit education and data collection.
- Food waste is a major focus, especially in California. California's SB1383 (full implementation by 2022) requires weekly collection of organics, cart inspections, and major education and outreach efforts.

Relationship between municipality and hauler(s) is not always good or beneficial to municipality. Old contracts are not prescriptive about education or data reporting to communities. Communities are requiring more education and outreach in new contracts.

Communities feel like they are already doing a lot of outreach but the message isn't getting to the residents

- Common outreach methods include periodic newsletters, service guides, bill inserts (harder to reach with people going paperless), mailers/post cards, social media, media press release and ads, and tabling at events.
- Cart tagging experience ranged from never done, barely done, do regularly with or without rejection, to do so frequently there's tag fatigue. There are some communities that cannot legally lift the lid to inspect the cart contents.
- Many programs are developing a website or app with search tool so residents can find out what is and is not accepted by their curbside program.
- Many local programs have fees for contamination but fee is mainly used as an opportunity to talk to resident and waived.

Harmonized message and material list needed in regions

- People are living and working in different cities.
- Multiple haulers in region or changing providers result in confusion over material lists.

Multicultural outreach needs more research-backed strategy and resources

- Driven by SB1383 for California.
- Need more translations but also guidance on what icons/photos work.

Multifamily recycling needs help

- Growing sector and significantly higher contamination rate than single-family.
- Many buildings don't provide recycling or have insufficient volume and/or poor signage.
- Easier to hide contaminants in large open containers.
- Residents are not responsible for bins/containers and property managers/owners don't live there so there is disconnect. Both groups need to be educated.
- Resident is usually not the bill payer so municipality doesn't have a record of individual addresses. Difficult to do door to door outreach without support from property managers/owners.
- High turnover requires constant education.
- More multicultural and diverse demographics.
- Often grouped with commercial and don't have separate metrics or program data.
- Popular education and outreach methods for multifamily include magnetic infocards, door hangers, tote bags or in-unit bins, and resident champion programs.

Rural communities need funding to offer drop-off recycling collection and education

Source reduction needs to be a priority

- Reduce packaging
- Cities are banning single-use plastics
- Promote closing the loop by requiring recycling content

Recycling is part of municipality or state's greenhouse gas/climate plan or zero waste initiative

Other Resources Referenced

The Recycling Partnership Resources

- More information about our national data can be found in the [2020 State of Curbside Report](#) (February 2020).
- [Bridge to Circularity Report](#) (2019)
- [West Coast Resource Portal](#) includes templates for infocards, oops tags, and signage
- [Anti-contamination Kit](#)
- [Drop-off Anti-contamination Kit](#)

California Beverage Container Recycling and Litter Reduction Program

In California, distributors of beverages subject to this program pay redemption payments to CalRecycle, the state agency. These payments are passed onto consumers when they purchase the beverage at a rate of 5 cents per container that is less than 24 ounces or 10 cents per container that is 24 ounces or greater. When consumers return these containers at certified recycling centers, they are eligible to receive the California Refund Value (CRV), which is the amount they paid at the point of sale. CalRecycle reimburses the companies operating the recycling centers for redemption payments. Curbside programs are also eligible to receive the refund value plus other administrative and incentive payments for program beverage containers collected curbside. CalRecycle uses unredeemed fees from beverage manufacturers to pay for incentives for in-state plastics reclaiming and manufacturing, handling fees at redemption centers, and other local grants.

Program containers include the following beverages sold in aluminum, glass, plastic, and bimetal containers:

- Beer and other malt beverages
- Wine coolers and distilled spirit coolers
- Carbonated fruit drinks, soft drinks, and water (including soda and carbonated mineral water)
- Non-carbonated fruit drinks (any % fruit juice, excluding 100% fruit juice in 46-ounce or larger containers), soft drinks, sport drinks, and water
- Coffee and tea drinks
- Vegetable juices in containers 16 ounces or smaller⁵

Figure 93: Beverage containers recovered in California in 2018⁶

76% by count or 70% by weight of containers were returned

	Aluminum	Glass	PET	HDPE	Total
Containers sold (millions)	8,496.28	3,209.65	12,480.70	196.17	24,382.80
Containers returned (millions)	7,029.96	2,113.55	9,276.24	127.77	18,547.52
Average container per pound	28.9	1.95	23.1	7.0	N/A
Containers sold (tons)	146,994	822,987	270,145	14,012	1,254,139
Containers returned (tons)	121,626	541,936	200,784	9,126	873,472
Containers returned through curbside programs	6%	25%	10%	27%	19%
Containers returned through non-curbside channels	93%	75%	89%	72%	81%

Note: Other container types (PVC, LDPE, PP, PS, other plastic, and bimetal) are not included in the total. Non-curbside channels include recycling centers and drop-off programs

Based on the data above, over 380,000 tons of program materials are not recovered annually in the state. Dividing this by the total occupied units in California, almost 60 pounds per household per year of these beverage containers are not captured curbside, at recycling centers, or at drop-off locations.

⁵ CalRecycle. 2018. How California's Recycling Program Works. <https://www.calrecycle.ca.gov/bevcontainer/programinfo/BasicCRV/>

⁶ CalRecycle. 2019. California's Beverage Container Recycling and Litter Abatement Program Fact Sheet. June. <https://www2.calrecycle.ca.gov/Publications/Details/1658>

Oregon Bottle Bill⁷

In Oregon, the Oregon Beverage Recycling Cooperative (OBRC), owned by beverage distributors and grocery retailers, manages the deposit and reimbursement of beverage containers. The distributor charges a 10-cent deposit to the retailer when the beverages are delivered, and retailer charges the consumer the deposit when the beverage is sold. When the empty container is returned to a store or a redemption center, the 10-cent flows back in the reverse order, from the store to the consumer and then the distributor to the store when the distributor collects the empty container.

In 2018 and 2020, the Bottle Bill was expanded to include the following beverages in sealed glass, metal, or plastic bottles or cans:

- Water, flavored water, soda water, and mineral water (3 liters or less)
- Carbonated soft drinks and kombucha (3 liters or less)
- Beer and malt beverages and hard seltzer (3 liters or less)
- Other non-alcoholic beverages (tea, coffee, fruit and vegetable juices, energy and sports drinks, aloe vera juice, coconut water, non-alcohol wine, drinking vinegar, protein shakes, ready-to-drink cocktail mixers, milk or plant-based milk beverages that include other ingredients) (4 ounces up to and including 1.5 liters)
- Hard cider, if 8.5% ABV or less (4 ounces up to and including 1.5 liters)
- Marijuana beverages (4 ounces up to and including 1.5 liters)

Figure 94: Beverage containers redeemed in Oregon in 2018⁸
85% by count of containers were returned, totaling 82.5 million pounds⁹

	Aluminum	Glass	Plastic	Total
Containers returned (millions)	513.61	129.01	336.54	979.17

Based on OBRC reports, approximately half of the bottles are redeemed in the greater Portland region. Calculations reveal that these households in the Portland region are redeeming approximately eight pounds of plastic, eight pounds of aluminum, and 28 pounds of glass bottles per household in a year. Based on data from the Metro regional government, an additional 84 pounds per household per year of glass is collected through the separate curbside glass collection. Returning to the Greater Portland Region Generation Study described on [on Page 32](#), adding data from these other recycling streams to the curbside values gives us a more complete picture of household generation in the Portland region. The total weight of recyclables generated by an average household in this region in a year is approximately 594 pounds per household.

⁷ Oregon Liquor Control Commission. The Bottle Bill & Redemption Centers. https://www.oregon.gov/OLCC/pages/bottle_bill.aspx

⁸ Oregon Beverage Recycling Cooperative. 2018. Quarterly Reports Q1 through Q4, 2018. <https://www.obrc.com/Reports>

⁹ Oregon Beverage Recycling Cooperative. 2019. 2018 Annual Report. <https://www.obrc.com/Content/Reports/OBRC%20Annual%20Report%202018.PDF>

