

THE STATE OF RESIDENTIAL RECYCLING AND ORGANICS COLLECTION IN WASHINGTON STATE

IMPORTANT NOTE: GIVEN THE CHALLENGES OF COMPILING THE INFORMATION IN THIS STUDY, WE DECIDED TO GO AHEAD RELEASE THIS REPORT IN NOVEMBER 2019, SO THAT IT CAN BE OF USE TO SOLID WASTE PROFESSIONALS IN WASHINGTON STATE. WE RECOGNIZE THAT THERE MAY BE SOME UPDATES NEEDED AND PLAN TO PUBLISH UPDATES PERIODICALLY. WE WILL PUBLISH WITH REVISED DATES.

Acknowledgements

Major thank you to McKenna Morigan, Cascadia Consulting Group, for her technical assistance and review.

Thank you to the following for their captivating and enriching inputs for this report:

Ryan Dicks, Pierce County

Kim Ducote, Resource Stewards, LLC

Debra Geiger, Spokane Regional Solid Waste System

Julie Gilbertson, City of Vancouver

Sego Jackson, City of Seattle

Ron Jones, City of Olympia

Kevin Kelly, Recology

Alli Kingfisher, Washington State Department of Ecology

Troy Lautenbach, Lautenbach Recycling

Jeff Hegedus, Whatcom County

Rich McConaghy, City of Vancouver

Polagaya McLaughlin, Snohomish County

Christopher Piercy, Kitsap County

Lisa Sepanski, King County

Meggan Uecker, Clallam County

We also want to thank to all those who dedicated their time to improve the accuracy of our observations. And thank you to Mariel Thuraingham for editing and review.

Please cite this report as:

Zero Waste Washington. 2019 (November 25). The State of Residential Recycling and Organics Collection in Washington State. Written by Nicolás M. Díaz Huarnez

This report is available at: www.zerowastewashington.org

TABLE OF CONTENTS

Abstract	5
1 Introduction.....	8
1.1 Context of recycling and organics collection	8
1.2 Methodology.....	8
2 Residential Recycling and Organics Collection in Washington State	10
2.1 Overview	10
2.2 Recycling and organics collection in Washington State	17
3 Perspectives on the System	23
4 Findings.....	28
5 Appendices.....	30
5.1 Appendix 1: Compiled Data	30
5.2 Appendix 2: Interviews guiding questionnaire	31

List of Figures

Figure 1: Counties included in each waste generation area	10
Figure 2: Streams collected curbside by waste generation area, number of jurisdictions	13
Figure 3: Recycling collection by jurisdiction	17
Figure 4: Type of recycling by type of plastic, by jurisdiction (count and percentage).....	18
Figure 5: Type of recycling by type of paper by jurisdictions (count and percentage).....	19
Figure 6: Type of recycling by type of metal, glass, by jurisdiction (count and percentage).....	20
Figure 7: Type of recycling of other materials by jurisdiction (count and percentage).....	21
Figure 8: Type of organics collection by jurisdiction (count and percentage of jurisdictions).....	22

List of Tables

Table 1: Counties included in each waste generation area	10
Table 2: Characteristics of analyzed waste generation areas.....	11
Table 3: Type of collection service by jurisdiction.....	11
Table 4: Frequency of collection by service area	12
Table 5: Streams collected curbside by waste generation area, number of jurisdictions	12
Table 6: Universal and subscription curbside service by waste generation area, number of service areas.....	13
Table 7: Recycling haulers in washington	14
Table 8: Drop-off locations by waste generation area	15



State of residential collection and drop-off access for Recyclables and Organics in Washington

(publicly funded services for residential curbside and drop off, as of October 1, 2019)

58% of jurisdictions in Washington have **curbside recycling collection**
49% of jurisdictions in Washington have **curbside organics collection**



Number of cities and counties that accept:

Bottles

183 at curbside (57% of jurisdictions)

70 at drop-off only (21% of jurisdictions)

78% of jurisdictions covered

Jugs

185 at curbside (58% of jurisdictions)

66 at drop-off only (21% of jurisdictions)

78% of jurisdictions covered

Bags

21 at curbside (7% of jurisdictions)

16 at drop-off only (5% of jurisdictions)

12% of jurisdictions covered

PAPER



Over 184 jurisdictions accept
Mixed paper, newspapers, cardboard & magazines
at curbside

Over 45 jurisdictions: at drop-off only

Over 83% of jurisdictions covered

Paper cups

77 at curbside (24% of jurisdictions)

2 at drop-off only (1% of jurisdictions)

25% of jurisdictions covered

GLASS & METAL



Glass bottles & jars

110 at curbside (34% of jurisdictions)

109 at drop-off only (34% of jurisdictions)

68% of jurisdictions covered

Aluminum cans

185 at curbside (58% of jurisdictions)

94 at drop-off only (29% of jurisdictions)

87% of jurisdictions covered

Scrap metal

74 at curbside (23% of jurisdictions)

134 at drop-off only (42% of jurisdictions)

65% of jurisdictions covered

Organics



Yard trimmings

153 at curbside (48% of jurisdictions)

87 at drop-off only (27% of jurisdictions)

75% of jurisdictions covered

Food waste

97 at curbside (48% of jurisdictions)

4 at drop-off only (1% of jurisdictions)

49% of jurisdictions covered

Food soiled paper

93 at curbside (29% of jurisdictions)

13 at drop-off only (4% of jurisdictions)

33% of jurisdictions covered

OTHER



Used cooking oil

20 at curbside (3% of jurisdictions)

46 at drop-off only (14% of jurisdictions)

17% of jurisdictions covered

Household batteries

33 at curbside (10% of jurisdictions)

193 at drop-off only (60% of jurisdictions)

70% of jurisdictions covered

Aseptics**

83 at curbside (26% of jurisdictions)

15 at drop-off only (5% of jurisdictions)

31% of jurisdictions covered

Curbside pickup includes special pickups

**Aseptic are polycoated paper containers such as milk cartons and some juice boxes

ABSTRACT

With a recycling crisis precipitated by China's recent National Sword initiative which restricts imports of recyclable materials and scrap, Washington State decision-makers and solid waste professionals are considering major system changes. In the spirit of helping provide information to inform new changes, we undertook this study of current status of residential curbside collection service and drop-off access for garbage, recyclables and organics (as of October 1, 2019).

Highlights are summarized below and shown in infographic on previous page::

- **Residential curbside *recycling* collection is available in 58% of jurisdictions and *organics* collection is available in 49% of jurisdictions in Washington.**
 - **Garbage:** All Washington jurisdictions have some type of curbside collection of garbage.
 - **Recycling:** 186 jurisdictions (58% of 320 total jurisdictions) in Washington have some type of curbside collection of recyclables available to residents. Ten municipal operations and 24 private haulers of residential solid waste offer this curbside recycling collection. Those with the highest numbers of serviced areas are: Waste Connections (62), Waste Management (61), Republic services (32), and Recology CleanScapes (10).
 - **Organics:** 158 jurisdictions (49%) have some type of curbside collection of organic material.
 - **Frequency of pick up:** At curbside, garbage is most often collected weekly whereas recycling and organics are most often collected every other week.
 - **Drop-off:** There are 171 publicly owned and/or funded drop-off locations, comprising both transfer stations and drop boxes. Most provide both free drop-off and fee-based drop-off services. This equates to an average of 2.3 drop-off locations available per 100,000 persons statewide. The West and Central waste generation areas have a higher ratio of drop-off service with 7.4 and 6.8 drop-off locations per 100,000 inhabitants, respectively. The Puget Sound area has the lowest ratio of this service with less than one drop-off site per 100,000 persons but has higher levels of curbside service.
- **Plastic bottles and jugs (78%), paper/cardboard (over 70%), aluminum cans (87%), and glass containers (64%) have among the highest recycling access.**
 - **Plastic recycling:**
 - 183 of 230 jurisdictions (57%) accept bottles at curbside and an additional 70 at drop-off (21%)
 - 185 jurisdictions (58%) accept jugs at curbside and an additional 66 at drop-off (21%)
 - 21 jurisdictions (7%) accept bags at curbside and an additional 16 at drop-off (5%)
 - 83 jurisdictions (26%) accept aseptic containers/cartons at curbside and an additional 15 at drop-off (5%)
 - **Paper recycling:**
 - 185 jurisdictions (58%) accept mixed paper at curbside and an additional 80 at drop-off (25%)
 - 184 jurisdictions (58%) accept cardboard at curbside and an additional 90 at drop-off (28%)
 - 77 jurisdictions (24%) accept paper cups at curbside and an additional 2 at drop-off (1%)
 - 42 jurisdictions (13%) accept shredded paper at curbside and an additional 12 at drop-off (4%)
 - **Glass recycling:** 110 jurisdictions (34%) accept glass bottles and jars at curbside and an additional 109 at drop-off (34%)

- **Metal recycling:**
 - 185 jurisdictions (58%) accept aluminum cans at curbside and an additional 94 at drop-off (29%)
 - 180 jurisdictions (56%) accept tin cans at curbside and an additional 85 at drop-off (27%)
 - 74 jurisdictions (23%) accept scrap metal at curbside and an additional 134 at drop-off (42%)
 - 65 jurisdictions (20%) accept aluminum foil at curbside and an additional 37 at drop-off (12%)
 - 41 jurisdictions (13%) accept aerosol cans at curbside and an additional 27 at drop-off (8%)
- **Other:**
 - 36 jurisdictions (11%) accept used motor oil at curbside and an additional 216 at drop-off (68%)
 - 33 jurisdictions (10%) accept household batteries at curbside and an additional 193 at drop-off (60%)
 - 20 jurisdictions (3%) accept used cooking oil at curbside and an additional 46 at drop-off (14%)
- **Organic materials are accepted in 75% of jurisdictions. Organics programs across the state vary widely in terms of type of collection, seasonality, requirement of subscription, and types of accepted materials.**
 - **Organics collection and drop-off:**
 - 153 jurisdictions (48%) accept yard trimmings at curbside and an additional 87 at drop-off (27%)
 - 97 jurisdictions (30%) accept food waste at curbside and an additional 4 at drop-off (1%)
 - 93 jurisdictions (29%) accept food soiled paper at curbside and an additional 13 at drop-off (4%)
 - 94 jurisdictions (29%) accept uncoated paper at curbside and an additional 2 at drop-off (1%)
 - 76 jurisdictions (24%) accept shredded paper at curbside and an additional 0 at drop-off
- **Washington encompasses a wide variety of social, geographical, and economic realities which help to understand local systems for solid waste collection.**
- **Rates of collection for recyclable materials depend not only on their prices as recycling commodities, but also on their level of access to end-markets, volume, level of contamination at their disposal, and existing infrastructure for processing.**
- **There is a lack of recycling program consistency, completeness, and accuracy in the information provided to customers, which can create customer confusion and increased contamination.**
- **Public recycling systems could be positively impacted in terms of coverage and efficiency through partnering with private collectors, especially scrap metal processors and thrift stores.**
- **Commingled systems where recyclables are collected together are the most frequent hauling system.**
- **Household Hazardous Waste collection systems are mostly independent from recycling and much more limited.**
- **Coordination is key to ensure a consistent, efficient, prospective, and resourceful response of recycling systems to existing dynamics in prices, costs, and customers behavior and attitudes.**
- **Local communities require strong leadership from the state in organizing and supporting solid waste programs, especially in regard to financial support.**

1 INTRODUCTION

This report seeks to describe the state of residential recycling and organics curbside and drop-off collection programs administered by local governments in Washington State. Specifically, the study compiled existing information (as of October 1, 2019) about service areas, providers, frequency and type of collection, lists of accepted materials, and available drop-off locations for recycling and organics at the city and county level. The report is informed by interviews with key actors in the local recycling system to obtain their impressions, perspectives, and approaches to the recycling and composting context, challenges, and potential policy solutions.

1.1 CONTEXT OF RECYCLING AND ORGANICS COLLECTION

Washington's recycling and organics (compost)¹ system is a complex network of different levels of government and private entities encompassing waste collection, processing, recycling, and end-use domestic and international markets. The historic paradigm of the system was supported by the stability of processing capabilities located in Asian countries – mostly China – which accepted recycling bales at competitive prices and low costs of transportation (shipment). This paradigm broke down in 2017 with the China National Sword Policy that severely limited the import of recyclables and scrap.

The drastic changes in international destinations for Washington's recyclables exports and increasing concerns about plastics handling in other Asian countries have motivated public agencies and their private partners to seek new solutions. Such policy has put pressure in the already stressed local recycling systems, exposing historical problems and raising issues including contamination, cost structure, existing infrastructure gaps, and underfunded programs.

Recycling and composting are certainly not the only changing systems in the state. An influx of new residents and an overall increasing population brings educational and outreach challenges to ensure that people understand proper disposal of waste, recyclables and compostable materials, while e-commerce growth and changing attitudes of customers continue to modify waste composition. Language barriers, equity, and multi-cultural needs are shaping the way governments and corporations relate to customers, while differentiated economic development and drivers affect the state's local and regional communities.

1.2 METHODOLOGY

This study involved collection and assessment of data about county and municipal recycling and organics collection programs for residential customers as well as drop-off programs. Online materials were examined for each analyzed jurisdiction² and associated haulers, including digital pamphlets, lists of prices and materials, handling instructions, associated UTC permits, and current solid waste management plans. The collected information was then organized in an Excel spreadsheet identifying each jurisdiction's areas serviced by a specific set of hauling providers. Such information was then shared with the identified solid waste managers, recycling coordinators or public works directors for each jurisdiction. The provided feedback was then included in the spreadsheet.

The focus of the assessment was on recycling and organics collection programs that were either administered or directly funded by government. Such programs are administered directly through contracts between cities and hauling companies or through UTC permits for counties' unincorporated

¹ "Compost" is used in some places in this report to refer to organics collection, because that is often the public-facing term

² For this study, jurisdictions are defined as incorporated municipalities (n=281) or unincorporated areas of counties (n=39). Solid waste in parts of some unincorporated areas is managed by tribal governments.

areas. The data were compiled by service area. So, for example, in some jurisdictions, there might be multiple service areas, each served by a different hauler.

In order to simplify recording of data, the identification of curbside collection was prioritized over drop-off-only collection, which was only identified when curbside was not available for an area. Therefore, drop-off collection of an item was only registered in the dataset if no curbside collection was available for such item in a service area. Collection services for multi-family, commercial and industrial customers were not included in the study, except that some of those customers might also use drop-off services.

Thus, this report mostly describes single-family recycling and organics collection, prioritizing curbside when available and identifying publicly-funded drop-off locations when available within 10 miles, some of which charge fees for specific items. Drop-off locations were identified in county waste management plans as well as jurisdictional and provider websites. Drop-off locations also include additional collection sites provided through the light recycle and e-cycle programs.

A total of 14 phone or in-person interviews were conducted with representatives of state, county and city solid waste management programs as well as recycling companies, across the state. The format of interviews was semi-structured with occasional interventions of the interviewer to clarify and connect related answers. Any identification of interviewees or their associated jurisdictions is avoided in this report, by using generic interviewee profiles and removal of identifying information.



2 RESIDENTIAL RECYCLING AND ORGANICS COLLECTION IN WASHINGTON STATE

This chapter describes the main features of residential recycling and organics collection programs in Washington State by first identifying the type of collection performed in different waste generation areas. The description is followed by an identification of specific recycling, organics and garbage items collected in curbside programs and at drop-off locations, or items not locally collected by publicly funded or sponsored programs.

2.1 OVERVIEW

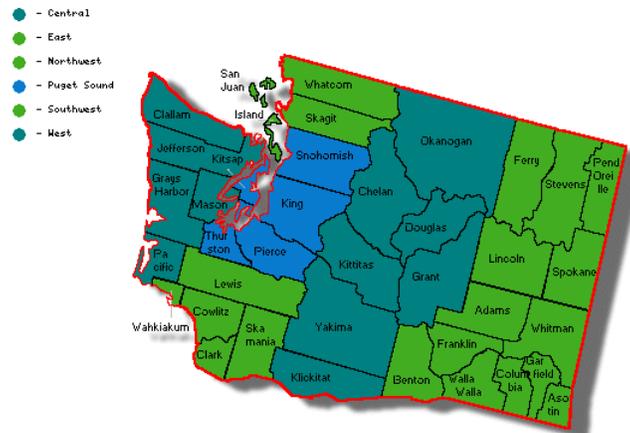
Washington State Department of Ecology (Ecology) has divided the state into six Waste Generation Areas (Table 1; Figure 1), characterized by determined geographical and socioeconomic variables³. For this study, key features and updated populations for these areas were updated (Table 2) showing the large range from 23 jurisdictions in each of the West and Northwest areas to 94 in the Puget Sound area.

Table 1: COUNTIES INCLUDED IN EACH WASTE GENERATION AREA

Central	East		Northwest	Puget Sound	Southwest	West
Chelan	Adams	Lincoln	Island	King	Clark	Clallam
Douglas	Asotin	Pend Oreille	San Juan	Kitsap	Cowlitz	Grays Harbor
Grant	Benton	Spokane	Skagit	Pierce	Lewis	Jefferson
Kittitas	Columbia	Stevens	Whatcom	Snohomish	Skamania	Mason
Klickitat	Ferry	Walla Walla		Thurston	Wahkiakum	Pacific
Okanogan	Franklin	Whitman				
Yakima	Garfield					

Note: Further information regarding Waste Generation Areas can be found at State of Washington Department of Ecology (2018) 2015-2016 Washington Statewide Waste Characterization Study available online at <https://fortress.wa.gov/ecy/publications/summarypages/1607032.html>

Figure 1: COUNTIES INCLUDED IN EACH WASTE GENERATION AREA



³ See State of Washington Department of Ecology (2018) 2015-2016 Washington Statewide Waste Characterization Study, available online at <https://fortress.wa.gov/ecy/publications/summarypages/1607032.html>

Table 2: CHARACTERISTICS OF ANALYZED WASTE GENERATION AREAS

Waste Generation Area	Counties	Jurisdictions	Estimated Population* (2018)
Central	7	66	577,137
East	13	85	1,050,680
Northwest	4	23	455,479
Puget Sound	5	94	4,495,587
Southwest	5	29	686,798
West	5	23	269,910
Total general	39	320	7,535,591

* Annual Estimates of the Resident Population, U.S. Census Bureau, Population Division

Residential solid waste collection is provided either through permits granted by the Washington Utilities and Transportation Commission (UTC) or through direct contracts with incorporated areas (for example, cities and towns) (Table 3). Incorporated areas have the option of providing solid waste collection services to their residents, either directly through municipal collection or through contracts with private haulers. Incorporated areas that do not provide service then fall under County jurisdiction along with unincorporated areas and receive service by permitted haulers under UTC regulation. Counties may not provide solid waste collection services directly but may contract for residential recycling service to residents in unincorporated areas within their jurisdiction.

Statewide, more than half of the analyzed jurisdictions have single-family residential collection service provided entirely by private haulers with UTC permits (56%). Nearly one-third of jurisdictions (31%) have residential collection provided entirely by private haulers under direct contracts. The remaining jurisdictions either provide residential service directly (7%) or have service provided through a combination of service provider types (6%). Reliance on UTC-permitted haulers is most prevalent in the West region (70% of jurisdictions) and East region (66% of jurisdictions), while use of service contracts is most prevalent in the Puget Sound region (44%) and Northwest region (39%),

Table 3: TYPE OF COLLECTION SERVICE BY JURISDICTION

Waste Generation Area	UTC		Contract		Municipal		Mixed service		Total N
	N	%	N	%	N	%	N	%	
Central	38	58%	19	29%	7	11%	2	3%	66
East	56	66%	22	26%	5	6%	2	2%	85
Northwest	9	39%	9	39%	3	13%	2	9%	23
Puget Sound	44	47%	41	44%	5	5%	4	4%	94
Southwest	16	55%	5	17%	0	0%	8	28%	29
West	16	70%	4	17%	2	9%	1	4%	23
Total	179	56%	100	31%	22	7%	19	6%	320

Note: mixed service includes jurisdictions with a combination of collection service provider types (e.g., UTC and contract, contract and municipal, municipal and UTC, etc.). Jurisdictions that have multiple service providers of the same type are included within that type (e.g., jurisdictions with multiple UTC permitted haulers are counted within UTC).

At curbside, garbage is most often collected weekly (366 of 385 service areas⁴), whereas recycling (181) and organics (116) are most often collected every other week (Table 4).

Table 4: FREQUENCY OF COLLECTION BY SERVICE AREA

Waste Generation Area	Number of service areas	Garbage			Recycling				Organics			
		Weekly	Every other week	Monthly	Weekly	Every other week	Monthly	N/A	Weekly	Every other week	Monthly	N/A
Central	113	102	11	0	17	95	0	1	44	66	0	3
East	32	29	3	0	7	22	0	3	6	15	0	11
Northwest	34	34	0	0	5	15	1	13	0	13	0	21
Puget Sound	77	75	2	0	1	18	3	55	3	12	0	62
Southwest	31	31	0	0	0	20	0	11	0	7	0	24
West	98	95	3	0	3	11	0	84	12	3	1	82
Total	385	366	19	0	33	181	4	167	65	116	1	203

Note: The highest frequency of collection is reported for each service area. Some jurisdictions have multiple service areas.

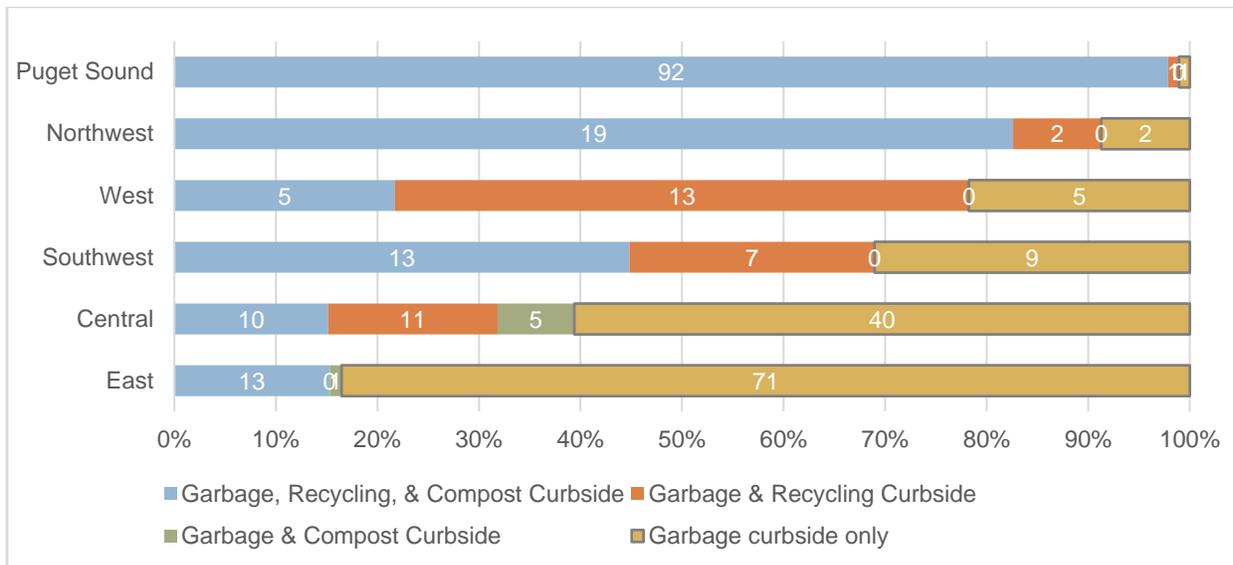
All jurisdictions have some type of curbside collection of garbage and a total of 186 jurisdictions (58%) in Washington have some type of curbside collection of recyclables available to single-family residents, though in some cases these services are available on an optional subscription basis or available only to a portion of residents within the jurisdiction. In addition, 158 jurisdictions (49%) have some type of curbside collection of organic material. These figures vary considerably among different Waste Generation Areas. While 92 Puget Sound jurisdictions (98%) have curbside collection for recycling and organics, only 15% of both Central and East jurisdictions have such type of collection available to residents. In the West area, only 5 of the 23 jurisdictions (22%) include residential curbside collection of recycling and organics (Table 5; Figure 2).

Table 5: STREAMS COLLECTED CURBSIDE BY WASTE GENERATION AREA, NUMBER OF JURISDICTIONS

Waste Generation Area	Number of Jurisdictions				Total
	Garbage, Recycling, and Organics Curbside	Garbage and Recycling Curbside	Garbage and Organics Curbside	Garbage curbside only	
Puget Sound	92 (98%)	1 (1%)	0 (0%)	1 (1%)	94
Northwest	19 (83%)	2 (9%)	0 (0%)	2 (9%)	23
West	5 (22%)	13 (57%)	0 (0%)	5 (22%)	23
Southwest	13 (45%)	7 (24%)	0 (0%)	9 (31%)	29
Central	10 (15%)	11 (17%)	5 (8%)	40 (61%)	66
East	13 (15%)	0 (0%)	1 (1%)	71 (84%)	85
Total	152 (48%)	34 (11%)	6 (2%)	128 (40%)	320

⁴ We use the term service area to describe that part of a jurisdiction (county or municipality) that is served by a specific hauling company, designated either by contract or through a UTC permit. We identified 385 service areas, including 218 with curbside recycling. Some cities and counties have more than one service area/service provider with different program rules and/or collection type

Figure 2: STREAMS COLLECTED CURBSIDE BY WASTE GENERATION AREA, NUMBER OF JURISDICTIONS



In jurisdictions where curbside recycling service is available, it is generally provided as a bundled service along with garbage collection. In jurisdictions with contracted service, the cost of recycling collection is often embedded in the rates residents pay for garbage service. In jurisdictions with service by private haulers under UTC permits, UTC regulation requires that haulers charge customers separate rates for recycling. Some counties, through their solid waste management plans and accompanying implementing ordinances, require that residents with curbside garbage service (in urban areas only or in all unincorporated areas) be subscribed to curbside recycling as well. Other counties require that UTC haulers provide residents in designated unincorporated areas curbside recycling service but leave the decision about whether or not to subscribe (for an additional fee) to residents.

The Puget Sound region has the highest number of service areas with universal curbside recycling for curbside garbage customers (99% of service areas with curbside recycling), either embedded in garbage rates or as a bundled subscription. The Central region has the lowest rate of universal service, provided in 36% of the service areas with curbside recycling (Table 6).

Table 6: UNIVERSAL AND SUBSCRIPTION CURBSIDE SERVICE BY WASTE GENERATION AREA, NUMBER OF SERVICE AREAS

Waste Generation Area	Number of Service Areas				Percentage of Service Areas		
	Universal, embedded	Universal, bundled subscription	Optional subscription	Total	Universal, embedded	Universal, mandatory subscription	Optional subscription
Puget Sound	50	61	1	112	45%	54%	1%
Northwest	3	19	7	29	10%	66%	24%
West	5	13	2	20	25%	65%	10%
Southwest	5	14	2	21	24%	67%	10%
Central	8	0	14	22	36%	0%	64%
East	7	2	5	14	50%	14%	36%
Total	78	109	31	218	36%	50%	14%

A total of 41 private haulers of residential solid waste operate in the state of Washington (several companies operate under multiple business names), of which 24 offer curbside recycling collection

(Table 7). Those with the highest numbers of serviced areas with curbside recycling are: Waste Connections (62), Waste Management (61), Republic services (32), and Recology CleanScapes (10).

Table 7: RECYCLING HAULERS IN WASHINGTON

Hauler*	contract	UTC	Total
Waste Connections**	13	49	62
Waste Management of Washington, Inc.	38	23	61
Republic Services	16	16	32
Recology CleanScapes	10	0	10
Nooksack Valley Disposal, Inc.	4	2	6
Sanitary Service Company, Inc.	2	3	5
Mason County Garbage Co., Inc.	1	3	4
Methow Valley Sanitation Service, Inc.	0	3	3
San Juan Sanitation Company	0	3	3
Sunshine Disposal & Recycling	2	0	2
Bainbridge Disposal, Inc.	0	2	2
Pullman Disposal Service, Inc.	0	2	2
University Place Refuse Service, Inc.	2	0	2
Waste Control, Inc.	2	0	2
Yakima Waste Systems, Inc.	0	2	2
Basin Disposal	2	0	2
Island Disposal, Inc.	1	0	1
Community Waste & Recycling	1	0	1
Freedom 2000 LLC	0	1	1
Rubatino Refuse Removal, Inc.	0	1	1
Sound Disposal, Inc.	0	1	1
Zippy Disposal Service, Inc.	0	1	1
Hometown Sanitation, LLC	1	0	1
Consolidated Disposal Service Inc.	1	0	1
Total	96	112	208

* Ten additional areas are directly serviced by public entities for recycling collection: Chelan, Enumclaw, Friday Harbor, Oak Harbor, Olympia, Richland, Ruston, Spokane, Sedro-Woolley, and Tacoma.

** Waste Connections operates under multiple provider names, including Harold LeMay Enterprises, Murrey's Disposal, Olympic Disposal, DM Disposal, Vashon Disposal, Lakeside Disposal

Most haulers operate under Washington's Utilities and Transportation Commission administered permits, of which there are a total of 42 active permits related to residential solid waste. Many haulers with UTC permits also provide residential collection service under direct contracts with jurisdictions, which are not regulated by UTC.

There are also 26 municipalities that directly collect garbage from residents in their jurisdiction, 10 of which also collect recyclables: Chelan, Enumclaw, Friday Harbor, Oak Harbor, Olympia, Richland, Ruston, Spokane, Sedro-Woolley, and Tacoma.

Organics and recycling, when collected, are usually picked up by the garbage service provider in the area. In some areas there are separate haulers for residential garbage, recycling, and/or organics.



Along with curbside collection, collection is performed through publicly owned and/or funded drop-off locations, comprising both transfer stations and dropboxes. A total of 171 such locations could be identified in jurisdictions' online published materials, most of them located in the East area (41), followed by the Central area (39) and Puget Sound (37) area.

At a state level, an average of 2.3 drop-off locations are available per 100,000 persons, although widely varying in different waste generation areas. The West and Central areas have a higher ratio of drop-off service with 7.4 and 6.8 drop-off locations per 100,000 inhabitants, respectively. On the other hand, the Puget Sound area displays the lowest ratio of this service with less than one drop-off site per 100,000 persons but has higher levels of curbside service.

Table 8: DROP-OFF LOCATIONS BY WASTE GENERATION AREA

Waste Generation Area	Drop-off / Transfer Stations	Population	Drop-off per 100,000 persons
Puget Sound	39	577,137	6.8
Northwest	41	1,050,680	3.9
West	17	455,479	3.7
Southwest	37	4,495,587	0.8
Central	17	686,798	2.5
East	20	269,910	7.4

Many public drop-off locations also accept covered materials through two existing statewide Product Stewardship programs: E-Cycle and LightRecycle, which accept electronic waste and mercury-containing light bulbs, respectively.



This study did not include waste mobiles and special drop-off events (see box below for example of a special event). Many jurisdictions host events once or more times per year and accept such items as shredded paper, tires, mattresses, clothing, toilets, bulky wood, and refrigerators. The jurisdictions may require fees for drop-offs at these events.

City of Redmond *special event*



What ONLY RESIDENTS can bring (Under Zip Code 98052):

BULKY GARBAGE: Broken furniture, large broken toys, carpets, toilet seat covers, garden hoses, non-recyclable plastics and non-construction debris. No sod or regular household garbage, electronics, or railroad ties, mattresses or box springs or anything collected in garbage bags.

STUMPS & LARGE TREE BRANCHES: Logs, firewood, and large tree limbs (a minimum of 4 inches in diameter). No sod, leaves, grass clippings, or tree limbs smaller than 4" in diameter.

CONSTRUCTION DEBRIS: All types of lumber (treated and painted included): plywood, pallets, particleboard, dimension lumber, fence materials, etc.; all construction debris: doors, windows, carpets, drywall, floors, decks, window glass, insulation/roofing materials, etc. The following items are NOT accepted: regular household garbage, sod, or railroad ties.

BRICKS, ROCKS, ASPHALT & CONCRETE: Pure bricks, rocks, asphalt and concrete only (for example: no concrete with fence poles). Hardened concrete mix in bags is accepted. A maximum volume of 300 lbs. (about 1/3 capacity of a half-ton pickup) is accepted.

CERAMICS: All types of ceramic sinks and toilets are accepted. Please REMOVE wax rings at the bottom and wooden or plastic toilet seat covers. Metal sinks and metal toilet parts are accepted at the Scrap Metal Station.

WHAT EVERYONE CAN BRING:

FOOD/CASH DONATION: Hopelink will collect nonperishable food for those in need in our community. Possible foods: canned tuna fish, pasta, canned fruit, peanut butter, macaroni and cheese, cereal, baby food, canned or jarred tomato products, and nonperishable juice. A cash donation, however, makes the biggest impact.

BICYCLES: Emerald Parents Association will accept all reusable/repairable bikes for both children and adults.

PLASTIC PLANT CONTAINERS: Black rigid and round plastic containers only. Unbroken without cracks. Accepting only (rinsed & cleaned): 1 gallon (6.5 inches in diameter & 7 inches in height); 2 gallon (8.5 inches in diameter & 8.5 inches in height); and 5 gallon (11 inches in diameter & 12 inches in height)

BATTERIES: Lead acid batteries: car, truck, marine and motorcycle. All household batteries (both regular and rechargeable). Please sort according to types: alkaline, Ni-CD, NI-MH, etc.

LASER/INK JET CARTRIDGES, CELL PHONES & PAGERS: The vendor can NO LONGER pay anything for all laser/ink cartridges used in printers or fax machines or cell phones for recycling.

TIRES: Light truck, car and motorcycle tires. Bias, steel belted and studded tires are okay. Free for first 6 off-rim tires. \$2.25 for each additional tire. \$5.50 for every on-rim tire. \$12.00 for every off-rim truck tire. \$25.00 for every on-rim truck tire.

HOUSEHOLD GOODS: Clothing, textiles including rags, books, furniture, etc. Furniture items must be reusable as is. Tax receipts available. Any items that need repair will be accepted as Bulky Garbage which is restricted for Redmond city-limit residents only.

REFRIGERATORS, FREEZERS & AIR CONDITIONERS: Household units ONLY. Promotional discount of \$25.00 (cash only) for each unit at drop off. The fee is for the safe removal and disposal of chlorofluorocarbons (CFC coolants) from those units.

ELECTRONICS: Anything electronically wired or battery-operated (including flashlights). NO TVs, monitors or computers (E-3).

APPLIANCES / SCRAP METALS: Any metal, auto parts, metal lawn furniture, mowers (drain all fluids), BBQ stoves, appliances (stoves, microwaves, dishwashers, washers/dryers, hot water tanks), metal-framed doors/windows, screen doors, exercise/gas powered equipment. \$5 cash for a fire extinguisher of any size and for each 5-gallon tank of butane, propane, Freon, or helium tank (free with its value removed). \$1 cash for each 1-gallon canister containing the same types of liquid. Any cans that contain chemicals are not allowed but accepted through King County's Hazardous Waste Program: Haz-Mat

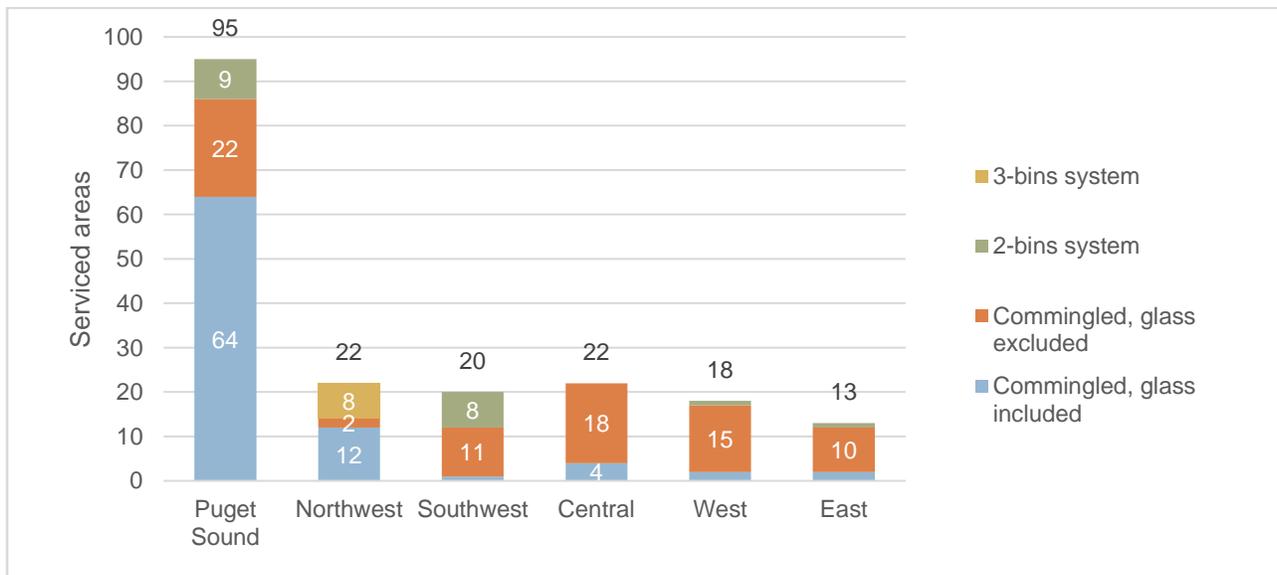
MATTRESSES: All mattresses and box springs will be collected as recyclable items. A fee of \$15 (cash only) for each piece is charged to process and recycle either the mattress or box spring.

From: <https://www.redmond.gov/328/Recycling-Collection-Event>



Of the 186 jurisdictions providing curbside recycling (Figure 3), most are located within the Puget Sound waste generation area (95). This area is characterized by offering commingled curbside recycling, with 86 jurisdictions offering commingled recycling, of which 64 jurisdictions include glass in commingled curbside recycling.⁵ Other waste generation areas have much lower numbers of jurisdictions providing curbside recycling. In most other regions, the most common collection method is commingled with “glass out.” Such systems usually rely on drop-off locations for glass recycling. In the Northwest region, 8 of 21 jurisdictions (38%) use 3-bin systems and in the Southwest region, 8 of 20 jurisdictions (40%) use 2-bin systems, which collect glass curbside but keep it separate from other materials.

Figure 3: RECYCLING COLLECTION BY JURISDICTION



⁵ This differentiation is made because of the difficulties that glass pose in recycling operations from feedstock obtained from commingled systems.

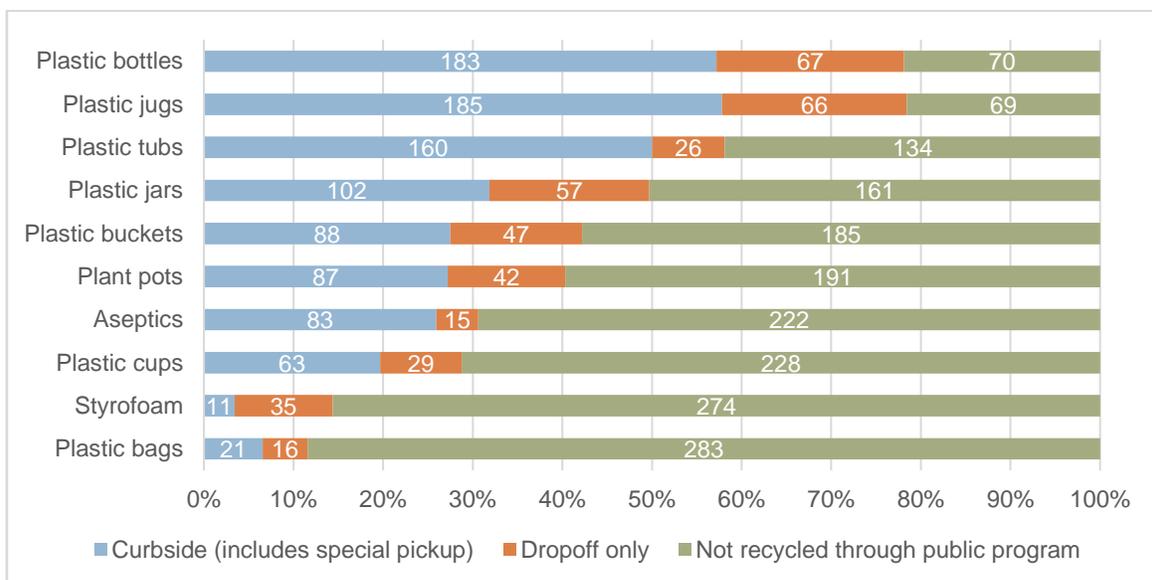
2.2 RECYCLING AND ORGANICS COLLECTION IN WASHINGTON STATE

Plastic

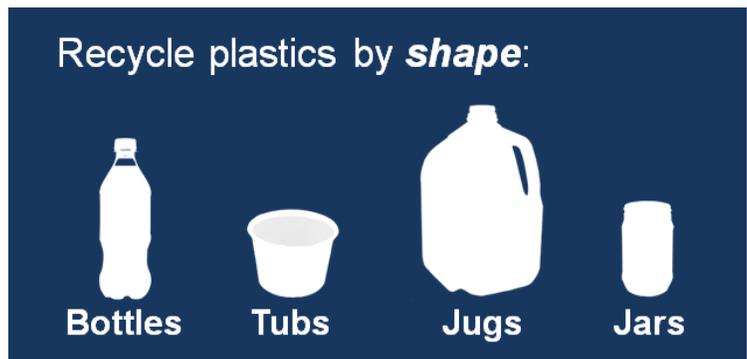
Collection of plastics varies widely. Historically, categories were divided by type of resin (#1 thru #7) but this currently changing to a division by shapes (e.g. bottles vs. flexible), which is better correlated with separation characteristics rather than final destination of the items.

The type of plastics most accepted for recycling in public programs are plastic bottles and jugs, which are accepted in curbside programs in 57% and 58% of the jurisdictions, respectively, as of October 1, 2019. When including drop-off-only recycling programs, this percentage increases to 78% of jurisdictions for each material type overall (Figure 4).

Figure 4: TYPE OF RECYCLING BY TYPE OF PLASTIC, BY JURISDICTION (COUNT AND PERCENTAGE)



Plastic tubs, generally associated with dairy products and traditionally #2 resin-type, are being increasingly accepted in public recycling programs as markets for end-use of this material continue to grow and stabilize. These materials are currently accepted at the curb in 50% of the state’s jurisdictions and in an additional 8% of jurisdictions that collect them in drop-off locations. Plastic jar containers are only accepted in 32% of curbside collection and 18% of drop-off only programs.



Recycling instructions in Clark County (from <https://clarkgreenneighbors.org>)

On the other hand, certain materials are minimally collected. Those less accepted are styrofoam and plastic bags, with about 14% and 12% of programs, respectively, accepting them either at the curb or in drop-off locations.

Plastic bags are the least collected material among all accepted plastics and soon will have lower collection. King County City of Seattle and City of Tacoma (curbside) have announced that they will stop collecting plastic bags in recycling programs starting in 2020.

Certain materials are not accepted in any program: plastic utensils and prescription vials.



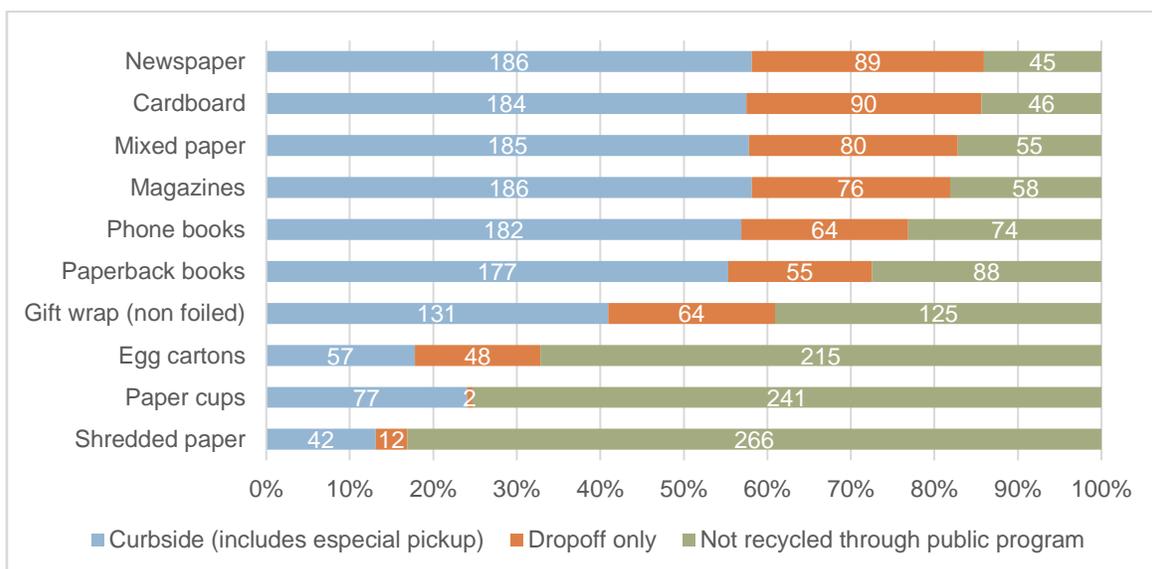
Plastic bag and wrap contamination in paper bale, 2019

Paper

Recycling collection of mixed paper is somewhat difficult to quantify because of inconsistent descriptive language (or imagery) on websites. “Mixed Paper” - including magazines - is collected in most of the jurisdictions (83%), either in curbside programs (58%) or in drop-off only programs (25%). Other paper materials with collection rates over 70% are cardboard, newspaper, phone books, and paperback books (Figure 5). For the latter, donation and re-sell are often promoted options, although it is often not clear on websites if these items are accepted for recycling.

Materials with low acceptance in recycling programs include egg cartons (33%), paper cups (25% of jurisdictions), and shredded paper (17%). The City of Tacoma has announced they will stop accepting shredded paper in curbside service in 2020.

Figure 5: TYPE OF RECYCLING BY TYPE OF PAPER BY JURISDICTIONS (COUNT AND PERCENTAGE)



Glass and Metal

Glass is collected at the curb in 34% of the jurisdictions. An additional 34% of jurisdictions collect glass at drop-off locations (Figure 6).

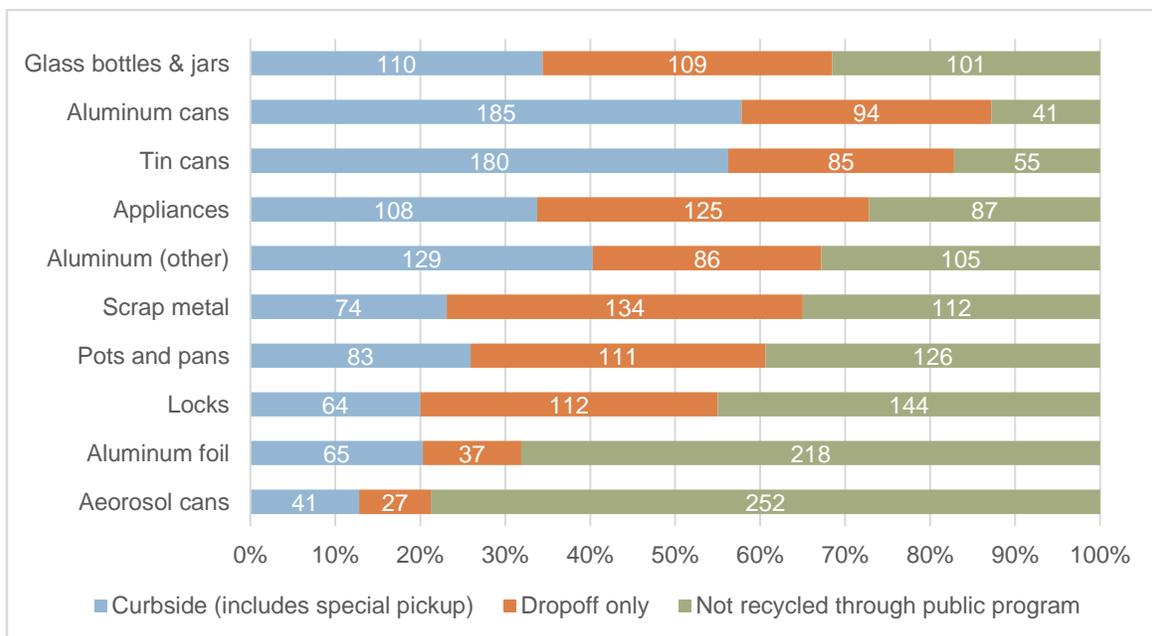
Several governments have modified to their glass recycling programs in recent months, especially those collecting it at commingled collection systems. Such changes are commonly due to glass' impact as a contaminant in bales of other materials, cost of transport due to its weight, and challenges regarding the final use of the recycled material.

Metal is commonly known for higher marketability and easier processing compared to other recyclables. Historically recycled materials such as aluminum and tin cans present the highest collection rates with (87% and 83% of the jurisdictions, respectively). Aluminum cans are collected curbside in 58% of jurisdictions with an additional 29% accepting at drop-off only. Slightly lower, 56% of jurisdictions collected tin cans with an additional 27% accepting them at drop-off only (Figure 6).

Scrap metal is usually another accepted material in recycling programs with 65% of jurisdictions allowing it in curbside programs (23%) or through drop-off only (42%). Pots, pans, and locks are specified as examples of scrap metal and, thus, show similar collection rates to scrap metal (Figure 6). In observations of the online materials, it was evident the existing gaps in information regarding what constitutes scrap metal: size, weight, non-metal content and shape often diverge from one service area or service provider to another.

Other metal items are less often accepted in these programs due to contamination risk and safety concerns. Aluminum foil and aerosol cans are the most common among those, with 32% and 21% of jurisdictions accepting them either at the curb or at drop-off locations. Aerosol cans, along with auto parts, are specially challenging due to the risk of explosion and incineration they pose on operations if not completely clean or empty.

Figure 6: TYPE OF RECYCLING BY TYPE OF METAL, GLASS, BY JURISDICTION (COUNT AND PERCENTAGE)

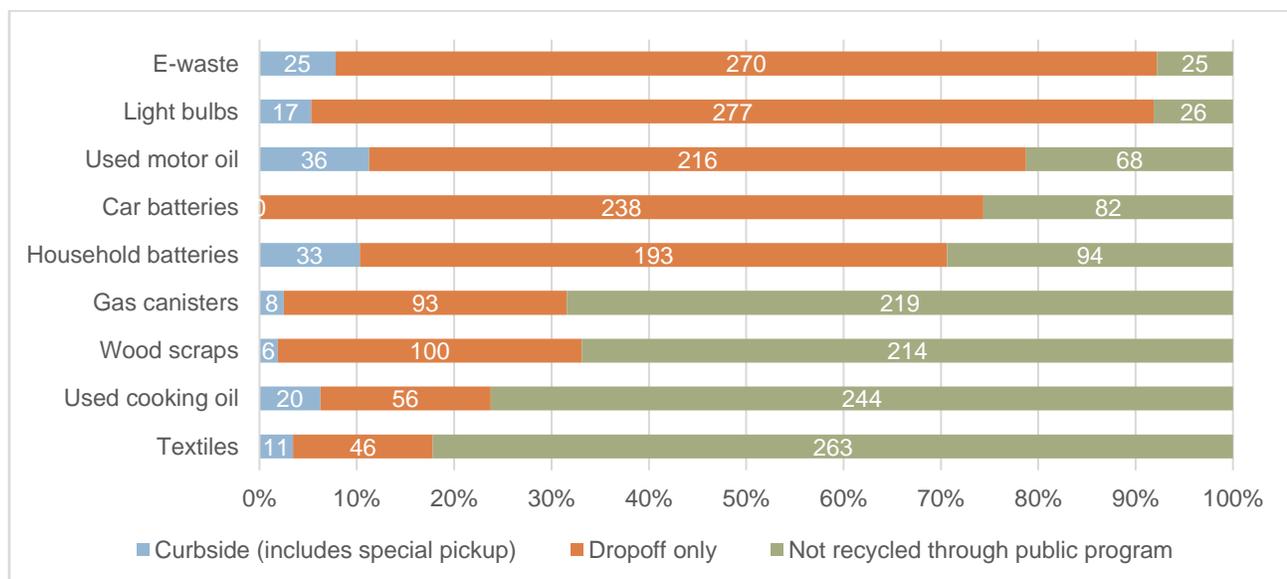


Appliances show higher rates of collection than scrap metal, with 67% of jurisdictions including them through various collection programs (curbside accounts for 34% of collection), most of it at the curbside through regular service for small appliances or special pickup for bulky items, such as refrigerators. The difference between both types of appliances is, nevertheless, not entirely clear. While small appliances are often defined as being less than 2’x2’x2’ size, the associated weights can differ from one jurisdiction to another and it’s not always clear what types of appliances are accepted at drop-off sites. Additionally, there is also some variation regarding acceptance of materials with content of hazardous gases inside them (i.e., freon and neon).

Other materials

Household Hazardous Waste are usually handled separately from recyclable materials because of safety and pollution risks associated with storage, transportation and disposal. Recycling collection can present an opportunity to improve these materials’ diversion as several curbside programs include several items and many drop-off recycling locations can handle some of them too (Figure 7).

Figure 7: TYPE OF RECYCLING OF OTHER MATERIALS BY JURISDICTION (COUNT AND PERCENTAGE)



Materials with high collection acceptance are used motor oil⁶ (79%), car batteries (74%), and household batteries⁷ (71%).

On the other hand, materials like untreated and unpainted wood scraps (33%), used cooking oil, (24%) and textiles (18%) display the lower acceptance collection rates, as listed on websites for curbside collection or regular drop-off.

Many of these materials are also collected at special events or mobile trucks.



⁶ Most recycling programs require that the oil is clean in order to be recycled.

⁷ The type/composition of accepted household batteries varies widely.

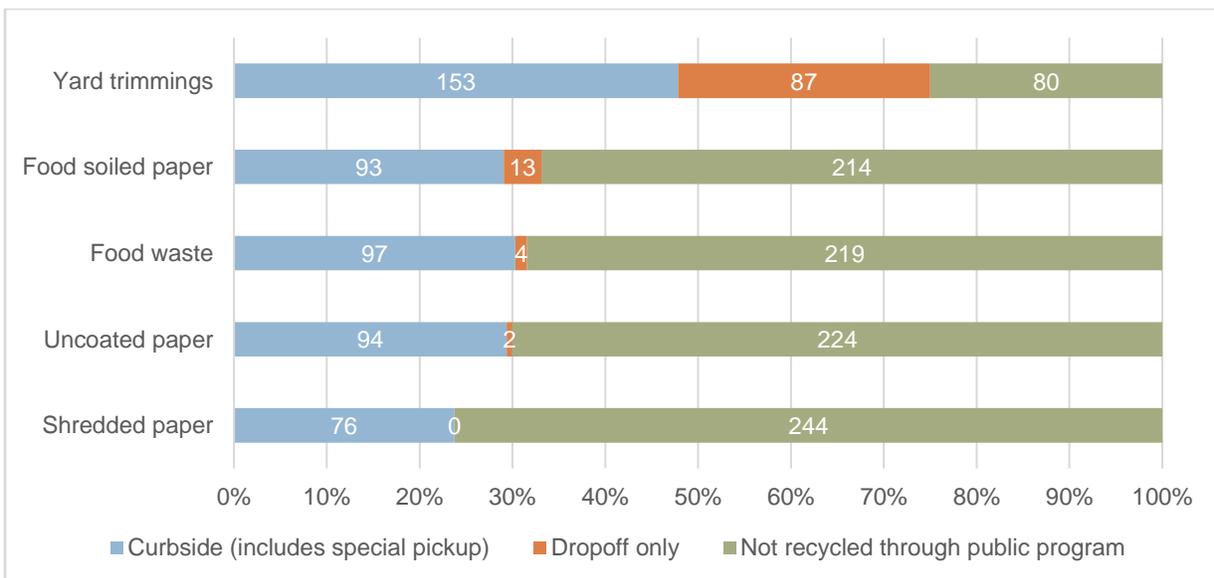
E-waste and light bulbs are also among the most collected materials among household hazardous waste items, with approximately 92% of jurisdictions collecting them (as listed or identified on the jurisdiction or provider websites; sometimes these sites refer people to collection locations such as Goodwill). Statewide programs E-Cycle and LightRecycle play a key role providing coverage for electronics and light bulbs due to required coverage mandated in state statute.

Organic material

Collection of organic material for composting is found in 75% of the jurisdictions. Such collection, however, is often seasonal, voluntary (subscription required), or limited in terms of accepted materials. The most accepted materials are yard trimmings, which are collected at the curb in 48% of the jurisdictions and at an additional 27% of jurisdictions at drop-off-only. Other materials like food waste, food soiled paper, and uncoated paper products are often collected together and present much lower collection rates (approximately 30% of jurisdictions). Due to risk of contamination with plastic, shredded paper is the least accepted material with 24% of jurisdictions accepting it (Figure 8).



Figure 8: TYPE OF ORGANICS COLLECTION BY JURISDICTION (COUNT AND PERCENTAGE OF JURISDICTIONS)



3 PERSPECTIVES ON THE SYSTEM

To provide context on current conditions and potential future actions, interviews were held with 14 solid waste experts, including state, city and county solid waste/recycling managers and representatives from the private recycling sector. This section highlights the main takeaways from the interviews.

As summarized below, interviews covered four topics: Recycling systems' adaptation, Coordination, Recycling systems' performance, and Recycling markets.

Interviewees were asked about the actions their associated jurisdictions were taking regarding the current context of recycling markets.

Recycling systems adaptation

- Most of the interviewees indicated that they are reviewing or modifying the list of accepted materials for recycling, generally regarding hard-to-process items like plastic bags and clamshells. These actions are supported by a constant monitoring of domestic and international recycling markets, cost structure for recycling, and contamination rates in curbside collection.
- Coordination is key, with most of interviewees working to coordinate with private partners, adjacent recycling systems, as well as monitoring customers attitudes and requirements from their system.

“The management here decided to put together a task force [...to address current recycling challenges], a subset of our advisory committees, so we have one advisory committee made up of our cities and our haulers and service providers, and we have another advisory committee which is our solid waste advisory committee which encompasses all our stakeholders including businesses, service providers, nonprofit organizations.”

- An important component of local action is the development of outreach and educational materials to help reduce contamination, for which coordination and monitoring are important. Information and educational campaigns are key to let customers understand the impact of contamination in the system.
- When asked about potential changes to their lists of acceptable materials for recycling, most interviewees mentioned that they are monitoring markets, processing issues, and costs before making decisions. People are taking a cautionary approach, as decisions only based in short-term financial needs could lead to problems in the long-term regarding residents' trust in the recycling system or investments not well aligned with local needs and context. Government mission, as some pointed out, encompasses not only the financial sustainability of the system but also its environmental and socioeconomic impact.



Billboard on I-5 from the summer 2019 coordinated Recycle Right campaign (Ecology and others)



Photo: Heather Trim

Washington State Recycling Association (WSRA) tour of Strategic Materials processing facility for glass and plastic, Seattle

One informant briefly explained the analysis performed by his jurisdiction:

“We are in the process of evaluating what the effect would be - on social, economic, and environmental - of removing glass from the single stream, as well as evaluating whether or not to keep polycoated cartons and frozen food boxes in the mix or not. [...] It is primarily a financial evaluation. The social piece has to do with a socio-political side: how do we communicate to the customers and how do they respond to that change? And the economic side is if we do provide source separated collection, how much it would cost for the average rate payer?”

- When asked about glass, most of interviewees identified it as a problematic material in commingled systems because it leads to contamination of other recyclables. Their jurisdictions are continuously analyzing the evolution of glass prices and costs which determine the feasibility of modifying its type of collection. Different approaches were mentioned, especially regarding glass separation from other recyclables at the source or at separation facilities through investment. Alternative approaches noted by some include the implementation of bottle bills or recycling content requirements from producers, which can improve coverage and funding for glass collection and reduce contamination.

Historically, not everyone, but most of the area in the county were taking glass in their curbside, and we just started asking people to pull it out. The county and the city together are working on a pilot project for glass, which is expensive to transport. We don't have any kind of facility over here where we can drop our glass after having had it recycled in our area. It is very expensive to send it to the west side, so we are looking for pilot projects with glass.

- Recycling is an activity that involves costs associated with collection, processing, stocking, and disposal. Interviewees generally agreed with the need to modify the perception that the activity finances

itself. Most of them indicated the need to better reflect such costs in the way residents pay both for curbside collection and for drop-off recycling, since any collection systems involves significant costs. What is more, some jurisdictions are exploring alternative pricing systems to deal with existing incentives to recycle products not included in lists of accepted materials. One informant explained this as:

“The recycling fee is embedded often times in the garbage fee, so people are paying for garbage and they think they are getting free recycling, but it is not free. People need to be made aware [of this] and start to talk about a solid waste fee, so they are paying annually for garbage and recycling.”

Coordination

- When asked about monitoring of adjacent recycling systems, most interviewees described how their jurisdictions were continuously tracking the development of domestic markets and government measures in nearby cities. Tracking of ordinances, bans, and changes in lists of recyclables are accompanied with an analysis of each jurisdiction’s own circumstances: costs, providers, and existing infrastructure. Local governments usually work with their private partners who can provide information about operating issues, trends, and forecasts, while coordinating with similar programs in surrounding jurisdictions.

- Contamination (as a regional issue) often appeared as a key concern for solid waste managers and recycling specialists. Approaches to this issue included technology prospection and policy benchmark, with bottle bills, recycling content, and extended producer responsibility being mentioned. One respondent described their effort to address contamination messaging:

“We continue to pay attention to what is happening regionally. I am part of number of different groups of solid waste administrators. We continue to monitor what is happening. With recycling everything is sort of local [...] It is important to pay attention to what is happening statewide and to hear about everyone’s challenges. But, at the same time, they are not always exactly the same challenges. We are looking for best practices, but there is always the same message of what to try.”

- Interviewees were asked about their jurisdictions’ relationship with private haulers. Most of them agreed that constant and close coordination with haulers increases awareness of issues and tracking of costs and state of markets. Improved coordination with haulers leads to the development of more consistent educational and outreach materials. Coordination also allows local governments to deal with permits that are administered by UTC and improve regional coordination when considering direct city contracts. As one informant explained it:

“The county tries to play a role of making a positive push towards contamination reduction and education, which is what we can do, given that we don’t have the same contracts’ stakes in it. We are one step removed from that, even though we know it does affect our costs as well, in the long term. So, what do I wish was better? I think that given that we share the same hauler with the cities, it is a little frustrating that there are separate contracts being negotiated and that the county representing its unincorporated customers has no direct negotiation. So, I just wonder sometimes how that affects the overall pricing or services...”

Performance & Operation

- Interviewees were asked about their views on enforcement to address contamination. Responses were mainly orientated to the need to educate customers about proper recycling, either through outreach campaigns or through cart tagging. The latter is not viewed as a corrective action but as a direct educational tool to deal with contamination, especially when reiterated. Several interviewees also mentioned the divergence of incentives among different actors of recycling systems, for which coordination instances configure a key strategy to ensure consistent responses to these dynamic systems. Lack of control was also mentioned as a common barrier for counties, with permits administered by UTC and cities being autonomous contractors.

As one interviewee exemplifies:

“[...] I think most [communities in Washington] are focused more in education outreach, and our – whether written or unwritten - policy implies that our community is aimed towards encouraging to make sure the customer is aware of their situation, whether this is good or bad. We’ve got a cart tagging program that we are implementing, and we are actually doing some initial research for that to see how well it will work in a larger scale. So [what] we do - and it is a rare occasion - where drivers note severe and repeated contamination, we monitor those and we are able to track those customers with a digital device in our route trucks, record the problem and when it is a repeated violation we then have a process of letting the customer know, basically tag them.”

- Household hazardous waste is usually collected at designated drop-off locations, although extended producer responsibility and curbside collection programs can bring new opportunities for their collection. Interviewees noted that recycling and HHW collection are separated systems that operate under different revenue sources and administrations. Several of them pointed out that these programs usually lack the funds and personnel to fully cover communities’ needs, usually operating a limited number of days a week. Extended producer responsibility was mentioned several times as a strategy to both increase funding and improve coverage for the collection of these materials.



As one interview put it:

“[...] The issue, of course, is that there are too few [Household Hazardous Waste] facilities and that is not very convenient, and it would be very costly and difficult for us to provide more facilities. But that is where producer responsibility comes in. So, in a producer responsibility system, the cost for, let’s say, handling household batteries, which is expensive for us, it would be covered by the producers and they would also be responsible for setting up many more locations throughout the city for collecting household batteries.”

Recycling markets

- Interviewees were asked about actions that could promote the development of domestic recycling markets. Several explained that such development is necessarily a regional effort – and sometimes even national – thus pointing out that jurisdictions’ actions are somehow limited. A strong coordination with recycling partners and local industries is key to protect and support each jurisdiction’s recycling system, as well as a close follow-up of the evolution of prices in international markets.
- Participants explained the importance of having enough resources to support industries associated to their recyclables. As mentioned by some of them, economic incentives like grants or tax breaks could lead to the creation of new and innovative businesses, as well as a sustained investment in separation technology to improve existing feedstock of recyclables. Certain policies were mentioned as positive to help develop these markets, especially recycling content requirements for packaging and paper.



Presentation at Washington State Recycling Association (WSRA) event
Photo: Heather Trim

As one interviewee described it:

“[...] We think that doing regional and national coordination on marketing is very important. We don’t have within our jurisdiction a whole lot of opportunities to buy recycled content necessarily, we do what we can, but we don’t have any rules or decisions about requirements or procedures. Some of that is because our municipal purchasing options are pretty decentralized. We know that most local market is for organics, so we encourage people to get compost products.”

- The interviews also explored the actions participants considered necessary from the state to support their local recycling systems. Most of interviewees valued the state efforts in creating coordination spaces in which different issues and approaches can be shared among key actors of recycling systems. These prove to be useful to understand the type of economic incentives that private actors require to create new businesses as well as to identify the type of administrative and infrastructure barriers to development at the state level.

Most of interviewees expect leadership from the state, especially in relation to facilitating coordination and exploration of approaches that involve private sector partnerships. Some of the participants also suggested that there should be consistency and clear signaling of what materials should be collected, as well as the provision of consistent materials for education and outreach. Such participants stated gains in efficiency related to a higher coordination at the state and local level.

One of the interviewees summarized this as:

“The state could be a leader on this, I mean the state has [set up the] Recycling Steering Committee and they have been able to do a great job in bringing stakeholders together and educating on some of the issues. I think that has been good and it is a good role for the state to, you know, sort of bring the key people together but also pursue policies that will have a really big impact so they just have established this recycling market development center. I think it will be interesting what is going to come up with that and whether or not they can drive longer term outcomes.”

4 FINDINGS

This study assessed current conditions of Washington's municipal residential collection and drop-off systems for garbage, recycling, and organics, including perspectives and local context provided by key experts. There are several considerations when discussing how the region can address a more efficient, equitable, and sustainable solid waste management system.

From the analysis of local collection systems, we found:

- **Residential curbside recycling collection is available in 58% of jurisdictions and organics collection is available in 49% of jurisdictions in Washington.** As of October 1, 2019, all Washington jurisdictions have some type of curbside collection of garbage and a total of 186 jurisdictions (58%) in Washington have some type of curbside collection of recyclables available to residents. In addition, 158 jurisdictions (49%) have some type of curbside collection of organic material. Of the 186 jurisdictions providing curbside recycling, most are located within the Puget Sound waste generation area (93). At curbside, garbage is most often collected weekly whereas recycling and organics are most often collected every other week.
- **Plastic bottles and jugs (78%), paper/cardboard (over 70%), aluminum cans (87%), glass containers (64%), and organic materials (75%) have among the highest recycling access.** Statewide, **plastic bottles and jugs** are accepted in programs in 78% of jurisdictions, whereas **plastic bags** are accepted in only 12% of programs. "**Mixed Paper**" - including magazines - is collected in most of the jurisdictions (83%). Other paper materials with collection rates over 70% are **cardboard, newspaper, phone books, and paperback books**. **Glass containers** are collected at the curb in 34% of jurisdictions and an additional 34% of jurisdictions collect glass at drop-off locations. **Aluminum cans** are collected curbside in 58% of jurisdictions with an additional 29% accepting at drop-off only. Collection of **organic material** for composting is found in 75% of the jurisdictions. Such collection, however, is often seasonal, voluntary (subscription required), or limited in terms of accepted materials. The most accepted materials are yard trimmings, which are collected curbside in 48% of the jurisdictions and at an additional 27% of jurisdictions at drop-off.
- **Washington encompasses a wide variety of social, geographical, and economic realities which help to understand local systems for solid waste collection.** Lists of recycling materials are defined according to local structure of costs for collection and processing, access to end-use markets, population density, and existing infrastructure for recycling and organics. Local governments work to identify opportunities but receive minimal state financial support. Drop-off intensive systems appear as cost effective in some low-density areas of the state (Okanogan and Pacific counties, for example).
- **Rates of collection for recyclable materials depend not only on their prices as recycling commodities, but also on their level of access to end-markets, volume, level of contamination at their disposal, and existing infrastructure for processing.** Materials like metal, cardboard, newspaper, and plastic bottles/jugs are collected in more than 70% of the state's jurisdictions. On the contrary, materials with higher rates of contamination (plastic wrap, aluminum foil, paper cups), that generate issues at separation (i.e., plastic bags) or that are hard-to-recycle (i.e., Styrofoam) are much less often collected.
- **There is a lack of recycling program consistency, completeness, and accuracy in the information provided to customers, which can create customer confusion and increased contamination.** During our assessment of online information, it was common to find diverging criteria to classify materials like scrap metal, mixed paper or even plastic bottles. Often, visual

materials lacked sufficient images to help customers clearly understand how to classify their items. Instructions for recycling and lists of accepted materials also varied among neighboring areas served by the same providers. Counties and their partner cities would benefit from developing common descriptions for categories, clear instructions and images, as well as closer coordination for contracts, permits, and outreach materials developed by their haulers.

- **Public recycling systems could be positively impacted in terms of coverage and efficiency through partnering with private collectors, especially scrap metal processors and thrift stores.** The observed low rate of collection of textiles could be explained by the low level of partnerships between public and private systems. Improved partnerships should be considered to increase the overall capacity of recycling systems. Installing shared collection drop-off sites and improving the availability of data for customers appear to be the preferred strategies. Data and centralized sources of information are especially important so customers can quickly find where to dispose of materials. Examples of this are found in the Department of Ecology, King County, Seattle and Tacoma online search tools and also in private initiatives like ReCollect's Waste Wizard.
- **Commingled systems where recyclables are collected together are the most frequent hauling system.** Glass as a contaminant is usually tackled by excluding it from curbside pickup and providing a network of drop-off locations for its collection. This strategy significantly reduces the amount of glass in the commingled system but also reduces its rate of collection. Alternative approaches including producer responsibility or container payment systems (bottle deposit bills) could provide both better coverage and material quality for recycling systems.
- **Household Hazardous Waste collection systems are mostly independent from recycling and much more limited.** Common issues include lack of personnel and funds to run facilities on a daily basis, thus reducing counties' capacity to regularly receive hazardous items. Certain materials are included in some recycling programs for commonly disposed items like household batteries and light bulbs. Alternative approaches involving extended producer responsibility could provide the funds and coverage to significantly improve collection rates, as demonstrated by statewide LightRecycle and E-Cycle programs.
- **Organics programs in Washington state vary widely in terms of type of collection, seasonality, requirement of subscription, and types of accepted materials.** By far, yard trimmings collection is the most frequent approach when combining both curbside and drop-off only collection systems. Contamination prevention and coordination with end-use producers can lead to increased options for composting in the state.
- **Coordination is key to ensure a consistent, efficient, prospective, and resourceful response of recycling systems to existing dynamics in prices, costs, and customers behavior and attitudes.** Statewide and local initiatives that allow key actors to understand and share information from different perspectives are necessary to improve the operation and design of recycling and composting throughout the state. Such initiatives should keep being supported and encouraged at additional levels of government and geographical areas.
- **Local communities require strong leadership from the state in organizing and supporting solid waste programs, especially in regard to financial support.** Grants and tax incentives directed to promote local markets can create innovative solutions and positive environmental impacts and promote job creation. It is key to identify differentiated capacities among communities when designing financial instruments, especially when considering the resources required to design and implement new projects.

5 APPENDICES

5.1 APPENDIX 1: COMPILED DATA

See separate excel file.

Key to abbreviations used in data files:

value	value_name	description
n	No	Indicates "no" for the category and jurisdiction
n/a	Not applicable	Not applicable
y	Yes	Indicates "yes" for the category and jurisdiction
yc	Yes, curbside collection	Recycling provided at curbside
yd	Yes, drop-off locations	Recycling only available at drop-off locations (some require fee), within boundary of area or within 10 miles of area
yp	Yes, special pick-up	Recycling provided at curbside but requiring notification and/or additional fees
b	Bi-weekly (Every-Other-Week)	Collection performed in a bi-weekly basis.
m	Monthly	Collection performed in a monthly basis.
w	Weekly	Collection performed in a weekly basis.

APPENDIX 2: INTERVIEWS GUIDING QUESTIONNAIRE

Interview Questions

Introduction

Brief presentation of interviewer, the project, and role of interviews in it. Brief description of the interview structure and dynamics, indicating protection of identity and use of information.

Current actions and context

1. How is/are the jurisdiction(s)/organization you work with responding to the crisis affecting recycling markets?
2. Are there elements from surrounding (i.e., other jurisdictions') recycling systems that the jurisdiction(s)/organization you work with should consider? If yes, which ones?
3. How much enforcement do/does the jurisdiction(s) you work with do and how effective it is?
4. How well do you work with the private haulers in the jurisdiction(s)? What controls are over them and how do you know how well they are doing the job? What do you wish was better?
5. What is the interaction between the Household Hazardous Waste collection and the recycling system(s) you work with? Are there any issues or opportunities?

Future actions

6. What changes are you considering for the allowed items for the jurisdiction that you work with?
7. What changes would you introduce to the pricing system for recycling of the jurisdiction(s) you work with? (check the jurisdiction's pricing system before the interview)
8. What do you think are the chances to get glass separated from curbside collection system in the jurisdiction you work with? What options do you foresee for the future in the area? (Jurisdictions with curbside collection only)
9. What type of actions are required to create or support local recycling markets in the jurisdiction you work with?
10. What conditions should the state develop to better support your own efforts towards an efficient recycling system?
11. Why doesn't your jurisdiction require recycling & composting from multi-family residences as they did from single family? (Jurisdictions/systems without required recycling for multi-family)