# 2017 Glass Recycling Survey

RESULTS

Glass Recycling Coalition | May 2017

# Table of Contents

# Introduction

The Glass Recycling Coalition (GRC) is a non-competitive, collaborative coalition focused on making glass recycling work. In the spring of 2017, the GRC conducted a survey of public sector, MRFs, and end market representatives in order to get a sense of how different members of the glass recycling chain view the state of glass recycling and better provide resources. The survey will be conducted annually to measure changes in attitude, track progress in improving glass recycling, and guide the direction of the GRC.

The survey results provide an attitudinal snapshot of how glass is currently recycled – how it is collected and processed and where it ends up – and current beliefs about glass recycling from numerous perspectives. Additionally, the survey offers a view of the types and extent of glass recycling challenges, as well as interest in tools and financial resources to aid with these concerns. The survey will be repeated periodically by GRC to measure progress, changes in beliefs, and other needed information to mold GRC effectiveness.

## KEY FINDINGS

- People expect to recycle glass; over 90% of respondents from each of the three groups surveyed indicated that their residents/customers expect to recycle glass.
- Approximately 65% each of public sector and glass industry respondents expressed concerns with glass recycling, primarily transportation barriers, lack of nearby end markets, contamination issues, and cost-effectiveness.
- Respondents care what happens to recycled glass; 75% of public sector respondents and 85% of glass industry respondents indicated that the final destination of recovered glass is important to them. Both groups ranked bottle-to-bottle recycling as their preferred end use of recovered glass.
- 40% of MRF respondents have additional glass cleanup equipment. This is an opportunity for the GRC to increase this number.
- Over 70% each of public sector and glass industry respondents facing glass recycling challenges expressed interest in public-private partnerships and grants to improve glass recycling.
- About half of respondents from each of the three groups surveyed believe the cost of collecting and processing recyclables should be shared among various members of the recycling chain.

## ABOUT THE GLASS RECYCLING COALITION

The Glass Recycling Coalition (GRC) brings together a diverse membership of 40 companies and organizations representing glass container and fiberglass manufacturers, brands that use glass to showcase their products, haulers, processors, material recovery facility, capital markets and end-markets to make glass recycling work.

Established in April 2016, GRC is a non-competitive coalition of U.S. value chain members involved in glass recycling and dedicated to supporting the most accessible and viable glass recovery and recycling options for consumers. The coalition encourages financially sustainable mechanisms that produce quality cullet and strengthen glass markets. For more information, contact info@glassrecycles.org

**GRC Members:**

Allagash Brewing Company
Ardagh Group
Balcones Resources
Bell's Brewery
Brewer's Association
Diageo
Casella
Constellation Brands
Emterra Group
Fetzer Vineyards
Gallo
Goose Island
GPI
Heineken
Johns Manville
Knauf Insulation
Machinex
Momentum Glass
National Waste & Recycling Association
North American Insulation Manufacturers Association (NAIMA)
O-I
Owens Corning
Pernod Ricard USA
Rumpke Recycling
ISRI
PACE Glass
Pratt Industries
Republic Services
Resource Management Companies
Ripple Glass
Rocky Mountain Bottle Company (Miller Coors)
Sierra Nevada Brewing Company
Sims Municipal Solutions
SERDC
Strategic Materials
The Recycling Partnership
Urban Mining NE
Waste Management

**Government Advisory Council Members:**

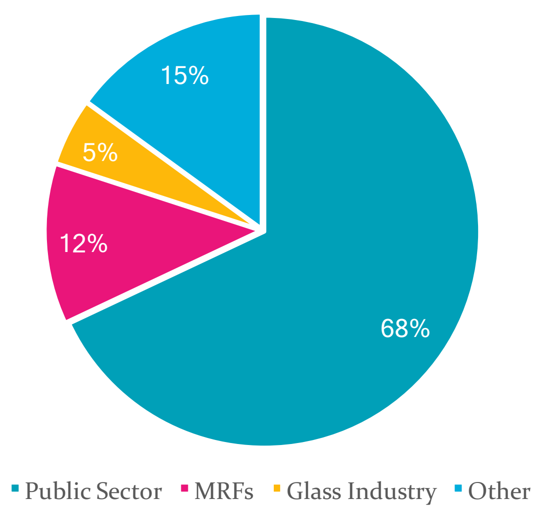
Massachusetts Department of Environmental Protection
State of Washington State Department of Ecology
City of Fort Collins Waste Reduction & Recycling
City of Houston Solid Waste Management Department

## Survey Results

The GRC opened the survey to public sector representatives, MRFs, and glass industry members nationwide. Over 4,200 municipal and MRF contacts, as well as GRC members, received an email with the link to the survey; 136 recipients actually clicked the survey link. Additionally, the survey was posted on the GRC website and social media pages, and was featured on Resource Recycling magazine's website.

More than 250 representatives throughout the glass value chain provided their perspectives on the state of glass recycling in the survey. Figure 1 shows the breakdown of survey respondents amongst the public sector (175 respondents), MRFs (31 respondents), the glass industry (12 respondents), and other (38 respondents). Each sector answered a set of questions that pertain to their sector; the survey results are presented in this report by these groups. While a number of questions only pertained to one sector, there is some overlap in questions asked that allow for comparisons between the three sectors' perspectives. It is important to keep in mind, however, that given the small number of MRF and glass industry representatives that responded to the survey, comparisons can only be made for the survey respondents, not the industry as a whole.

*Figure 1 Breakdown of survey respondents by sector*




### PUBLIC SECTOR

Public sector representatives from municipalities, counties, solid waste districts, and states provided insight on community recycling programs and the glass recycling challenges they face.

#### *Community Recycling Programs*

Table 1 shows the prevalence of different collection systems used to collect glass in respondents' communities (note that percentages add to over 100% because communities may have more than one system for collecting glass). More than half of respondents have glass collection available through a drop-off program (glass may also be collected at curbside in some of these communities, while in others it may be the only collection method used for glass). Almost half of respondents collect glass through a single stream curbside program. Twelve percent of public sector respondents do not recycle glass.

*Table 1 Prevalence of different systems to collect glass among public sector respondents*

| Collection System | Percent of Respondents That Use Collection System |
|---|---|
| **Single stream curbside** | 49% |
| **Dual stream curbside** | 9% |
| **Glass collected separately at curbside** | 13% |
| **Source separated curbside collection** | 8% |
| **Drop off** | 65% |
| **None** | 12% |
| **Other** | 4% |

Residents overwhelmingly want to recycle glass (96% of public sector respondents indicated that residents in their community expect to recycle glass), and the public sector's responses illustrate the influence of their residents in their decisions around recycling. Respondents were asked for the top three reasons glass should be kept in recycling programs (Figure 2), and they most commonly selected "Residents want to recycle glass" (selected by 86% of respondents). The influence of residents' concerns is not specific to glass recycling, but to recycling programs on the whole. When asked for the top three program priorities for recycling in their community (Figure 3), respondents most commonly selected "resident satisfaction" (67% of respondents).

*Figure 2 Public sector respondents' top reasons glass should be kept in recycling programs*

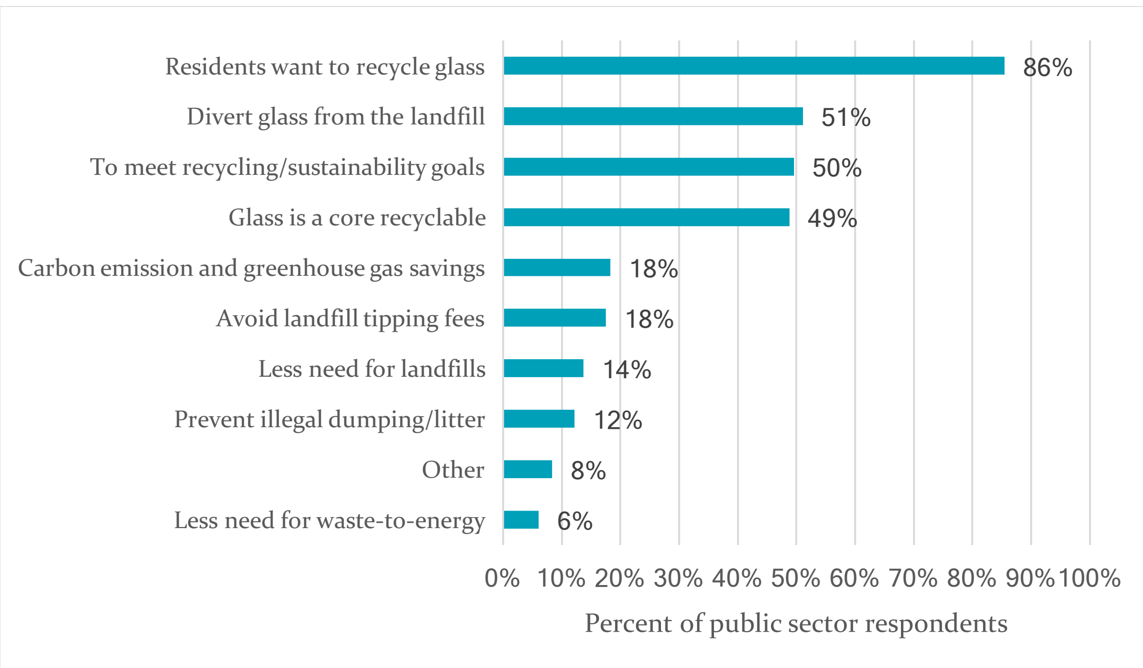


*Figure 3 Public sector respondents' top priorities for community recycling programs*

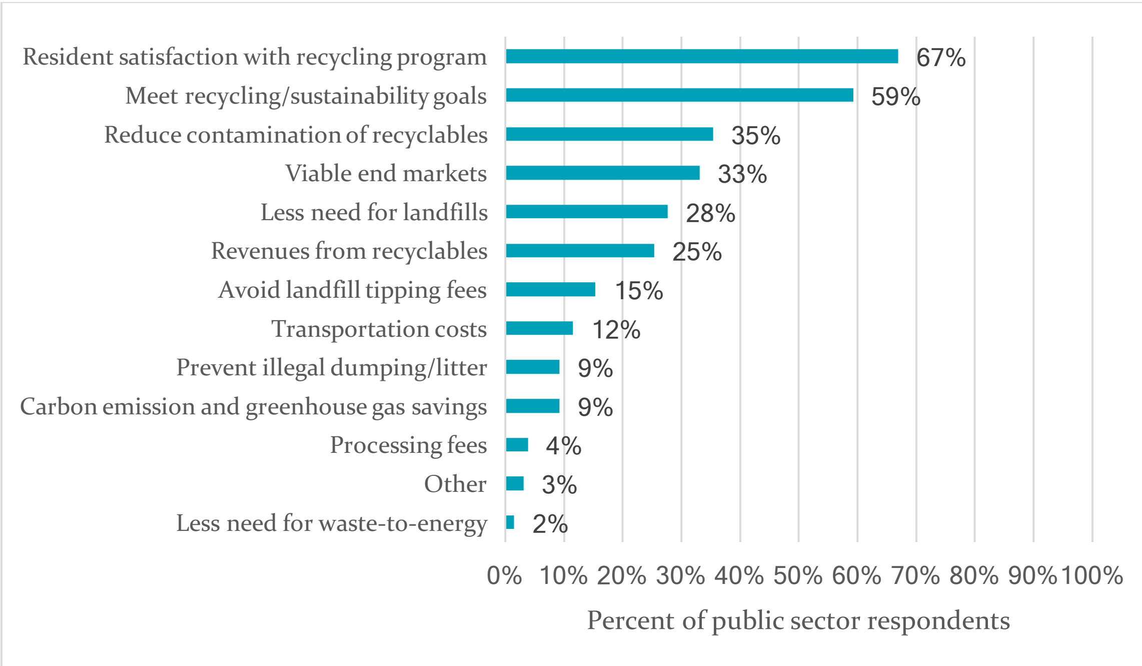



Figure 4a illustrates which member(s) of the recycling value chain public sector respondents suggested should cover the cost of collecting and processing recyclables. About half of public sector respondents believe that two or more entities should share these costs. Of the respondents that selected one entity to cover the costs of recycling, most selected packaging manufacturers while only two percent selected cities/counties.

Figure 4b further breaks down which groups those public sector respondents who believe costs should be shared selected to share these costs. Packaging Manufacturers were most often selected by these respondents. Half of these respondents indicated that cities/counties should share the costs of recycling.

*Figure 4a Public sector respondents' choices of which group(s) should cover the costs of recycling*

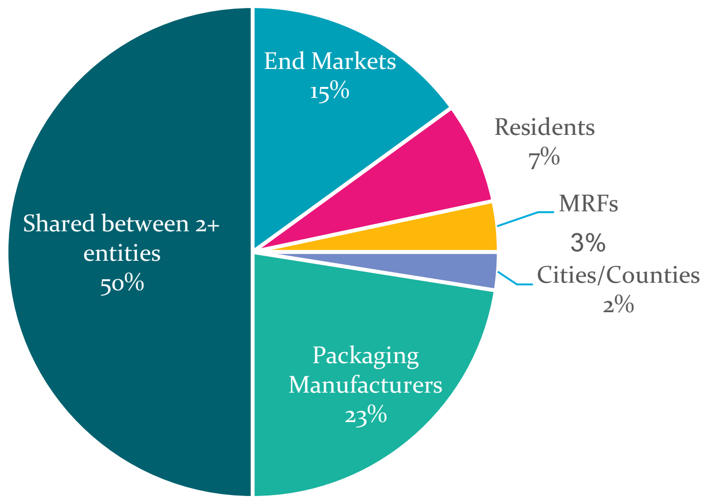
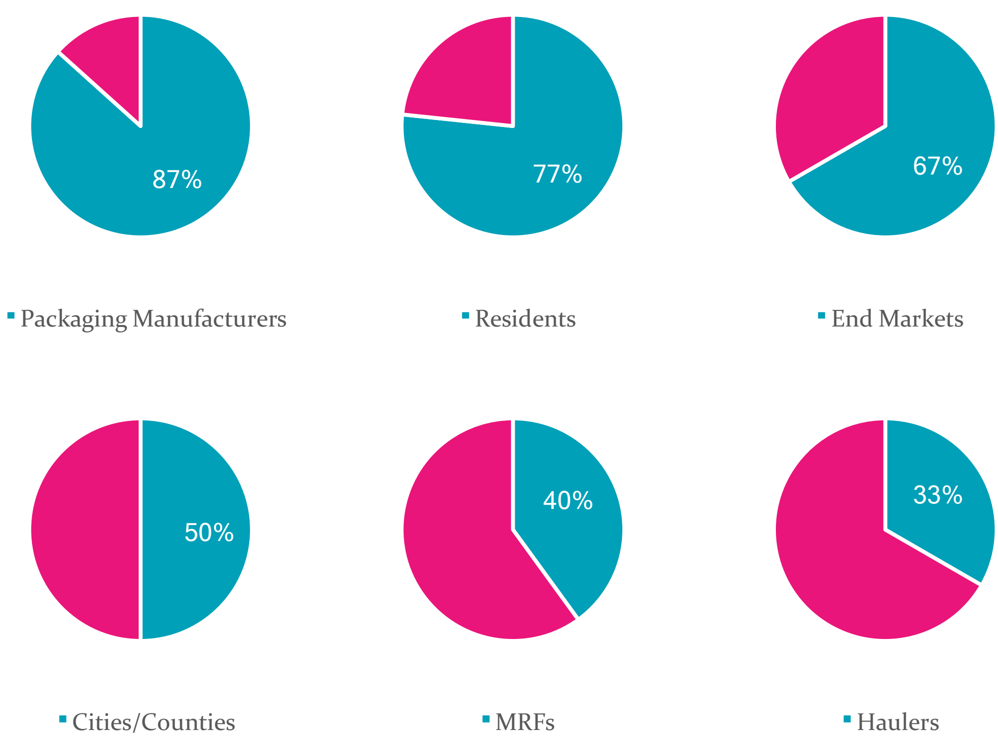


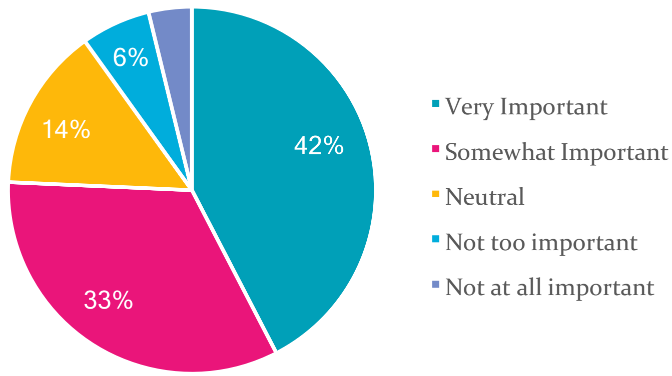

*Figure 5b Public sector respondents' choices of which groups should share the costs of recycling*



### *Final Destination of Glass*

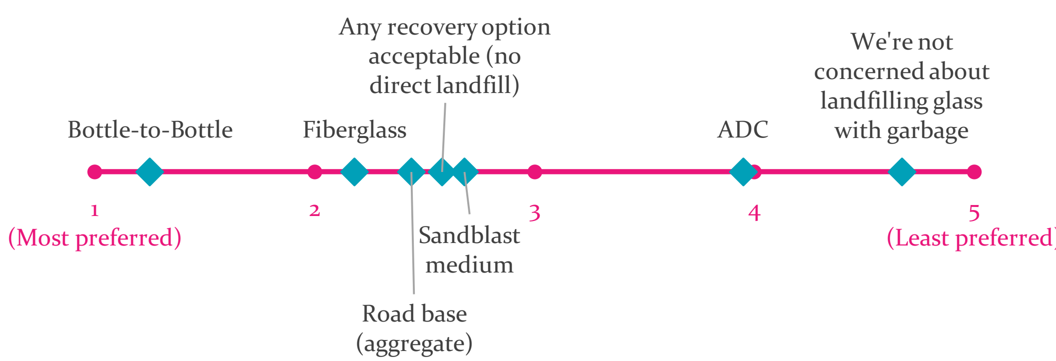
Two-thirds of public sector respondents know the final destination of the glass recovered in their community. Another eight percent of respondents do not accept glass in their recycling programs, and the remainder do not know the destination of their recovered glass. Furthermore, about 75% of public sector respondents indicated that the final destination of their community's glass is "very important" or "somewhat important" to them, revealing that they do care where their glass ends up (Figure 5).

*Figure 6 Importance of the final destination of glass recovered by community recycling programs to public sector respondents*




The public sector further revealed their concern about the final destination of their glass by rating different glass end uses on a scale of one to five (one being the best end use and five being the worst end use). Figure 6 plots the weighted average score for each end use from most to least favorable; the lower the weighted average, the more preferable the end use. Public sector respondents ranked bottle-to-bottle recycling most favorably and sending glass to the landfill with garbage least favorably.

*Figure 7 Weighted averages of public sector respondents' preferred glass end uses, in order from most to least preferable*



### *Glass Recycling Concerns & Aid*

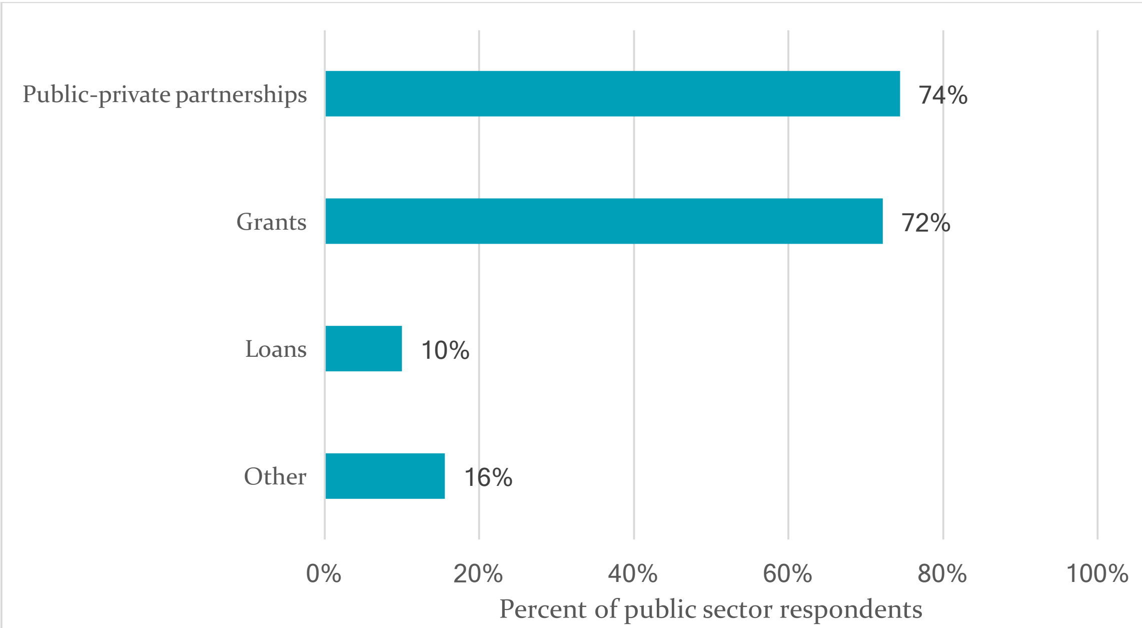
Sixty-three percent of public sector respondents indicated that they have some concerns with glass recycling. Table 2 details the challenges that these communities face. The most prevalent challenge among these respondents is end markets, with 82% of this group indicating they have a concern relating to end markets (for instance, they have no or few end markets nearby, or their nearby end markets will not consistently accept their community's glass). Other main concerns pertain to contamination issues and the cost-effectiveness of glass recycling.

*Table 2 Percent of public sector respondents facing specific glass recycling challenges in their community*

| Glass Recycling Challenges | Percent of Public Sector Respondents Facing Challenge in Their Community |
|---|---|
| **End markets (e.g. few/unreliable options)** | 82% |
| **Contamination issues** | 60% |
| **Cost-effectiveness** | 45% |
| **Processing capability** | 22% |
| **Hauler/MRF stopped accepting glass** | 16% |
| **Hauler raised price to keep glass in the program** | 16% |

Respondents who expressed concerns with glass recycling were asked about their interest in financial resources. Over 70% of this group expressed interest in public-private partnerships and grants (Figure 7).

*Figure 8 Interest in certain financial resources from public sector respondents facing glass recycling challenges*




Respondents facing glass recycling challenges were also asked to select tools or information that would be useful to increase quality glass recycling in their community. The top three tools, each of which were selected by roughly 50 percent of those who are facing glass recycling challenges, were types of glass end markets, best practices in glass recycling collection or processing, and information on grant funding for glass recycling (Table 3). Over 75% of these respondents indicated that webinars and presentations are the best way to share these tools and information (Table 4).

*Table 3 Percent of public sector respondents experiencing challenges with glass recycling that would find the following tools to be useful*

| Tool/Information | Percent |
|---|---|
| **Types of end markets that are available for glass** | 54% |
| **Best practices in glass recycling collection or processing** | 50% |
| **Information on grant funding for glass recycling** | 45% |
| **Options for preserving glass in recycling collection** | 40% |
| **Case studies of local governments making glass recycling work** | 40% |
| **Information about glass recycling for legislators/decision makers** | 29% |
| **Process of how glass is recycled into new containers** | 20% |
| **A list of top considerations when making recycling program changes** | 16% |
| **Other** | 12% |

*Table 4 Preferred platforms for sharing tools and information among public sector respondents experiencing challenges with glass recycling*

| Platform | Percent |
|---|---|
| **Webinars/presentations** | 77% |
| **Email alerts** | 58% |
| **Newsletters** | 45% |
| **Social media** | 13% |

A quarter of public sector respondents have explored the resources that already exist on GlassRecycles.org, signifying that there's an opportunity to promote GRC's resources in addition to developing new ones.

## GLASS INDUSTRY/OTHER

Representatives from the glass industry answered many of the same questions as the public sector. The glass industry respondents provided similar feedback on the state of glass recycling to that from public sector respondents.

### *Who should pay for recycling?*

Figure 8a illustrates which member(s) of the recycling value chain glass industry respondents suggested should cover the cost of collecting and processing recyclables. Just like the public sector, about half of glass industry respondents believe that two or more entities should share these costs. Of the respondents that selected one entity to cover the costs of recycling, most selected packaging manufacturers. Of those that indicated that the cost should be shared, half selected end markets as one of the groups that should share in the costs of recycling, followed closely by packaging manufacturers and residents (Figure 8b).

*Figure 9a Glass industry respondents' choices of which group(s) should cover the costs of recycling*

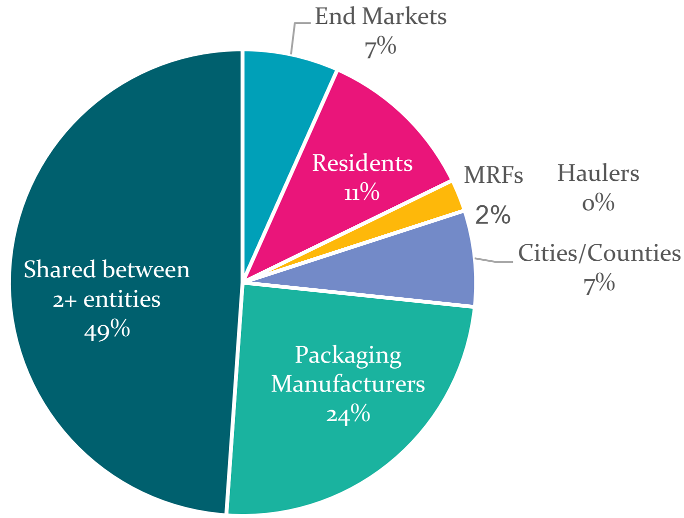
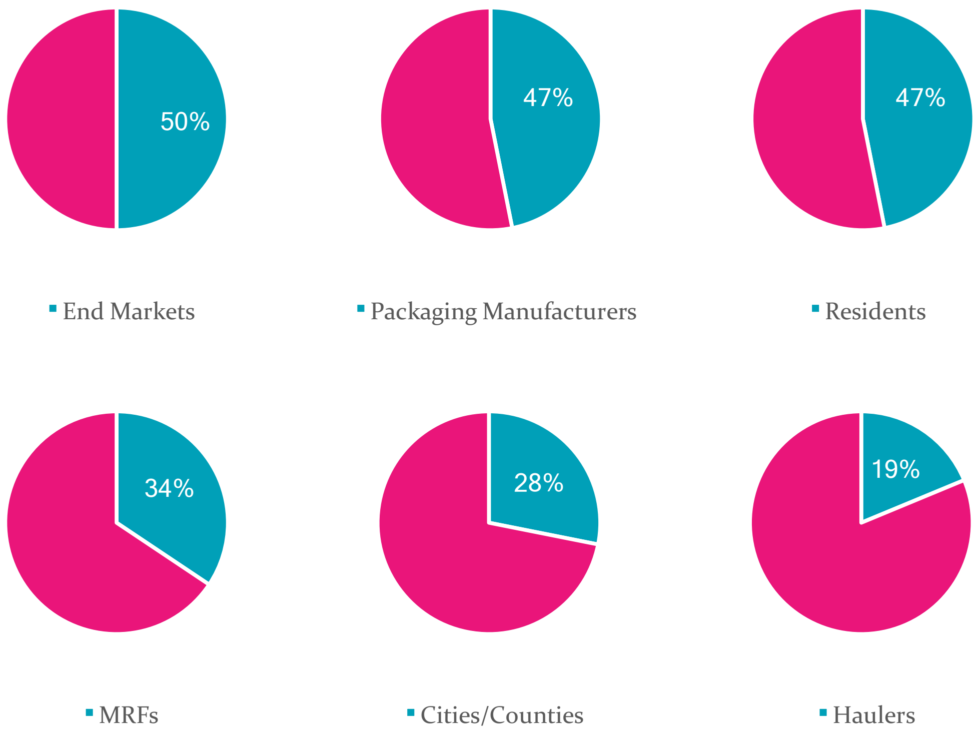


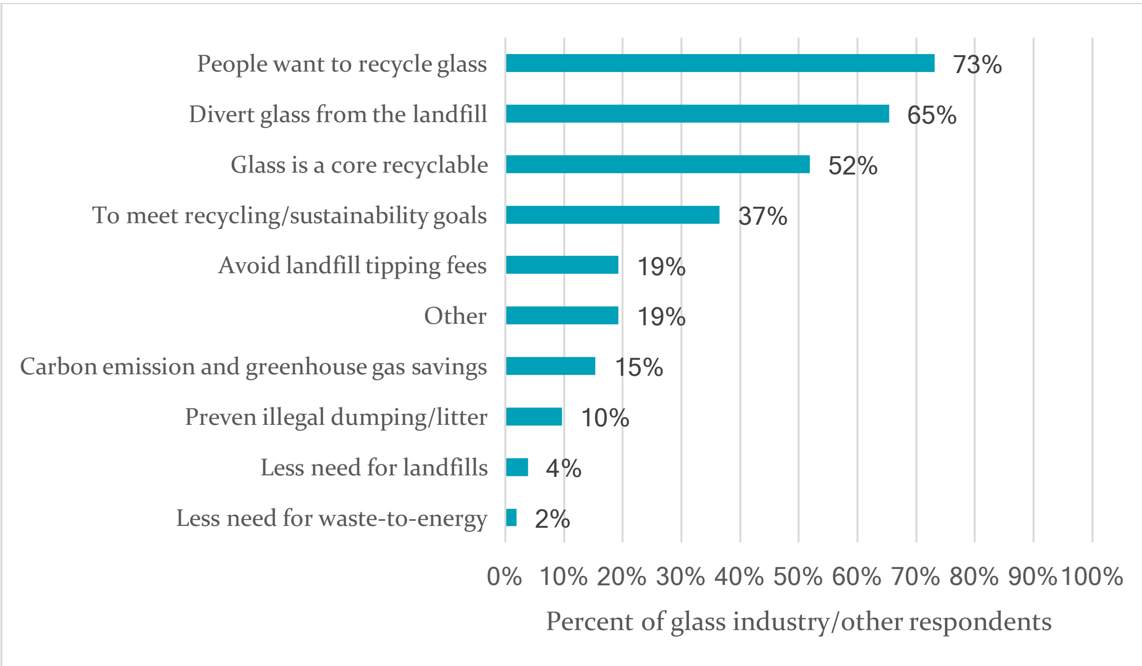
*Figure 10b Glass industry respondents' choices of which groups should share the costs of recycling*



### *Why should glass be recycled?*

Like the public sector, glass industry representatives revealed a push from the public to recycle glass. Ninety-one percent of their customers expect to recycle glass. Furthermore, when glass industry respondents were asked to select their top three reasons that glass should be kept in recycling programs, they, like the public sector, most commonly selected "people want to recycle glass" (Figure 9).

*Figure 11 Glass industry respondents' top reasons glass should be kept in recycling programs*




### *Final Destination of Glass*

Glass industry respondents also revealed that they are concerned with the final destination of recovered glass; 85% of glass industry respondents rated the final destination of recovered glass as "very important" or "somewhat important" (Figure 10). The glass industry further revealed their concern about the final destination of their glass by rating different glass end uses on a scale of one to five (one being the best end use and five being the worst end use). Figure 11 plots the weighted average score for each end use from most to least favorable; the lower the weighted average, the more preferable the end use. Glass industry respondents ranked glass end uses in nearly the same order of preference as the public sector. Most notably, respondents ranked bottle-to-bottle recycling most favorably and sending glass to the landfill with garbage least favorably.

*Figure 12 Importance of the final destination of glass recovered by community recycling programs to glass industry respondents*

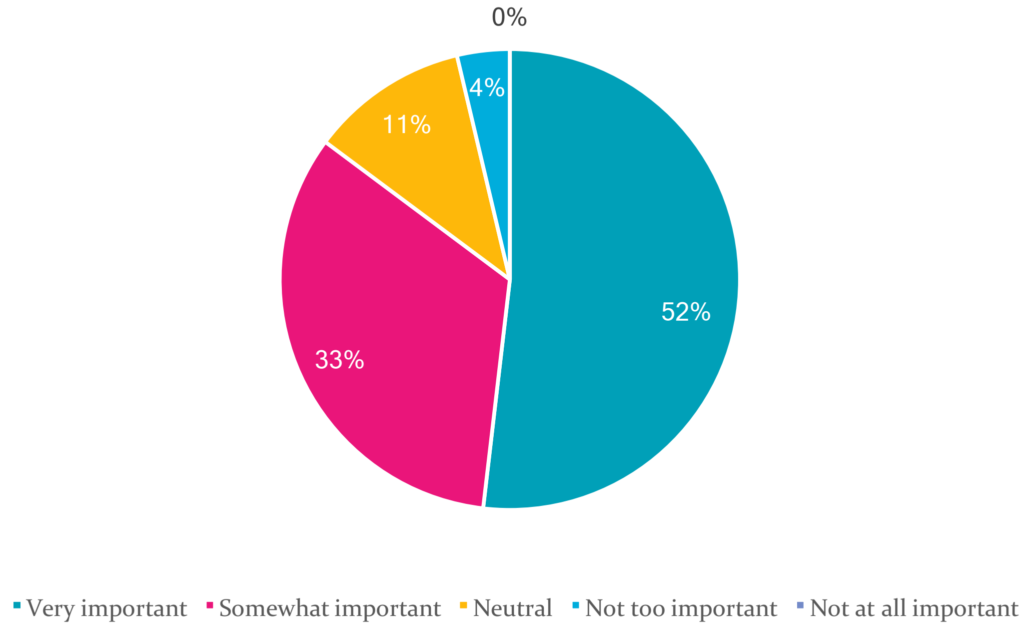
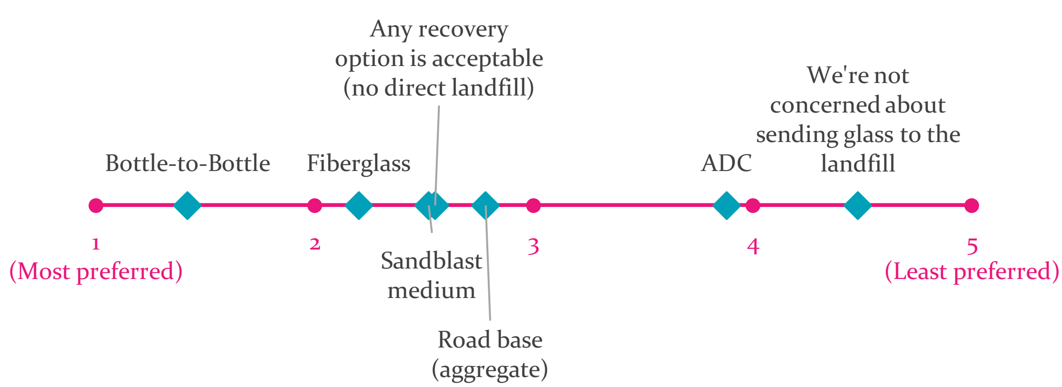



*Figure 13 Weighted averages of glass industry respondents' preferred glass end uses, in order from most to least preferable*




## *Glass Recycling Concerns & Aid*

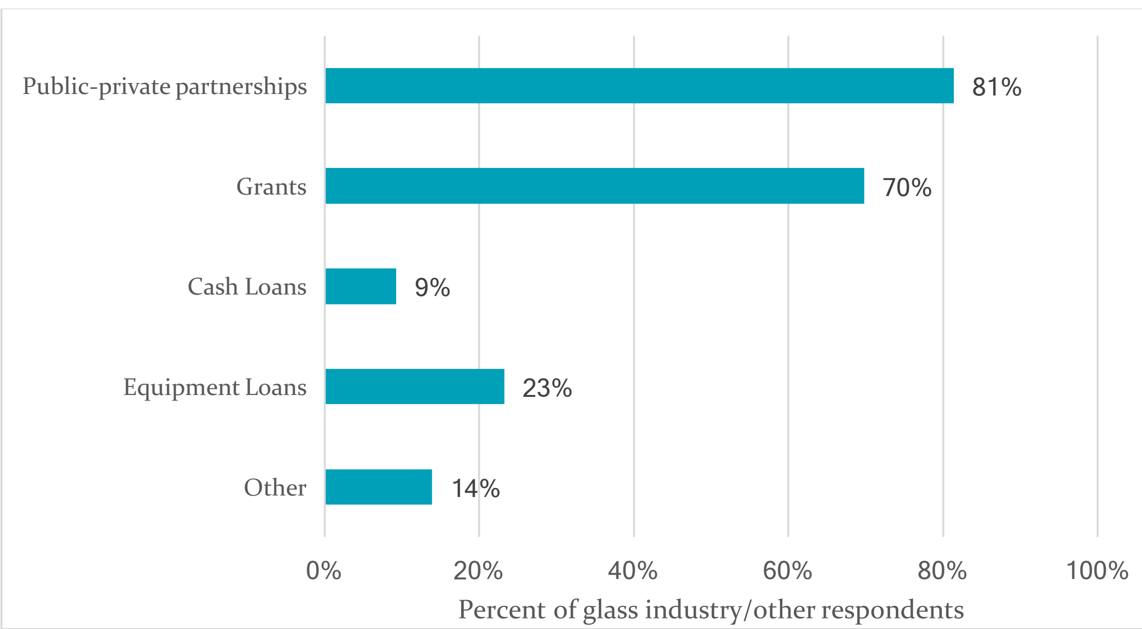
About two-thirds of glass industry respondents indicated that they have concerns with glass recycling. Glass recycling challenges they identified are listed in Table 5. The glass industry shared the main concerns as the public sector – contamination, cost-effectiveness and end markets – and also expressed a concern with service providers that stop accepting glass.

*Table 5 Percent of glass industry respondents who identified specific glass recycling challenges*

| Glass Recycling Challenges | Percent of Glass Industry Respondents |
|---|---|
| **Contamination/quality issues** | 64% |
| **Cost-effectiveness** | 56% |
| **Some recycling service providers have stopped accepting glass** | 55% |
| **End markets** | 51% |
| **Lack of glass processing options** | 40% |
| **Lack of advanced glass cleaning systems in MRFs** | 38% |
| **Not enough glass is being recycled** | 22% |
| **Opponents' efforts to remove glass** | 16% |
| **Customer service issues trying to move glass** | 15% |

Glass industry respondents were also asked about their interest in financial resources to improve glass recycling. The glass industry, like the public sector, expressed more interest in public-private partnerships and grants than in other types of financial resources (Figure 12).

*Figure 14 Interest in certain financial resources from glass industry respondents*




As for other resources to improve glass recycling, 47% of glass industry respondents have explored the resources on GlassRecycles.org

## MRFS

MRF respondents provided a glimpse into how recycled glass is currently processed and where it is sold.

### *Glass Processing*

MRF respondents were asked which type(s) of processing system they operate for glass (Figure 13). The most commonly used processing system by MRF respondents is single stream or mixed recyclables; 62% of MRF respondents use single stream processing for glass (regardless of whether they use additional processing systems).

Forty percent of MRF respondents have additional glass cleaning equipment. Figure 14 shows the types of glass cleaning equipment these respondents use; most (73%) use air knives, vacuums or blowers to remove paper and organics. Another eight percent of MRF respondents indicated that they do not have additional glass cleaning equipment but would consider it, and 20% have already considered additional equipment but determined it too costly.

*Figure 15 Processing systems used by MRF respondents for glass*

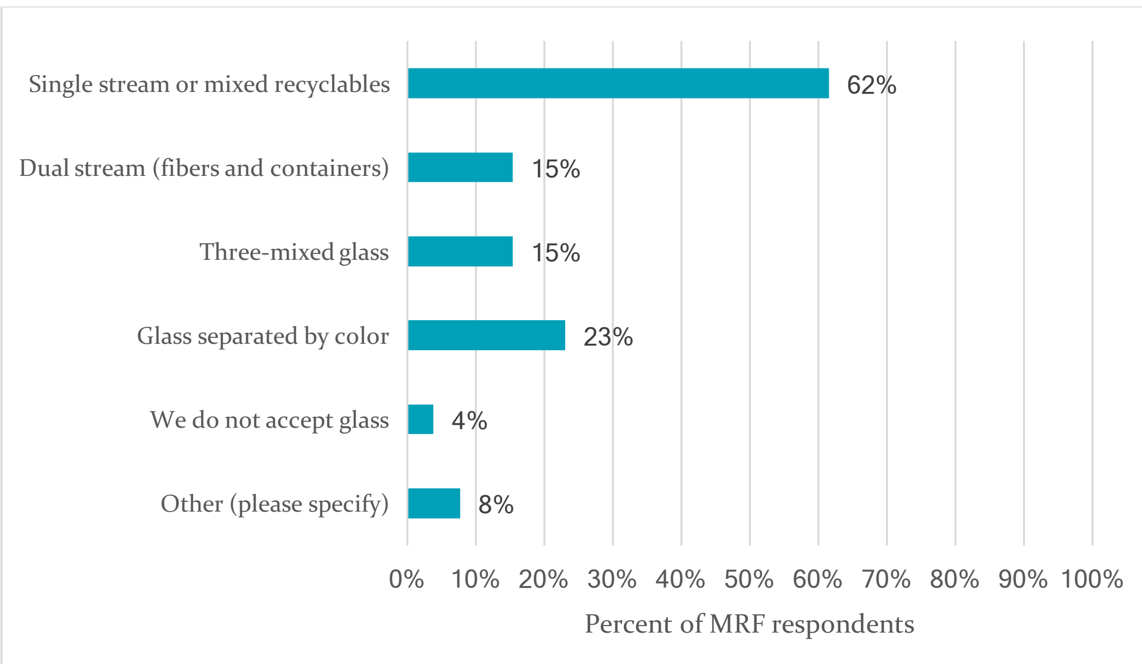
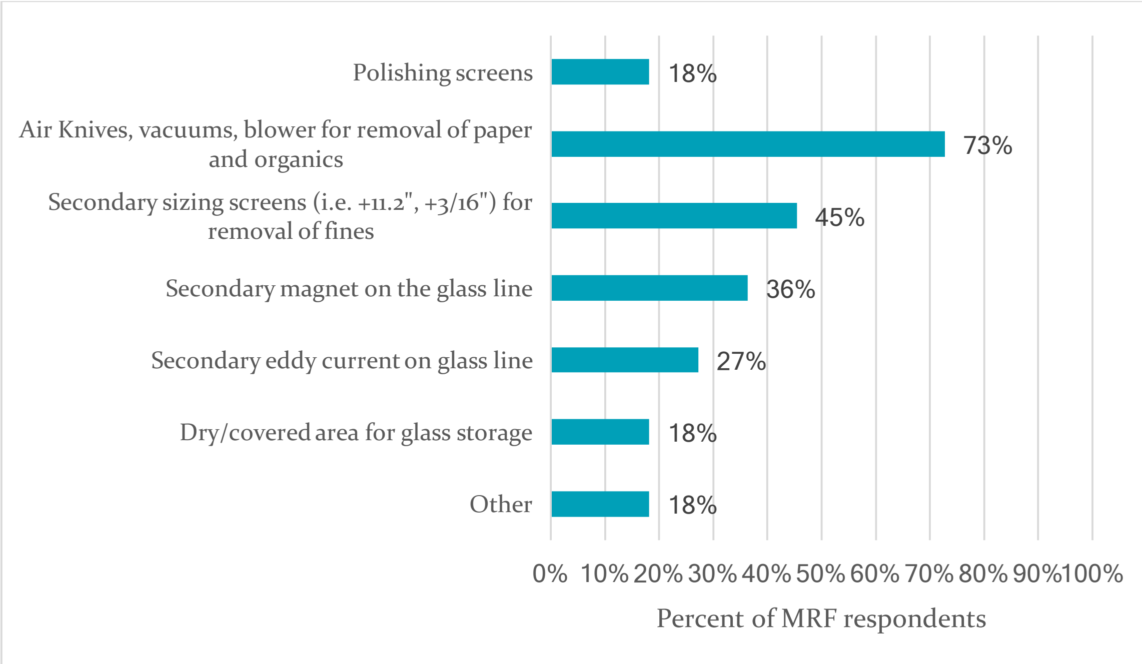


*Figure 16 Additional glass clean up equipment used by MRF respondents*




### *Destination of Collected Glass*

MRF respondents were asked to provide all of the end uses of the glass processed at their facility (Table 6). The MRFs' most utilized end use is bottle-to-bottle recycling. More than half of MRF respondents indicated that at least some of their glass becomes cullet to be recycled into glass bottles.

*Table 6 Final destinations of glass processed by MRF respondents.*

| Glass End Use | Percent of MRF respondents |
|---|---|
| **Glass into cullet recycled into glass bottles** | 58% |
| **Recovered as sandblast medium** | 12% |
| **Recovered as road base (aggregate)** | 15% |
| **Recovered for fiberglass** | 23% |
| **Used as Alternative Daily Cover (ADC) in a landfill** | 19% |
| **Any option for recycling glass is acceptable, as long as it isn't landfilled with garbage.** | 23% |
| **N/A: We don't accept glass in our recycling program** | 19% |
| **Other** | 8% |

MRF respondents provided up to three factors determining where they sell their glass (Table 7). The top three factors selected suggest that respondents' priorities are cost and contamination/quality. While public sector and glass industry respondents reported that people's desire to recycle glass is a primary reason that glass should be recycled, MRF respondents did not reveal a similar pressure in decision-making to act on customer's desires. In fact, only eight percent of MRF respondents indicated that customer expectations for recycled glass to be used in glass manufacturing is a top consideration in determining where they sell their glass – despite 100% of MRF respondents reporting that their customers expect to recycle glass. Many of the MRF representatives who responded with "other" specified that they only have one outlet for their glass.

*Table 7 Determining factors of where MRFs sell their glass.*

| Determining Factor of Where Glass is Sold | Percent of MRF Respondents |
|---|---|
| **Transportation cost** | 54% |
| **Highest price paid per ton/lowest cost per ton** | 46% |
| **Processor will take all glass I bring** | 42% |
| **Highest and best end use** | 27% |
| **Any option for recycling glass is acceptable, as long as it isn't landfilled with garbage** | 23% |
| **Other** | 15% |
| **Most glass yielded (recovered)** | 8% |
| **Customer expectations for recycled glass to be used in glass manufacturing** | 8% |
| **Landfilling is most convenient or cheapest option** | 8% |
| **Landfill construction material substitution (ADC, road base, French drains) fulfills recycling obligation** | 8% |
| **Contractual obligations** | 4% |
| **N/A: We don't accept glass in our recycling program** | 4% |

*Who should cover costs?*

Figure 15a illustrates which member(s) of the recycling value chain MRF respondents suggested should cover the cost of collecting and processing recyclables. Their responses matched those from the other two groups. About half of respondents believe that two or more entities should share these costs, and of the respondents that selected one entity to cover the costs of recycling, most selected packaging manufacturers. Figure 15b shows which groups MRFs who believe the costs of recycling should be shared should actually share these costs. Eighty-five percent of these MRF respondents indicated that residents should share the costs. MRFs were least often selected by these respondents.

*Figure 17a Breakdown of MRF respondents' choices of which group(s) should cover the costs of recycling*

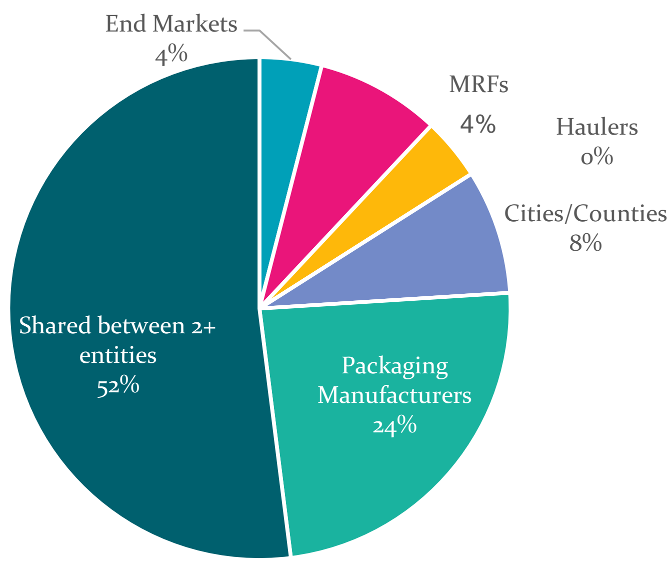
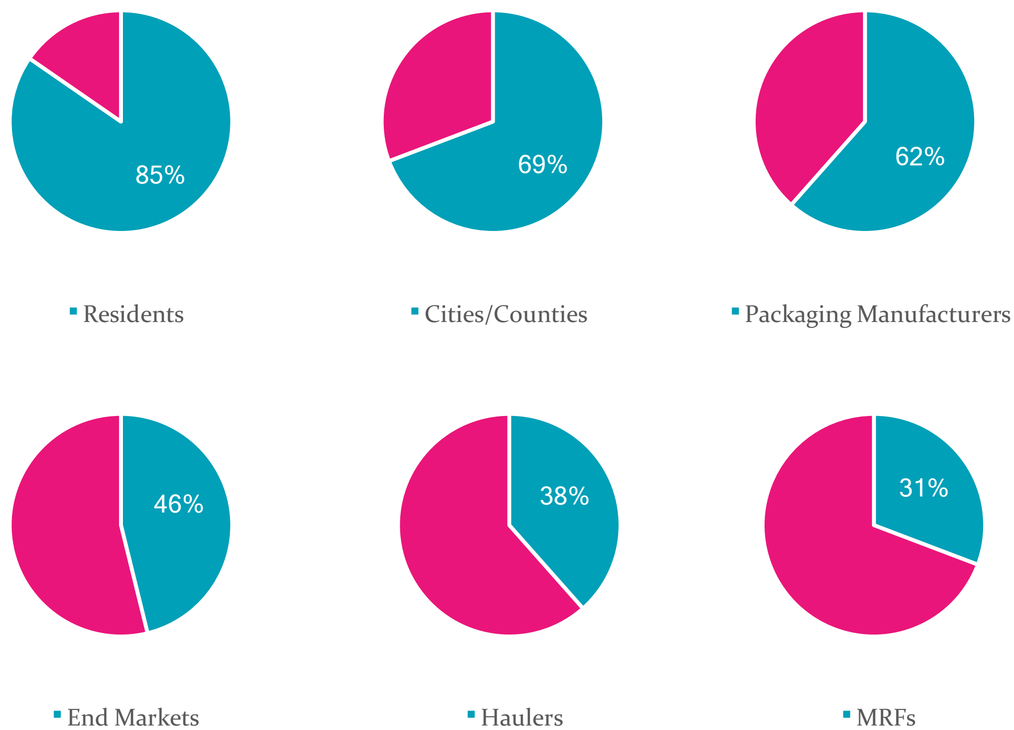


*Figure 18b Breakdown of MRF respondents' choices of which groups should share the costs of recycling*




## INTEREST IN GRC INVOLVEMENT & OTHER FEEDBACK

All survey respondents were asked about their interest in GRC membership and becoming a Glass Champion. Sixty-five respondents expressed interest in learning more about becoming a Glass Champion and/or member. Additionally, 16 respondents from the public sector indicated that they are having success with glass recycling and are willing to help develop a case study for the GRC website.

Many respondents' comments in the space for other feedback fell into four categories:

1. Involvement: Respondents elaborated on why they didn't express interest in becoming involved with the GRC (e.g. budget/time restraints or they're already a member) or reaffirmed their willingness to share their experiences with glass.
2. Concerns: Respondents briefly shared the glass recycling concerns in their community, particularly regarding end markets and transportation costs.
3. Objections: Respondents maintained their objections to glass recycling (for instance, that glass recycling does not work in single stream systems, or that they do not see the feasibility of glass recycling in their community despite residents' demands).
4. Solutions: Respondents suggested tactics such as building partnerships and expanding bottle bills to improve glass recycling.

# Conclusion

Attitudes about glass recycling are shared among the public sector, MRF and glass industry respondents surveyed. All three groups face high expectations from their customers to recycle glass. Public sector and glass industry respondents agree that the end use of recovered glass is important, but more than half of these respondents expressed concerns with glass recycling. Generally, both groups face glass recycling challenges pertaining to end markets, contamination and cost-effectiveness, and indicated that financial resources such as public-private partnerships and grants could be beneficial in addressing these concerns. Lastly, a large share of all three groups believe that costs associated with recycling should be shared among the recycling chain.