



# Phase 1 Results

Measuring the Organics Diversion Improvements from Enhanced Tenant Engagement at Four Multi-Family Dwellings in Albany, CA

A man with a beard and dark hair, wearing a dark shirt, stands next to a green recycling bin. He is pointing towards a red sign on the wall that reads "FOR RECYCLABLES ONLY PLEASE DO NOT DISPOSE OF TRASH IN THIS RECYCLABLE". The bin has "RECYCLED RECYCLING" and "Waste Management" printed on it.

Prepared by  
Global Green USA  
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# Project Summary

Landfilling or burning recoverable wastes costs cities and businesses millions of dollars each year and releases potent greenhouse gases. With the support and participation of a variety of corporate and philanthropic partners, Global Green's Coalition for Resource Recovery (CoRR) helps to develop, implement, and improve systems by which these wastes can be consistently and economically recovered, bringing valuable material back onto the market and creating a net greenhouse gas benefit. These partners have the opportunity to advance their sustainability and waste diversion performance, better serving customers and residents seeking to lead greener lives.

To achieve the goal of reducing and diverting food scraps, Global Green USA is focusing on one of the most difficult areas for program implementation – multi-family dwellings (MFDs). MFDs pose unique challenges due to the fact that the tenants do not have a direct incentive to reduce waste generated, or divert their wastes cleanly, since all the waste is placed in a common bin that is paid for by the property manager. Education and outreach programs rely instead on motivation by tenants to act responsibly toward their community, as well as help their building reduce waste-related costs overall.

Global Green USA used a pilot approach to determine the likely diversion outcomes from common tenant outreach and engagement strategies. In coordination with waste haulers, city agencies, and property managers Global Green undertook in-depth analyses of targeted buildings to determine the food scrap reduction and diversion rates for the first tenant engagement scenario – distribution of kitchen pails and compostable, water resistant paper bags, as well as door-to-door, one-on-one outreach. From these findings, we determined:

- Overall diversion rates for the buildings selected (the total material, by weight, being recycled or composted);
- Volume and contamination of the organics stream; and
- Recommendations to increase organics diversion.

Based on the success of this project, Global Green USA is seeking to expand the pilot to additional buildings in more cities across the San Francisco Bay Area, and evaluate the success of a wider variety of resident engagement strategies.

For more information, please visit [www.thecorr.org](http://www.thecorr.org).

## **Providing the Kitchen Pails, Bags, and Training Increased Organics Diversion by 9%**

Compared to the control buildings, which were of similar size, in similar neighborhoods, and had started organics service at about the same, organics diversion was higher by 9% in the selected buildings, where Global Green had provided equipment and training. This amounts to approximately 0.5 lbs. per household per week. Annually, this amounts to an improvement at these targeted buildings of over 1,200 lbs. relative to a scenario in which these buildings had not received this assistance. Contamination rates in both selected and control buildings were approximately 5%.

## **Participating Locations Achieve 40% Diversion, 7% Greater than Control Group**

This was an improvement from the hauler Waste Management's estimated 19% diversion for these locations prior to the introduction of the compost service. However, it is clear from the waste audits that many recoverable items still being sent to landfill.

## **Resident Satisfaction with the Program and Equipment was High**

On average, residents rated the kitchen pails and water-resistant paper bags at between 4 and 5 (5 being the highest possible rating) for leakage, odor control, and ease of use. All participants were using either just the bag (18%), just the pail (2%), or both (80%) to collect food scraps in the home. No participant was using an alternative method (e.g., milk carton). Two households were not participating due to language barriers, and only one household was not participating by choice. Several tenants suggested changes to the bin and bag system, including the following:

- A multi-chamber bin that shows what the desired proportions of waste should look like.
- Bins and water-resistant paper bags that are designed to fit together.
- Foot pedal for small pail, since most people keep the pail on the floor or under the sink.

## **Making Bags Available Locally or In the Building Will Help Make the Program Successful**

The most commonly asked question from residents after using the water-resistant paper bags was, "Where can we get more?" The typical model for providing bags is through local retailers, where the tenant has the responsibility of procuring the bags. However, an emerging model, which is used in some buildings in San Francisco and elsewhere, places the responsibility on property managers and/or waste haulers to purchase and provide bags to tenants in a central location. This model was pioneered by CoRR member EcoSafe Zero Waste, and has not yet been tested in the East Bay.

## **Language Diversity is Essential for Outreach Materials**

Outreach materials for this program were provided in English, Spanish, and Korean. In many cases, the children in households that spoke an additional language were able to translate for the heads of the households. However, there were some cases in which this was not possible. In order for it to be possible for outreach materials to be understood by all residents, additional languages would need to be included, particularly Farsi, Hindi, Mandarin, and Tagalog.

# Acknowledgements

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About Global Green USA and its Coalition for Resource Recovery

Global Green USA is the U.S. arm of Green Cross International, which was founded by President Mikhail S. Gorbachev to foster a value shift towards a sustainable and secure future by reconnecting humanity with the environment. Global Green USA works to create sustainable urban environments and combat global warming through a unique, model-oriented approach that merges innovative research, technical assistance, community-based projects, and targeted education and outreach.

The Coalition for Resource Recovery (CoRR) is a working group of companies, under the direction of Global Green USA, dedicated to combating climate change and generating business value by transforming waste into assets. CoRR conducts pilots and related research to identify and accelerate development of scalable, transferable waste diversion programs and technologies.

For more information about this report and the Coalition for Resource Recovery, please visit [www.thecorr.org](http://www.thecorr.org), or contact Lily Kelly at [lkelly@globalgreen.org](mailto:lkelly@globalgreen.org).

# The Opportunity

Assessing and refining successful food scrap reduction and recovery programs for multi-family dwellings (MFDs) is more important now than ever before. According to the US Census Bureau, over 38% of Alameda County's housing units are in MFDs, totaling approximately 223,000 units of housing and over 600,000 residents.<sup>1</sup> As the county's population continues to grow and demand for multi-family housing stock remains strong, it is likely that a large portion of future housing stock will be in the form of MFDs.<sup>2</sup>

This housing type faces a variety of unique challenges concerning implementation of food scrap recovery. These include: difficulty providing a direct financial reward to tenants for diverting waste, as a building's waste is typically paid for by the building managers and waste production typically cannot be tracked to individual households; perceived inconvenience of food scrap recovery in most high-rise structures (unless floor-by-floor collection areas or chutes were provided in the original design); and concerns about pest control given the large quantities of food scraps generated on a small footprint.

At the same time, access to a concentrated volume of organic waste greater than that of individual family homes creates a unique opportunity to reduce landfilled waste and achieve greenhouse gas emissions reduction goals. Additionally, the availability of local organics processing infrastructure near the East Bay means there are many good outlets for valuable nutrients in unwanted food scraps, were they collected cleanly and conveniently.

An estimated 56,510 tons of organic waste were disposed of from multi-family buildings in Alameda County in 2008,<sup>3</sup> which, given population increases, is likely a very conservative estimate of how much was generated in 2014. However, even assuming this amount remained unchanged, the disposal of this quantity of food scraps into the landfill releases the equivalent of 42,644 tons of CO<sub>2</sub> into the atmosphere.<sup>4</sup> Reducing this by even 25% through source reduction and diversion would yield an emissions reduction the equivalent of planting over 250,000 trees in Alameda County.<sup>5</sup>

1 US Census Bureau. "State and County Quickfacts." Available at <http://quickfacts.census.gov/qfd/states/06/06001.html>

2 Association of Bay Area Governments and Metropolitan Transportation Commission. "Plan Bay Area." Available at [http://files.mtc.ca.gov/s3.amazonaws.com/pdf/Plan\\_Bay\\_Area\\_FINAL/pbafinal/index.html](http://files.mtc.ca.gov/s3.amazonaws.com/pdf/Plan_Bay_Area_FINAL/pbafinal/index.html)

3 StopWaste.org "2008 Alameda County Waste Characterization Study." Available at <http://www.stopwaste.org/docs/acwcs-2008r.pdf>

4 US EPA "Waste Reduction Model (WARM)." available at [http://epa.gov/epawaste/conserves/tools/warm/Warm\\_Form.html](http://epa.gov/epawaste/conserves/tools/warm/Warm_Form.html)

5 US EPA "Greenhouse Gas Equivalencies Calculator." Available at <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

## City of Albany Resource Recovery System

The City of Albany is located in Alameda County, which has a goal of 75% landfill diversion. The City opted into Phase II of the Alameda County Waste Management Authority Mandatory Recycling Ordinance 2012-01 which requires businesses, institutions, and multi-family dwellings to sort their recyclables and organic materials from their trash. In order to ensure compliance, the City of Albany developed a comprehensive outreach plan, of which this project was a key part.

The following is a list of the MFDs selected by Global Green for this study

- 1350 Solano Ave (26 units)
- 1100 Portland Ave (12 units)
- 1062 and 1066 Kains (shared trash service) (8 units each)

These buildings were selected based on several criteria, including their size (the average MFD size in Albany was 10 units, so the study included some above and some below that size) and the proximity of their property managers and owners (we chose buildings whose property managers were based in the region, and so could be easily reached). We also prioritized buildings whose property owner also owned several in the region, and so could easily expand the identified best practices to other buildings.

Each of these buildings receives trash service from Waste Management (WM). In conjunction with Cascadia, WM provided the buildings with one or more 96-gallon recycling bins, at least one 3-yard trash dumpster, and one 64-gallon organics bin. For 1350 Solano and 1062-1066 Kains, the organics bins were deployed just after the initial outreach was conducted. The organics bin at 1100 Portland had been deployed shortly before the initial outreach took place. All collected material from these locations is brought by Waste Management to their Davis Street transfer station in San Leandro, where it is processed as follows:

**Landfill:** At that location, the landfill-bound waste is dumped into a pit and then loaded into long-haul trucks and taken to the Altamont Landfill, among other destinations.

**Recyclables:** The recyclables are sorted into commodities, typically bales of mixed paper, cardboard, tin, aluminum, glass, PET, HDPE, and various other grades of plastics. These are shipped to various destinations to be turned into new products.

**Organic Waste:** The organic materials are transferred into long-haul trucks as well, and are transported to several different composting facilities in the region, including the Redwood Landfill, Grover Landscape Services, and Jepson Prairie Organics. The finished compost is either sold at the composting site, or brought back to the Davis Street Transfer Station to be sold to buyers from the Oakland and San Leandro community.

The following details what materials were indicated as acceptable, according to WM's provided signage, in the bins available to residents at the MFDs in Albany.

## Materials Accepted in Three-Stream System

| Mixed Recycling   | Composting                              | Trash                 |
|---|---|-----------------------|
| Magazines   | All Food                                | Styrofoam             |
| Newspaper   | Coffee Filters And Grounds              | Straws                |
| Office Paper  | Tea Bags                                | Gloves                |
| Cardboard   | All Paper To-Go Boxes & Containers      | Drink Boxes & Pouches |
| Junk Mail   | Napkins                                 | Snack Chip Bags       |
| Cup Lids  | Paper Towels                            | Tetrapak Packaging    |
| Aluminum Cans   | Paper Cups                              | Broken Glass          |
| Pans & Foil   | Paper Plates                            | Plastic Utensils      |
| All Metal Cans  | All Plant Material                      | Broken Dishes         |
| Empty Aerosol Cans  | Waxed Cardboard                         | Textiles              |
| Plastic Bags & Films<br>(Bagged Together In A<br>Clear Plastic Bag) | Clean Untreated Wood &<br>Sawdust       |                       |
| Glass & Plastic Bottles   | Cups                                    |                       |
| Plastic Containers  | Compostable To-Go<br>Boxes & Containers |                       |
| Plastic To-Go Boxes   |   |                       |
| Rigid Plastics No Larger<br>Than 15" In Any<br>Dimension            |   |                       |

# Methods and Results

In coordination with waste haulers, city agencies, and property managers, Global Green undertook in-depth analyses of four targeted buildings to determine two things:

- The expected food scrap diversion rates for a common tenant engagement scenario (door-to-door outreach to tenants, and provision of kitchen pails and bags); and
- Residents' responses, opinions, and suggestions concerning the food scrap recovery program and equipment provided.

To this end, Global Green conducted:

Door-to-door outreach, including delivery of food scrap collection tools for tenants, including:

- Kitchen countertop pails donated by Orbis Corporation
- Paper, water-resistant, compostable bags donated by Bag to Earth. These bags were selected because the composting facilities used by the waste hauler do not accept compostable plastics.
- Outreach materials in English, Spanish, and Korean that explain the purpose and requirements of the program.
- Follow-up tenant surveys at each building 6-8 weeks into the programs to get qualitative feedback on diversion tools provided.
- Waste audits at each participating MFD to determine diversion results.
- Comparison waste audits at similar MFDs that did not receive any equipment, outreach, or assistance to determine the added value of this enhanced tenant engagement strategy.

All diversion and tenant satisfaction results were collected into this report, as well as short guidance documents for property managers. Our goal is that these findings will help guide the ongoing rollouts of food scrap recovery programs at MFDs in Alameda County and across the country.

## Waste Audits

During the weeks leading up to the initial outreach and equipment distribution, Global Green staff undertook at least one waste audit at each location. Then, 6-8 weeks after the program's launch, they undertook at least one follow-up waste audit at each location. The audits were timed to capture a full week's worth of compost, and as many days as possible of recyclables and trash.

At least 3 additional site visits, we came back to check if the waste amounts we recorded were typical volumes. The waste volumes in these check-ins matched the range of amounts recorded in our waste audits.

To ascertain the diversion rates and organics stream contamination, we used the following methodology:

- Using an LCT counting scale with sensitivity to 0.001 lbs., we weighed each unopened bag. Loose materials were bagged and then weighed.
- We noted the weight of the bag, and the bin in which the unopened bag or bag of loose materials was found.
- We then opened each bag of organics, isolated and weighed the contaminants, weighed the organic material contained, and noted the type of contamination found.
- We then combined these data to determine the diversion rate for the building (how much of the waste generated is diverted to a sorting or composting facility) and the contamination rate for the organics stream (how much of the material sent to the composting facility is appropriate to that facility).

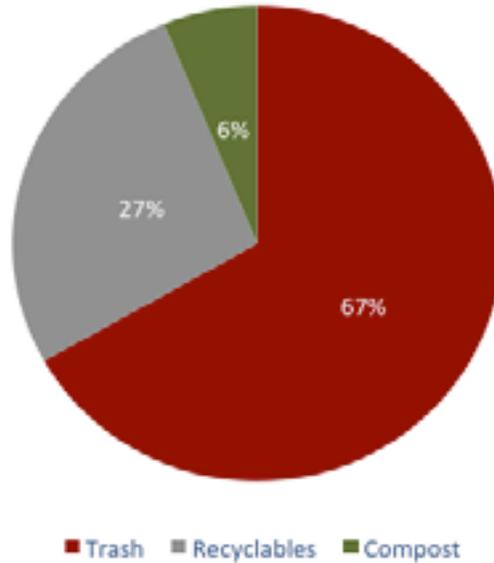
The observed amounts were converted into a weekly estimate based on how many days it had been since the last pickup had occurred for that waste stream. We assumed that pickups occurred in the morning of the day.

For example, an audit that took place on a Thursday evening when trash pickup had occurred on the prior Tuesday morning counted the amount of trash as representing three days' generation (Tuesday, Wednesday, and Thursday). The weekly average would then be derived by taking the observed weight of trash, dividing it by three to get a daily average, and then multiplying it by seven to get a weekly average. This methodology was used for all three waste streams.

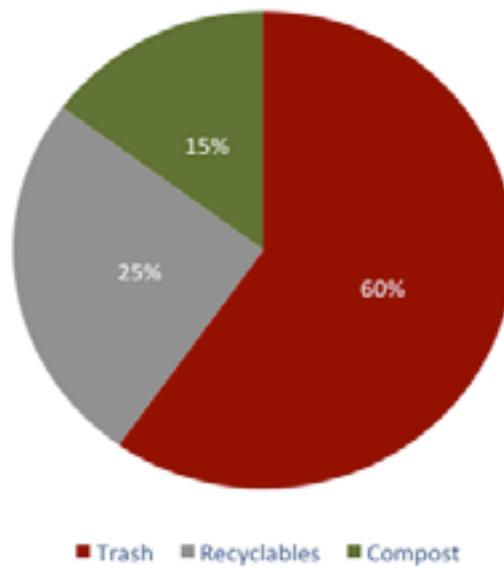
For the overall diversion rates, all material found in either the organics or recycling bins was counted as diverted, even if there were contaminants found, given that this is the way in which the hauler also estimates diversion. All material found in the trash bin was counted as landfilled.

The following graphs are based on the full weekly average waste stream compositions observed from both the four targeted buildings (a total of three waste service areas) as well as three "control" MFDs that did NOT receive training or equipment, and began composting at about the same time as the four MFDs that were targeted by Global Green – where tenants were provided with equipment and training. All measurements are by weight.

## Control Buildings



## Selected Buildings



From these results we can see that the organics diversion was greater by 9% (15% vs. 6%) at the buildings where the tenants were provided with training, kitchen pails, and bags. Overall diversion was also greater by 7% (40% vs. 33%) in the selected buildings. However, it remains clear also that there is much more to be done to fully address the amount of waste going to landfill.

## Tenant Outreach and Surveying

The purpose of this project was to test the efficacy of a commonly used strategy for building buy-in from tenants – door-to-door outreach, combined with provision of basic equipment for collecting food scraps for disposal in the central bin.

Global Green USA staff and volunteers undertook two rounds of door-to-door outreach and surveying at each building – the first round consisted of distribution of equipment and educational materials in English, Spanish, and Korean, one-on-one explanations of how to use the bins and bags, and a “before” survey which was designed to capture some demographic information, as well as determine tenants’ experience with and interest in food scrap recovery.

The second round of surveying was more in-depth, focusing on whether and how the tenants were participating in the program, and the tenants’ use of and opinions on the bags and kitchen pails that were distributed. The results of the second survey are below. The percentages given are of respondents only, and of program participants only unless noted otherwise.

Over the course of undertaking both surveys Global Green reached 85% of the 54 households. There were two strategies that we believe helped to achieve this high percentage. The first was that for two of the four buildings we had either a resident or a property manager who knocked on the doors and introduced the surveyor. The second strategy was to have the surveyors take their time when conversing with tenants, and to form a relationship with them as much as possible. This meant we likely had more residents who opened their doors during the second round of surveying than we would have had the surveyors not taken that extra time to make a connection.

As mentioned above, the outreach materials were provided in English, Spanish, and Korean, but some household spoke additional languages primarily. In many cases, children in households that spoke a language not included on the outreach materials were able to translate for the heads of the households. However, there were some cases in which this was not possible. In order for outreach materials to be understood by all residents, additional languages will be included in future phases, particularly Farsi, Hindi, Mandarin, and Tagalog.

### “Before” Survey Questions and Consolidated Responses

| Questions   | Responses (all buildings)   |
|---|---|
| How long have you lived in this building?   | Average: 9.5 years  |
| How many people live in your household?   | Average 2.2 people  |
| Have you separated your food scraps before in a workplace or previous home?                 | 55% said yes  |
| Do you think that recovering food scraps is important? Why or why not?                      | 100% of respondents said yes, reason given was that it’s good for the environment |
| Are you planning to participate when the building launches the food scrap recovery program? | 100% of respondents said yes.   |

Several of these results are notable. First, the tenants are largely longtime residents; the tenant turnover rate is relatively low, meaning that this kind of training is likely to have a long-term impact on the building’s diversion performance. Second, more than half had separated their food scraps in other situations.

For the last two questions of the survey, the fact that 100% of respondents said they thought it was important and would participate at first appears to indicate that these questions are not useful. However, the data itself actually shows that every person who said that they would participate, and who was home when the surveyor returned, also said they had actually participated. This cannot be verified, but it seems to indicate that a large proportion of people see the merit of participating in the program.

**“After” Survey Questions and Consolidated Responses**

Of the households surveyed during this round of outreach, 9% were not participating. In some cases, language barriers meant that some questions were understood and some were not. The following results represent only those respondents who were participating in the program, and who understood the question and were able to give an answer.

|   | Counter Top | Under Sink | Beside the Trash |
|---|-------------|------------|------------------|
| Where do you store your kitchen pail/bag? | 11%         | 74%        | 15%              |

The kitchen pail is designed to be used on the countertop, but instead more residents were placing it under their sinks or down low beside the trash cans than were using it as it was originally intended. This may be due to concerns about odors and/or flies.

|  | Once a Day | 3-4 Times a Week | 2-3 Times a week | Once a week |
|--|------------|------------------|------------------|-------------|
| How often do you empty the kitchen pail/bag? | 15%        | 22%              | 37%              | 26%         |

Initially, we had predicted that the residents would empty their kitchen pail/bag about twice a week. However, almost as many people were emptying it more frequently, meaning that more bags are going to be needed than originally anticipated. Several residents stated their more frequent emptying of the pail as a response to concern about odors.

|   | Yes, used both | No, used pail only | No, used bag only |
|---|----------------|--------------------|-------------------|
| Do you use a compostable liner in the kitchen pail? | 79%            | 7%                 | 14%               |

This finding showed that by far the preferred method for capturing the food scraps was to use both the bag and the pail together. This is relevant because currently the City of Albany is making only pails available for free to the public. However, more people were using the bag alone than using the pail alone, indicating that bag use improves the experience.

|   | Most frequent response | Other responses   |
|---|------------------------|---|
| What feature do you like most about the kitchen pail? | Odor control           | <ul style="list-style-type: none"> <li>• Reduces flies</li> <li>• Good size</li> <li>• Easy to empty</li> </ul> |

As is common with any food scrap recovery program, there were concerns about odors and flies. For many residents, the pail was seen as a valuable way to mitigate these concerns. The pail was also considered easy to use and well designed, though some residents suggested adding a foot pedal to facilitate its use when it is stored on the floor or under the sink.

|   | Bag Only | Pail and Bag | Pail Only |
|---|----------|--------------|-----------|
| How did you carry your food scraps to the central organics bin? | 63%      | 30%          | 7%        |

A larger than anticipated portion of the residents were bringing their pail and bag down to the compost bin to avoid possible leaking or tearing of the bag. This may have been a precautionary rather than reactionary measure, however, as very few residents reported having experienced either leakage or tearing of the bags.

|   | Ease of Use | Leakage | Odor Control |
|---|-------------|---------|--------------|
| On a scale of 1 to 5 (5 meaning highly satisfied, 1 meaning not satisfied) how would you rank the bag in terms of | 4.42        | 4.35    | 4.63         |

Most residents had only positive feedback concerning both the pail and the bags. The most frequently expressed concern was about how to procure more bags, which indicates a high level of interest in continuing to use them.

|   | Better | The Same | Worse | Never Used Another Bag |
|---|--------|----------|-------|------------------------|
| How would you rank the paper water-resistant bags compared to plastic compostable bags? | 15%    | 15%      | 15%   | 55%                    |

Most of the respondents had either not used another bag, or liked the idea of a paper bag over a compostable plastic bag. However, there were some residents who preferred a plastic bag, mainly because it was perceived to hold more food scraps. A larger size of paper bag may be worth exploring for the next phase.

|  | Yes | No | What was missing                                   |
|--|-----|----|--|
| Did you receive all the information you needed in terms of usage instructions? If not what is missing? | 96% | 4% | Had moved in after program launch, didn't get kit. |

Of those who were participating, only one household indicated that they had not received a kit, but had been bringing their food scraps to the green bin anyway. They were provided with the kit and bags.

|   | No Changes | Changes suggested  |
|---|------------|--|
| Are there any changes or improvements that you recommend? | 44%        | <ul style="list-style-type: none"> <li>• Bins and water-resistant paper bags that are designed to fit together.</li> <li>• Bags available in buildings at all times.</li> <li>• Foot pedal for small pail, since most people keep the pail on the floor or under the sink.</li> <li>• A multi-chamber bin that shows what the desired proportions of waste should look like.</li> <li>• Odor control accessories</li> <li>• Clearer signage on central organics bin</li> </ul> |

The suggested changes have been passed on to the relevant manufacturers, who are exploring the options for altering the products or designing new ones to accommodate these suggestions.

## Next Steps

These Phase 1 Results are just the first of several steps of a larger project designed to gather, analyze, and disseminate information and resources for food scrap recovery system deployments. Specifically, we will be working to determine the expected diversion outcomes for a variety of outreach and engagement strategies that may be undertaken by municipal and county policymakers who will be tasked with designing and maintaining the resource recovery systems at MFDs (and other types of buildings) in their localities.

For the next phases of the project, top priority outcomes will include:

- Expansion upon the initial project in Albany, CA through inclusion of food scrap source reduction toolkits in the door-to-door outreach, and waste audits to determine how much these toolkits reduce food scrap production overall.
- Data on expected diversion/cost improvements of door-to-door outreach and equipment provision for residents of MFDs of a variety of socio-economic backgrounds, and extrapolated improvements to city- and county-wide diversion rates were enhanced outreach to be implemented more broadly.
- Data on expected diversion outcomes from hosting events and tours designed to further engage residents in their local resource recovery system.
- Data on food scrap stream capture rates and patterns at MFDs that have received door-to-door outreach and equipment and events, as well as those that did not.
- Additional data on common resident concerns, confusions, and desires related to food scrap recovery.
- A compilation of this data into both reports and short brochures usable by property managers to help them understand the value of ensuring that that tenants understand the program thoroughly.

Once these outcomes are achieved, property managers and city agencies will be able to make more informed decisions about the types of investments to make in outreach, and more accurately anticipate the reduction and diversion outcomes and returns on investment from a variety of strategies for diverting food scraps from MFDs. If the results demonstrate that reduction and diversion outcomes improve with increased outreach and equipment provision, this may also provide a financial basis for greater investment by waste haulers and/or property managers in ongoing enhanced outreach to residents in MFDs.

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