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Metro | Agenda

Meeting: MRF/CT Subcommittee Meeting #3

Date: Thursday, March 17, 2016

Time: 9:30 a.m. to 11:00 a.m.

Place: Metro Council Chambers

Purpose: To continue discussion of issues related to potential regulation of source separated recyclables material recovery facilities (SSR MRFs) within the region.

Outcomes: The subcommittee will further discuss issues related to the potential regulation of SSR MRFs and will better understand:

- how these facilities operate
- the distinction between different classes of facilities
- Metro's interest in additional regulation

9:30 a.m.	Welcome, Review Summary and Agenda	Roy Brower
9:40 a.m.	How a SSR MRF Processing Facility Operates	Vinod Singh/Dylan de Thomas
9:50 a.m.	Material Composition Findings (Metro studies)	Dan Blue
10:00 a.m	Metro Authorizations and Exemptions Discussion - identify classes, characteristics of different facility types subject to or exempt from Title V - clarify Metro interest in regulation of SSR MRFs	Dan Blue/Warren Johnson
10:30 a.m.	Examples of Facility Impacts and Concerns	Dan Blue
10:45 a.m.	Member Check In and Review Next Meeting Topics	Dan Blue
10:50 a.m.	Public Comments	Public
11:00 a.m.	Adjourn	Roy Brower

For agenda and schedule information, call Dan Blue at 503-797-1863, e-mail: dan.blue@oregonmetro.gov.

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Metro | *Meeting minutes*

Meeting: MRF/CT Subcommittee Meeting #3 Summary

Date/time: Wednesday, March 17th, 2016; 9:30 a.m. to 11:00 a.m.

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- how these facilities operate
- the distinction between different classes of facilities
- Metro's interest in additional regulation

Attendees
Bruce Walker, City of Portland
Theresa Koppang, Washington County
Vinod Singh, Far West Recycling
Brian May, WRI Republic
Jeff Murray, EFI
Dylan de Thomas, Resource Recycling
Scott Farling, Agilyx
Matt Marler, Covanta
Audrey O'Brien, Oregon Dept. of Environmental Quality
Mike Lafferty, Citizen Rep
Francisco Ibarra, Citizen Rep
Betty Patton, Recycling Advocates
Andy Kahut, KB Recycling
Roy Brower, Metro

Absent
Mike Davis

Presenters/Staff:
Dan Blue, Metro
Kim Waxler, Metro
Shane Abma, Metro
Warren Johnson

Guest list is available upon request.

1. **CALL TO ORDER AND DECLARATION OF A QUORUM**

   Chair Roy Brower called the meeting to order and declared a quorum.

2. COMMENTS FROM THE CHAIR AND SUBCOMMITTEE MEMBERS

Chair Brower welcomed members to the third meeting of the Material Recovery Facility and Conversion Technology Subcommittee (MRF-CT).

Subcommittee members and staff supporting the committee introduced themselves.

Chair Brower informed the Subcommittee that there was a signup sheet for guests, that the meeting was being recorded and that the recording would be made available upon request. The meeting summary from the February 24, 2016 meeting was reviewed and approved with a request from Mr. Murray for added content.

Chair Brower provided comments that the meeting was a follow-up to prior Subcommittee meetings and was intended to address some of the data needs identified at the February 24th meeting. Chair Brower indicated his hope that by the end of the meeting that the subcommittee may begin to answer the question whether MRFs that process source separated recyclables should be subject to licensing and inspection by Metro. He further suggested that if there were any other data needs on the part of the subcommittee that those should be expressed during the meeting.

Chair Brower reviewed the main topics for the meeting and the presenters that would discuss those topics including Vinod Singh and Dylan de Thomas who would present on current Metro region MRF operations and equipment used to process materials, Dan Blue who would briefly present findings of a recent material composition findings focusing on curbside recycling set outs in the region, and that Mr. Blue would continue with a discussion of current Metro authorizations and review different classes of facilities in order to clarify what is under consideration for potential licensing and inspection and the types of facilities that are not under consideration at this time. Chair Brower indicated that staff would also share some pictures from current non-licensed facilities within the region.

Mr. Murray spoke to the meeting minutes and asked that staff please add the specific question he raised at the February 24th meeting be entered into the minutes. Mr. Brower assured Mr. Murray that that would be added to the meeting summary.

3. HOW A SSR MRF PROCESSING FACILITY OPERATES – VINOD SINGH, DYLAN DE THOMAS

Mr. Singh and Mr. de Thomas introduced their presentation and screened a video called "Saving Little Pieces of our Earth" that included video footage taken at in region MRFs that receive source separated curbside and commercial recyclables for processing. The video is available online by searching for the title on Youtube or by contacting Dan Blue at dan.blue@oregonmetro.gov.

After screening the video Mr. Singh and Mr. de Thomas showed additional pictures and short video clips taken at Far West Recycling and WestRock MRF facilities in the region to additionally show and describe different machinery and processes used in the processing of recyclable materials in preparation for sending them to markets.

Mr. Singh and Mr. de Thomas provided an overview of how materials flow through the MRF equipment, what types of materials are pulled and consolidated, and some insights and

reminders into current market issues which were discussed in detail at the February 24th meeting.

Ms. Patton asked Mr. Singh and Mr. de Thomas about using optical sorters and sorting out natural HDPE by colors indicating that it was possible to do this, but that most facilities in the area are not using optical sorters (only one in the region) and that most of that work was done by hand sorters.

4. MATERIAL COMPOSITION FINDINGS – DAN BLUE

Mr. Blue reviewed findings from a 2014-15 Metro study that looked at residential curbside recycling and garbage compositions. The full study is posted to the Subcommittee webpage. The study assessed the level of contaminants found in recycling set outs in the region, and also looked at the amount of recyclable material left in the curbside garbage stream. For context Mr. Blue provided contamination rates in curbside recycling from a 2004 DEQ study which was approximately 8.4%, (Mr. Murray clarified that there was another series of the same study done in 2008 by DEQ). The 2014/2015 study indicated an increase in contaminants to 8.9%.

Mr. Blue discussed the composition of the contaminants from the study including: rigid plastics, glass, food and yard debris, film plastics, paper, consumer electronics, and even some household hazardous waste, diapers, and other unidentified contaminants. Mr. Blue referenced that some of this contamination is due to "aspirational" recycling (with the generator thinking (or hoping) that the material should be recycled).

Subcommittee members discussed the disposition of some of the contaminants, for example film plastics, which are being recovered to some degree at some cost. Mr. Murray referenced the 2004-2008 DEQ composition studies and stated that the focus was heavily on recyclables coming out the end of the process with news bales heading to mills (such as plastic bottles and aluminum). Mr. Murray asked, given the change in material composition going to the MRFs and the decline in the amount of newsprint in the mix whether MRFs were selling news bales to domestic markets? Mr. Singh responded no they were not. Mr. Murray's stated that without the volumes of newsprint in the stream, it may not be as difficult to sort out containers from the outgoing fiber streams and that that is less of an issue.

Ms. Koppang referenced a 2011/2012 Washington County study that was similar to the Metro study, and the findings from that study were almost identical in terms of the contamination rates. Mr. Murray indicated that this was partly due to the decline in newsprint in the recycling stream. Mr. Singh indicated that the decline in newsprint is a national trend, to the degree that paper grades have been revised significantly due to these changes in the market. Mr. de Thomas provided further clarification on this shift in material composition coming off the curb.

5. METRO AUTHORIZATIONS AND EXEMPTIONS DISCUSSION

Mr. Blue presented a system graphic that portrayed the scope of Metro authority in terms of regulating facilities in the region, and the variety of classes of facilities that have an authorization from Metro (such as a license, a franchise, a designated facility agreement etc.). The Authorization Graphic is posted to the Subcommittee webpage Mr. Blue and Mr. Brower clarified that of all of the classes of facilities that Metro has authority to regulate, the

focus of the Subcommittee was to look only at two specific classes including source separated recyclable material recovery facilities, and conversion technology type facilities.

Metro's legal authority extends over all of the materials portrayed in the graphic, but that does not mean that Metro regulates all the covered facilities through the issueance of licenses or authorizations, or does inspections routinely at the non-licensed facilities. There are specific classes of facilities that are exempt from this in Metro Code Chapter 5.01. The two classes of facilities that this subcommittee is discussing includes the MRFs that process source separated recyclables and conversion technology facilities. Mr. Blue indicated that there are only six MRFs in the region that are under consideration for the proposed licensing and inspection requirements and currently only one facility that may fit under the Conversion Technology class.

Mr. Kahut asked what gets us from single stream to source separated recycling, is it purely "residential mix?" Mr. Blue and Mr. Brower indicated that that was a critical question for the Subcommittee to address - how and where do you draw that line?

Ms. Koppang mentioned that some facilities in the region are licensed by Metro because they process other materials in addition to source separated recyclables (such as KB Recycling).

Mr. Kahut spoke to his Metro license and that he feels that his facility is being held to a higher standard than several of the currently exempted facilities.

Mr. Blue reviewed a list of the characteristics of a source separated recyclables MRF. This included:

- Accept or purchase comingled curbside and commercial recycling streams for processing, sorting, consolidation, baling, and marketing
- Comingled material typically collected within a regulated environment e.g. franchised collection system
- Variable contamination rates depending on generator practices
- Little or no control over incoming material
- Speculative accumulation can occur and accompanying potential degradation of materials if not processed and moved in timely fashion
- Potential for negative environmental or health/safety issues
- Potential for negative impacts offsite e.g. adjoining properties and community (dust, noise, smell, vectors, litter, fire safety…)
- Subject to negative impacts of a highly volatile commodity market
- Can impact rates charged to generators

6. EXAMPLES OF FACILITY IMPACTS AND CONCERNS

Mr. Blue introduced the next agenda item, which was a series of photos taken at several of the MRFs currently exempt from licensing and inspection. These photos were taken by Metro inspectors or local government representatives over the last 12 years or so. The photos were intended to show both best practices and issues. The photos are included in the meeting PowerPoint which is located on the Subcommittee webpage.

Mr. Marler asked that in the absence of any Metro authority or otherwise, what types of permits do these facilities have to get, or what kinds of inspections are these facilities subject to? Mr. Brower responded that DEQ bases their program on a complaint basis if the facilities are not otherwise permitted or regulated, so it wouldn't rise to the DEQ level

unless there were citizen complaints. Local code enforcement may get engaged but that is rare.

In response to Mr. Marler's question, Mr. Singh responded that there are stormwater permits for these types of facilities, and that OSHA does come in at times, and there are sometimes complaint-based interventions from local government. Mr. Murray commented that he was not sure how Columbia Recycling could be categorized as a MRF since he didn't think it accepted residential curbside recycling and that perhaps it didn't fit in with the other facilities. Mr. Blue clarified that that facility does receive commercial commingled materials including some from franchised haulers and that they do process those materials on site and prepare them for markets.

Mr. Walker mentioned concerns about materials collected within his regulated system going to some facilities that have issues as presented in the photos, and he wants to know what authority he has in regards to where the materials go.

Mr. Murray stated that there are issues, and the industry would like to help solve those problems, but Mr. Murray questioned whether Metro had reached out to some of these facilities to address the issues voluntarily. Mr. Brower responded that while Metro staff have not been refused access to visit the facilities, Metro does not have any standards in place to compel the facility to address any issues that might be identified.

Mr. Murray indicated that back in 2004 industry was willing to consider some voluntary standards, but that process didn't pan out. Mr. Murray posed the question of does the Subcommittee have to only look at the question of whether the facilities should be regulated, or could we first look at other voluntary measures to get to the issues identified?

Mr. Brower responded to this, and indicated an appreciation for the concept, but indicated some concerns for the voluntary approach, pointing the experience of the post-collection MRFs processing construction and demolition waste (C&D) in 2006-2008. At that time, several MRFs attempted to process C&D waste outdoors near waterways. Metro worked with the industry and local government stakeholder to establish "MRF standards" which required C&D processing to generally be done on an impervious surface inside a building. Administrative Procedures for MRF Standards will be posted to the Subcommittee webpage.

Mr. Singh indicated that the proposal for regulation was far reaching, and including operations, including tons per hour, material quality. Mr. Brower clarified that those types of standards were not part of the original intended changes, and are not being proposed for consideration by the Subcommittee. Rather Mr. Brower stated that Metro is interested in housekeeping and operational standards such cleanliness, litter control, vector and odor control etc.

Ms. Koppang provided some comments on behalf of Washington County's inspectors, and spoke to the necessity to have some authority to enter facilities on private property and against the concept of voluntary compliance. She clarified that her inspector's have no authority to go onsite at private facilities, and that they have an interest in seeking transparency on the issue of authority to inspect, go onsite, and address concerns identified.

Mr. Blue commented that public confidence in the system can be damaged by mishandling of materials that came off of regulated collection programs.

Mr. Murray stated that the information provided in the meeting was very helpful, and appreciated the comments from Ms. Koppang, but stated that if program material collected from the curb as recycling ended up going to disposal as solid waste, that would be a state

violation and could be enforced against without any additional Metro regulation. Mr. Brower responded that yes that is the case, but how does one know when violations are occurring?

Mr. Singh invited the Subcommittee to attend an upcoming tour of the Far West Recycling facility to be held later in the week.

7. REVIEW OF THE NEXT MEETING'S AGENDA, PUBLIC COMMENTS, AND FINALCOMMENTS

Mr. Brower invited public comments. Mr. Dave White of ORRA spoke to a number of items including being appreciative of the content of the meeting and that it got to the issues at hand. Mr. White asked when Metro's definitions of solid waste and commingled recycling were revised and why? He further stated that when he had met with Metro late in 2015 he heard Metro discussing ways that Metro could improve the quality of materials coming out of these facilities. He's happy to hear that Metro is not looking to regulate these facilities for those purposes. However, Mr. White referenced a Metro Code section that discussed Performance Standards, Design Requirements, and Operating requirement which to him sounds like requiring standards beyond the housekeeping issues that were discussed at this meeting.

Mr. White also stated that there is confusion around Metro asking the membership to waive their position on Metro's legal authority as a condition of participation on the subcommittee, and that he wanted to confirm that that was not Metro's intention, and that rather Metro doesn't want to revisit the authority issue within the Subcommittee and that there were other venues for that debate. Mr. Brower confirmed that agreeing with Metro's position on legal authority to regulate these facilities was not a precondition of participation on the subcommittee.

Mr. Brower thanked everyone for attending. The meeting adjourned at 11 a.m.

Upcoming MRF-CT Meeting: Monday April 18th, 10 a.m. Metro Council Chamber

MRF/CT Subcommittee Meeting 3

March 17, 2016

9:30 a.m. – 11:00 a.m.

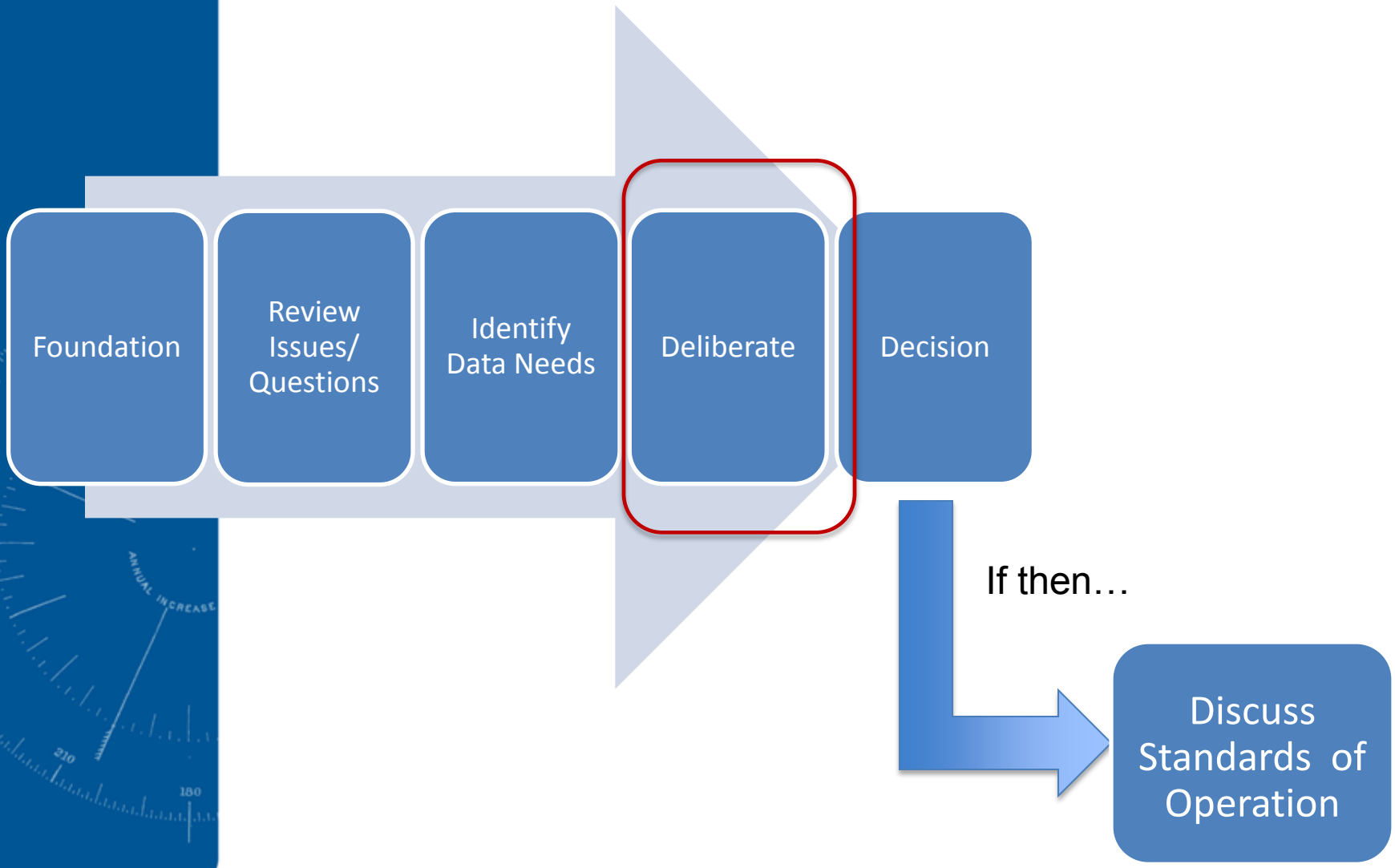
Metro Council Chambers

Agenda

9:30 Welcome, Review Summary and Agenda	Roy Brower
9:40 How a SSR MRF Operates	Vinod Singh & Dylan de Thomas
9:50 Material Composition Findings (Metro)	Dan Blue
10:00 Metro Authorizations and Exemptions	Dan Blue & Warren Johnson
10:30 Examples of Facility Impacts and Concerns	Dan Blue
10:45 Review Next Meeting Topics	Roy Brower
10:50 Public Comments	
11:00 Adjourn	

*see detailed Agenda handout

Process Check



How a SSR MRF Operates

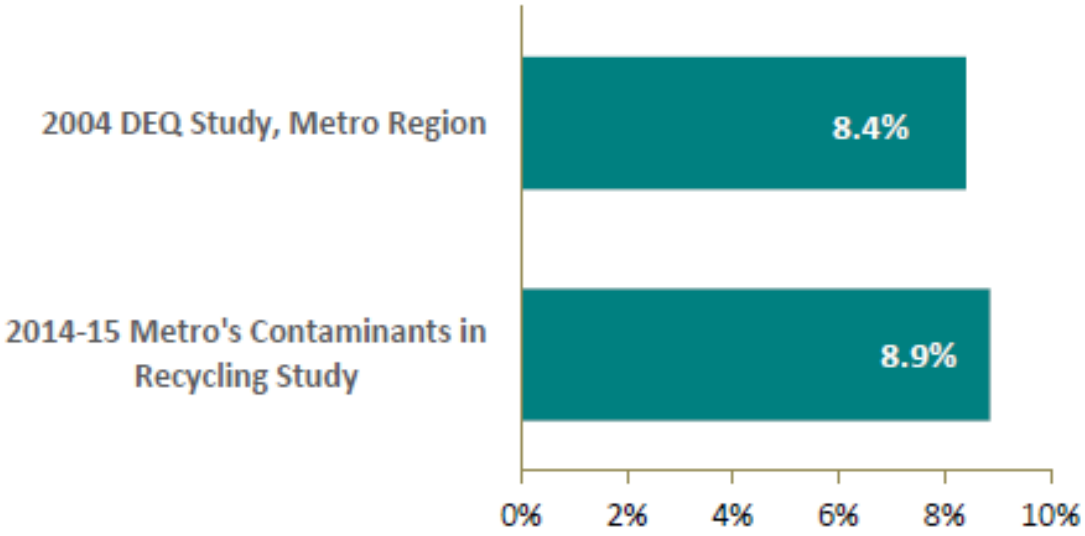
Vinod Singh – Far West Recycling

Dylan de Thomas – Resource Recycling Magazine

Saving Little Pieces…

Material Composition Findings

Figure 13 compares percentage of contamination in recycling for the Metro-area from DEQ's 2004 study to Metro's 2014-15 study.

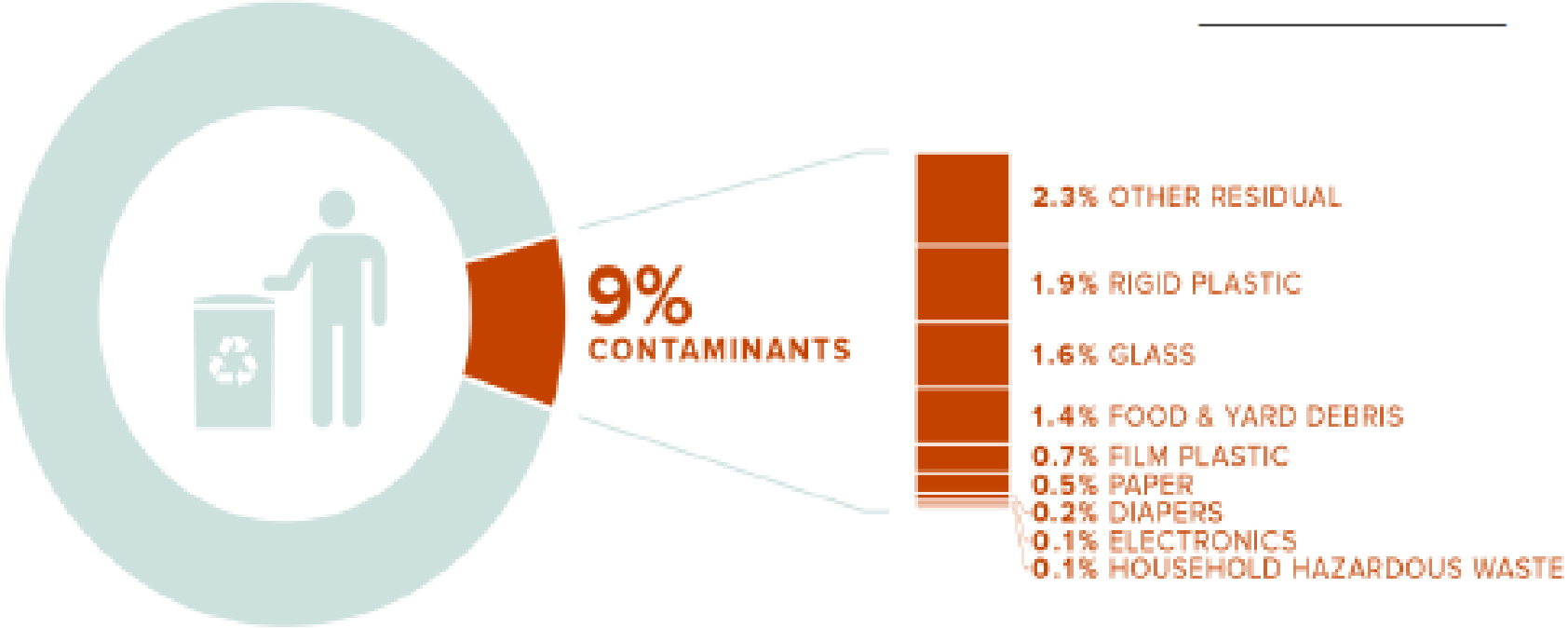


Source: Metro Single-family Recycling and Waste Composition Studies 2014-15

Material Composition Findings

Figure 12: Contaminants in the Recycling Cart: Metro region

The study indicates that the region throws more than 9,000 tons of contaminants in the recycling each year.



Source: Metro Single-family Recycling and Waste Composition Studies 2014-15

Metro Authority

Metro Authorizations (Franchises - Licenses)

Wet Waste (F)
- Pride Recycling
- Troutdale Transfer Station
- Forest Grove Transfer Station
- Willamette Resources, Inc.

Dry Waste (L)
- ECR
- Greenway Recycling
- KB Recycling
- Aloha Garbage
- CORE Recycling

Yard Debris (L)
- Grimm's Fuel
- McFarlane's Bark
- Allwood
- Wood Waste Management

Roofing, Tire, Other Facilities (L)
- RB Recycling (Tires)
- Tire Disposal Corp.
- Northwest Shingle Recyclers
- Thermo Fluids

?

Metro Exemptions (by Code)

Aggregate/Inert Facilities (E)
- Portland Sand & Gravel
- Tigard Sand & Gravel
- Fazio Landfill and Recycling

Single Stream Recyclers (E)
- Calbag
- Schnitzer
- Environmental Fibers Inc. EFI
- Denton Plastics

Conversion Technologies (E)
- Agylix Wastech
- Agylix Tigard
- Gasification*
- Autoclaving*
- Hydropulping*

*MSW or segment of MSW

Source Separated Recycling Recovery Facilities n = 6 (E)
- **Far West Recycling Hillsboro**
- **Far West Recycling Portland**
- **Oregon Recycling Systems**
- **Pioneer Recycling Clackamas**
- **WestRock**
- **Columbia Recycling Inc.**

F = Franchise
L = License
E = Exempted

Characteristics of currently exempt SS MRFs:

- Accept or purchase comingled curbside and commercial recycling streams for processing, sorting, consolidation, baling, and marketing
- Comingled material typically collected within a regulated environment
- Variable contamination rates depending on generator practices
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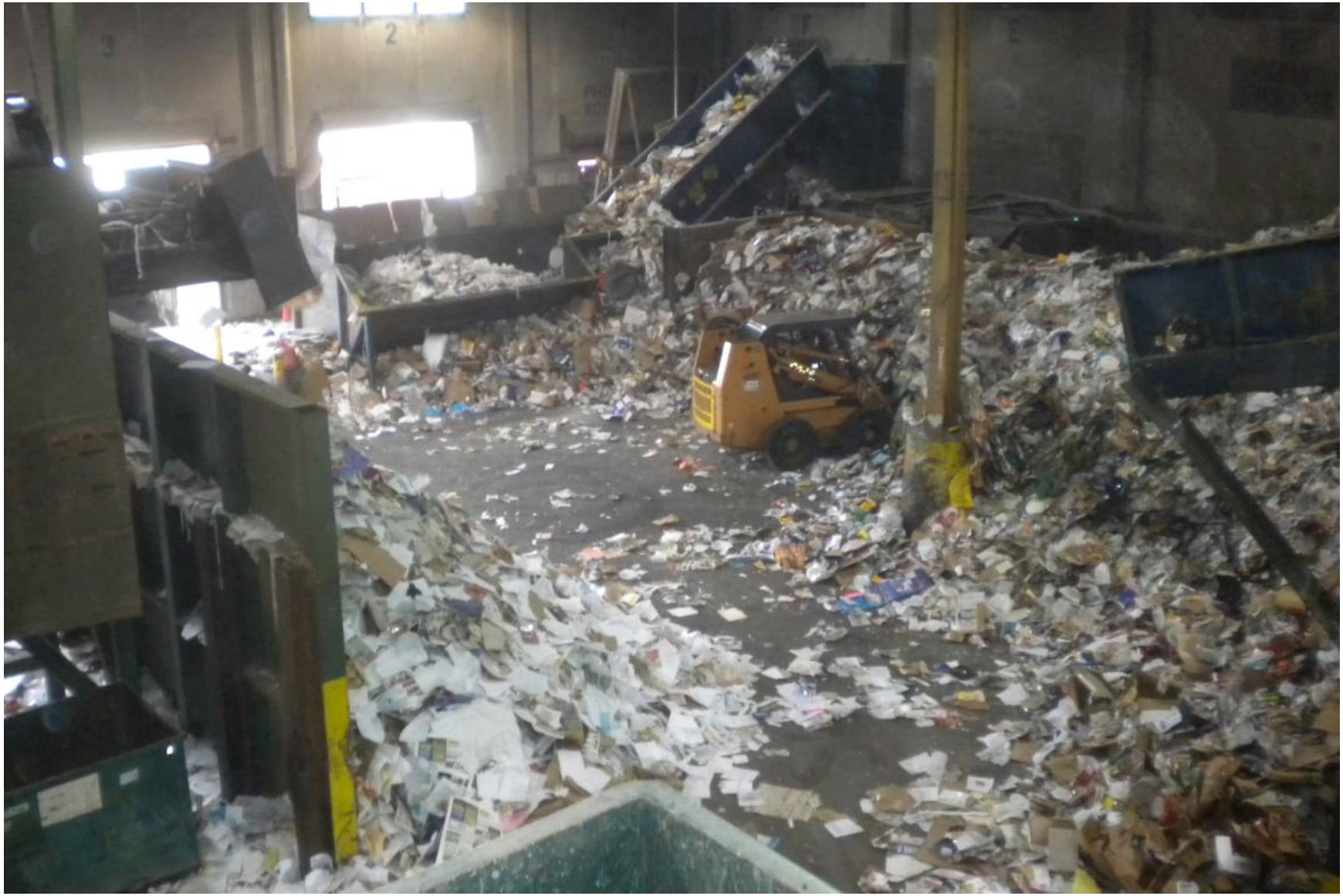

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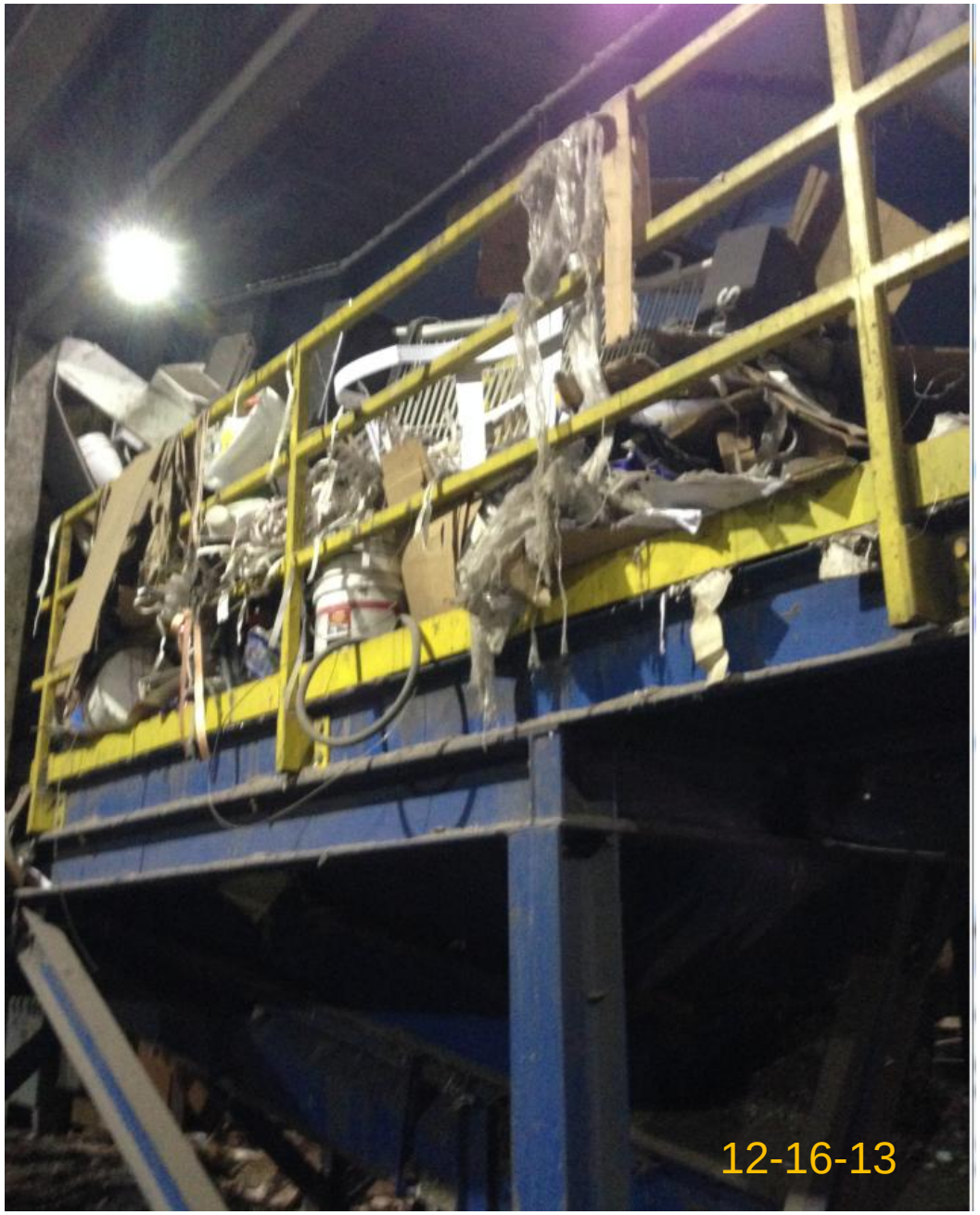
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11:00 Adjourn	

*see detailed Agenda handout

Subcommittee Check In

- Is approach working?
- Anything in particular that is not working for you?

Next Meeting Topics

Meeting: #4 – April 18th 10:000 a.m., Metro Council Chambers

- ***Review Prior Meeting Summary, Clarifications, Questions***
- ***Review Meeting #4 Objectives***
- Deliberation
- Stakeholder feedback, questions
- Pose the Question?
- ***Member Check in (every meeting)***
- ***Review schedule (what's on deck)***

MRF/CT Subcommittee

Adjourn.

Thank You!

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MAKING A GREAT PLACE

Metro

Single-family Recycling and Waste Composition Studies

2014-15

July 2015

About Metro

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy, and sustainable transportation and living choices for people and businesses in the region. Voters have asked Metro to help with the challenges and opportunities that affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to providing services, operating venues and making decisions about how the region grows. Metro works with communities to support a resilient economy, keep nature close by and respond to a changing climate. Together we're making a great place, now and for generations to come.

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The evolution of recycling in our region

Recycling saves energy, reduces air and water pollution, reduces greenhouse gases, and conserves natural resources.

Curbside collection of recyclables makes recycling convenient. This service has been a key element of the Metro region's recycling programs since 1983, when the Oregon Opportunity to Recycle Act required communities throughout the state to provide curbside collection.

Within the region, weekly recycling collection is the service standard for single-family households. However, some communities have moved to every-other-week collection of mixed recyclables and monthly collection of glass.

Recycling makes it possible to use materials that would otherwise go to the landfill to make thousands of products. A successful recycling system depends on the quality of material collected at the curb. A key goal of these studies was to help ensure that the region continue to generate the best and most marketable recyclable materials through its collection programs, while also providing accessible and cost-effective service to the public.

SECTION 1: INTRODUCTION

In March 2015, Metro completed two studies to inform assessments of the performance of the region's single-family household recycling programs. More than 300,000 pounds of household garbage and recycling were collected and sorted over a seven-month period. This report presents the results of the two studies.

Study 1: Curbside recycling program performance

This study looked at the amount of curbside recyclables in garbage carts and compared the performance of less frequent recycling collection programs to weekly collection programs.

Study 2: Contaminants in recycling

This study looked at the amount of contaminants that were in recycling carts and compared the performance of less frequent garbage collection to weekly collection.

SECTION 2: CURBSIDE RECYCLING PROGRAM PERFORMANCE

Overview

This study evaluated the amount of curbside recyclables in garbage carts and compared the performance of different recycling collection programs across the region. More than 240,000 pounds of garbage was collected and sorted to provide data on weekly recycling and less frequent recycling collection programs. Metro designed the study to determine if there are statistically significant differences between types of collection programs, while providing representative results for individual jurisdictions.

Study Questions

1) What amount and type of curbside-acceptable recyclables are being thrown away as garbage?

2) Do weekly and less frequent recycling collection programs perform at an equivalent level?

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Background

Metro and local governments share responsibility for implementing the Regional Solid Waste Management Plan (RSWMP). A component of this plan is the Regional Service Standard (RSS), which establishes recycling service levels and education requirements for businesses and households in the region. The primary purpose of the standard is to ensure a comprehensive and consistent level of recycling service throughout the region. The standard for households is weekly collection of all standard recyclable materials.[1]. Metro is responsible for monitoring the implementation of the standard and overall performance of residential curbside recycling programs. Local governments are required to certify that their recycling service levels are consistent with the Regional Service Standard or apply for an approval of an alternative program.

The alternative program allows a jurisdiction to adopt a program that differs from weekly collection, but achieves the same level of performance. Currently, a local government seeking alternative program approval must implement a study or pilot program to demonstrate how the program will achieve the same level of performance as the regional standard. Metro has found implementation of the alternative program challenging for a number of reasons, including the complexities and costs of conducting individual jurisdiction studies. To date, five jurisdictions have been approved for alternative programs.

Table 1. Approved Alternative Recycling Collection Programs

	Commingled Recyclables	Glass
Regional Standard	**Weekly**	**Weekly**
City of Tigard	Weekly	Monthly
Unincorporated Washington County	Every-other-week	Every-other-week
City of Hillsboro	Every-other-week	Every-other-week
City of Sherwood	Every-other-week	Monthly
City of Durham	Every-other-week	Monthly

[1] These are: (1) commingled newspaper, magazines, catalogs, phone books, corrugated cardboard, scrap paper, milk cartons, plastic bottles/tubs/plant pots/buckets, aluminum/tin/steel cans, small scrap metal; (2) glass bottles and jars in a separate bin; (3) yard debris in a separate cart; and (4) used motor oil in separate plastic bottles.

In response to these challenges, Metro initiated a project to measure the amount of recyclables in garbage loads with the intent of identifying whether there are any statistically significant performance differences between jurisdictions with weekly collection and those with less frequent collection.

Metro will use the study results, along with other information, to determine whether amendments to the Regional Service Standard should be considered to address recycling collection service frequency and reducing the amount of recyclables in the garbage.

Samples getting weighed after being sorted.

Methodology

Number of Samples

A total of 860 samples were collected as a part of the Recycling Program Performance study. Using standard deviation to project the required sample size, Metro and its consulting statistician determined that 97 samples per jurisdiction were needed to calculate the aggregate regional performance of weekly collection programs and of less frequent collection programs. This sample size also allowed for the calculation of jurisdiction-specific performance. Additional information on the study design is in Appendix A.

Sample Selection

For each jurisdiction, Metro randomly selected residential addresses that served as the basis for identifying the truck-loads included in the sampling. For weekly collection service, Metro sampled from five jurisdictions that represented 90 percent of the households in the region with that service level: Portland, Beaverton, Gresham, Lake Oswego and unincorporated Clackamas County. For less frequent service, Metro sampled from jurisdictions that represented 98 percent of the households with that service level: Hillsboro, Sherwood, Tigard, and unincorporated Washington County. The City of Durham was excluded from the study due to sampling challenges associated with the low number of single-family households located within the city.

Collection haulers provided the route information for each of the randomly selected residential addresses and were also asked to confirm the two following criteria:

1) No more than five percent multifamily or commercial customers on the route.

2) No loads from households outside the identified jurisdiction.

If the route failed to meet both criteria, an alternate route was selected.

For some jurisdictions, cross-jurisdictional mixing posed challenges to collecting samples that met the specifications. In these circumstances, an alternative sampling method was used that included a weighted approach where haulers identified eligible routes and the most recent truck weights for those routes. The required number of samples was then distributed across the routes based on the truck weights from the previous week.

Since it was common for more than one household to be randomly selected from a particular route, up to three samples were allowed per truck. Haulers dumped their loads in an elongated pile and the contractor used a 16 cell grid (eight sections, two layers) superimposed over the dumped material. Random numbers were generated and then the contractor took a sample weighing a minimum of 250 pounds from the designated cell. If more than one sample was taken from a truck, the samples were spaced out from the front, middle and back of the truck.

Material Categories

The samples were sorted into the individual material categories listed in Table 1. Metro included the additional materials to inform future program planning.

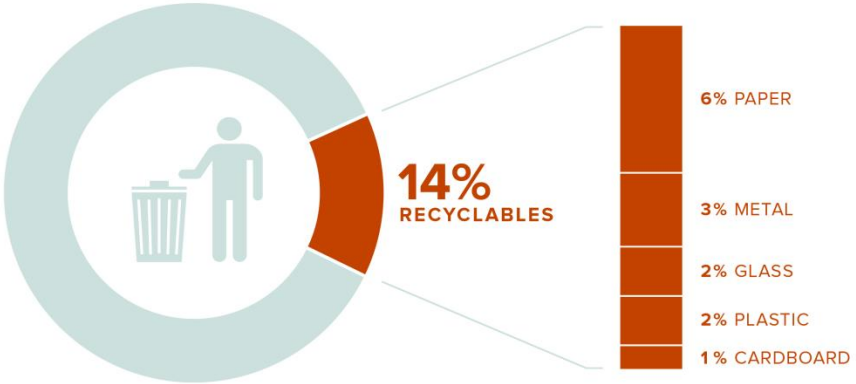
The material definitions used were consistent with the Oregon Department of Environmental Quality's waste composition studies and can be found in Appendix B.

Table 2. Recyclables in Garbage Material Categories
Acceptable curbside recyclables:
1) **Cardboard** 2) **Paper** 3) **Plastic** 4) **Metal** 5) **Glass**
Additional materials:
6) **Yard Debris** 7) **Food** 8) **Compostable material (non-food)** 9) **Household hazardous waste** 10) **Oregon E-Cycles electronics** 11) **Waste**

Regional Performance

Overall, the study showed 14 percent of what's in a typical garbage cart in the region are materials that could have been put in curbside recycling carts. This percentage, shown in the graphic below, was calculated by combining the results from the 860 garbage samples and includes both weekly and less frequent recycling programs. Paper makes up the largest portion of recyclables thrown away as garbage.

Figure 1: Recyclables in the garbage cart: Metro region



Performance by Program Type

The data was further analyzed by program type and by jurisdiction to compare different collection program frequencies. Figures 2,3 and 4 show the data results by jurisdiction. Figure 5 shows the data aggregated by program type.

The study looked at the quantity of recyclables in garbage as a percentage of the samples collected and sorted as part of this study. It did not consider the total weight of garbage or recyclables set out by any single household. Jurisdictional comparisons on a household basis cannot be made because the average weight of garbage in household carts may vary from jurisdiction to jurisdiction. In other words, if jurisdiction A's average garbage cart weight is 30 pounds and jurisdiction B's is 20 pounds, then jurisdiction A's residents are putting more recyclables in their garbage even if the percentage is the same as jurisdiction B's.

It is important to note that the City of Portland changed to every-other-week (EOW) garbage collection in 2011. Since this program change, the city reports that garbage collected from households has dropped by over a third. This indicates Portland households now put less garbage in their garbage cans than they previously did and there may be fewer recyclables in their garbage now, compared to the pre-2011 time period.

Recyclables Disposed

The study indicated that every year Metro-area residents throw away 36,000 tons of acceptable curbside recyclables.

The greenhouse gas emissions benefits of recycling these materials would be equivalent to taking 22,000 passenger vehicles off the road.

Figure 2 shows the percentage of garbage that is recyclables for the jurisdictions with weekly service.

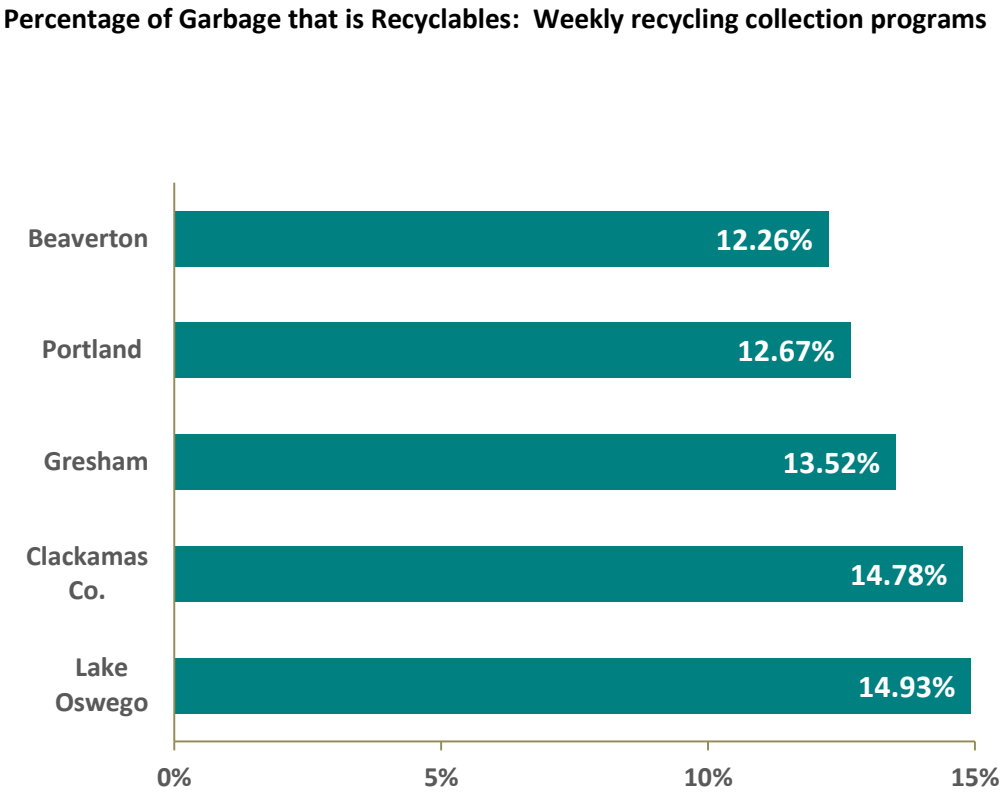
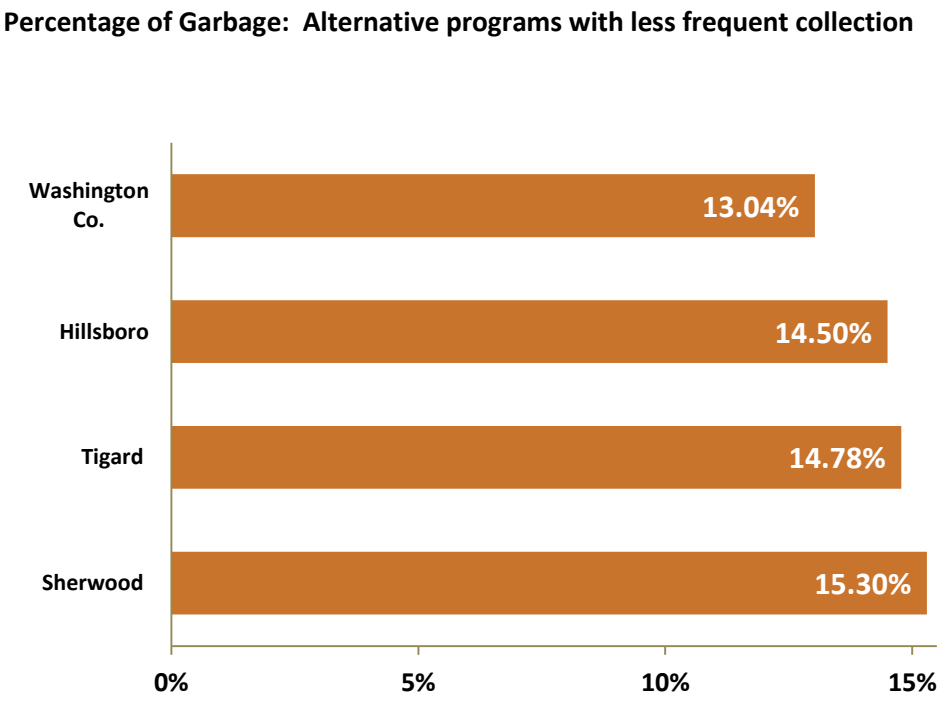


Figure 3 shows the percentage of garbage that is recyclables for the jurisdictions with less than weekly service.



Percentage of Garbage that is Recyclables: All recycling programs

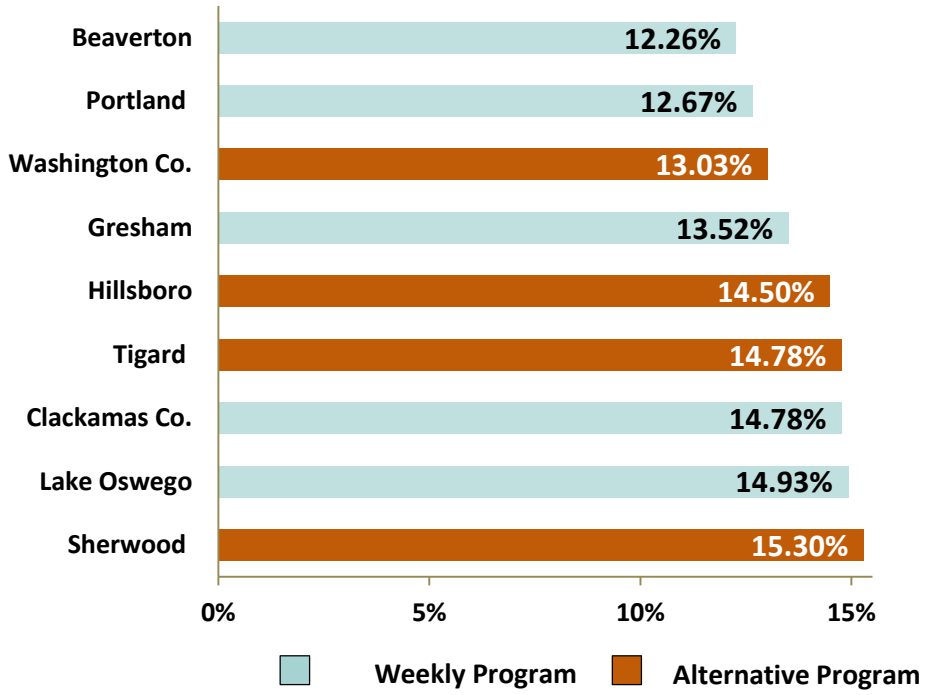


Figure 4 shows jurisdictions with weekly and less frequent collection in sequential order by percentage of garbage that is recyclable.

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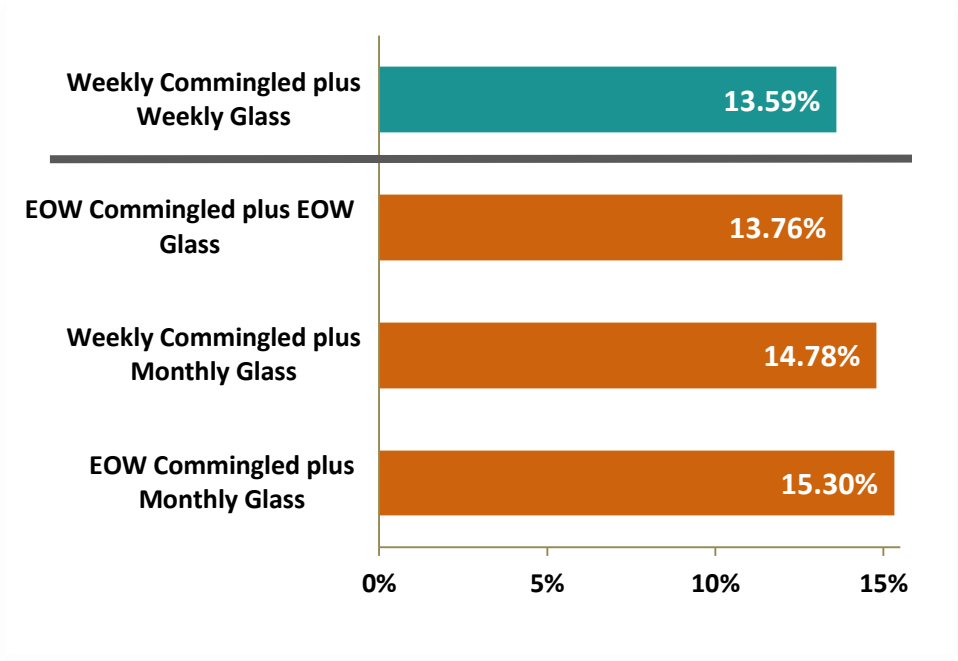
The following table breaks down the percentage of curbside recyclables in the garbage by material.

Jurisdiction	Paper	Cardboard	Plastics	Metal	Glass	Total
Beaverton	4.84%	1.09%	1.59%	2.65%	2.09%	12.26%
Portland	4.66%	2.06%	1.68%	2.88%	1.38%	12.67%
Gresham	5.78%	1.22%	1.82%	2.96%	1.75%	13.52%
Washington Co.	5.18%	1.19%	1.95%	2.70%	2.01%	13.04%
Hillsboro	6.00%	1.14%	2.08%	2.88%	2.41%	14.50%
Tigard	5.51%	1.20%	2.62%	2.86%	2.60%	14.78%
Clackamas Co.	5.64%	1.43%	2.34%	3.13%	2.25%	14.78%
Lake Oswego	6.09%	1.49%	1.63%	3.59%	2.14%	14.93%
Sherwood	6.14%	1.12%	2.46%	3.21%	2.37%	15.30%

Table 3 shows material composition for recyclables in garbage by jurisdiction.

Figure 5 shows the data aggregated by program type Less frequent programs include every-other-week (EOW) and monthly collection.

Percentage of Garbage that is Recyclables: Aggregated data by program type



The average for programs with weekly collection is 13.59 percent. Aggregated averages for the less frequent collection programs range from 13.76 percent to 15.30 percent. The study found no statistically significant difference between the regional standard program (weekly collection of commingled and of glass) and the programs that collected commingled recycling and glass every other week. The study did find that, on average, programs that collected glass monthly had significantly higher percentages of recyclables in the garbage than did the programs that followed the regional standard of weekly collection.

KEY FINDINGS: RECYCLABLES IN GARBAGE

1.0 There was no statistical difference in the aggregate comparison of weekly recycling collection to every-other-week collection.

2.0 There were statistical differences in the aggregate comparison of weekly recycling collection to programs that include monthly glass collection.

Organics pulled from samples of garbage.

Results for Other Materials

Overview

The study incorporated additional material categories, including organics, household hazardous waste and electronics, to help inform future program planning. These materials were not part of the evaluation of recycling collection frequency.

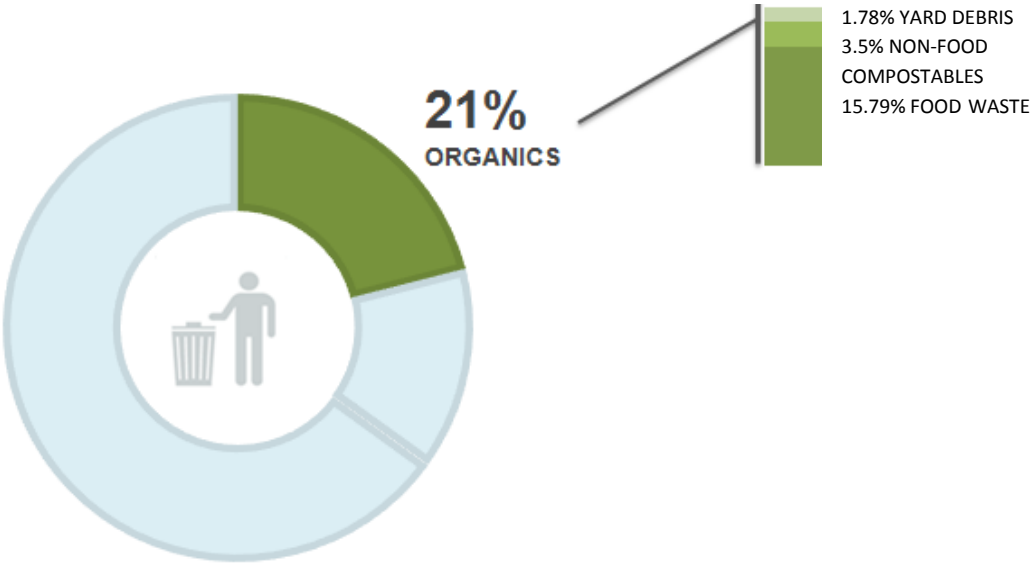
Organics

All Metro-area programs collect yard debris separately for composting, which reduces the amount of organics thrown away in the garbage. The City of Portland also collects food waste and non-food compostables, such as pizza boxes and napkins.

The study found that organics represented 21 percent of the material in garbage carts region-wide and that this material is primarily food waste

Figure 6: Percentage of Garbage: Organics by material

Figure 6 shows the regional average of garbage that is organics.



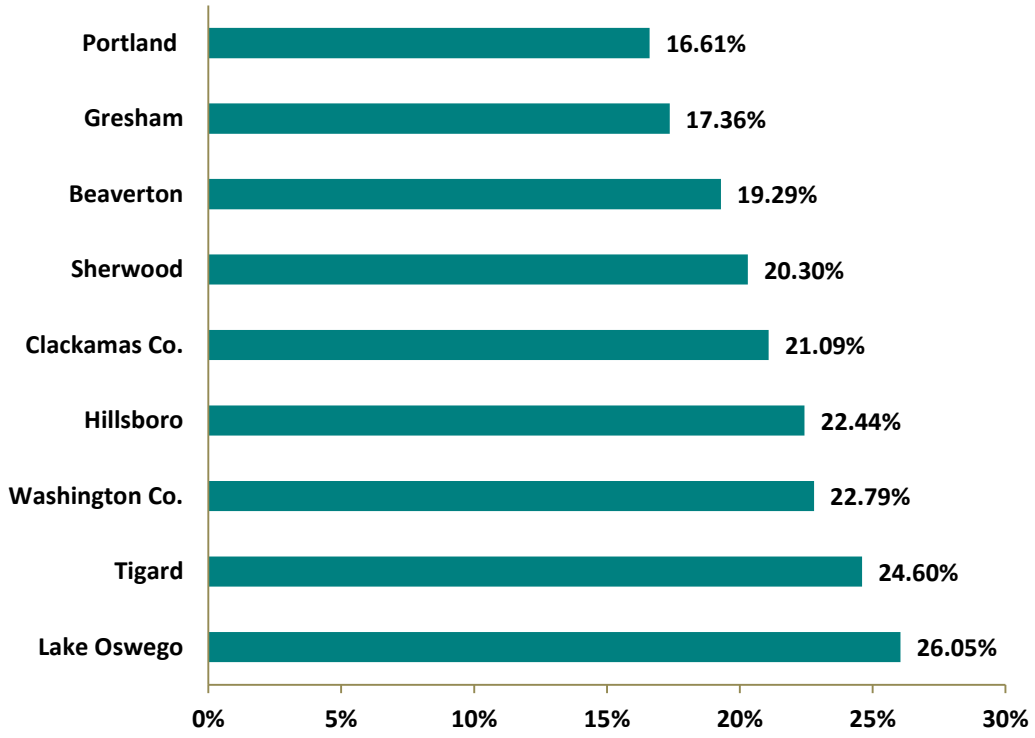


Figure 7 shows the percentage of garbage that is organics by jurisdiction.

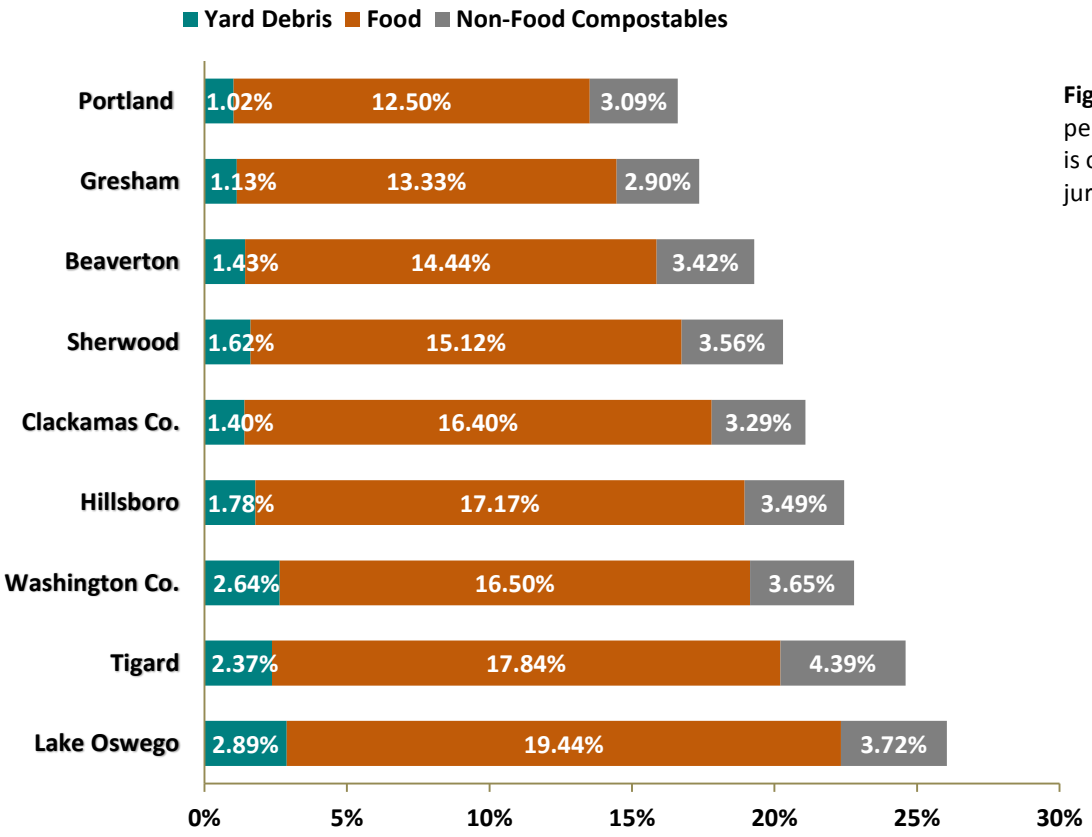


Figure 8 shows the percentage of garbage that is organics by material by jurisdiction.

Household Hazardous Waste

The study found that household hazardous waste represented 0.4 percent of the material in garbage carts region-wide. Metro staff conducted further analysis by sorting the material into additional categories.

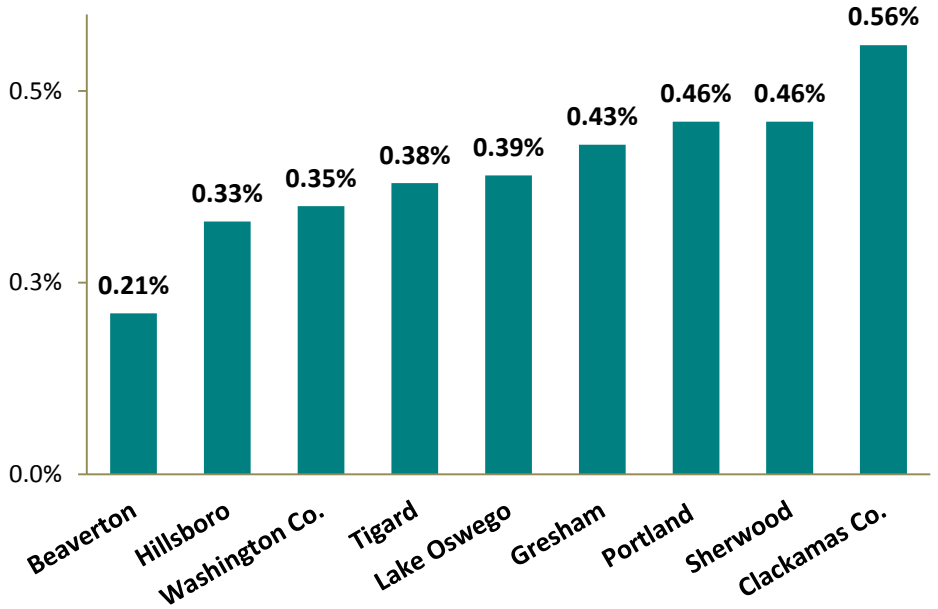


Figure 9 shows the percentage of garbage that is household hazardous waste by jurisdiction.

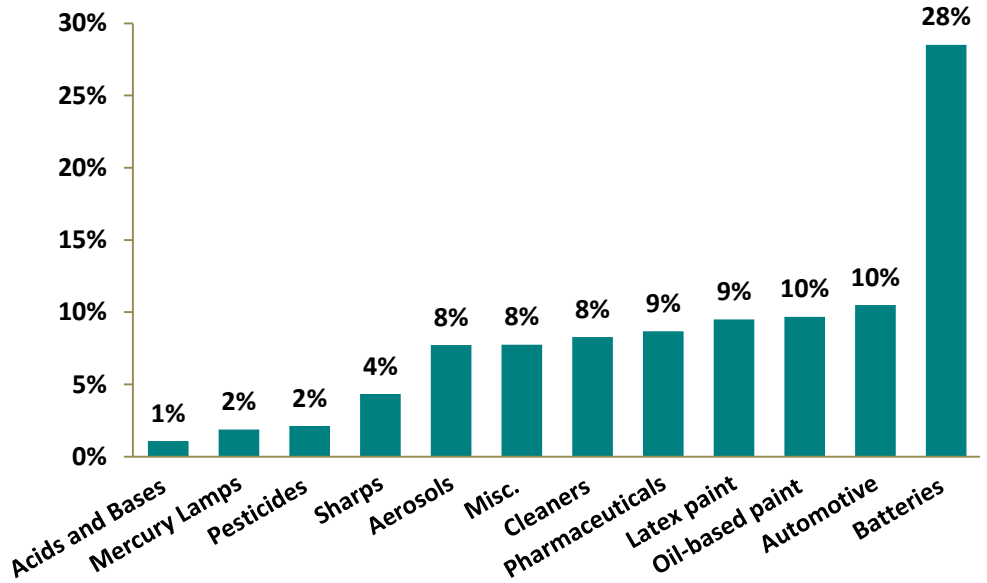
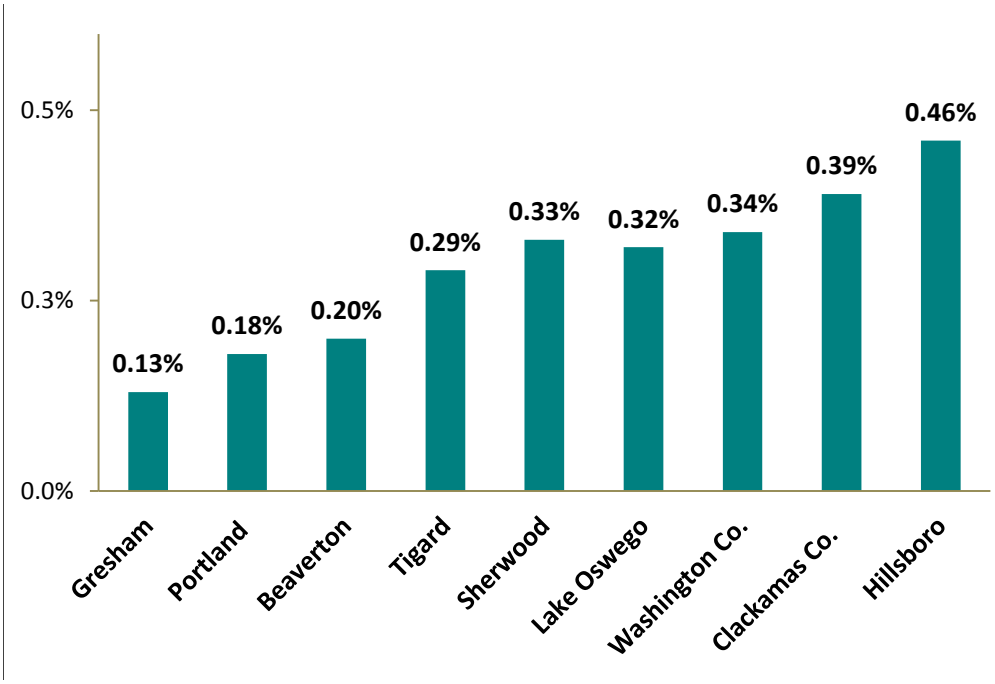


Figure 10 shows household hazardous waste by material type for the region as a whole.

Oregon E-Cycles Electronics

Since 2009, residents have had access to the Oregon E-Cycles program that provides free recycling of computers, monitors and televisions. The study showed that these electronics represented 0.29 percent of the material in garbage carts region-wide.

Figure 11 shows the percentage of garbage that is Oregon E-Cycles materials by jurisdiction.



SECTION 3: CONTAMINANTS IN RECYCLING STUDY

Overview

This study evaluated the amount of contaminants in recycling carts. These are items that are not recyclable curbside. The study compare different garbage collection program frequencies based on data from sampling more than 78,000 pounds of material in recycling carts from weekly and every-other-week garbage collection programs.

Study Questions

1) What amount and type of contaminants are being put in recycling carts?

2) Does every-other-week garbage collection correlate with higher levels of contamination?

Background

In 2011, the City of Portland moved to every-other-week garbage collection, becoming the only jurisdiction in the region with less than weekly service. Although the Regional Service Standard does not address garbage collection, this study was undertaken as a result of concerns expressed by some participants in the regional recycling system about increased contamination accompanying less frequent garbage collection. The study compares contamination levels for the City of Portland program and the rest of the region.

Methodology

The same method used to determine the number of samples for the Recyclables in Garbage study was applied to the Contaminants in Recycling study design. Data from DEQ's 2004 Recycling Composition Study provided the standard deviation estimate planning value. Recycling contamination tends to have more variation than garbage, which increased the total number of samples per jurisdiction to 139 each, for a total of 278 samples. The samples were sorted into eleven material categories, with one for the total amount of acceptable curbside recyclables and also individual categories to measure major contaminants. The material categories are listed in the table below. For more information on the study design please see Appendix A.

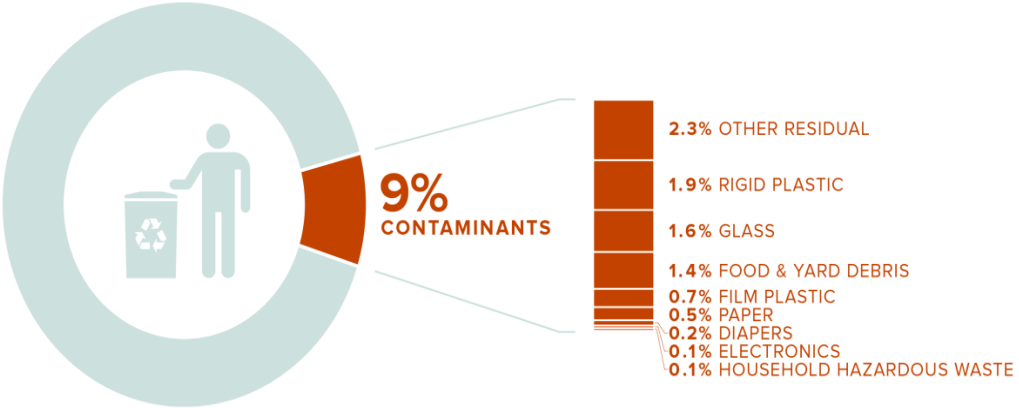
Table 4: Material categories
1) Acceptable standard recyclables
2) Glass containers (in the commingled cart)
3) Plastic bags and film
4) Unacceptable paper
5) Unacceptable rigid plastics
6) Yard debris and food waste
7) Diapers
8) Household hazardous waste
9) Oregon E-cycles electronics
10) Other residuals

The study indicates that the region throws more than 9,000 tons of contaminants in the recycling each year.

Regional Performance

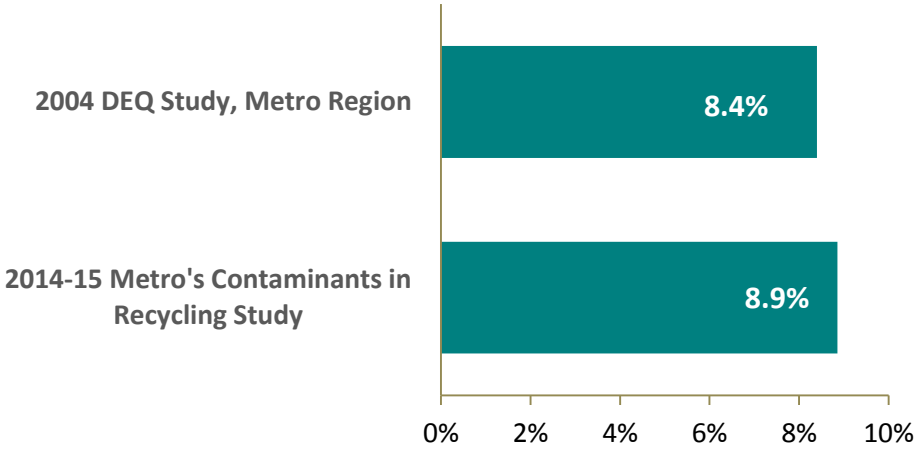
Using the study results, Metro calculated regional averages for the amount and types of contaminants in recycling carts from single-family residents. The study showed a regional average of 9 percent contamination in recycling carts.

Figure 12: Contaminants in the Recycling Cart: Metro region



The level of contamination has stayed relatively consistent over time, based on a comparison to a DEQ 2004 contamination study of roll carts.

Figure 13 compares percentage of contamination in recycling for the Metro-area from DEQ's 2004 study to Metro's 2014-15 study.



Performance by Program Type

The study analyzed the sampling data to determine if every-other-week garbage collection correlated with higher contamination levels in the recycling. The results indicated a slight difference for the two service levels with the every-other-week garbage program with a lower percentage of contamination. However, the statistical test used to compare them did not detect a difference in the level of contamination. Therefore, every-other-week garbage collection did not correlate with higher overall contamination levels in recycling.

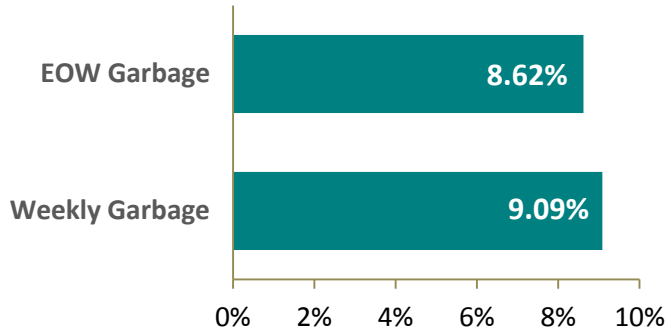


Figure 14 compares percentage of recyclables that is contaminants in recycling between weekly collection and Portland's every-other-week (EOW) garbage collection program.

Even though there is no difference in the overall average of contamination, there are statistical differences between Portland's every-other-week garbage collection program and the rest of the region's weekly program for four materials: other residuals, diapers, glass and film plastic.

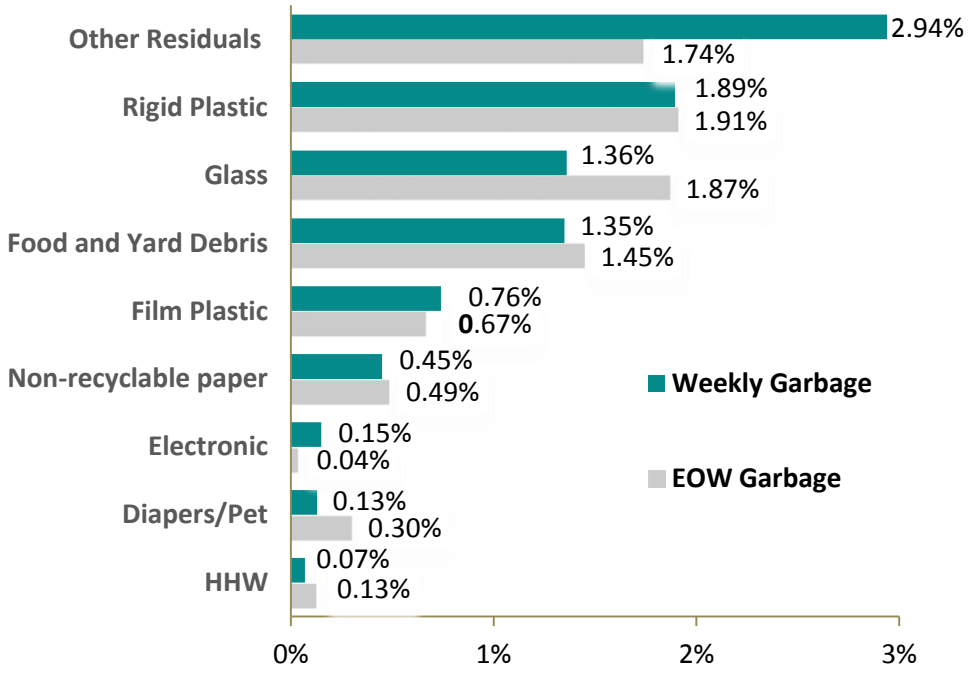
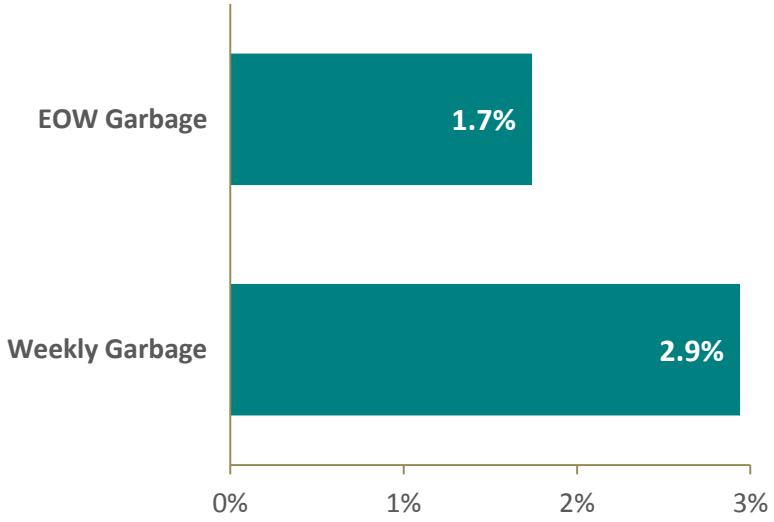


Figure 15 shows the material composition of the recycling contamination found in Portland every-other-week (EOW) samples compared to the regional samples with weekly garbage collection.

Other residuals

Regional samples had more of the materials categorized as "other residuals" in the recycling compared to the Portland samples. Materials common in this category were items such as carpet, clothing, wood, furniture pieces and non-recyclables glassware.

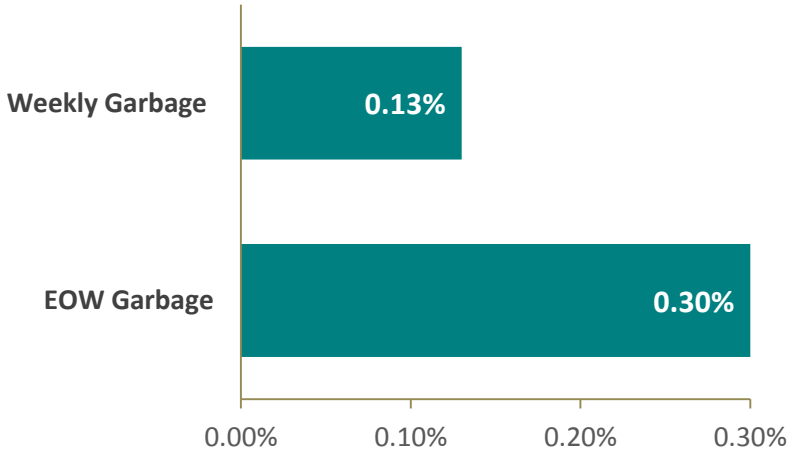
Figure 16 shows the percentage of recyclables that is other residuals in commingled recycling in programs with weekly collection and City of Portland's every-other-week (EOW) garbage collection.



Diapers

Diapers were found in recycling carts across the region, with Portland's samples showing more diapers than in non-Portland samples. Diapers pose health hazards for workers who collect and sort recyclables. They also soil paper and other materials, preventing them from being recycled. If the Metro region had as many diapers in the recycling as Portland, there would be an additional 178,000 pounds of diapers in the recycling per year.

Figure 17 shows percentage of recyclables that is diapers in programs with weekly collection compared to City of Portland's every-other-week (EOW) garbage collection program.



If the region as a whole had only 5 bags per sample, that would mean 7.2 million fewer shopping bags contaminating the recycling.

Plastic film and shopping bags

Plastic film[2], including shopping bags that are not recyclable curbside, was found in recycling carts across the region. These plastics can jam up sorting machinery at recycling facilities, increasing the cost of converting recyclables into new products.

There was no statistical difference for Portland samples compared to the regional samples for non-shopping bag plastic film, such as produce bags and wrap. However, there was a difference for plastic shopping bags, with Portland samples having an average of five shopping bags per sample and regional samples having 17 bags per sample.

Table 5. Average weight (in pounds) and item count for film and shopping bags per commingled recyclables sample

	Other Film	Shopping Bags	Bag Count
Portland	1.83	0.11	5
Rest of region	1.80	0.33	17

Glass

Glass is intended to be collected curbside in a separate bin instead of in the recycling cart throughout the Metro region, but was found as a contaminant in the recycling cart in both programs. There was a statistically significant difference between the programs for the amount of glass in the recycling samples, with Portland having more glass compared to the rest of the region.

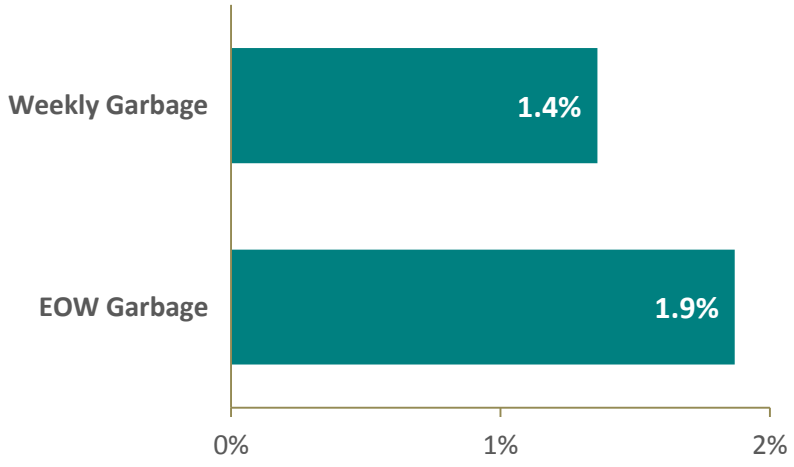


Figure 18 shows the percentage of commingled recyclables that is glass in programs with weekly collection compared to City of Portland's every-other-week (EOW) garbage collection program.

[2] Plastic film includes plastic bags, tape, sheeting, and other non-rigid items.

The Oregon Bottle Bill requires every container of carbonated soft drink, beer and water sold in Oregon to be returnable, with refund value currently set at a nickel.

Oregon Bottle Bill Deposit Containers

The study also looked at the amount of deposit containers in each recycling sample. Table 4 shows the average weight of deposit containers for samples collected from Portland and the rest of the region. There was a statistical difference in the number of deposit containers with the Metro region having more deposit containers per sample.

Table 6. Average weight (in pounds) and count for deposit containers per commingled recyclables sample

	Weight	Deposit Container Count
Portland	2.03	45
Rest of region	2.44	52

Key Findings for Contaminants in Recycling:

1.0 Every-other-week garbage collection does not correlate with higher overall contamination levels in the recycling.

2.0 There are statistical differences for material-specific contamination between weekly and every-other- week garbage collection.

SECTION 4: SUMMARY OF CONCLUSIONS FROM THE TWO STUDIES

There is an opportunity to reduce the amount of recyclables in garbage carts.

The study showed that 14 percent of what's in garbage carts is material that could have been placed in curbside recycling carts. This percentage indicates that approximately 36,000 tons of curbside recyclables are disposed each year.

Every-other-week collection of commingled recyclables and glass did not show more recyclables in the garbage compared to weekly collection of these materials.

There was no statistical difference in the aggregate comparison of weekly recycling collection to every-other-week collection. However, there were more curbside recyclables in the garbage in communities with monthly glass recycling collection than in communities with weekly or every-other-week glass collection. In particular, the two jurisdictions with monthly glass recycling collection had more glass containers in the garbage than did any of the jurisdiction with more frequent glass collection.

Every-other-week garbage service did not show more overall contamination of recycling than weekly service.

There was no statistical difference in overall contamination in recycling carts when comparing weekly garbage collection to every-other-week collection. However, there were statistically significant differences identified for some specific materials.

There is an opportunity to reduce the amount of contamination in recycling carts.

The study showed a regional average of 9 percent contamination in recycling carts. This amounts to about 9,000 tons of contaminants placed in recycling carts annually. The level of contamination has remained constant over the last ten years. Diapers and plastic bags have been identified by many of the processing facilities as being particularly problematic. Diapers pose health hazards to workers at recycling facilities and prevent materials from being recycled. Plastic bags impair machinery, increasing processing costs for facilities.

Looking Ahead

Working together, Metro and its city and county partners will use these studies, along with other information, to answer the following questions:

- Should the region work on reducing the amount of recyclables in the garbage? If so, how do we best do that?
- Should the region work to reduce the amount and types of contamination found in recycling carts? If so, how do we best do that?
- Should less frequent recycling collection programs be a generally accepted practice in the region? How might this affect the entire system of collecting recyclables, yard debris, food scraps and garbage?

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Metro Central
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Forest Grove Transfer Station
Troutdale Transfer Station
Willamette Resources
CRC Vancouver
Metro South
Far West Recycling (all locations)
SP Recycling
Oregon Recycling Systems
KB Recycling
Rock Tenn

Metro would also like to thank local governments and recycling and waste collection companies for their participation in the study and providing the route information needed to allow collection of the samples.

Metro Authority

Metro Authorizations (Franchises - Licenses)

Wet Waste	Dry Waste	Yard Debris	Roofing, Tire, Other Facilities
F Pride Recycling	L ECR	L Grimm's Fuel	L RB Recycling (Tires)
Troutdale Transfer Station	Greenway Recycling	McFarlane's Bark	Tire Disposal Corp.
Forest Grove Transfer Station	KB Recycling	Allwood	Northwest Shingle Recyclers
Willamette Resources, Inc.	Aloha Garbage	Wood Waste Management	Thermo Fluids
	CORE Recycling		

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Metro Exemptions (by Code)

E Aggregate/Inert Facilities

Portland Sand & Gravel
Tigard Sand & Gravel
Fazio Landfill and Recycling

E Single Stream Recyclers

Calbag
Schnitzer
Environmental Fibers Inc. EFI
Denton Plastics

E Conversion Technologies

Agylix Wastech
Agylix Tigard
Gasification*
Autoclaving*
Hydropulping*

*MSW or segment of MSW

E Source Separated Recycling Recovery Facilities n = 6

Far West Recycling Hillsboro
Far West Recycling Portland
Oregon Recycling Systems
Pioneer Recycling Clackamas
WestRock
Columbia Recycling Inc.

F = Franchise
L = License
E = Exempted