RESIDENTIAL COMPOSTING MONITORING PROGRAM: A CONTAMINANT NOTIFICATION SYSTEM FOR THE CITY OF EUGENE'S PILOT RESIDENTIAL COMPOSTING PROGRAM

Megan McGowen
Bree Nicolello

Under the supervision of Jason Dedrick, Robert Parker, and Bethany Steiner

December 10, 2015

Executive Summary

The City of Eugene, Oregon seeks a monitoring plan for their residential composting pilot, to begin in Fall 2016. Through the University of Oregon Community Planning Workshop (CPW), a team of two undergraduate students researched literature and case studies, as well as conducted informational interviews, to develop recommendations for the City. This report synthesizes their findings and recommendations, in addition to providing resources and tools for implementation of the plan.

As the crux of the monitoring plan is to mitigate potential contamination of residential compost, the students conducted informational interviews with key partners to determine individual needs and capacity. Furthermore, the team reached out to two of their case study cities, Renton, Washington and Cambridge, Massachusetts, to learn more about their specific monitoring programs. They also performed a literature review to understand existing conditions and needs that research has identified.

A major theme that emerged from student research is that various pilot partners may have different definitions of success. For the pilot to be successful, partners will need to collaborate on mutual goals and outcomes, to ensure that the needs of both public and private partners are being met. Moreover, another theme that became increasingly apparent is the pressing manner of successfully housing and circulating data and trends. A strong pilot will have standards for data collection across partners, as well as protocol for input and ensuring transparency through consistent communication and dissemination.

Having established best practices, the project team created a set of recommendations that encompass the aforementioned themes. These recommendations include:

- Increasing City FTE or hiring a third party consultant to conduct monitoring/contamination notification efforts
- Weight
- Database
- Audits/visual audits
- Surveys
- Data dissemination

This report addresses key needs and considerations for a successful monitoring program, as well as recommendations for addressing them.

About the Community Service Center

The Community Service Center (CSC) of Oregon, a research center affiliated with the Department of Planning, Public Policy and Management at the University of Oregon, is an interdisciplinary organization that assists Oregon communities by providing planning and technical assistance to help solve local issues and improve the quality of life for Oregon residents. The role of the CSC is to link the skills, expertise, and innovation of higher education with the transportation, economic development, and environmental needs of communities and regions in the State of Oregon, thereby providing service to Oregon and learning opportunities to the students involved.

About the Community Planning Workshop

The Community Planning Workshop (CPW) is an experiential program within the Department of Planning, Public Policy and Management at the University of Oregon. Students work in teams under the direction of Faculty and/or Graduate Teaching Fellows to develop proposals, conduct research, analyze and evaluate alternatives, and make recommendations for possible solutions to planning problems in Oregon communities. The CPW model is unique in many respects, but is transferable to any institution that desires to link pedagogy with community service.

CSC Directors and Staff

Josh Bruce, AICP
Julie Foster
Michael Howard
Robert Parker, AICP
Megan Smith
Bethany Steiner
Titus Tomlinson

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Background

The City of Eugene has a population of 159,190 and produces 40 million pounds of food waste every year. Each ton of food waste diverted from the landfill prevents approximately one ton of carbon emissions. To meet statewide organic waste reduction targets, as well as goals addressed in the City's Climate Recovery Ordinance, it is essential for the City to provide innovative sustainable services and programs to residents. Therefore, the City is expanding beyond their existing commercial composting program, *Love Food, Not Waste* (LFNW), and pursuing residential food waste diversion solutions. Composting provides numerous benefits to residents, including nutrient rich soil, carbon capture, and increased community engagement. Food waste, also known as organic waste or material, includes any kind of food product and excludes paper and compostable products.

Project Description

As part of statewide initiatives to reduce organic waste in Oregon's waste stream, the City of Eugene is launching a residential composting pilot project in fall of 2016. The proposed residential composting pilot program will commence in Fall 2016 and include four neighborhoods within the Eugene area. These neighborhoods will be chosen based on routes (service from Lane Apex or Sanipac), demographics, and other relevant factors. Residents in participating neighborhoods will be given a container they can use to place food scraps in their kitchen. Organic material will then be placed in yard debris container and picked up on a weekly basis. Garbage haulers will then bring this material to Rexius, a local commercial compost facility that processes food and yard debris into compost.

To be successful, the City of Eugene must work closely with local partners to determine what is allowable waste in the composting stream. Based on the capacity of Rexius, compostable items accepted would include all organic materials, but exclude paper products. Therefore, it is critical for the City to develop a system of notifying residents about contaminants in their food waste, as well as providing extensive education and outreach around the composting process. Contaminants include any product that is not food waste, including inorganic compostable materials, food soiled paper, and plastic-based materials. The largest contaminant in most composting streams are plastic bags.

The fee structure is being discussed among City staff and potential partners. Participants in the program will be able to use the composting service at no extra cost. The City will likely pay for contamination fees, as a certain level of contamination is unavoidable. Should the program be expanded, these fees are likely to be incorporated into the overall rate structure per customer, also known as an "embedded fee." The City can also pursue an additional fee-based structure, in which residents can opt into participating and add compost service to their household. The pilot neighborhoods will be based on route data for participating haulers. Currently, the City is in discussion with both Lane Apex and Sanipac about potential participation, as they are two of the largest haulers in the area.

Although many details of the program have yet to be finalized, the monitoring strategies described in this plan are scalable. Based on data collected from monitoring and program evaluation, the yearlong pilot project will inform the eventual development of a permanent residential composting program in the City of Eugene.

Methodology

This report is based on informational interviews, literature research, and case studies. We conducted informational interviews with the following: City of Eugene Code Enforcement; Rexius; Lane Apex; Sanipac; the City of Renton, Washington; and the City of Cambridge, Massachusetts. A robust level of research and case study development was also conducted and the case studies included in this report were chosen because of their demographic relevance to Eugene. Additionally, cities that had conducted compost programs with three or more garbage haulers were highly valuable, as Eugene has an open market for waste management services. Interviews were conducted with the cities of Renton and Cambridge because their pilot program included the most comprehensive practices for monitoring that could apply in the context of Eugene.

How to Use this Report

I. **Case Studies**: This section details the case studies selected for this report and details each component of their monitoring programs. They also break down the number of haulers in the area, as well as whom the City partnered with to carry out their pilot.
II. **Recommendations:** This chapter describes the project team's recommended monitoring plan, as well as implementation strategies and potential timelines.
III. **Conclusion:** This portion of the report lays out how this monitoring plan can be used to set goals for the pilot, as well as how to leverage this information effectively.
IV. **Appendix**: The appendix contains the full text of our informational interviews, detailed case study information, and resources for the City to use when integrating this monitoring plan into their work.

Terms and Definitions

Organics: Any food waste, including meat and dairy, that is thrown out
Every Other Week (EOW): Refers to a collection frequency in which garbage is collected every other week
Audit: An in-depth examination of compost containers, in which a monitor will thoroughly search through a compost container to evaluate its contents.
Visual Audit: A quick scan of a compost container, simply by opening lid, to briefly evaluate bin condition
Tagging: Placing a "tag" or paper notification on a cart. This can include positive or negative information.
Contamination: Whenever non-organic waste is placed into a compost bin. This includes
Compost: Food waste mixed into yard debris
Embedded Fee: When fees to participate are integrated into an overall fee structure. For example, rather than paying an additional fee for service, a customer would be switched to EOW collection and receive weekly compost pick-up.
Haulers: References the garbage haulers (Lane Apex and Sanipac)
Diversion Rates: The rate of food waste diverted from the landfill
Set outs: The number of participating households that set out compost on any given day.

Part I: Case Studies

The matrix below compares key characteristics of each pilot program examined in the case study evaluation. These features are highlighted specifically due to their relevance to the contamination notification and monitoring aspects of each city's pilot program. These case studies also informed many of the recommended practices for the City of Eugene's pilot. For a more detailed description of each city's pilot program, please see pages 19-20 in the appendix.

Figure 1. Case Study Pilot Program Overview

	Tacoma, WA	**Renton, WA**	**Portland, OR**	**Cambridge, MA**
Overview				
City Population	203,446	98,404	619, 360	107,289
Length of Pilot	6 months	5 months	1 year	1 year
# and Type of Hauler(s)	- 1 hauler - Public	1 private	- 4 Haulers - Private	- 1 hauler - Public
Type(s) of Participating households	- Single family - duplexes	Single family	- Single family - Multi-family (2-4 units)	- Single family - Multi-family
# of Neighborhoods	2	3	4	1
# of households	1,370	- 1,429 (independent variable)	2,000	554
Rate Structure	Embedded fee	Embedded fee	Embedded fee	No fee to participate
Acceptable Materials	- All solid food - Brown bags/newspapers	- Food scraps - Food-soiled paper	- All food scraps - Paper products	- All food scraps - All soiled paper - Certified compostable products

Figure 2. Monitoring Plan Highlights, Case Study Pilot Programs

	Tacoma, WA	**Renton, WA**	**Portland, OR**	**Cambridge, MA**
Monitoring/Data Collection				
Frequency of Collection	- Weekly organics - Garbage EOW	- Summerwind Control Area (weekly garbage with smaller bins, weekly compost) - Tiffany Park (EOW garbage with WM-carts, weekly compost) - Glencoe (EOW garbage with WM-carts, EOW compost)	- Weekly organics - EOW garbage (Customers can pay double the rate for weekly garbage)	-Weekly organics/garbage
Who collects monitoring data?	- Solid waste utility representatives conducted surveys - Hired temp. labor to supplement monitoring; city staff.	- Third-party consultant collected samples - City conducted visual audits - Haulers documented route tonnage	- Garbage haulers performed visual audits and tagged carts - City staff conducted surveys - Portland METRO weighed loads before they reached compost facility - PSU Community Environmental Services collected data during two neighborhood walkthroughs - Green Solutions (consultant) took and measured samples	- Organics Program Assistant (OPA) collects data - Haulers weigh loads
Participant Feedback	- Automated phone surveys - "Knock & Talk"	- Two mailed surveys from City - One phone survey from consultant	- City staff mailed survey with option to respond online - City staff conducted focus groups	- 6 surveys (using Survey Monkey)
Visual Audits	- Visual audits conducted - Lifted lid and marked down percentage of contamination, as determined by visual audit	- City staff and consultant did three ride-alongs in each pilot neighborhood and conducted visual audit of container condition and setouts - King County conducted 3 random walk-around monitoring sessions	- Visual audits and field observations by haulers - CES developed a walking route of 100 homes in each of seven pilot sub-areas. Gather set-out data before collection vehicles arrived.	- Visual audits conducted by haulers and OPA

Contamination Notification	- Sporadic tagging	- Tagging is contractually required but occurs infrequently due to automatic collections	- Cart tag by hauler and follow-up letter from City	- Tagging - Emailed household if bin was rejected
Weight Measurements	- Diversion rates calculated. Not specified who/how often	- Haulers measured tonnage each route	- Loads were weighed 4 times during study and once pre study - Set outs/load weights	- Haulers weighed load after each route
Other	- Measured call rates to customer service representatives - Diversion rates	- Consultants sorted samples into material types, weighed, and then reviewed (one-time measurement in December 2007)	- Measured if customers responded to service level changes by switching to weekly garbage collection - Waste characterization and food scrap diversion rates - Used three control groups to measure external and economic factors	- "Organics Collection Database" updated daily on route via tablet by OPA

Part II. Recommendations

The case study analysis and informational interviews with key stakeholders provided insight into a set of best practices for a residential composting pilot monitoring plan. Although no two programs were alike, research showed that a successful plan needs to include four elements: (1) a sound method for checking contamination, (2) a dedicated employee or consultant to conduct audits and collect data, (3) a methodology that results in valid data, and (4) an efficient way to collect and store that data.

Based upon these four core concepts, it is recommended that the City of Eugene use routes as the unit of sampling. To ensure statistically significant data, the routes should cover a significant number of households and be a good representation of the diverse socio-economic landscape in Eugene. Due to efficiency and insurance liabilities, the hauler cannot perform monitoring and data collection, as it would require the hauler to get out of their vehicle. As haulers stop up to a hundred times per day, it is neither feasible nor safe for a hauler to leave their vehicle to perform auditing.

For this reason, it will be necessary for the City to hire a third party consultant or increase FTE to carry out an effective plan. It is also recommended that the City create an Access database that can be used by the consultant in the field, and accessed by partners. A complete write up of a proposed contamination notification and monitoring plan can be found below.

Weight Measurements

The ability to calculate diversion rates is pivotal in establishing the efficacy of a residential composting program. The City of Eugene must work closely with Lane Apex and Sanipac to collect weight measurements of both compost (yard debris) and garbage that result in valid and reliable data. Ultimately, haulers will be responsible for measuring total pounds per route per week for the entirety of the pilot. This applies to both garbage and yard debris, for each route served in the pilot.

It is important to recognize that there are multiple factors that can result in unreliable, skewed data. Multiple haulers serving the same route, inconsistency in data collection on behalf of the haulers, and not having appropriate sample sizes/inconsistent sample sizes across neighborhoods are all factors that could lead to biased data.

To mitigate data inconsistencies, the City of Eugene will need to collaborate with the haulers to develop standards for data collection. In order to ensure that the data that is collected is statistically relevant, there should be at least 400 households in the sample size and that weights are taken over the entirety of the pilot to ensure changes in seasons are accounted for.

Both Lane Apex and Sanipac have established that they track weight information for each route and have historical data. The City could select certain routes as control variables to compare against their pilot neighborhoods, should they choose to do so.

Contamination Notification

Minimizing contamination is central to the success of a residential composting program. In order to accomplish this, the City should hire a third party consultant, or designate FTE of city staff member, to conduct the monitoring/contamination notification. For the purposes of this report, the term “consultant” is used to describe the individual who will perform tasks and functions related to monitoring.

For the first month of the pilot, the consultant will drive the route before the hauler and audit every bin, tagging those that contain contaminants. Haulers will not pick up tagged bins. After the first month, participating neighborhoods will be split into equal sections, depending on the number of subscriber. Each section will be audited for two consecutive weeks. The consultant will go through the same process with each section that they did in the first month. However, if on the second week a bin is tagged that was also tagged the previous week, an email will be sent to those households to reiterate what allowable materials are, and the importance of contaminant free compost.

Although this process is more time consuming than conducting visual audits, it is a much more robust system that will result in a cleaner final product. During this process, the consultant will also be able to collect other data, such as: set outs (is the bin set out or not), bin condition, fill-rate of container, and number of tagged bins per route. This information will be uploaded to the Access database and can be used to track contamination trends, participation rates, and help to calculate average lbs./HH/week diverted. It is important to note that containers at the curb are the property of whichever hauler serves that household, eliminating any legal concerns with this method.

If feasible, consultants should also conduct brief visual audits of set outs along all of the routes and then tag and record any set outs with visible contaminants. Visual audits are significantly less reliable, especially when compost is mixed with yard debris. However, a reduced form of monitoring is still superior to none and will help collect a more robust measure of percentage of bins tagged per route per week.

Feedback

In each case study program, surveys were found to be extremely useful in engaging residents throughout the pilot and establishing a line of communication between partners. Surveys also act as another method of collecting data relevant to the contamination and monitoring aspects of the pilot program. This should prove to be extremely helpful to the City of Eugene as they work with participants to reduce the amount of contaminants in the compost stream.

City staff or a consultant can conduct surveys. Participants will be sent a mailed survey along with the option to fill it out online. They will also have the opportunity to interact with City staff near the beginning of the pilot through a "Knock and Talk," which provides the opportunity for participants to ask questions and share concerns face-to-face with staff. Finally, a phone survey will be conducted at the end of the pilot by either city staff or a consultant. This will ensure that there is statistical significance among respondents and consistency across demographics. This information could be added to the database, should the City be interested in tracking qualitative data in this fashion. The surveys should be conducted seasonally. For example, the City could use the following survey calendar:

- Month 3: Mailed/online survey
- Month 6: "Knock and Talk"
- Month 12: Mid-point mailed/online survey
- Month 15: Mailed/online survey
- Month 18: Mailed/online survey
- Month 24: Post-pilot phone survey

The City will also measure call rates to their staff with questions and complaints about program. This will be monitored monthly and added to Access database. Measuring call rates to the customer service line will allow the City of Eugene to understand how well residents

understand the program, and how well the contaminant notification system is working. This will therefore be a reflection of the success of not only the monitoring plan, but of the education and outreach aspect as well.

Sampling

To properly understand the level of contaminants, it is recommended that the City use random sampling to understand the percentage breakdown. Either using City staff or a third party consultant, sampling should be conducted on a bi-annual basis, preferably in the summer and winter. Samples will be collected from random households along various pilot routes by bagging a sample of the compost in tarp and stored for later sorting. This material will then be taken to Rexius, sorted into material types, and weighed. Data should be reviewed by Rexius or another party to ensure quality control and correctness. This information will be put in the Access database and should be used to track waste characterization and the percentage of contamination throughout the pilot. We recommend collecting samples from the curb rather than the route truck before they tip their load, as it allows for a better estimation of the level of participation, as well as a greater range of samples.

The formula used to calculate the sampling interval is based on formulas used by King County, Washington for their organics monitoring program. Renton, Washington, one of our four case studies, is located in King County and used a similar sampling mechanism, although they conducted a waste characterization study only once during their year-long pilot. The recommended process and formula is as follows:

1. Sampling Interval (Route-specific)
    a. List the number of subscribers for the route. This information will be available via the Access database.
    b. Use set-out counts available via the Access database to calculate the average of expected set-outs. For example, King County found that only 50 percent of users set out their compost containers.
    c. Divide the expected number of set-outs by the number of samples to be collected by the route. This is the expected "n," or the expected sampling interval.
    d. Multiply the expected "n" by 0.9, as samples must be collected before the end of the route is reached. Slightly reducing the sampling interval allows for the sampling collector to have a space to accommodate any unexpected issues along the route.
    e. The adjusted "n" will be used to select set-outs for sampling.
2. Composition Calculations

This formula will help us to understand the ratio of the collected samples to the total weight for each material substream that makes up the composting stream. This is calculated by summing each material's weight across all selected records and dividing by the sum of the total weight of material.

$$r_j = \frac{\sum_i c_{ij}}{\sum_i w_i}$$

Where:
r = ratio
c= weight of all materials
w= sum of all material weights
for i = 1 to n
where n = number of selected samples
for j = 1 to m
where m = number of material categories

It is then recommended that the City use a statistical test to ensure results are statistically significant. While King County used a 90 percent confidence interval, the City of Eugene could use either a 90 percent or 95 percent confidence interval. Keeping in mind that the ratio includes two random variables (the material and total sample weights), the variance around the estimate should be calculated prior to calculating the confidence interval. The formula is as follows:

1. Calculate the variance

$$\hat{V}_{r_j} = \left(\frac{1}{n}\right) \cdot \left(\frac{1}{\overline{w}^2}\right) \cdot \left(\frac{\sum_i \left(c_{ij} - r_j w_i\right)^2}{n-1}\right)$$

Where:

$$\overline{w} = \frac{\sum_i wi}{n}$$

Finally, precision levels are calculated at either a 90 percent or 95 percent confidence level, using the following formula:

$$r_j \pm \left(t \cdot \sqrt{\hat{V}_{r_j}}\right)$$

Where:
t = the value of the t-statistic corresponding to a 90 percent confidence level (1.645) or corresponding to a 95 percent confidence level (1.960). The t-statistic is based on using an infinite number of degrees of freedom (DF). It is recommended to use infinity DF when the standard deviation must be based on fragmented data or scientific judgment.

Gantt Chart

The chart below synthesizes the recommended monitoring and contamination notification techniques and how they breakdown over the two year pilot period. For example, during the first month of the pilot it is recommended that the City of Eugene track weight measurements and audit all routes. During Month 6, the chart shows that in addition to tracking weight measurements, the City should be conducting a "Knock & Talk", as well as performing the sampling method. Different from the first month, the

contaminant notification in Month 6 is comprised of auditing bins in on section of a route, and visually auditing the remainder.

Figure 3. Recommended Monitoring/Contaminant Notification Schedule, Eugene Pilot

Task	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Weight Measurements						
Sampling						Sample Collection
Contaminant Notification: Strategy 1	All routes monitored	Section-specific begins				
Contaminant Notification: Strategy 2	All routes monitored	Visual Audit				
Feedback			Mailed/Online Survey			Knock & Talk

Task	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Weight Measurements						
Sampling						Sample Collection
Contamination Notification: Strategy 1	Section-specific rolls over					Section-specific rolls over
Contaminant Notification: Strategy 2	Visual Audit					
Feedback						Mailed/Online Survey

Task	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18
Weight Measurements						
Sampling						Sample Collection
Contamination Notification: Strategy 1					Section-specific rolls over	
Contaminant Notification: Strategy 2	Visual Audit					
Feedback			Mailed/Online Survey			Mailed/Online Survey

Task	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24
Weight Measurements						
Sampling						Sample Collection
Contamination Notification: Strategy 1			Monitoring ends			
Contaminant Notification: Strategy 2	Visual Audit					
Feedback						Phone Survey

Database

In order to synthesize all of the listed recommendations, the City of Eugene will need to maintain an Access database to be accessible to all pilot partners and consultants. This database will store all data collection throughout the entirety of the pilot program. When in the field, the consultant or dedicated city staff member will have a tablet with access to this database that allows for easy data collection and transmission on route.

Dissemination

An added benefit to vigilant data collection is the ability to communicate the effectiveness of the program to participants. It is recommended that the City capitalize on this opportunity in order to keep continued engagement and participation from residents and partners. By pulling quarterly reports from the Access database to send to Lane apex, Sanipac, and Rexius, the City can demonstrate that they are continuing to monitor contamination and keeping all stakeholders goals in mind. It is also recommended that the City of Eugene send out a seasonal newsletter to participants with updates on the program, composting tips, and diversion rates. This newsletter can be coupled with the mailed/online surveys. Giving participants tangible, statistical results, will allow them to more easily see the benefits of continued participation in the program.

Data and Outcomes

The data measurements below will help determine the City's progress in achieving their goals, and the overall programmatic outcomes. As previously stated, each of these datapoints will be collected and stored in the Access database.

- *Lbs./route/week (garbage and yard debris):* This will be the City's main tool in displaying diversion rates throughout the pilot.
- *Set-outs/route/week:* This will serve as a reflection of participation rates. It will also enable the City to calculate the average of lbs./HH/week (divide lbs./route/week by # of set-outs).
- *Percentage of bins tagged/route/week:* In addition to the two random sampling days, this will give the City a datapoint to associate with contamination levels. Are they increasing throughout the pilot? Decreasing? This will help evaluate both the contamination notification plan as well as the education and outreach. This will also be key in evaluating whether the City has achieved Rexius' goal of a clean composting product.
- *Lbs/material type/route/biannually:* This datapoint will allow for the City to determine the amount of pounds per material type, including the percentage of contamination present. This can be used to track if yard debris decreases or increases certain times throughout the year, whether or not contamination fluctuates during different seasons, and if the rate of food waste is constant or inconsistent.

Conclusion

For each role in the pilot program, success has a different meaning. For the City of Eugene, success may be increasing diversion rates and establishing a program that can expand citywide. Conversely, Sanipac and Lane Apex may view success as maintaining efficiency and retaining their market share. Lastly, a successful composting program for Rexius is one in which a contaminant free product is made. Ultimately, the contamination notification and monitoring plan are what will tie all of these seemingly unrelated things together. An effective pilot program relies on the symbiotic partnership between these three entities, and therefore, a well executed monitoring plan. Implementing this at the beginning of the program will ensure that the priorities of each stakeholder are being considered, and that there is a way to evaluate those goals when the pilot is over.

The ability to evaluate the key components of the pilot program will be crucial when the City of Eugene looks at whether they want to expand the program. Having data that can illustrate program strengths and weaknesses will be a tremendous asset to the City moving forward. This won't only benefit the City at the end of the program. Monitoring will allow for continued evaluation throughout the two-year pilot, and the chance for the City of Eugene to continuously assess their performance and set new goals and benchmarks.

In order for monitoring to be effective, it must be done correctly. Developing a methodology that ensures a large enough sample size and descriptive sample population must be done from the beginning. Continuing data collection in a standardized way throughout the pilot is also a necessity. Finally, using the data in a meaningful way once the data is collected will enhance the program from both the resident's and the City's perspective. Failing to do any of these things will cause the monitoring plan to fall flat, and in turn, significantly harm the efficacy of the composting program. An effective monitoring plan is one of the biggest factors in determining the success of a pilot program. The City of Eugene has an opportunity to set themselves apart by developing a plan that could set the standard for years to come.

Appendix

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Recommendations Matrix

Strategy	Implementation
Database	Access database to be accessible to all pilot partners and consultants. This will be a hub of information and data about the pilot. *Frequency:* Varying *Point of Contact:* City of Eugene
Weight Measurements	**Garbage Haulers** • Year prior to pilot: track weight of garbage and yard debris in pilot neighborhoods • During Pilot: Track weight of garbage and yard debris • Data gets sent to 3rd party consultant or City to be added to Access database *Frequency:* Daily (after each yard debris/garbage route) *Unit of Measurement:* lbs/route/wk *Point of Contact:* Consultant or City
Contamination Notification	3rd party consultant traveling along the route before haulers pick-up compost. •First Month: All bins on route will be audited and tagged if contaminants present. •Remainder of pilot: Neighborhoods split into sections. Each section is audited for two consecutive weeks: • 1st Week: Audit all houses in that section. Tag bins with contaminants. • 2nd Week: Audit all houses in same section. Bins with contaminants receive tag. If they were tagged in the previous week, email participant notifying them of contamination. *Frequency:* Varying *Units of Measurement:* Number of tags; Number of emails sent. *Point of Contact:* Consultant
Feedback	**Surveys** • Four mailed with the option to fill out online • One "Knock and Talk" • One phone survey at the end of the pilot *Frequency:* Seasonally *Point of Contact:* Consultant or City of Eugene **Participant Call Rates** • City should measure call rates to city staff with questions and complaints about their program *Frequency:* Monthly *Point of Contact:* City of Eugene
Data Collection	**Rexius** • Track contaminants in each load once compost gets to facility *Frequency:* After each route *Point of Contact:* Consultant **3rd Party Consultant** • In addition to number of tagged bins and emails sent, consultant will track: • Number of set-outs per route, bin condition (odor/vector problems), weather, fill rate of each container. **Haulers** • Record weight, route information, time, date *Frequency:* After each route *Point of Contact:* Consultant
Sampling	A third party consultant or City staff should conduct random sampling on a seasonal basis, in summer and winter (such as August and December). These samples will be sorted into material types, weighed, and then use to determine the percentage of contaminants. *Frequency:* Biannually; throughout the duration of the pilot *Point of Contact:* Consultant or City

	Units of Measurement: lbs/type of material/route
Data Dissemination	• Compile quarterly reports using the Access database to send to LaneApex, Sanipac, and Rexius. • Send out a seasonal newsletter to participants with updates on the program, composting tips, and diversion rates. This can be coupled with the mailed/online surveys. *Frequency:* Quarterly/Seasonally *Point of Contact:* City of Eugene

Case Study Summaries

Tacoma, Washington: Residential Composting Monitoring Program

Overview

Tacoma, Washington is located roughly 35 miles south of Seattle and boasts a population of 203,446 (the third largest in the state). In 2010, Census data showed that the median age in the city was 35.1 years and 23% of residents were under the age of 18. Tacoma is known for its location on Washington's Puget Sound, the city's walkability, and was also voted one of the most livable areas in America.

Tacoma began their residential pilot program in July 2011. Despite having already accepted food scraps with yard debris since 1995, Tacoma city officials were committed to increasing outreach and awareness with a new and effective program. The six-month long program was designed to assess how participants would respond to the food waste program, as well as every other week garbage collection. The city of Tacoma partnered with the Compost Factory in Puyallup (operated by Waste Connections) to undertake everything from education to compost processing. The project provided compost services to two neighborhoods, comprising 1370 single-family homes/duplexes. The neighborhoods were chosen based on varying route size and demographics.

Monitoring

As part of increased advertising and outreach, Tacoma provided brown buckets for participants to collect food scraps in the kitchen. These scraps were then placed in the yard waste bin for weekly collection. Garbage collection was reduced to every other week, as a reflection of the city's goal to reduce waste. In addition to purchasing brown buckets for residents, Tacoma used part of their budget on hiring temporary labor to supplement the education/outreach aspect of the program as well as the data collection/monitoring.

Tacoma focused their efforts largely on advertising and education. This translated into less monitoring compared to other pilot programs. However, as part of the pilot program they conducted phone surveys, "Knock & Talks", and visual audits.

"Knock & Talks"

Solid waste utility representatives went door to door in the middle of the pilot program in order to educate and receive customer feedback. During these visits, 47% of residents reported that they were recycling food waste. Tacoma found that this style of communicating with participants was extremely effective, despite how time intensive and costly it is. The initial round was so successful that they planned more door-to-door visits.

Visual Audits

In the first months of the pilot program, staff conducted visual audits of the yard waste containers and took note of percentage food waste. Judging from appearance only, staff noted that food waste was 27% of yard waste carts.

Phone Surveys

An automated phone survey was conducted halfway through the pilot in order to assess participation rates and participant satisfaction rates. Staff noted that the survey helped identify potential barrier to participation. The survey also recognized vectors to be a major concern for residents.

Tacoma used three main benchmarks to evaluate their residential food waste program. The three goals they intended to meet were:

1. 32% of set-outs [yard waste containers] contain food waste
2. 48% participation rate
3. Divert 10% of food waste

In order to measure their status in relation to their goals, they used a distinct strategy for each benchmark.

1. Drive by evaluations
2. Door to door "Knock and Talks"
3. Call rate to customer service
4. Tons Diverted

Conclusions

As previously stated, Tacoma focused much more on education and outreach as opposed to contaminant notification. The data collected during their pilot, therefore, reflected resident feedback, participation rates, and diversion rates. Although this may be less helpful when trying to compile a monitoring program, it has provided a few key insights. "Knock and Talks" if used correctly can be used for both education, and also play a role in the monitoring plan. The case study also showed that hiring temporary labor for the pilot program could prove to be highly effective. If the city of Eugene can use this case study as a control group (a city who uses very little contaminant notification), it could show which element (education vs. contaminant monitoring) is more valuable in a pilot program.

Renton, Washington: Residential Composting Monitoring Program

Overview

Renton, Washington is located 11 miles from Seattle, Washington and lies on the southeast shore of Lake Washington. A part of King County, Washington, Renton has a population of 90,927 and is the home of Boeing, GEICO, Providence Health and Services, and a training facility for the National Football League's Seattle Seahawks. In 2000, the median income for a household in the city was $45,820 and 9.7 percent of the population were below the poverty line. It is one of the fastest growing communities in the Puget Sound area, as a result of its proximity to key employers, affordability, and quality of life.

The City of Renton began developing a composting program in 2006, as part of its contract renegotiation with Waste Management (WM). Work on a pilot began in early 2007 and was designed by the City of Renton, King County Solid Waste Division (KCSWD), Public Health – Seattle and King County, and WM. The composting was also coupled with a recycling pilot. Three neighborhoods were selected for the pilot, one of which was the control group. The figure below details service, container type and number, and accepted materials along each route.

Collection Area	Garbage	Recycling	Yard Debris
Summerwind Control Area + Remainder of City (Status Quo)	Weekly, customer-owned containers with small number of carts.	Weekly, 3-bin	Weekly, City provided cart, no food scraps accepted
Tiffany Park (702 households)	Every-other-week (EoW), with WM-provided garbage carts	EoW, with WM-provided recycling carts	Weekly, City provided cart, food scraps added.
Glencoe (727 households)	(EoW), with WM-provided garbage carts	EoW, with WM-provided recycling carts	EoW, with WM-provided recycling carts, food scraps added

The five-month pilot focused on single-family homes and partnered with one private garbage hauler, WM.

Pilot Components

The monitoring pilot consisted of collection quantity tracking, auditing of container set-outs, observing public health concerns, control area bin examinations, waste characterization, and surveys. These monitoring components were based on focusing on public health impacts of reduced-frequency garbage collection, customer satisfaction, route tonnage data, and yard debris composition. All participants received a larger garbage cart than that of the size of current weekly service. They also received commingled cart-based recycling and Renton discontinued their 3-bin recycling system, which required residents to separate newspaper, mixed paper, and mixed containers. WM previously used non-compacting recycling trucks, but updated their trucks to permit recycling commingling on route and deliver to commingled recycling facilities.

The pilot ran from August to December 2007 to capture data that reflected a fuller range of weather. The pilot ran for five months, but monthly route data was obtained prior to the pilot in 2006 for comparison. The City embedded the cost of new garbage carts, recycling carts, and composting into residents' existing fee. Thus, participants were billed the same rate they had previously paid for weekly service, despite reduced service. Renton has mandatory collection through city billing; so, all households in the two pilot areas will be covered by the pilot.

Monitoring

The pilot data was collected to address the four components described above. As the pilot project sought to focus on service changes and expansion to garbage, recycling, and compost, key issues include:

- Garbage container sizing
- Rate incentives
- Promotional materials
- Update recycling containers
- Roll-out compost collection to pilot residents
- Biodegradable kitchen container liners
- Strategized customer service
- Project website

The pilot monitored their program through observing container and bin setout condition, customer surveys, route weight logging, and sampling composition of the collected organics stream.

Container Setout and Condition

Container setout and condition were monitored through on-route monitoring by a consultant or City staff member who rode along with the garbage hauler. This occurred three times along each of the three pilot routes. The condition of container setouts was logged and used to compare and evaluate if setout conditions varied between smaller garbage cans and larger carts. The observer did not leave the truck, but logged if containers were overfilled, had lids open or closed, condition around carts, notable vectors, surrounding litter, or materials that didn't fit into the cart. On-route monitoring showed that there were few inappropriate setouts and that this ensured that vectors could not access materials.

Beyond on-route monitoring, the consultant and King County Public Health staff conducted in-depth, walk-around monitoring sessions three times throughout the project. They randomly chose 25 consecutive setouts in an area and then closely observed the container setout at each selected households. These observations audited residue levels, container damage, area conditions, odor and vector presence, and any other public health concerns. Overall, few problems were observed, particularly in the pilot areas where households had received new containers. The majority of

observed container conditions involved odor and residue, many of which were observed the day after the Thanksgiving and Christmas holidays.

Resident Feedback Surveys

A mailed survey was sent to participating residents in November 2007 and was followed-up by a phone survey in early December 2007. These surveys were conducted by a consultant. It should be noted that the mailed survey is not a strong example of customer feedback on the pilot, as those who participate self-select. The mailed survey was primarily used to test different survey questions and evaluate how participants responded prior to conducted the phone survey. The phone survey was conducted over the first two weeks of December 2007 and used 300 statistically selected households (150 households in the two independent variable neighborhoods).

Daily and Monthly Average Route Weights

The 2006 monthly route data was collected as a comparator against the 2007 pilot data on a pound-per household basis for each collection stream. However, the prior year and 2007 data were not directly comparable and proved to be inconclusive. Route drivers for both the pilot and control routes recorded daily route weights for each collection stream. These were calculated to a monthly average rate per household, which were then averaged across the five-month pilot to ensure consistency across varying number of weeks per month. The results surprised pilot partners, as total generation of garbage, recycling, and composting for pilot areas decreased, while the control route remained roughly the same. Moreover, composting increased in the control neighborhood by 22.9 percent, but decreased in the pilot areas. This is perhaps most perplexing, as annual variation in compost in expected, as yard debris generation is impact by seasonal changes. The variation in the control area should have indicated the variation in all households receiving WM service. Based on this, the pilot neighborhoods should have experienced a similar increase to the control neighborhood, plus an increase in tonnage due to EOW garbage collection. Visual audits and sampling indicated that food scrap diversion did not decrease during this time, but route data demonstrates otherwise. However, garbage quantities in each pilot area decreased by a large amount, which was surmised to be additionally diverted food scraps. Yet, this information did not end up reflected in the route data. WM did look over their route tonnage data and confirmed that the loads were weighed accurately. However, the point of the project was less about volume and more about evaluating collection frequencies. Additionally, the goal was to dispel public health myths about placement of organics waste in the yard debris container.

Organics Composition

An organics load from each of the two pilot areas was sampled and sorted by a consultant at the compost facility during the second week of December 2007. The composition analysis determined the level and amount of various materials in the composting steam. This was used to

determine if weekly and EOW organics collection affects quantity and composition. The EOW organics collection did not decrease diversion rates according to the one-time load composition analysis. However, a one-time composition analysis is not enough to properly evaluate if there is was a definite effect of EOW and weekly collection frequencies on diversion rates.

Conclusions

The strategies that were most successful include efforts made to examine and audit bin and container conditions and participant surveys. The City of Renton and its partners made a concerted effort to thoroughly examine conditions through both visual audits and randomized walk-around monitoring sessions. Moreover, their efforts at soliciting feedback are noteworthy, as they employed a dual strategy. Through employing a mailed survey that allowed residents to self-select into participation, in tandem with a statistically significant phone survey, they ensured that feedback wasn't limited to those who felt strongly about the program.

The main focus of pilot was on the effects of collection frequency on food waste diversion, not contamination. Although cart tagging is contractually required, this activity does not regularly occur, due to automated collection by garbage haulers. However, contaminant monitoring is an ongoing discussion in King County and with the compost facility, Cedar Grove. It would be advantageous for the City of Eugene to maintain a strong relationship with the City of Renton and learn from their ongoing efforts to reduce contamination in their compost stream.

Portland, Oregon: Residential Composting Monitoring Program

Overview

The City of Portland, Oregon is the largest city in the state of Oregon and is the county seat of Multnomah County. It is located at the intersection of the Willamette and Columbia rivers, nestled in the Willamette Valley region of the Pacific Northwest. Portland has an immediate population of 619,360 and a metropolitan population of 2,348,2477. Portland is known as one of the most environmentally conscious cities in the United States and is renowned for its commitment to public transportation, walking and bicycling, public parks, and organic food and materials. Its climate includes chilly, rainy winters and mild, dry summers.

In 2007, the Portland City Council passed the Portland Recycles! Plan that expanded its residential recycling and composting programs. The first phase of the plan focused on expanding curbside recycling and provided residents blue and green roll carts. The second phase implemented weekly curbside compost collection and every-other-week (EOW) curbside garbage collection. The City of Portland began its curbside collection pilot on May 3, 2010, focusing on 2,000 households in four different areas. The City had four private haulers participate in the yearlong pilot. The pilot included single-family homes and "smallplexes" with two to four units. Data was collected by garbage haulers, Portland Metro, Portland State University Community Environmental Services (CES), Green Solutions (City consultant) and the City of Portland. Portland Metro is the metropolitan planning organization for the Portland, Oregon region and oversees the region's solid waste system. They also operate transfer facilities for solid waste processing and transfer and collect solid waste fees and taxes to disseminate to municipalities within the Portland metro area. The City of Portland works directly with customers and waste collection companies to regulate and manage systems within the urban growth boundary. They also set rates for residential customers, provide education and outreach, regulate collection, grant and monitor collection franchises, and resolve customer complaints.

Pilot Components

The pilot program collected food scraps and food-soiled paper products in the compost roll cart, where it was commingled with yard debris. Residents also received kitchen pails to collect food scraps and then transfer them to their green roll cart. Although compost originally started off as every other week, it soon changed to weekly. Garbage service also changed, moving to every other week. Although the option was available for residents to pay double the monthly rate for weekly service, few residents pursued it. Rates did not change for residents who stayed with the same container size with the new standard service. The fee to participate in the composting pilot was embedded.

The pilot areas were based on demographics, geography, and service areas of the four private haulers who participated in the pilot. Demographic information was especially important, as the

neighborhoods included needed to be representative enough of their geographic areas to conducive to testing outreach and messaging on a diverse array of populations. The City also used a control group of three adjacent neighborhoods to see the influence of changes to the economy other external factors that influence garbage generation.

Monitoring

The pilot data was collected to inform which aspects of the program worked and what didn't in order to improve the program before a citywide rollout. Additionally, the City wanted to measure if and how resident behavior changed during the pilot, determine program rates, and measure best practices for outreach and communicating the program. The evaluation strategy used included:

- Customer surveys and focus groups
- Food scrap diversion and contamination rate
- Container weights and volume estimates
- Labor costs and on-route/off-route driver labor hours
- Container set-out weights and total load weights
- Resident response to service frequency and change
- Visual audit and observations of green containers

Participant Outreach and Feedback

Participants received two inserts with a frequently asked questions brochure, pick-up schedules, and program information. The haulers also tagged residents' green compost containers to alert participants the month before the pilot began that service was changed. The City used two newsletters to stay in touch with residents, the first midway through the pilot and the second in the month before the pilot ended. City staff also directly reached out to participating residents through focus groups and a mailed survey with an option to respond online.

Weekly Load Weights and Waste Characterization

The garbage haulers also tracked the weight of each garbage load, both pre-pilot and every three months during the pilot. During a measurement month, loads were weighed weekly at METRO facilities and then averaged out across the pilot areas. This was used to determine waste diversion rates and evaluate if the composting pilot had any effect on diverting food waste from being placed in garbage containers. This data was compared to the control group, which was weighed in June 2010 and October 2010. This also allowed the City to examine if compost loads and residents' likelihood to compost is affected by seasonal changes. At the same time (every three months), Green Solutions, on behalf of the City of Portland, also took samples from composting in pilot areas and then sorted and weighed them. This was used to measure the breakdown of materials in each curbside stream.

Visual Audits

Garbage haulers conducted visual audits and field observations. Data was also collected by CES between July and September 2010 and October through December. The CES staff gathered data on container set-out before collection vehicles arrived and visited approximately 100 homes in every pilot and control neighborhood. They examined fullness of each container and measured the percentage of containers that reached varying percentages of fullness.

Conclusions

The most successful strategy used by the City of Portland was their monitoring mechanism for tracking load weights and sampling. This data was successfully compared to the three control neighborhoods and allowed the City to measure that the pilot did lead an increase in food waste diversion. The City also employed a focus group strategy that the City of Eugene may want to include in their participant outreach plan. This may provide a deeper level of discussion about the pilot and a chance for the City to learn about benefits and drawbacks in a more robust fashion. This group can also be used as a mechanism to test scenarios for public education and pilot logistics.

Similarly to other case studies, the City of Portland sought to test if changing the standard weekly collection affected system efficiency and truck emissions (through fewer weekly collections). The primary purpose of the pilot is to test convenience and diversion rates, as well as collect and implement participant feedback to use for design and development of a city-wide program.

Cambridge, Massachusetts: Residential Composting Monitoring Program

Overview

Cambridge, MA, a city of 107,289 people, is situated just north of Boston across the Charles River. The city is widely known as being home to two of the most renowned universities, Harvard and Massachusetts Instituted of Technology. In 2010, the median age was 30.5 years and 13.3% of the population was under the age of 18. The census also reported that the median household income was $47,979. Once ranked the most liberal city in America, it is no surprise that Cambridge elected to implement a residential composting program.

After receiving a grant from the Massachusetts Department of Environmental Protection, Cambridge initially completed a feasibility study, and three years later began their one-year pilot program. The City's reasons for engaging in a residential composting program were to reduce waste, curb climate emissions, control trash disposal costs, address rodent control, and meet public demands for compost service.

The pilot began in April 2014 after 554 households, both single and multi-family, elected to participate in the program. Each participating household received a kitchen container to collect food scraps and soiled paper and a green curbside bin (for composting material only). Three main stakeholders facilitated the program: the Department of Public works (one public hauler), the Organics Program Assistant, and Rocky Hill Farms (the compost processor).

Monitoring

Resident Feedback Surveys

Department of Public Works (DPW) Staff issued six surveys to participants using survey monkey. Surveys were distributed throughout the year of the pilot to adjust for changing opinions, seasonality differences, etc. The survey questions were designed to cover the following areas:

- Demographics
- Changes in Generation of Household Waste
- Opinions on Kitchen Containers, Compostable Bags and Green Bins
- Behaviors Regarding Cooking, Shopping, Leftovers and Wasting
- Odors, Fruit Flies and Rodents

"Organics Collection Database"

DPW developed an "Organics Collection Database" in Access for the Organics Program Assistant to use to collect data in the field. The database is comprised of the following forms:

1. Crew Route Data Entry Form: This form stores "collection day details" including driver, laborer, weather, start and finish times, weigh in times, weights, etc.

2. Monitoring Data Form: This lists each stop in the order of route collection and whether their bin was set out or not. This form also monitors fill level and contamination.
3. Weekly Collection Query: Indicates the total number of stops that have been collected and those that haven't. This allows staff to determine lbs/HH/wk or to estimate load weights.
4. Buildings Monitored on a Given Week Query: Lists buildings monitored by date. Specifically, associated data for fill rate, contamination, and loose food.

Contamination Notification and Bin Tagging

Visual audits were used to assess both contamination and participation rates. For the former, the OPA was tasked with monitoring. The route was divided into ten sections. For 26 weeks, two sections were monitored for contamination for two consecutive weeks. This allowed for follow-up if there was contamination in the bin. If a small amount of contamination was found, the OPA put the contamination back and tagged the bin. If more contamination was found, the entire bin was rejected and not emptied. Emails were sent to those residents reminding them what to compost and letting them know why their bin was rejected. Cambridge found that no more than 2% of bins were rejected each week.

Route Weights

With the initial 554 confirmed households, the load weight was taken after each route. Midway through the pilot, additional households joined the program, which reduced the weighing to monthly. Due to the aforementioned data collection and ability to aggregate the weight up to a monthly scale, the loads were weighed on a monthly basis. The daily weights were comparable to the averages so they were satisfied with this data.

Conclusion

The most unique aspect of Cambridge's pilot program is their use of a tablet to record and collect data in the field. Through the use of these mobile databases they are able to collect a significant amount of data in an efficient way. The positive effects of this are evident in the conclusions they are able to draw from each route. Another successful aspect of their program is their use of an online survey database to disseminate the surveys during their pilot. The ability to produce six unique surveys and distribute them throughout the year of the pilot created a strong feedback loop between the city and the participants. City staff is able to produce monthly emails to participants detailing program performance (tons diverted, environmental impact, etc.) as well as seasonal composting tips a result of the data collected between these two mechanisms.

Despite some differences in pilot structure between Eugene and Cambridge, mirroring the effective aspects of Cambridge's monitoring plan/data collection could prove to be extremely advantageous. Specifically, Cambridge proved that the ability to synthesize field data into relevant, user-friendly statistics will be crucial if Eugene wants to transform a pilot program into a city-wide initiative.

Informational Interviews

Rexius Interview
November 11, 2015

Interview with Jack Hoeck – VP Environmental Services at Rexius

STATEMENT: Notes from this interview will be included in a monitoring plan submitted to the City of Eugene, hereby making it part of a public record. Do you give us your permission to take notes?
Yes

1. There was a pilot program in 2005. Can you share any details about this program, as well as what worked and what didn't specifically related to contaminant monitoring?
Don't remember many of the details of how that program was set up; we've done many food waste programs over the years. Our main concern is in regards to contamination is plastic (bottle caps, yogurt containers, utensils, etc.) However, the biggest concern is film plastic, which includes plastic bags and other similar items. When we went into the commercial food waste program [Love Food Not Waste] with the city, the biggest issues occurred because we said we would allow compostable plastics. Rexius states that allowable plastics must be:
1. Certifiably compostable
2. Differentiable from 10 ft. away
3. Related to food waste
Because of the issue with plastics, if we were to do another pilot we would only accept food.

2. How much capacity do you have in your facility to store compost?
We have plenty of capacity at our facility to store compost. This isn't a concern.

3. Will pilot compost be stored separately from other compost?
No. Pilot compost will be mixed with other compost once it is brought to the facility.

4. Will pilot compost be separated by neighborhood or all together?
When the haulers dump the load from each neighborhood it can be examined for contaminants separately. However, it will eventually be mixed with other neighborhoods.

5. Does weekly pick-up impact storage capacity?
Storage capacity at our facility is not the issue.

6. Could you eventually handle a full citywide program? The pilot program will be a two-year program.

Yes. Capacity isn't the issue; the rate structure is the issue. Currently, yard waste is $22/ton and food waste is $42/ton. Operational costs could be hard to figure out.

7. What is the chain of actions for compost processing once it reaches the facility? What is the timeline?

Most of the material that comes to this facility is tipped off at the Highway 99 facility, where it is examined for contamination, and then brought to the Coburg facility. Compost is then processed at the Coburg facility. If the routing worked out where it was closer to bring it to the Coburg facility that would be OK too.

8. How does your facility handle contaminants? If separated, where are they disposed of?

We use a "picking policy." Once a load reaches our Coburg facility we examine it for contaminants. If there are 0-25 contaminants we impose a fee on the haulers. If there are 25-50 contaminants there is a higher fee. If there is above a certain number of contaminants the load is considered too contaminated and the haul is placed in the landfill. Rexius disposes of the contaminants, which is reflected in the higher tipping fees.

9. What data points are you looking at for measuring contaminants?

All material that waste haulers bring is goes across a scale (both for food and for yard debris). Contamination in food waste is measured by "pick."

10. We hope to measure tonnage weekly, monthly, seasonally, and across neighborhoods. Is this feasible? Are there data points we are missing or shouldn't include?

Yes, this would be feasible.

11. If feasible, do you have any suggestions for best practices of documenting data?

Each load will be "picked" before it is mixed with another load [at Rexius].

12. How do you see yourself working with garbage haulers? Do you have any suggestions on how they can best monitor contaminants visually? Should this happen before or after they reach your facility?

Lane Apex and Royal Refuse are the smaller haulers we are currently working with. They seem to be better at "closing the loop" on contamination.

In order to take the compost material for your pilot program there would need to be a monitoring program in place, contaminate notification system in place, and a system that allows Rexius to understand where the contamination comes from. This would all involve haulers in some way.

13. Thank you for your time. Do you have any questions or comments for us? We will also share our contact information in case you wish to get in touch with us about any further ideas or questions.

Concerns:

1. Are the diversion rates a reflection of quality compostable material?
2. What are people's [the City's] motives for doing this in the first place?
3. If there is too much contamination in the product, food waste composting does nothing for the business and will end up back in the landfill.
4. If it is working, then everyone is happy. If it isn't working, then what happens? If there is contamination, then what happens? Does Rexius have to commit for 2 years? Is the city committing to monitoring contamination for 2 years?
5. I don't want to do it if I'm going to be the one holding the bag with the crappy material. The contamination is the only reservation – volume isn't an issue.
6. Food waste is currently kept separate from yard waste (comingling the two increases potential for contamination, and loses the ability to mark it "certifiably organic"). This mechanism will change with the residential program.
7. I've seen that compostables increase contamination in the compost stream

Case Studies to look at:

- Composting facilities in Portland
- Dirt huggers
- PRC facility outside of Corvallis
- Recology
- Allied (has a landfill)

Key Points:

· How does the city define success?

· Rexius defines success by having a superior product with as little contamination as possible.

Lane Apex Interview
November 24, 2015
Interview with Jack Kauble – Customer Service and Special Projects

STATEMENT: Notes from this interview will be included in a monitoring plan submitted to the City of Eugene, hereby making it part of a public record. Do you give us your permission to take notes?
Yes

1. How long does the average route take?
All of our routes are four days a week, ten hours. Already haul food waste to Rexius, yard debris goes to Lane Forest.

2.Are there any kind of efficiency or temporal targets for haulers to meet?
No targets. Drivers can fix problems outside truck.

3. Do you currently haul compost for the LFNW program?
Yes. We had to get special truck and containers, as well as run special days. New trucks do not have a camera.

4. Were there any additional changes to that needed to be made to licensing agreements or union contracts for work with LFNW? Would they need to be changed for a residential program?
No.

5. We are considering the usage of garbage haulers as part of the contaminant notification system. Although we are still deciphering how frequently and how often contaminants should be audited, is this a strategy that is feasible? If not feasible, why?
One of the problems we have is with monitoring right now. Spot check is efficient. Consider consultants along route before driver. For efficiency purposes, it would be better if a consultant could do this. But, the haulers are okay with tagging if need be.

6. Do you have any recommendations for how frequently contaminants should be monitored?
Food waste is such a small program, that monitoring isn't needed. If contamination, can take back to source and educate. Difficult to do with larger source. Be sure to track all streams. Have to do tracking already to justify rate structure.

7. Do you have any suggestions for best practices of documenting data?
Capture account #, monthly weights, cart size data.

8. Should monitoring and contamination be built into fees?

(Stephanie Scafa) The City will bear the cost of contamination

9. *We are considering the usage of "tagging" households that do not comply with the composting program, as well as some positive reinforcement mechanisms for those who are successful. Do you have any recommendations? Are there any tools you use that are successful?*
Already tag carts for recycling. Not a big fan of tag, but have to use them. Rexius is making compost out of food waste to sell. Bagged product is good. Any kind of positive feedback is good. Consider requesting budget committee consider using pilot compost on public facilities.

10. How do you see yourself working with Rexius? Do you have any suggestions on how they can best monitor contaminants once it reaches their facility and continue garbage haulers' work?
LaneApex brings to Lane Forest and not Rexius. Stephanie has not reached out to Lane Forest, understandable if it impacts participation. As far as impacting LaneApex, take it to Lane Forest because it is across street, but Highway 99 is not far out of the way. As long as Rexius lets LaneApex know, then good, just keep communication open. Small enough to be able to get back to residents. No recommendations for monitoring. Again, will be bigger load than LFNW and intermingled with yard waste. Should be pretty identifiable if contaminated. Expect same type of strong communication. Rexius is limited how they can do it (picking policy).

11. Did you participate in 2005 pilot?
Was still at Sanipac, so does not know.

12. Thank you for your time. Do you have any questions or comments for us? We will also share our contact information in case you wish to get in touch with us about any further ideas or questions.
Weekly service may not be feasible, because of logistics and using same trucks. Can do it with commingled, but yard debris is completely issue. Certain amount of trucks, no designated trucks for just yard debris (every other week with garbage and trash, switch off). Small percentage put food scraps in yard debris. Maybe if thing progresses, we can get better feel for this next spring when yard debris starts popping. We can use this prior data to evaluate waste characterization of yard debris. A successful program would be a low number of contaminants. As low as 3.7 percent would be great [in response to the average percentage of contaminants across case studies]. Efficient and least contaminated way. May need monitor on each route for each company. Likes one neighborhood at a time approach. Borrow lessons learned from leaf collection program as means to communicate.

Sanipac Interview
November 20, 2015

Interview with Aaron Donley – Sales Manager

STATEMENT: Notes from this interview will be included in a monitoring plan submitted to the City of Eugene, hereby making it part of a public record. Do you give us your permission to take notes?
Yes

1. How long does the average route take?
8-10 hours, but this will be different. Depends on seasonality for yard debris. Do every other week yard debris. Differs depending on set-outs. This will be on the off week. Shared maps with Stephanie. Make sure target of stops followed day-long target. 100 stops on off day or any day. Set-out rate should be documented.

2. Do you currently haul compost for the LFNW program?
Yes.

3. Were there any additional changes that needed to be made to licensing agreements or union contracts for this to happen?
Changes in administrative rule as part of rate structure. A residential compost program wouldn't affect anything, other than admin rules.

4. We are considering the usage of garbage haulers as part of the contaminant notification system. Although we are still deciphering how frequently and how often contaminants should be audited, is this a strategy that is feasible? If not feasible, why?
Will not get good contamination identification from driver. Have to have someone go ahead of route and look at cans. Can get route info. Recycling is easier to do. It would really slow down operations for drivers to get out of trucks. For insurance reasons and efficiency, want someone to go ahead of truck. Will Rexius charge by pick? For pilot, will not affect haulers. Stephanie will follow up. Big concern.

5. Do you have any recommendations for how frequently contaminants should be monitored?
Four areas, once a week. Monitor weekly for the first month, have frequent offenders as spot check. Go back as Rexius identifies contaminants. Sanipac could come back weekly with those results, but resource dependent. Have someone else do monitoring. The route itself takes all day. But just driving or walking would be a lot faster. The people need to know it's being monitored, put in intro packet. Monitors need to be able to tag cart so driver doesn't pick up. Plus, participants should be tagged with a sticker so haulers know who is in program. When people do well, have top 300 get letter of congrats or tag on cart that says "great job"

6. We are considering the usage of "tagging" households that do not comply with the composting program, as well as some positive reinforcement mechanisms for those who are successful. Do you have any recommendations? Are there any tools you use that are successful?

"Oops Sanipac Contamination" tags. Monitor if these work. Be wary of open market customer service. If hauler notices a lot of contamination through hopper cam, driver will let Sanipac know, tag cart and City can follow up.

7. How do you see yourself working with Rexius? Do you have any suggestions on how they can best monitor contaminants once it reaches their facility and continue garbage haulers' work?
Need to be on same page with Rexius. Driver gives identification number with route, data, City/Sanipac both know.

8. Where do you currently take yard debris?
Rexius. [Stephanie] We will need to set up structure for how Rexius meets driver, how does it get to apex/sanipac and then how does it get to the city

9. How is tonnage weighed?
By truck going into Rexius and by route. Important to identify truck/route

10. Where should data be housed?
Will think more about this.

11. Thank you for your time. Do you have any questions or comments for us? We will also share our contact information in case you wish to get in touch with us about any further ideas or questions.
Extra labor would be driver two days a week on off days. Will depend on size of samples on how long routes will take. What disposal rate will look like. Will have to try to figure it out while we are going through pilot. 2 years is enough to decipher, can we extrapolate out to whole community. Debris is $24/ton, may be gap in pilot material we take. Look into contamination fee, increased tip fee, marketing angle in approaching contamination. Communications platform starting in January and February. Do we want to roll out all four neighborhoods at once, or focus messaging on one area and make it better? Consider staggering neighborhoods, maybe three year pilot?

City of Eugene Code Enforcement Interview
November 20, 2015

Interview with Rachelle Nicholas and Doñna Nowakowski– Code Compliance Supervisor, Code Compliance Inspector

STATEMENT: Notes from this interview will be included in a monitoring plan submitted to the City of Eugene, hereby making it part of a public record. Do you give us your permission to take notes?
Yes

1. How does Code Enforcement work with the Waste Prevention Department?
Reactive, not proactive. Typically how they operate. If a neighbor calls and complains, will send a letter to property owner.

2. We are examining different systems to notify residents and reward good behavior. Do you have any recommendations or strategies that have worked for your department?
No. Enforcement business, so big hammer is that if they don't comply, we find them. Only called out for problem. Not really up for positive reinforcement. Would love if this could happen, just not staffed for that. Maybe work with neighborhood groups, set up contamination competition. Work with people who are already established. Lowest contaminant rates win certificate to rexius for neighborhood projects.

3. We are currently considering the feasibility of having either garbage haulers, staff, or a third party monitor contaminants. Would your department have the capacity to partake in a monitoring program?
With no additional staff, no.

4. If not feasible, what do you see as your role in this pilot? Do you see yourself having a role at all?
Probably not, unless we get complaints about odors or vectors.

5. Thank you for your time. Do you have any questions or comments for us? We will also share our contact information in case you wish to get in touch with us about any further ideas or questions.
Have done audits in the past, more auditing companies to ensure compliance. Also, have to communicate it is City initiating, not haulers. Anticipate resident frustration over reduced capacity if EOW garbage.

City of Cambridge, Massachusetts Interview
December 7, 2015

Participants
Randi Mail (Recycling Director); Email: rmail@cambridgema.gov
Michael Orr (Waste Reduction Program Manager); Email: morr@cambridgema.gov

STATEMENT
Notes from this interview will be included in a monitoring plan submitted to the City of Eugene, hereby making it part of a public record. Do you give us your permission to take notes?

Yes

QUESTIONS
1. How much additional FTE did you need to run your pilot program?
We created an additional part time staff position [the Organics Program Assistant]. The OPQ worked roughly 15 hours per week for the duration of the pilot. This person rode along with the hauler on routes and also did some office work. Once the pilot expanded citywide, a dedicated fulltime position was created [Waste Reduction Program Manager].

2. *Did you hire additional city staff or a third party consultant? Why did you pick one over the other?*
We received informal advice from HDR (a consultant based in Ontario), but never paid a consultant for services. Continually talked with the granter about what to do with the program. Rhodes Yepsen (writes for BioCycle) also gave advice about the program. Again, none of these people were paid; they just served as a "brain trust."

3. In order to monitor the pilot, the neighborhood was split into ten sections and then each section was monitored for 2 consecutive weeks. Can you explain how the neighborhood was split, what the monitoring consisted of, and what happened once you did a full rotation?
Edwin Hoffman was the OPA at the time and is no longer with us. Neighborhood was split based on efficiency. Set-out rates were monitored for every house. Fill level, contamination, and bin condition were only noted for the split sections.

Following up with households via email (in addition to tagging) was a good way to engage participants beyond tagging.

4. *Was the database used only by the OPA? Where was it housed? Did the partners have access to the database?*
Housed at the city. Used only by the OPA. There was no reason for anybody else to use it during the pilot [the hauler was public].

5. *Your pilot documentation reported very low contamination rates. Would you attribute this more to education and outreach efforts or prudent monitoring/contamination notification?*

Comprehensive effort. The structure of a self-selected program also helped. Education materials highlighted good, clear photos with succinct language. Using a kitchen bin with a liner decreases contamination

6. Is there a reason you chose do to online surveys over phone/intercept surveys?
Talked with Rhodes a lot about the best practices in other organics programs. Self-selected program would certainly contribute to high response rates (each participants current email was documented). We sent the surveys along with program results. Surveys were sent out twice. Survey Monkey platform was used.

7. *Do you have the final copy of the surveys you disseminated to participants? We were hoping to give it to the city as a successful example.*
- Yes, we can send that to you

8. What were Cambridge's goals for the pilot program? How did these compare to your partners goals?
Cambridge's goals:

- Reduce waste
- Reduce climate emissions
- Reduce garbage costs
- Demonstrate active, widespread community participation

Rocky Hills (Compost Facility)

- Contaminant free
- Continue to be a player
- Quality and quantity

There is a lot of trust needed to make the partnership work, and we have had a good relationship with them.

9. Do you plan on making any significant changes to the contaminant notification system or monitoring plan when you roll out to a citywide initiative?
Still monitoring for contamination, and bin set out rates. Not monitoring for loose food and fill level. Rather than having a public hauler, there is a private hauler. The private hauler now takes on more of the responsibilities of monitoring and contamination notification.

10. If you had one piece of advice for the City of Eugene regarding their contaminant notification system and/or monitoring plan, what would it be?

- Strongly recommend a bag system. Google "Unimax" for the bin type (it is an Italian brand). These bins reduce moisture, odors, and weight, which ultimately reduces the "Yuck factor". This translates into increased participation rates. With compostable bags people are more aware of what they are doing and less likely to put the wrong item in there.
- Tell the story of what is going to happen with their compost. Explaining the full lifecycle (how food scraps turn into compost) helps people become more invested. This will make

them less likely to put contaminants in their bin. Make sure people understand the benefits of their actions.
    - Participants are able to pick up free soil made from compost as part of this process.

Other comments:

- Now that the program is not opt in (everyone has received a green bin), there is slightly more contamination and participation rates are lower. This way is still recommended.
- Most of contamination comes from multi-family units.

Recommended Survey Questions

See following page.

Cambridge, MA Curbside Compost Pilot Survey 1

1. How long have you lived at your current address?

- ○ 0-3 years
- ○ 4-6 years
- ○ 7-12 years
- ○ 12+ years

2. How many people currently live in your household? How old are they?

	1 person	2 people	3 people	4 people	5 people
Under 5	○	○	○	○	○
5-12	○	○	○	○	○
13-19	○	○	○	○	○
20-45	○	○	○	○	○
45-80	○	○	○	○	○
Over 80	○	○	○	○	○

3. How did you hear about the pilot program? (check all that apply)

- ☐ Information table
- ☐ Neighborhood sign
- ☐ Letter from Cambridge Public Schools
- ☐ From a neighbor in your multi-family building
- ☐ From a friend/family/neighbor
- ☐ Cambridge recycling website or newsletter

Other (please specify)

4. Have you ever composted at home?

- ○ No, I have never composted before
- ○ Yes, I still compost at home with a backyard bin
- ○ Yes, I still compost at home with a worm bin

Yes, but I have composted at a different address

- ○ Yes, I was composting until the pilot started
- ○ Yes, I was composting, but stopped before the pilot started

5. How many bags of trash to you generate each week? (13 gallon kitchen bags)

- ○ Less than 1
- ○ 1
- ○ 2
- ○ 3
- ○ More than 3

6. How many compostable bags have you used per week in your kitchen container?

- ○ 1
- ○ 2
- ○ 3
- ○ More than 3

7. Have you noticed a change in your trash? (check all that apply)

- ☐ No change
- ☐ I have less trash
- ☐ My trash weighs less
- ☐ My trash smells less

Other (please specify)

8. When do you typically eat your leftovers?

- ○ 1-3 days after cooking them
- ○ 4-6 days after cooking them
- ○ I freeze them so I can defrost them later
- ○ I never save leftovers

9. Approximately, what percent of the food that you buy do you throw out?

- ○ Under 10%
- ○ 10%-25%
- ○ 25%-50%
- ○ Over 50%

10. What percentage of your food waste could be prevented by preparing less, serving less or by changing your cooking habits?

- ○ Under 10%
- ○ 10%-25%
- ○ 25%-50%
- ○ Over 50%

11. Do you use a sink disposal?

- ○ Yes, it works fine
- ○ Yes, but it clogs
- ○ I used to, but not since the pilot started
- ○ No, but I would like one
- ○ No, I would not use one

(Run disposal with a moderate flow of cold water, coninue to run water for a few seconds after grinding is clompete. Avoid using hot water and never pour grease down the drain)

12. How is the compost pilot working for you so far?

- ○ It's great! Everything is clear and the system is easy
- ○ It's okay, I have some questions/issues
- ○ I have some concerns and am no longer participating

If any, what questions, comments or concerns do you have?

Done

Cambridge, MA Curbside Compost Pilot - Survey 2

***1. Why did you chose to participate in this program? (Check all that apply)**

- [ ] It's easier than composting at home
- [ ] To cut my carbon footprint
- [ ] To reduce my waste
- [ ] To help save the city money
- [ ] To help build healthy soil for local farmers
- [ ] Other (please specify)

***2. How many people live in your household?**

- ◯ Live alone
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ More than 4

***3. Which meals do you eat at home?**

Breakfast	
Lunch	
Dinner	

***4. On average how many meals do you cook using fresh produce a week?**

- ◯ 0
- ◯ 1 to 2
- ◯ 3 to 4
- ◯ 5 to 6
- ◯ 7
- ◯ More than 7

***5. On average, how many pre-prepared (frozen, delivery, takeout) meals do you eat a week at home?**

- ○ 0
- ○ 1 to 2
- ○ 3 to 4
- ○ 5 to 6
- ○ 7
- ○ More than 7

***6. Which grocery stores do you shop at regularly? (Check all that apply)**

- ☐ Star Market (Porter Square)
- ☐ Pemberton Farms (Mass Ave)
- ☐ Whole Foods (Fresh Pond)
- ☐ Trader Joe's (Alewife Brook Parkway)
- ☐ Formaggio's Kitchen (Huron Ave)
- ☐ Capone Foods (Mass Ave)
- ☐ Cambridge Naturals (Porter Square)
- ☐ Market Basket (Somerville Ave)
- ☐ Harvest Co-op (Central Square)
- ☐ Other (please specify)

***7. What type of food scraps do you collect in your kitchen container? (Check all that apply)**

- ☐ Raw & cooked vegetables, fruit
- ☐ Meat & fish (including bones)
- ☐ Shells (egg, shellfish)
- ☐ Dairy products
- ☐ Baked goods
- ☐ Rice, beans, pasta
- ☐ Tea bags, coffee grounds
- ☐ Uneaten food from your plates

Used napkins, paper towels, coffee filters, waxed paper

- [ ] Spoiled food
- [ ] Pet food
- [ ] Other (please specify)

***8. What prompts you to empty your kitchen container? (Check all that apply)**

- [ ] It is full
- [ ] Regular change of the bag every 2-3 days
- [ ] If I'm going away for a couple days
- [ ] Other (please specify)

***9. Have you noticed any odor from the kitchen container?**

- ○ No
- ○ Yes

10. If you answered "Yes" to the previous question, when do you notice odor? (Check all that apply)

- [ ] When there is fish, meat or dairy products
- [ ] When there are particularly wet scraps
- [ ] When I have not replaced the bag in 3 days or more
- [ ] Other (please specify)

***11. What do you think of the size of the kitchen container and bag?**

- [ ] Both are just right
- [ ] The container is too small
- [ ] The container is too big
- [ ] The bag is too small and hard to tie when full

Comments

Cambridge, MA Curbside Compost Pilot - Survey 3

***1. Do you feel like collecting food scraps in a separate bin is now a habit?**

- ○ Yes
- ○ No

Comments:

***2. Have you spoken with friends, family or neighbors about the pilot? (Check all that apply.)**

- ○ Yes
- ○ No

Please describe how you've talked about the program with others, and any memorable conversations about it:

***3. Are you using the kitchen collector the City provided to collect your food scraps?**

- ○ Yes
- ○ No

If No: Why? What kind?

***4. Where do you keep your kitchen container?**

- ○ In the refrigerator
- ○ In the freezer
- ○ Under the kitchen sink
- ○ On the kitchen counter

Other/Comments:

***5. Have you used the Buy One Get One Free coupon for BioBags?**

- ○ Yes, though I did not run out of bags.
- ○ Yes, I ran out of bags.
- ○ No, but I will when need more bags.
- ○ No, I have plenty of bags.

Comments:

***6. Have you had fruit flies?**

- ○ Yes
- ○ No

Comments:

7. If you've had fruit flies, what did you do to address it?

- ☐ Stored my kitchen container in the refrigerator
- ☐ Stored my kitchen container in the freezer
- ☐ Changed the bag more frequently
- ☐ Set up a vinegar trap
- ☐ Ignored them

How did this strategy work?

***8. Before the pilot, did you notice rodents around your property?**

- ○ Yes
- ○ No

Please describe any problems:

***9. Since the pilot started, have you noticed a change in rodents around your property?**

- ○ Same as before
- ○ Rodent activity has increased
- ○ Rodent activity has decreased

Please describe how/why the rodent problems have changed:

10. If your outdoor green bin has a latch on the top of the lid (for 3-12 unit buildings), what do your think about these bins?

- ☐ Great, size is fine and they're easy to use
- ☐ Sometimes it's hard to close
- ☐ Too big
- ☐ Too small

Comments:

11. If your outdoor green bin has a latch on the front of the lid (for 1-2 unit buildings), what do your think about these bins?

- ☐ Great, size is fine and they're easy to use
- ☐ Sometimes it's hard to close
- ☐ Too big
- ☐ Too small

Comments:

***12. Have you cleaned your outdoor green bin? (When you do, thank you for draining the wash water onto a grassy area, never into storm drains.)**

- ○ Yes
- ○ No, it hasn't needed cleaning.
- ○ No, but it could use cleaning.

Comments:

***13. Have you picked up finished compost from the Recycling Center for your garden?**

- ○ Yes
- ○ No

Comments:

***14. Since the pilot started, have you changed the way you prepare and/or serve food?**

- ○ Now I prepare/serve less to reduce waste
- ○ Now I worry less about wasting food because I can compost it
- ○ No change

Comments:

***15. Since the pilot started, have your shopping habits changed? (Check all that apply.)**

- ☐ I purchase more food
- ☐ I purchase less food
- ☐ I shop more frequently
- ☐ I shop less frequently
- ☐ No change

Comments:

***16. From the last survey, we learned that the majority of participating households are composting spoiled or uneaten food. While some waste is inedible, what would help reduce edible waste? (Check all that apply.)**

- [ ] Tips for smart shopping
- [ ] Tips for smart food prep
- [ ] Tips for smart storage
- [ ] Tips to eat everything I buy
- [ ] Tips for leftovers
- [ ] None of the above
- [ ] Other

Comments/Other:

Next

Cambridge, MA Curbside Compost Pilot - Survey 4

***1. When collection was cancelled due to a snow storm, how did that affect your composting experience?**

- ○ I had enough room in my bin.
- ○ My bin filled so I stored my scraps in my fridge/freezer.
- ○ My bin filled so I stored my scraps outside in a different container.
- ○ My bin filled so I brought my scraps to the St. Peter's Field community compost drop off.
- ○ My bin filled so I stopped composting until my bin was emptied.

Comments:

***2. Since the summer ended, have you experienced less odor collecting and storing your food scraps?**

- ○ Yes
- ○ No
- ○ Maybe

Comments

***3. On average, how many compostable bags did you use per week this summer?**

- ○ 1
- ○ 2
- ○ 3
- ○ 4+

Comments:

4. On average, how many compostable bags are you using per week this winter?

- ○ 1
- ○ 2
- ○ 3
- ○ 4+

Why?

***5. Have you noticed a change in bag performance since the summer ended?**

- ○ Yes
- ○ No
- ○ Sometimes

Comments:

***6. Have you purchased more compostable bags? (BioBags are available at Cambridge Naturals, Whole Foods, Pemberton Farms, Tags Hardware and Shaws.)**

- ○ Yes and I used the coupon
- ○ Yes but I did not use the coupon
- ○ No

***7. Since the pilot started, have you noticed a change in your trash? (Check all that apply)**

- ☐ No change
- ☐ Weighs less
- ☐ Smells better
- ☐ Less volume

Other/Comments:

***8. How many bags of trash are you generating each week? (13 gallon kitchen bags)**

- ○ 1
- ○ 2
- ○ 3
- ○ 4+

Comments:

***9. Storing the kitchen collector in the refrigerator or freezer is a best practice to reduce odors and flies. Have you ever stored it in the refrigerator or freezer? Why or why not?**

- ○ Yes
- ○ No

Please tell us more about how you've made this work, why you've chosen not to, or if you plan to try it.

***10. The kitchen container and compostable bags are designed to let heat escape and moisture evaporate. This lets food scraps dry out, which slows the rotting process, reduces odor, lightens the load, and keeps your curbside bin more clean.**

After your initial supply of compostable kitchen bags runs out, households will have to purchase them. (The BioBag Buy One Get One Free coupon is valid through 4/22/15 at local retailers.)

We recommend using 2-3 bags per week. Would you buy bags to participate in the program if it cost $20-$30 per year for your household?

- ○ Yes
- ○ Maybe
- ○ No

Please share your thoughts on purchasing compostable bags:

Next

Community Meeting Agenda

Compost Pilot Program Monitoring Plan

Date: November 17, 2015

Time: 8:30 AM - 9:30 AM

Location: Sloat Room, Atrium Building

Objectives

- Provide input on monitoring feedback loop
- Explore feasibility of applying case study best practices to Eugene pilot
- Evaluate plan from a co-partial perspective
- Discuss next steps and potentially overlooked areas of focus

Agenda

- Introductions and Agenda Overview - *5 minutes*
- Project Background/Case Study Presentation - *15 minutes*
- Small Group Discussion - *20 minutes*
    - See questions below
- Report-Out and Debrief - *15 minutes*
- Next Steps - *5 minutes*

Questions for Small Group Discussion

1. Which practices do you recommend the City of Eugene use to audit compost bins for contaminants?
2. How should we close the feedback loop between contaminant monitoring and residents?
3. Which stages of the process provide opportunities for measurable data points? What is the best way to measure these data points?
4. Do you have any additional thoughts or recommendations?

Community Meeting Power Point Slides

See following page.

City of Eugene Residential Composting Pilot

Contaminant Notification Monitoring Plan

Megan McGowen and Bree Nicolello
Community Planning Workshop

Project Background

- Eugene produces 40 million lbs. food waste yearly
- Expanding beyond commercial composting program, *Love Food, Not Waste*, and pursuing residential food waste diversion.
- A successful pilot program requires collaboration with key stakeholders
- Our project: contaminant notification system for pilot program
- Collected data will inform monitoring program and determine potential expansion of composting program

REXIUS

LANE apex disposal services

Sanipac
Doing Good In Our Community

Tacoma, WA - Overview

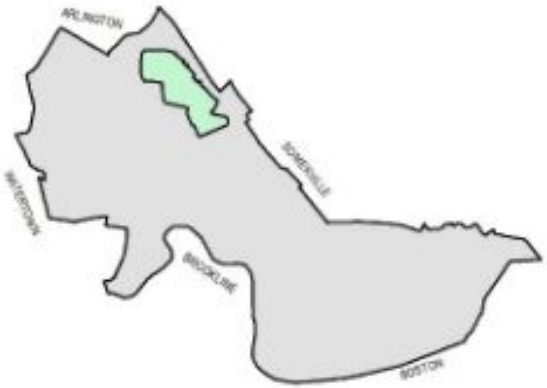
- Population of 203,446
- 6 Month pilot
- One public hauler
- Single family & duplexes
- Embedded fee
- All solid food, brown bags/newspapers
- Weekly organics; EOW garbage

Tacoma, WA - Monitoring

- Visual audits (percentage contamination)
- Sporadic tagging
- Automated phone surveys
- “Knock & Talk” - designed to get participant feedback
- Call rates to customer service
- Diversion rates
- Hired temp. labor to supplement monitoring

Cambridge, MA - Overview

- Population of 107,289
- 1 Year long pilot
- 1 public garbage hauler
- Single and multi-family homes
- No additional fee
- Weekly organics and weekly garbage
- Pilot has been expanded into a citywide program
- Accepts food scraps, soiled paper, and certified compostable products



Pilot area, Cambridge, MA

Cambridge, MA - Monitoring

- OPA monitored bins for fill level and contamination
- Route divided into 10 sections; first 2 weeks and last 5 weeks monitor as many bins as possible. Each section monitored for 2 consecutive weeks.
- Tagged bins with contaminants; emails sent to households whose bins were rejected
- Haulers measured tonnage each route
- “Organics Collection Database”:
    - Crew Route Data Entry Form - Collection day details
    - Monitoring Data Form - All stops in order; “out” or “not out”
- Issued six surveys using survey monkey

Renton, WA - Overview

- Population of 98,404
- 1 year long pilot
- One private hauler
- Single-family
- Three neighborhoods
    - one control/status quo, two independent)
- 1,429 participating households
- Embedded fee
- Can compost food scraps and food-soiled paper
- Every other week for independent variable, weekly for control
- Control group used three bin system, independent groups used mixed yard/food scraps

The Landing in Renton, Washington

Renton, WA - Monitoring

- Focus on public health, customer satisfaction, route tonnage, and yard debris composition
- Use of consultant, City staff, and garbage haulers
- Volunteers tagged contaminated bins and City fined households
- Two mailed surveys (city) and one phone survey (consultant)
- Haulers daily measured route tonnage
- Consultants sampled, sorted, and measured debris composition at composting facility (one-time measurement in December 2007)
- City staff and consultant did 3 ride-alongs on each route and conducted visual audit of bin condition
- 3 random walk-around monitoring sessions by City staff for deeper examination of bin condition

Portland, OR - Overview

- Population of 619,360
- Year long pilot
- Four haulers
- Single family and 2-4 unit multifamily
- Four neighborhoods
- 2,000 participating households
  - Three adjacent control groups
- Embedded fee
- All food scraps and paper products
- Weekly organics and every other week garbage

Alphabet District, NW Portland, OR

Portland, OR - Monitoring

- Garbage haulers and consultants collected data
- City sent one survey to pilot households
- Haulers conducted visual audits and field observations
- Haulers tagged contaminated carts, City sent follow-up letter
- Consultants conducted sorting of waste and container monitoring/weighing
- Loads were weighed four times during study and once pre-study
- Loads were weighed before and after setting out
- Measured response to service changes
- Analyzed waste characterization and food scrap diversion rates

Eugene, OR Pilot - Overview

- Two-year pilot to begin in Fall 2016
- Food scraps will be placed in yard debris containers
- Organic material only
- Four (to be determined) neighborhoods
- Number of participating households is unknown
- Routes to be served by Lane Apex or Sanipac
- Compost to be processed by Rexius
- Weekly compost and garbage pickup
- Embedded fee

The Schoolhouse Garden at Edison Elementary School

Eugene, OR - Composting Process

1. Yard debris and compost placed by residents in containers

2. Weekly debris pickup by garbage hauler

3. Debris driven by hauler to Highway 99 Rexius facility

4. Compost processed at Highway 99

- Weighed
- “Picking policy”
- Ground/mixed

5. Processed compost taken to Rexius Coburg facility