CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of the City Auditor

Report to the City Council
City of San José

CURBSIDE RECYCLING: THE CITY CAN ENHANCE ITS SINGLE-FAMILY RESIDENTIAL RECYCLING PROGRAM TO IMPROVE WASTE DIVERSION

Report 15-06
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CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of the City Auditor
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May 22, 2015

Honorable Mayor and Members
Of the City Council
200 East Santa Clara Street
San José, CA 95113

Curbside Recycling: The City Can Enhance Its Single-Family Residential Recycling Program to Improve Waste Diversion

The Environmental Services Department (ESD) has contracted with two haulers to provide recycling service to the City's 213,000 single-family residential households. These contracts are the primary vehicles for the City to achieve its single-family curbside recycling goals as outlined in the City's Zero Waste Plan. Each of the contracts provides diversion goals, or targets for how much waste is to be diverted from landfill disposal. In addition, they describe the haulers' responsibilities for picking up and processing recyclable materials, as well as providing public outreach and education to residents. ESD's Integrated Waste Management Division is responsible for managing the contracts to ensure the City's residents are receiving the services called for in the contracts.

Under the current system, residents put all of their recycling into one recycling cart to be picked up and sorted at the haulers' material recovery facility (MRF) to be later sold to manufacturers or other users of recycled materials. The objective of this audit was to assess the effectiveness of the City's single-family residential recycling program. This audit was conducted in response to the ESD Director's request for an audit in this area.

Finding 1: Single-Family Residential Households Have the Lowest Diversion Rate of the City's Main Waste Streams. Only one third of the garbage and recycling generated by single-family residences was diverted from a landfill in 2014, the lowest rate among the main sources of waste generated in the City. In 2014, the City began to phase in a program to recover recyclable or organic materials from single-family residential garbage carts (referred to as backend sorting). This has the potential to significantly increase diversion overall for single-family residences, primarily by recovering recyclables and organic materials placed in residential garbage carts that otherwise would be landfilled.

Meanwhile, single-family curbside diversion rates (i.e., materials actually recycled through placement in blue residential recycling carts) have fallen across the City. This is particularly true in two of the City's three recycling service districts; these two districts account for more than three quarters of all the single-family residences in the City. The contractor responsible for those two districts did not meet its contractual diversion goals in 2011 through 2014.

Many factors can affect whether the City is able to meet its curbside recycling goals, including household recycling behavior, the availability of markets for recycled commodities, and how the City's contracted

haulers collect and process materials. Since 2008, haulers have collected and processed fewer tons of recyclables. In addition, recycled commodity prices dropped, and studies have shown 25 to 35 percent of material in recycling carts were not recyclable.

ESD plans to conduct a waste characterization and residue study (of the haulers' MRFs) to more precisely determine the extent to which the recycling stream has changed since 2008 and better understand why diversion goals are not being met. We recommend the City utilize the results from this study to work with the haulers to determine where program improvements can be made, and set a baseline for single-family diversion goals in future contracts.

If the study shows that clean recyclables are present in the residue from either MRF, the City should require the contractor either improve its MRF processing procedures to ensure compliance with the terms of their contract, or explore backend sorting the MRF residue to recover any materials which were not recovered during processing. Because diversion is calculated differently between the two haulers, we also recommend that in future contracts the City standardize its diversion calculations to better track diversion progress.

Finding 2: The City Can Enhance its Education and Outreach Programs to Improve Recycling. Education and outreach are vital to maintaining a successful recycling program, both in the short and long term. Both the City and its haulers have recycling outreach responsibilities. Since 2008, the City has largely relied on its haulers for education and outreach. However, it does not appear that current activities have been successful. The shift to the haulers leading outreach efforts has coincided with a drop in the single-family curbside residential diversion rate from 36 percent in 2008 to 27 percent in 2014. In addition, one hauler has raised concerns that the amount of non-recyclable material found in recycling carts has been increasing.

Existing outreach activities are limited in scope, and primarily involve attendance at events and serving notices to noncompliant households (non-collection notices or NCNs). When compared with other jurisdictions, school MRF tours and educational presentations are infrequent – reaching just 6 of the 330 San José public and private schools in 2014. While there may be multiple reasons for the fall-off in residential diversion rates, we recommend that the City require its haulers to refocus their efforts on increasing the number of presentations to school and community groups, and engaging in door-to-door interactions with residents, particularly in neighborhoods known to have contamination problems.

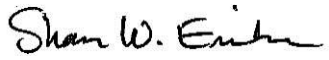
Finding 3. The City Can Better Enforce Municipal Code Provisions Surrounding Repeat Contamination in Recycling Carts. The Municipal Code requires that recycling containers be utilized only for their intended use. To enforce this, haulers issue NCNs and refuse to pick up contaminated carts. NCNs issued by haulers serve as the primary enforcement method to reduce contamination in recycling carts. By refusing to pick up contaminated carts, the haulers can prevent non-recyclable waste from contaminating otherwise clean recyclables.

Haulers track NCN issuance by residence and report it to the City. Most residences have never received an NCN. However, there are cases of repeat contamination – nearly 300 residences received 12 or more NCNs during 2013 and 2014. In these more egregious cases, receipt of multiple NCNs and non-pick up of their cart has not deterred residents from continuing to place non-recyclable materials in their recycling cart.

The contracts require the City to work with haulers to resolve situations related to repeat contaminators. Although ESD has drafted residential recycling enforcement procedures which include issuance of a $50 citation after the sixth NCN and a possible upsizing of the garbage cart after the ninth NCN, those procedures have not been implemented to date. To ensure consistent enforcement, we recommend ESD work with the haulers to clarify under what circumstances NCNs are issued and finalize and implement enforcement procedures.

We would like to thank the Environmental Services Department and the City Attorney's Office, as well as California Waste Solutions and GreenTeam of San Jose for their time and insight during the audit process. This report includes six recommendations. We will present this report at the June 1, 2015 meeting of the Transportation and Environment Committee. The Administration has reviewed this report and its response is shown on the yellow pages.

Respectfully submitted,



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Introduction

The mission of the City Auditor's Office is to independently assess and report on City operations and services. The audit function is an essential element of San José's public accountability and our audits provide the City Council, City management, and the general public with independent and objective information regarding the economy, efficiency, and effectiveness of City operations and services.

In accordance with the City Auditor's Fiscal Year (FY) 2014-15 Work Plan, we have completed an audit of the City's single-family residential curbside recycling program. The audit was conducted in response to the Environmental Services Department Director's request for an audit in this area.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. We limited our work to those areas specified in the "Audit Objective, Scope, and Methodology" section of this report.

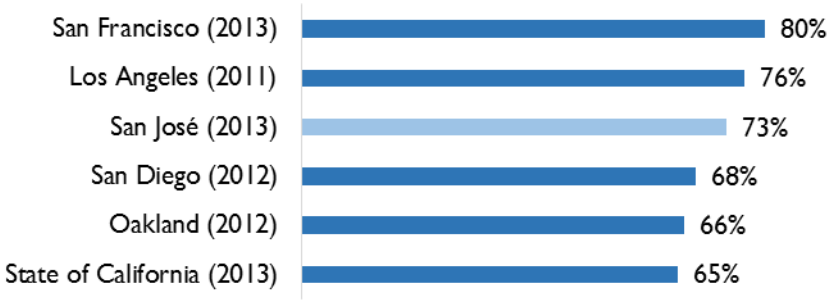
The Office of the City Auditor thanks the Environmental Services Department, the City Manager's Office, and the City Attorney's Office as well as California Waste Solutions and Green Team of San Jose for their time and insight during the audit process.

Background

The City, through the Environmental Services Department (ESD) and its Integrated Waste Management (IWM) Division, supports residential, commercial, and City facility and operations solid waste disposal. In the fall of 2007, Council adopted a resolution establishing a goal of 75 percent waste diversion from landfill by 2013, and a goal of Zero Waste by 2022; San José's 2013 diversion rate was an estimated 73 percent, up from 71 percent in 2012.

Although the City did not achieve its 2013 goal, San José has long been recognized as a leader in recycling, and was one of the first to implement a curbside program. As shown in Exhibit 1, compared to other large California cities, San José's citywide diversion rate (including residential, commercial, and City facility and operations) is lower than San Francisco and Los Angeles, but is higher than San Diego, Oakland, and the statewide diversion rate.

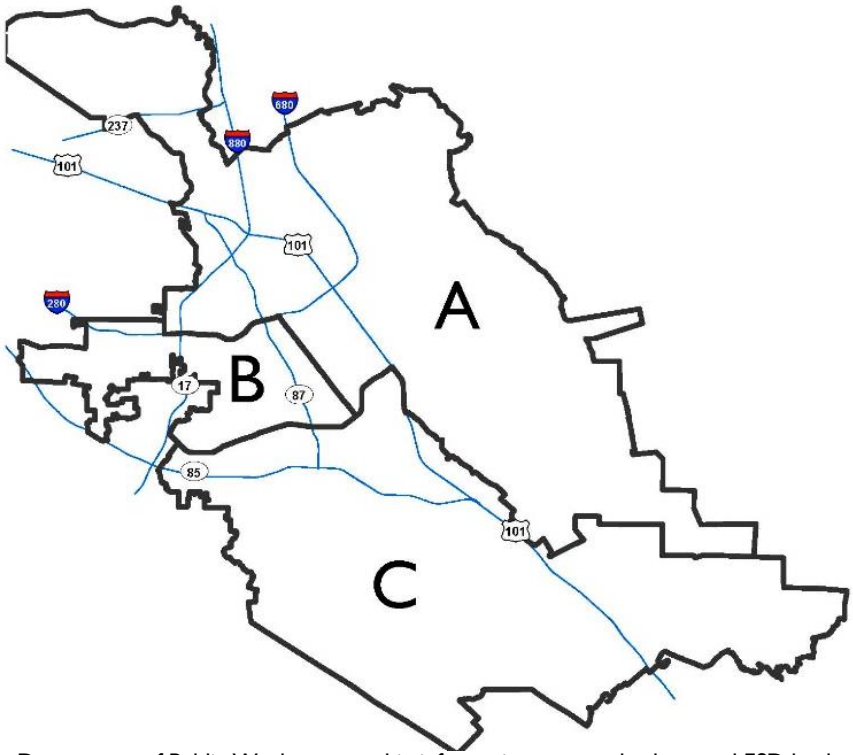
Exhibit 1: Comparison of San José's Citywide Diversion Rate to Other Jurisdictions



Source: Individual city and state websites for most recently reported diversion rates.

The City began curbside recycling in 1989 with a three-sort system for newspaper, glass, and metal cans. In 1993, the City created three distinct hauler districts (see Exhibit 2), and the recycling program was expanded to a four-sort recycling system for mixed paper, newspaper, glass, and mixed recyclables. In 2002, the current Recycle Plus program was implemented, and includes unlimited collection of commingled recyclables in one container (also known as single-stream recycling) and unlimited, loose-in-the-street or containerized yard trimmings.

Exhibit 2: San José Garbage and Recycling District Boundaries



Source: Department of Public Works geographic information system database and ESD hauler collection district boundaries.

IWM's residential services group manages curbside recycling and garbage collection for both single-family and multi-family dwellings, which accounts for approximately 29 percent of the total waste generated in San José. There are about 213,000 single-family households under its Recycle Plus program. More than 150,000 tons of single-family garbage and 95,000 tons of single-family recycling were collected by the City's contracted garbage and recycling haulers in 2014.[1] Additionally, the City collects on average about 135,000 tons of yard waste annually.

Under the current system, residents put all of their recycling into one cart for pickup by the City's haulers. This is then transported to a material recovery facility (MRF) to be processed. During processing, the materials are manually and mechanically sorted and separated into different types and categories (e.g., paper, glass, plastic). They are then baled and sold as recycled commodities for use by manufacturers or other users of recycled materials.

Based on results from a National Citizen Survey conducted in the fall of 2014, 71 percent of residents rated the quality of the City's garbage and recycling services as good or excellent and 70 percent rated the City's yard waste services as good or excellent.[2]

The City Contracts with Third Parties to Collect and Process Residential Recycling

The City currently contracts with two recycling haulers to provide services to the City's single-family residential households: California Waste Solutions, Inc. (CWS) and Waste Connections of California, Inc. (d/b/a GreenTeam).[3] These contracts are the primary vehicles for the City to achieve its single-family residential recycling goals. Each contract sets diversion goals and describes the haulers' responsibilities for picking up and processing recyclable materials. The City has had previous contracts with these haulers dating back to 2002 (GreenTeam) and 2007 (CWS). These contracts were renegotiated and replaced by new contracts in 2010 (running through 2021) extending the term of the contracts in exchange for various financial, operational, and programmatic benefits to residents. Exhibit 3 shows the current recycling and garbage haulers for each of the Recycle Plus districts and the number of households served in each district.

[1] The 95,000 tons of recycling is the total weight of all materials that residents placed in their recycling cart. In 2014, the amount that was actually recovered for recycling totaled only 68,000 tons.

[2] This survey did not differentiate between single-family and multi-family residences.

[3] GreenTeam is the City's garbage and recycling hauler for district B and also provides multi-family garbage and recycling collection services for the whole City.

Exhibit 3: Recycling Haulers/Processors by District

	Estimated Single-Family Households (2014)	Recycling Service Provider	Garbage Service Provider
District A	97,000	CWS	Garden City
District B	49,000	GreenTeam	GreenTeam
District C	68,000	CWS	Garden City

Source: Environmental Services Department

The recycling haulers are primarily paid on a per household basis utilizing a base service rate which was agreed to at the beginning of the contracts. The base rate is adjusted annually to reflect the rise in fuel or other non-processing operating costs. The current base service rates for recycling services for districts A, B, and C are $8.95, $12.72, and $9.63 per household, respectively. In FY 2013-14, payments to CWS and GreenTeam for recycling collection and processing totaled $16.9 million and $7.5 million, respectively (GreenTeam received an additional $4.3 million for garbage collection).[4]

In addition to pick up and processing of recycled materials, both haulers are also required to carry out outreach and education activities and maintain a customer service operation (billing related inquiries, however, are currently handled by the City's call center).

Residents Are Charged Based on the Size of Their Garbage Carts

Residents are charged a fee on a "pay-as-you-throw" rate schedule, whereby a residence is charged based on the size of the garbage container it utilizes. This rate structure, also known as "volume-based pricing," is designed to incent residents to recycle more and throw away less. Pay-as-you-throw rate structures are common throughout the Bay Area.

Under San José's rate structure, recycling is unlimited at no additional charge. Similarly, there are no additional charges for yard waste if the trimmings are left loose in the street. There is a yard waste charge if a resident opts to utilize a cart. The current monthly rates for single-family residences are shown in Exhibit 4.

[4] The City paid a total of $11.8 million to GreenTeam in FY 2013-14. The breakdown between the payments for recycling versus garbage collection is an estimate. These payments also reflect any deductions for liquidated damages, disincentive deductions if the hauler did not meet required diversion standards, or disposal charges for materials collected by the recycling hauler but which were not sorted because of contamination or some other reason and were landfilled.

Exhibit 4: Monthly Garbage and Recycling Rates for Single-Family Residences

Collection Service	2014-15 Monthly Rate[5]
Garbage:	
32-gallon cart	$30.84
64-gallon cart	$61.68
96-gallon cart	$92.52
Recycling:	
Any size cart (32, 64, 96 gallon)	Included with garbage fee
Yard trimmings:[6]	
Loose in the street	Included with garbage fee
Cart	$4.69

Source: Environmental Services Department website

Note: Additional fees may apply for on-premise collection, extra garbage stickers, large item pickup, and other services.

Roughly 90 percent of the City's single-family residences utilize the 32-gallon garbage cart. The City's monthly charge for the 32-gallon cart appears to be in line with other Santa Clara County cities.[7] Currently, most residents are charged on a bimonthly billing cycle. Beginning in July 2015, residential single-family households will be billed for garbage and recycling services through the Santa Clara County Secured Property Tax Bill.

Other residential garbage and recycling services include the Neighborhood Clean-Up Program, which provides large neighborhood clean-up events to City neighborhoods,[8] and large item collection service. Both of these services have a contractual requirement of 75 percent diversion. According to ESD, both programs assist in reducing the quantity of waste that could otherwise end up in landfill.

Audit Objective, Scope, and Methodology

The objective of our audit was to assess the effectiveness of the single-family residential curbside recycling program. The scope of the audit included a review of hauler contracts to understand contract compliance in the areas of diversion goals, outreach activities, customer service, and processing operations.

[5] For FY 2015-16, ESD is recommending a Recycle Plus rate increase of up to 3 percent for single-family residences.

[6] GreenWaste Recovery is the contracted hauler for yard trimmings and processes district B recyclables under a subcontract with GreenTeam.

[7] Of the reviewed jurisdictions' rates, Sunnyvale had the highest 32-gallon rate of $34.88 per month and Cupertino had the lowest at $23.40.

[8] Each San José neighborhood is scheduled to be served by neighborhood clean-up events once every three years.

Through an examination of contractual requirements, as well as a series of interviews and analyses of hauler-issued reports, we sought to understand the relevant management controls and differences in diversion rates across the City. Specifically, we:

- Reviewed the City Charter and Municipal Code to understand the legal responsibilities and authorities permitted.
- Reviewed relevant Council memoranda, budget documents, and program reports, including program and service delivery changes and performance measures reported to the City Manager's Budget Office.
- Interviewed ESD management and staff, including communications staff, contract managers, and Integrated Waste Management inspectors. Furthermore, we interviewed Local Enforcement Agency staff (in the Department of Planning, Building, and Code Enforcement) to understand permitting processes for material recovery facilities and Public Works staff to determine compliance with contractual prevailing wage requirements.
- Toured California Waste Solutions' and GreenWaste Recovery's material recovery facilities in order to understand recyclables processing methods and other aspects of operations. Additionally, we examined select garbage and recycling carts with staff from California Waste Solutions and GreenTeam to obtain an idea of how the contaminated carts issue differs across the City and under what circumstances non-collection or other informational notices are distributed.
- Analyzed monthly, quarterly, and annual reports submitted by both haulers in order to calculate diversion rates, assessed the use of courtesy and non-collection notices, evaluated outreach activities, and tracked changes in overall recycling and solid waste collection, the quantity of recycled materials sold by the City's haulers, and the revenues received by the haulers from such sales. Although we reviewed the haulers' submitted data for reasonableness by comparing tonnages over time and by understanding how the materials are weighed and sorted in the material recovery facilities, we did not test the underlying hauler data systems.
- Benchmarked outreach and/or enforcement activities with other public agencies, including the cities of Fresno, Oakland, Sacramento, San Bernardino, San Diego, San Francisco, Santa Clara, and Sunnyvale, and joint powers authorities such as Rethink Waste (in San Mateo County) and StopWaste (in Alameda County). We also benchmarked rates, rate structures and residential garbage and recycling program elements of various cities in Santa Clara County such as Cupertino, Sunnyvale, Palo Alto, Milpitas, Gilroy, Morgan Hill, and Mountain View.

- Reviewed best practices, including the Solid Waste Association of North America's *Managing Recycling Systems*, and literature about market trends for recycled commodities.

Additionally, we obtained demographic (census) statistics for collection districts, created geographic information system maps to portray community profiles, and mapped non-collection notices for 2013 to 2014. We used these maps to analyze recycling behavior as well as City and hauler outreach methods to determine effectiveness of past efforts.

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Finding 1 Single-Family Residential Households Have the Lowest Diversion Rate of the City's Main Waste Streams

Summary

Only one third of the garbage and recycling generated by single-family residences was diverted from a landfill in 2014, the lowest rate among the main sources of waste generated in the City. In 2014, the City began to phase in a program to recover recyclable or organic materials from single-family residential garbage carts (referred to as backend sorting). This has the potential to significantly increase diversion overall for single-family residences, primarily by recovering recyclables and organic materials placed in residential garbage carts that otherwise would be landfilled.

Meanwhile, single-family curbside diversion rates (i.e., materials actually recycled through placement in blue residential recycling carts) have fallen across the City. This is particularly true in two of the City's three recycling service districts; these two districts account for more than three quarters of all the single-family residences in the City. The contractor responsible for those two districts did not meet its contractual diversion goals in 2011 through 2014. Many factors can affect whether the City is able to meet its curbside recycling goals, including household recycling behavior, the availability of markets for recycled commodities, and how the City's contracted haulers collect and process materials.

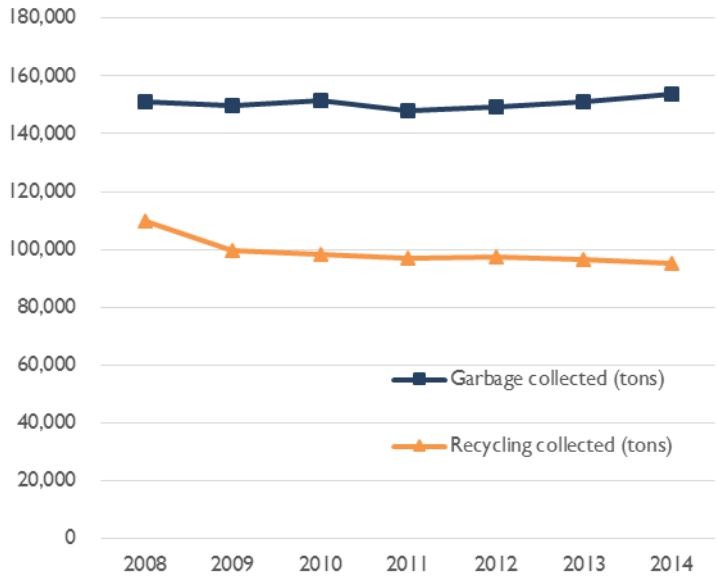
ESD plans to conduct a waste characterization and residue study (of the haulers' MRFs) to determine how the recycling stream has changed since 2008 and better understand why diversion goals are not being met. We recommend the City utilize the results from this study to work with the haulers to determine where program improvements can be made, and set a baseline for single-family diversion goals in future contracts. If the study shows that clean recyclables are present in the residue from either MRF, the City should require the contractor either improve its MRF processing procedures to ensure compliance with the terms of their contract, or explore backend sorting the MRF residue to recover any materials which were not recovered during processing. We also recommend that in future contracts the City standardize its diversion calculations across the City to better track diversion progress.

The Amount of Recycled Materials Collected Has Declined Since 2008

Based on data submitted monthly and annually by the City's contracted haulers, the amount of garbage collected from single-family residences has remained fairly steady since 2008, increasing by just 2 percent from 151,000 tons to 154,000 tons

in 2014 (on a per household basis, the amount of garbage collected actually declined slightly). However, the amount of recycling collected has declined by 13 percent over that same time, from nearly 110,000 tons of recycling collected to the current 95,000 tons.

Exhibit 5: Single-Family Residential Garbage and Recycling Tonnages by Year



Source: Auditor analysis of data summarized by the Environmental Services Department from hauler monthly and annual reports.

Only One Third of the Garbage and Recycling Generated by Single-Family Residences Was Diverted From a Landfill

The City measures recycling progress by calculating the percentage of waste that is diverted from landfill disposal (called the diversion rate). Diverted waste includes recycled commodities recovered through the recycling program, or compostable organic materials, such as food and yard waste, collected and transported to a composting facility.

The City has six main sources of waste: City operations, commercial enterprises, single-family residences, multi-family residences, yard waste, and construction and demolition activities. Diversion rates differ across the sources as shown in Exhibit 6. As noted by ESD in a memorandum to the City Council's Transportation and Environment Committee in November 2014, the single-family residential diversion rate is the lowest among the six sources, yet it is the second largest contributor to the City's waste stream.[9]

[9] In the memorandum to the City Council's Transportation and Environment Committee, ESD refers to five main sources of waste (not separating yard waste from the residential waste stream). However, during its discussion of single- and multi-family residential diversion results, it reports yard waste results separately. For purposes of this audit, we have broken out yard waste as a separate source.

Exhibit 6: City Waste Sources and 2014 Diversion Rates

	Diversion Rate	Percent of Total (by weight)
Single-family	32%	21%
Construction and demolition	75%	43%
Multi-family	78%	8%
Commercial	78%	17%
City facilities	91%	1%
Yard waste	97%	10%

Source: Environmental Services Department (based on data provided by the City's contracted garbage and recycling haulers)

The single-family diversion rate of 32 percent includes recycling from curbside containers, large item pickups, and neighborhood cleanups as well as compostable materials captured through backend sorting of district B's solid waste (described below), but excludes yard trimming collections. ESD has calculated the portion of the 2014 diversion rate attributable to curbside recycling alone as 27 percent (i.e., 27 percent of the 32 percent is attributable to what residents place in their recycling carts, as opposed to materials recovered through backend processing, neighborhood cleanups, etc.).[10]

The City Has Begun a Program to Increase Diversion by Backend Sorting Its Solid Waste

As described in the Background section of the report, the City has a goal of diverting 100 percent of the waste generated in the City from landfills by 2022. In 2008, the City Council accepted a Zero Waste Strategic Plan that listed options to maximize diversion across the various waste streams. One of the options to be considered is hauling single-family residential garbage to a material recovery facility (MRF) with the capability of processing solid waste (a "dirty" MRF). The purpose would be to sort and recover materials from the garbage stream for recycling or composting instead of hauling the garbage directly to a landfill. This process is referred to as backend sorting.

Backend sorting has the potential to significantly increase waste diversion for single-family residential households. The main reason for this is the recovery of additional recyclables as well as compostable materials (e.g., food waste) that are currently landfilled. For example, the City conducted a waste characterization study in 2008 (described further below) that found that 52 percent of materials found in the single-family residential garbage stream was compostable. Further, the study found that an additional 19 percent was potentially recyclable. In 2008, the City began backend sorting multi-family garbage and ESD has attributed a

[10] It is difficult to compare single-family residential curbside diversion rates with other jurisdictions because of differences in program design (e.g., how yard waste or other organic material is collected) or the commingling of materials (e.g., trucks in other jurisdictions may pick up both single- and multi-family residential materials).

significant increase in the multi-family diversion rate to this process (from about 35 percent in FY 2007-08 to nearly 80 percent the following year).

Beginning in July 2014, ESD began an initial phase of backend processing single-family residential garbage. ESD budgeted $2.5 million for this first phase of the program, which covered district B (about 20 percent of the City's single-family residential households).[11] About $1 million of the costs were expected to be covered by reduced disposal fees at the Newby Island landfill. Funding for the initial phase of the program came from rate increases approved in FY 2014-15 (which raised the 32-gallon garbage cart monthly rate from $29.95/month to $30.84/month).

ESD expects to expand the program with a goal of serving all single-family homes over the next five years. Proposed rate increases of 3 percent for FY 2015-16 will allow for the second phase of backend sorting that will include additional residences from district A (representing about 20 percent of the City's single-family residences). ESD has budgeted another $2.5 million for the second phase of the program. As in 2014, a portion of the costs will be covered by reduced disposal fees.

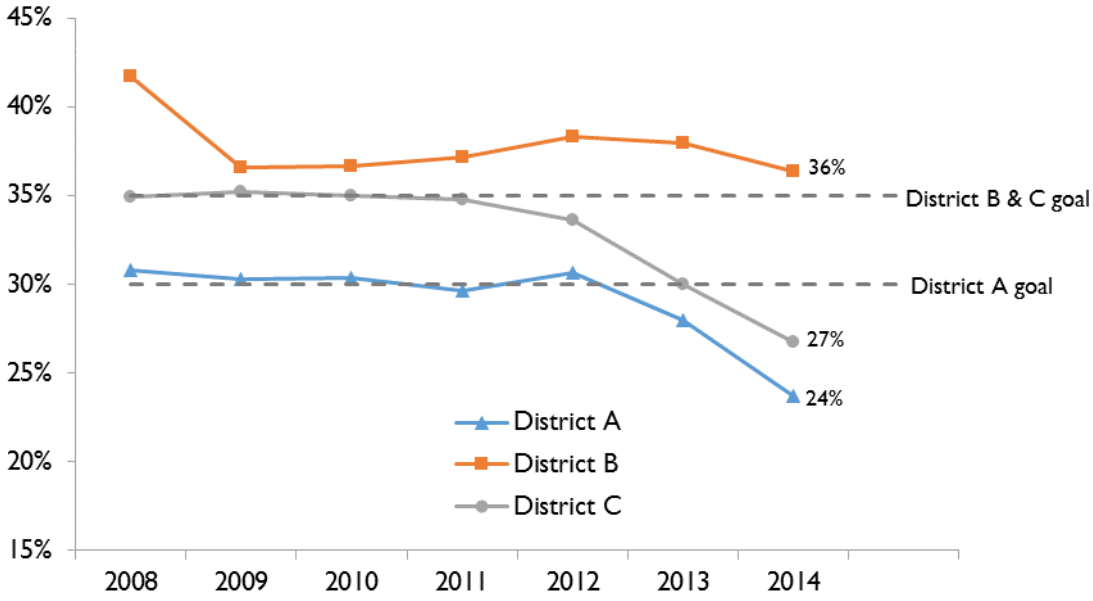
In addition to the materials found in the solid waste stream, materials found in recycling carts that are not recovered during sorting at the haulers' MRFs (such as non-recyclable materials and solid waste found in recycling carts) can also be backend sorted to recover whatever organic or potentially recyclable materials remain. This material is referred to as a MRF's residue; currently backend sorting of district B's residue already occurs. The effectiveness of the haulers' current MRF operations is a target of third-party evaluation that ESD is planning to undertake (described further later in this chapter).

Single-Family Curbside Diversion Rates Have Fallen Across the City; Most Significantly in Districts A and C

As described in the Background section of this report, the City is divided into three districts for residential single-family recycling service. One hauler (CWS) serves districts A and C and another (GreenTeam) serves district B. Because of historical differences in diversion rates, residential curbside diversion results and goals differ significantly across the three districts. Exhibit 7 shows each district's diversion goals, as well as the calculated diversion rate for each district from 2008 through 2014.

[11] Similar to the multi-family program, single-family residential backend processing for district B has been conducted at a facility owned and operated by GreenWaste Recovery, Inc. In addition to a recycling processing line, GreenWaste's facility has a separate line to sort garbage.

Exhibit 7: San José Recycling Districts' Goals and Results, 2008 Through 2014



Source: Environmental Services Department and contracts with the City's recycling haulers

Note: Current agreements were effective July 1, 2010. The listed diversion goals for each district are the standard against which the contracted recycling service providers are measured in their respective contracts. The actual diversion results are calculated using the agreed-upon methodologies outlined in the contracts.

One Hauler Has Not Met Its Division Goals

As shown in Exhibit 7, CWS did not meet its goals in each of its districts in 2011 through 2014. Each of the hauler contracts contain incentives for exceeding contractual diversion goals, and disincentives for not achieving its goal. As a result of not meeting its contractual diversion goals for districts A and C, the City assessed CWS penalties totaling $37,000, $284,000, and nearly $577,000 for 2012, 2013, and 2014 respectively.

Many Factors Can Affect Whether the City Is Able to Meet Its Diversion Goals

There are many variables that can affect whether the City and its recycling haulers meet diversion targets. For example, potentially recyclable materials will not be recovered if a resident places them in a garbage cart or commingles recyclable material with garbage in such a way that it becomes contaminated. How the haulers collect and process the materials can impact whether materials are successfully recycled. Finally, the haulers' sales efforts and the availability of markets for recycled materials can also affect whether items are ultimately recycled or end up in a landfill.

Household Recycling Behavior Can Change Over Time

The curbside recycling diversion goals included in the hauler contracts are unchanged from their respective 2007 contracts. However, any changes in recycling behavior since then could affect how easily or how difficult it may be for the haulers to meet those targets. For example, if over time households recycle less material relative to the amount they put in their garbage cart, it may be difficult for a hauler to maintain the same level of diversion it had once been able to achieve. It should be noted that in their contracts with the City, the haulers have the responsibility to provide outreach and education to residents to influence recycling behavior (see Finding 2) and bear the risk for changes in behavior.

As described earlier, the amount of garbage, or solid waste, collected in the City from single-family residences has increased slightly from 151,000 tons in 2008 to 154,000 tons in 2014. However, on a per household basis, the amount of garbage collected has actually declined by about half a pound per week, from 28.3 pounds per week to 27.7 pounds (a 2 percent decrease). Total tons of recycling collected has decreased by 13 percent, from 110,000 tons in 2008 to 95,000 tons in 2014. On a per household basis, it declined by 16 percent, from 20.6 pounds to 17.2 pounds per week.[12]

The changes in total tons collected and pounds per household collected vary across districts. Exhibit 8 shows the change in garbage and recycling from 2008 to 2014 across the City's three Recycle Plus districts.

[12] Compared to 2010, when the contracts with the haulers were replaced with new agreements, the change in recycling collected has been less dramatic, declining just 3 percent in total tons collected and 5 percent on a per household basis.

Exhibit 8: Total and Per Household Garbage and Recycling Collected by Recycle Plus District, 2008 and 2014

		2008	2014	% change
District A	Single-family households	92,074	96,741	5.1%
	Solid waste (tons)	74,629	77,939	4.4%
	Recycling (tons)	47,063	43,152	-8.3%
	Solid waste (lbs/household/week)	31.2	31.0	-0.6%
	Recycling (lbs/household/week	19.7	17.2	-12.7%
District B	Single-family households	47,079	48,938	3.9%
	Solid waste (tons)	28,667	29,210	1.9%
	Recycling (tons)	25,322	21,333	-15.8%
	Solid waste (lbs/household/week)	23.4	23.0	-2.0%
	Recycling (lbs/household/week	20.7	16.8	-19.0%
District C	Single-family households	66,236	67,618	2.1%
	Solid waste (tons)	47,742	46,496	-2.6%
	Recycling (tons)	37,386	30,817	-17.6%
	Solid waste (lbs/household/week)	27.7	26.4	-4.6%
	Recycling (lbs/household/week	21.7	17.5	-19.3%
Total Citywide	Single-family households	205,389	213,297	3.9%
	Solid waste (tons)	151,038	153,646	1.7%
	Recycling (tons)	109,771	95,302	-13.2%
	Solid waste (lbs/household/week)	28.3	27.7	-2.0%
	Recycling (lbs/household/week	20.6	17.2	-16.4%

Source: Auditor analysis of ESD consolidated monthly recycling reports from data submitted by haulers in monthly and annual reports.

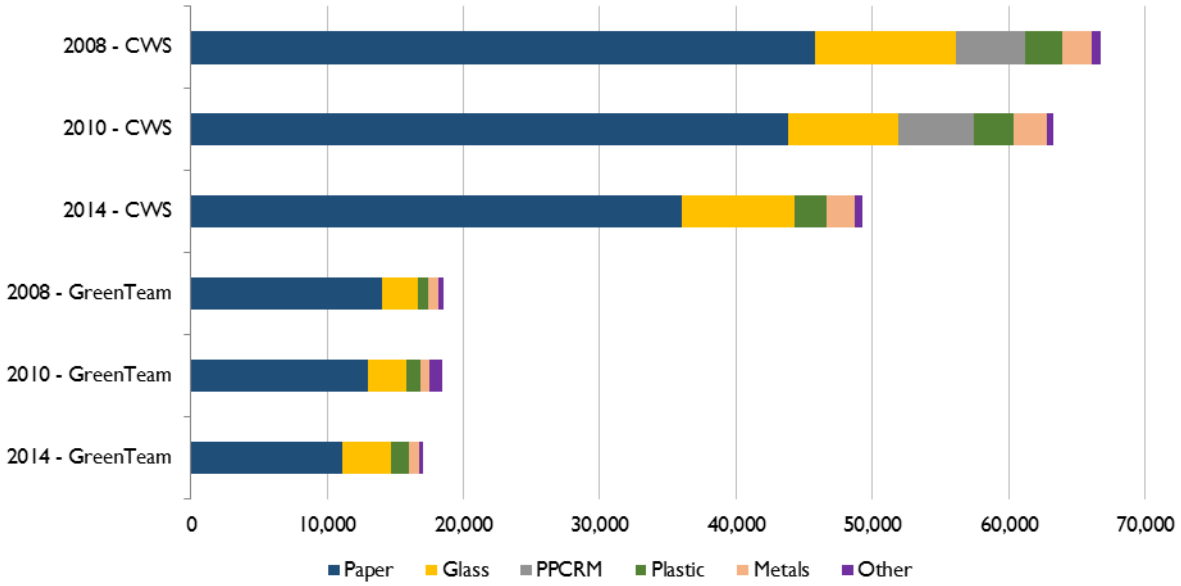
Consumer Choices and Marketability of Recyclable Commodities Can Impact Diversion Rates

Each of the haulers receive all of the revenues from the sale of recycled commodities recovered through the recycling program. This is meant to incent the contractors to find markets for potentially recyclable materials and reap the benefits.[13] This also shifts the risk for changes in consumer behavior and the recycled commodities markets from the City to the contractors.

One of the main recyclable commodities sold by the City's haulers is newspaper. In 2008, newspaper accounted for 39,000 of the 67,000 tons of recyclables recovered and sold by CWS (or 59 percent of the total). However, the newspaper market has been in decline for a number of years and the amount sold by CWS dropped from 39,000 tons in 2008 to 29,000 tons in 2014. This trend has affected both haulers, with the amount of total paper sold dropping by about 20 percent for each hauler from 2008 to 2014. Exhibit 9 shows the sales of recovered recyclable commodities by hauler.

[13] In some cases, the hauler may pay a third party to take recyclable material.

Exhibit 9: Estimated Tons of Single-Family Residential Recyclables Sold by the City's Recycling Haulers, 2008, 2010, and 2014



Source: Auditor analysis of CWS' and GreenTeam's annual sales reports and the Environmental Services Department's annual diversion calculation worksheets.

Notes:

(a) 2008 was the year of the most recent characterization study of the City's recycling stream. In 2010, the City renegotiated its existing hauler contracts, extending the length of the agreements in exchange for various financial and programmatic benefits.

(b) Paper includes old newspaper, corrugated cardboard, and other mixed paper products. PPCRM refers to Post-Processing Commingled Recyclable Materials. These are materials that cannot be separated by categories as defined by the Institute of Scrap Recycling Industries, Inc. standards.

Overall, CWS and GreenTeam saw drops in recycling sales by 26 and 8 percent respectively. CWS showed declines in each of the commodity types shown in Exhibit 9. GreenTeam actually saw an increase in sales of tons of recycled glass, plastics, and metals in 2014 compared to 2008; but these increases could not compensate for the decline in paper.[14]

[14] The City can also influence what ends up in the recycling or waste stream through ordinances such as the 2012 Bring Your Own Bag Ordinance, which disallowed grocery stores, pharmacies, and retailers from providing plastic carryout bags. In 2014, GreenTeam reported selling an estimated 80 tons of plastic bags from single-family residences in district B. This was down from about 260 tons in 2008.

Because its diversion calculation is based on tons of recyclables collected, processed, and sold, the decline in sales has had a significant impact on CWS' diversion rates. For example, we estimate the decline in paper accounts for more than a 3 percentage point decline in CWS' 2014 diversion rate.

In another example, CWS did not sell any post-processed commingled recyclable materials (PPCRM) in 2014. These materials, which are defined as materials collected as part of its single-family recycling service that it could not separate by categories as defined by industry standards, were previously sold for further processing to remove any remaining recyclable materials (in 2008, CWS sold 4,800 tons of PPCRM).[15] The lack of sales of these materials in 2014 reduced CWS' diversion rates by more than 3 percentage points, and meant these materials were likely landfilled.

The Decline in the Quantity of Materials Sold Coincided with a Drop in Recycled Commodity Prices

There have also been changes in individual recyclable commodity markets. In 2009, in conjunction with the overall economic slowdown, there was a downturn in the recycling commodities markets which impacted both of the recycling haulers' sales efforts. The markets appear to have recovered by 2011; however, in 2013 China implemented "Operation Green Fence" to prevent low quality or contaminated recyclables from entering into their markets. This, again, greatly reduced the demand for recyclable materials. Commodity rates also dropped during the 2014 labor dispute involving west coast ports.

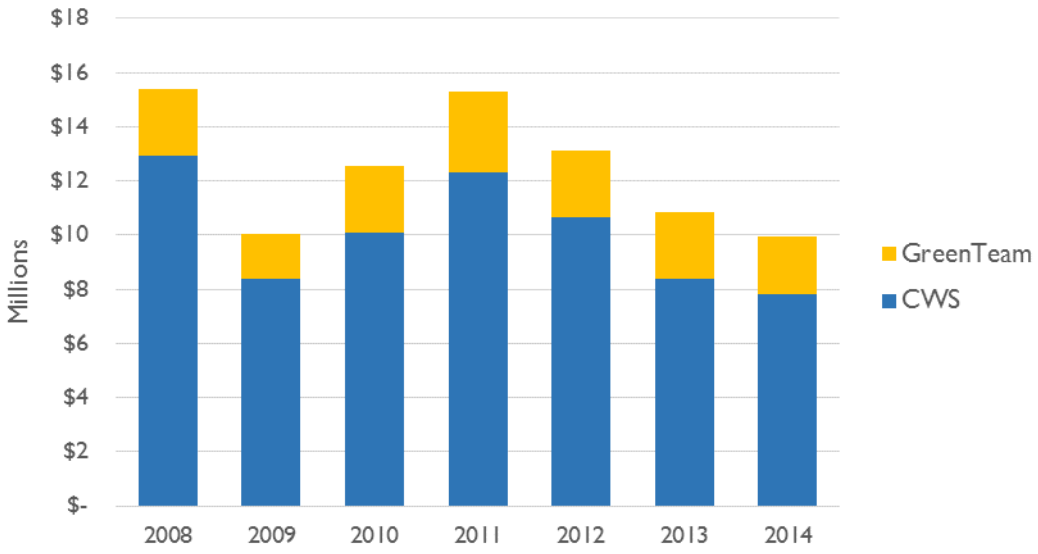
As described above, there was a distinct decline in the tons of newspaper sold. This decline was exacerbated by a roughly 30 percent decrease in the price each of the contractors was receiving for newspaper since 2011. There have also been fluctuations in the prices the haulers have received for other important recycling commodities, such as corrugated cardboard, PET plastics (commonly used in water or other plastic bottles), and aluminum.

Each hauler has seen their revenues from the sale of recycled materials decline since the beginning of the current contracts in 2010. As shown in Exhibit 10, since 2011, aggregate annual revenues across both haulers have dropped from more than $15 million to around $10 million.[16] In each case, both the total quantity sold and average price per ton received have dropped.

[15] Per the GreenTeam and CWS contracts for recycling services with the City, the amount of PPCRM sales allowable for diversion calculation purposes is limited to 10 percent of total recyclable material collected. GreenTeam reports do not indicate sales of PPCRM as a commodity.

[16] As noted in the Background, the sale of recycled commodities is just a portion of the revenues the haulers receive. The City compensates the haulers on a per household basis. This compensation totaled about $26 million in FY 2013-14.

Exhibit 10: Estimated Annual Revenues from the Sale of Recyclable Materials From San José Single-Family Residences



Source: Auditor analysis of data provided by the Environmental Services Department.

Note: Current agreements were effective July 1, 2010. GreenTeam sales are an estimate as total reported sales include materials from multi-family residences. The single-family residential portion of the sales is an allocation based on the relative tons received from the two sources.

Differences in How Materials Are Processed Can Affect Diversion

The City has a single-stream residential recycling program, whereby residents put all of their recycling (e.g., paper, plastic, aluminum cans, glass) into one cart to be sorted and processed by the City's recycling haulers. At the haulers' MRFs, materials move along conveyor belts where workers and mechanical processes sort and separate materials. The sorted materials are baled and later sold. Any materials that have escaped sorting, such as non-recyclable materials and solid waste found in recycling carts, is disposed of at the Newby Island Landfill.[17] These materials are known as the MRF's residue.

According to CalRecycle (California Department of Resources Recycling and Recovery), single-stream recycling places more pressure on the processing stage to correctly sort recyclables and minimize the effects of contamination. Throughout the process, there are a number of factors which can affect whether potentially recyclable materials are not sorted and are included in the residue. These include the amount of pre-sorting of material before it is loaded onto the conveyor belts at the MRF, the level of manual labor on the processing line, the speed of the conveyor belts, the amount of materials loaded on the conveyor belts at any given time (the burden), and the kind of automated sorting equipment utilized at the MRF.

[17] Newby Island Landfill is expected to reach its capacity in 2025. A decision to increase capacity is pending.

The City's Recycling Haulers Are Obligated to Process all Recyclable Materials Collected

The contracts with CWS and GreenTeam provide that each of the haulers supply a MRF with sufficient capacity to process recyclable materials and that *all* recyclable material is to be processed, even if it is not profitable for sale. CWS' contract further provides that the residue may contain only a *de minimis* amount of clean recyclable material that escaped sorting (not including recyclable materials that were contaminated). Anything beyond a *de minimis* amount of clean material in the MRF residue may be a violation of CWS' contract.

Past Studies Have Shown That Between 25 to 35 Percent of Materials in Recycling Carts Were Not Recyclable

In 2003, the then service provider for districts A and C conducted waste characterization studies to address operational issues. The studies showed that between 30 and 35 percent of the materials found in recycling carts was not recyclable. As these were conducted by a third party and City staff could not validate the results, the City undertook its own waste characterization study in 2008 to provide general information across all service districts.

Exhibit 11 shows the breakdown of the contents of the single-family residential recycling stream as reported in the City's 2008 waste characterization study. The study showed that across the City, 25 percent of the materials found in recycling carts was not recyclable. In district A, that number was 31 percent, 5 percent of which was organic material such as food and yard waste.

Exhibit 11: Composition of Single-Family Residential Recycling Carts, 2008

	Overall	District A	District B	District C
Recyclable materials:				
Paper	52%	50%	56%	53%
Glass	9%	6%	10%	13%
Plastic	7%	7%	7%	7%
Other (metals, textiles)	6%	6%	5%	6%
Non-recyclable materials:				
Organics[18]	3%	5%	2%	2%
Other non-recyclable*	22%	26%	19%	19%

Source: City of San José Waste Characterization Study, May 2008

Note: Due to rounding, columns may not add to 100 percent.

* Examples of material in this category include household hazardous materials, plastic trash bags, paint, disposable diapers, hypodermic needles, ceramics, animal carcasses and feces, ash, contaminated textiles, and construction materials (such as shingles or drywall).

[18] In 2008, a third-party consultant for ESD conducted a yard trimmings survey and found that while two of three residents who utilize a yard trimmings cart would separate food waste into their yard trimmings cart, only 39 percent of loose in the street yard trimmings customers would do so.

In recent years, CWS has raised concerns that the amount of contamination in recycling carts has increased in districts A and C, and in 2013, the number of non-collection notices CWS issued increased significantly.[19] Contamination in a recycling cart has a two-fold impact. First, these are materials which the hauler cannot sell. Second, some non-recyclable materials, such as food waste or other 'wet' materials, can contaminate otherwise clean recyclables and render them unmarketable. ESD, however, has not been able to verify whether contamination has increased over time.

The City Is Conducting a Waste Characterization Study to Better Understand Changes in the Recycling Stream

The City has two solid waste and recycling consultants under contract to provide solid waste and recycling program audits and assessments, financial and records assessments, and solid waste program support. Because the City has seen a decline in single-family residential diversion rates in recent years, ESD has tasked one of the consultants to conduct a waste characterization and residue study to better understand the reasons behind the decline.

For the waste characterization portion of the study, the consultant will analyze 20 to 25 samples of incoming recycling for each of the three service districts (each sample will weigh between 125 and 150 pounds). The samples will be sorted and categorized by material type, with non-recyclable materials identified to determine a 'contamination' rate. The results can then be compared to the 2008 results to better understand any changes in the recycling stream and recycling behavior. The results of this study can also inform future outreach and education efforts by ESD and its haulers (see Finding 2).

For the residue study, the consultant will analyze 12 residue samples (each also weighing between 125 and 150 pounds) at the two MRFs to identify the material content and determine whether there is any clean recyclable material remaining in the residue that escaped sorting. This will enable ESD to assess the haulers' compliance with the processing requirements of their contracts, in particular whether each hauler is processing all recyclable material that it collects and

[19] A non-collection notice is a tag left on a recycling cart by the hauler, which can signify that they found residential solid waste commingled with recycled materials in a residence's recycling container in such a way that they could not easily separate the materials (i.e., remove the materials and place them in the garbage cart). In these instances, they will not pick up the cart until the resident removes the solid waste. See Findings 2 and 3 for further discussion of non-collection notices.

whether CWS' residue contains more than the *de minimis* clean material allowed under the terms of its agreement with the City.[20]

According to ESD, the study is expected to be completed in the fall of 2015. See Appendix D for a draft scope of work.

Recommendation #1: The Environmental Services Department should utilize the results of its upcoming Waste Characterization and Residue Study to:

a) **Provide baselines for single-family curbside diversion goals in future contracts, and**
b) **Work with its haulers to determine where program improvements can be made.**

Recommendation #2: If the upcoming Waste Characterization and Residue Study shows that clean recyclables are present in the residue from either MRF, the Environmental Services Department should require the contractor either:

a) **Improve its MRF processing procedures to ensure compliance with the terms of their contract, or**
b) **Explore backend sorting its residue to recover any materials which were not recovered during processing.**

[20] After the transition to the new haulers in 2007, the City contracted for third-party quality assurance and contract compliance monitoring for CWS' processing operations. The program was intended to be in effect for the initial two-year period of CWS' contract and was expected to be discontinued after that period if CWS had maintained compliance with the contract's processing requirements. This program ended in 2010.

Currently, the City may have their second consultant conduct a MRF operations assessment for one or both haulers. This will involve evaluating existing MRF equipment and operations, and making recommendations on technological or mechanical changes to improve processing. See Appendix E for a draft scope of work.

Defining and Calculating Diversion Consistently Can Better Help the City Track Its Recycling Progress

As described earlier, diversion rates are meant to measure the percentage of waste that is diverted from landfill disposal. How that is actually calculated in practice for single-family residential households can be difficult because materials may be commingled across districts, or in the case of GreenTeam, with multi-family residential households and with other jurisdictions' recycling. In addition, comparing diversion rates across service districts can be complicated because of different methodologies for calculating diversion across the haulers.

The Current Recycling Contracts Calculate Diversion Rates Differently

The current contracts with the two haulers, renegotiated and agreed to in 2010, include the following methodologies for calculating diversion rates:

- The contract with CWS calculates diversion by dividing the total amount of **recyclables sold** by the total waste stream (garbage plus recycling). Included in the "sold" amount are materials which CWS is able to donate or otherwise dispose of in a manner that allows for it to be recycled and not landfilled.
- The contract with GreenTeam calculates diversion as the amount of **recyclables recovered** through processing at its MRF divided by the total waste stream.[21]

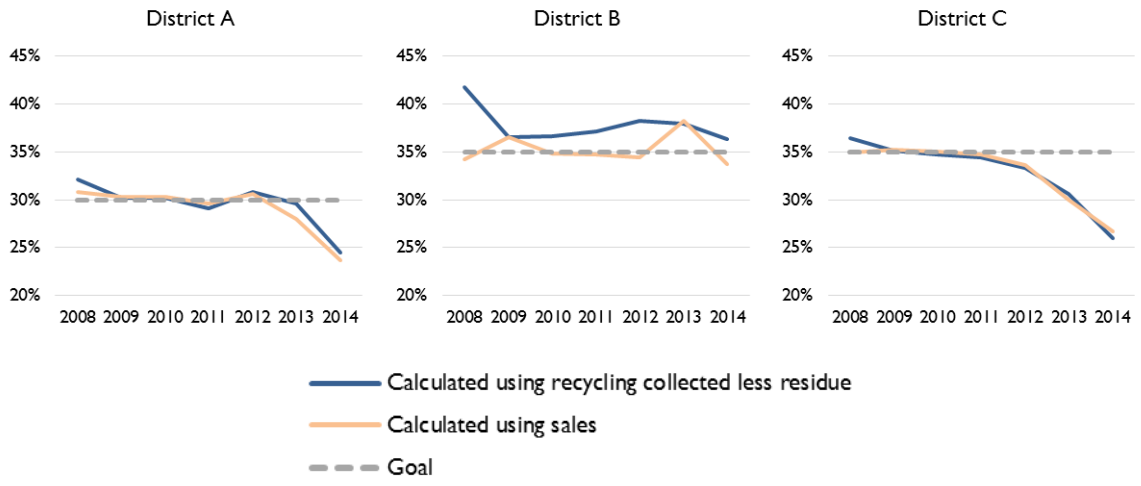
The key distinction between the two is that CWS' diversion is measured by the amount of materials sold and GreenTeam's diversion is measured by the amount of material they are able to recover from the recycling stream, regardless of whether it is sold.[22] This distinction is important as not all recovered materials are the same; some are contaminated or of low quality and the hauler may be unable to find a buyer for the materials. Recovered recyclables that are not sold will likely end up being landfilled unless the haulers are able to locate a party to take the materials for recycling (either as a donation or for compensation). From 2008 through 2014, it is estimated that GreenTeam recovered 137,000 tons of single-family residential recyclable materials; we estimate that associated sales (including donated items) totaled 128,000 tons.

[21] The actual calculation for GreenTeam is (total recycling collected less residue)/(total garbage plus recycling collected) where residue is the amount of material collected in the recycling carts, but which was not able to be processed for sale (e.g., non-recyclable materials placed in the recycling cart, contaminated recyclable materials). In contrast, the formula to calculate CWS' diversion rate is (tons of material recycled, processed, and sold)/(total garbage and recycling collected).

[22] The GreenTeam contract addresses sales through the inclusion of a "marketability" standard which requires they demonstrate that at least 85 percent of all material recovered was sold. As with the CWS contract, the agreement allows for recovered materials to be deemed "sold" if they are able to give the materials away or pay someone to recycle them.

Exhibit 12 shows how each district's diversion rate was calculated using the agreed-upon methodologies in their respective contracts, as well as calculated using the methodology included in the other hauler's contract. The variation in methodologies led to a more than 5 percent difference in diversion in district B in one year (applying CWS' diversion calculation methodology to GreenTeam sales estimates for district B implies that district B would not have met diversion goals in five of the seven years of the current contract).

Exhibit 12: Estimated Diversion Rates by District Utilizing Contractual and Alternative Methodologies



Source: Auditor analysis of information provided by the Environmental Services Department from hauler monthly and annual reports.

Notes:

(a) For purposes of measuring contract compliance, the diversion rate for Districts A and C (CWS) is calculated using sales. GreenTeam's diversion rate for District B is calculated using recycling collected less residue.

(b) Recyclables recovered may not actually be sold because of contamination or other quality-related issues. Sales in these charts also include materials given away or for which the haulers paid to have taken away. When recovered recyclables are not sold or given away, they will likely be landfilled. Sales may occur in the year following the year sorted. As a result, in some instances the weight sold may be greater than the weight of the residue.

(c) Current agreements were effective July 1, 2010.

Other Factors and Assumptions Can Affect the Calculated Diversion Rates

As noted earlier, the commingling of materials with other recycling streams at the haulers' MRFs can complicate how diversion is calculated by district. Because of this commingling, ESD must make assumptions about how to best allocate sales or residue across these streams. This can complicate diversion rate calculations.

For example, at the CWS facility, the recycling streams for districts A and C are commingled once they reach the facility. Sales data reported by CWS is then allocated between districts A and C based on the volume of recycling materials incoming into the facility (based on weight tags of the trucks entering the facility). However, based on a 2008 waste characterization study described earlier, the recycling streams may be different, with district A's level of contamination much higher than district C's. If adjusted to account for these different levels of potential contamination, district A's 2014 diversion rate would be lower by about 1.5 percentage points and district C's would be higher by 2 percent.[23]

For GreenTeam, district B recyclables are commingled with the City's multi-family residential recycling as well as other jurisdictions' recycling.[24] To determine how much recyclable material is recovered, ESD conducts audits of select truckloads of single- and multi-family recycling one or two times each year. The amount of residue is calculated using an historical average of the rate of residue after processing the samples at the GreenTeam MRF. This is then subtracted from recycling collected to determine how much recycling has been recovered and is to be diverted. As a result, the diversion rate is calculated based on not just how the contractor processed material in any given year, but how it has been processing materials over the course of the contract.[25]

Finally, there may be seasonal or weather-related factors as well. For example, if recyclable materials enter a MRF wet, they may dry and their weight may drop before they are sold. This weight loss could be as much as 5 percent.

Recommendation #3: To better track progress in single-family curbside recycling and inform the development of performance targets, the Environmental Services Department should define a standard diversion calculation and apply it consistently across all garbage and recycling districts in future recycling contracts.

[23] The difference results from allocating sales by each districts' proportion of "clean" recyclable materials collected rather than total materials collected. The amount of "clean" materials collected was calculated as the amount of materials collected less the percent of non-recyclable materials found in each district's recycling stream in the 2008 Waste Characterization study.

[24] Prior to April 2014, GreenTeam operated its own MRF. Beginning in April 2014, it began utilizing a MRF owned and operated by GreenWaste Recovery, Inc.

[25] It should be noted that if the 2014 diversion calculation was solely based on the results of the 2014 audits, the calculated diversion rate would likely have been higher than reported.

Finding 2 The City Can Enhance Its Education and Outreach Programs to Improve Curbside Recycling

Summary

Both the City and its haulers have recycling outreach responsibilities. However, since 2008, the City has largely relied on its haulers for outreach. This coincided with a drop in the overall single-family curbside residential diversion rate from 36 percent in 2008 to 27 percent in 2014. Existing outreach activities are limited in scope, and primarily involve attendance at events and serving notices to noncompliant households (non-collection notices). School MRF tours and presentations are infrequent, especially when compared to other jurisdictions. While there may be multiple reasons for the fall-off in residential diversion rates, we recommend that the City require its haulers to increase the number of presentations to school and community groups and engage in door-to-door interactions with residents particularly in neighborhoods known to have contamination problems.

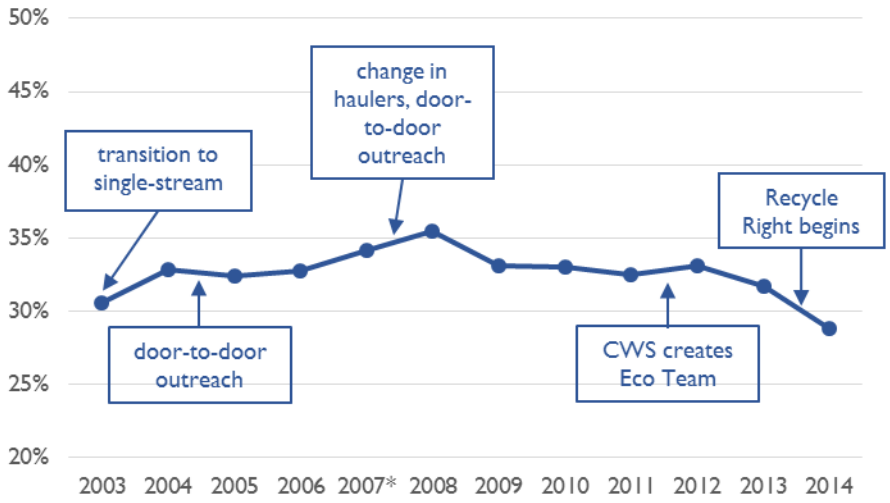
City and Haulers Both Have Roles in Outreach

Outreach activities have been shared to varying degrees between the City and its haulers since the start of single-stream recycling in 2002. For example, because of the transition to single-stream recycling in FY 2002-03, ESD worked with its haulers to conduct comprehensive outreach, and had an outreach budget of over $2.3 million that year. A door-to-door effort occurred in 2004, with a focus on routes with contamination issues,[26] and again in FY 2007-08 during a change in haulers; the City's annual outreach budget ranged from $351,000 to $432,000 during this time. From 2003 to 2008, the overall single-family curbside residential diversion rate rose from 31 percent to 36 percent.

ESD has attributed much of its success with recycling to a history of consistent, thorough, and multilingual outreach. However, after peaking in 2008, the curbside diversion rate declined from 36 percent to 27 percent in 2014. This decline has coincided with a drop in the City's outreach budget to about $222,000 a year, as the City shifted much of its outreach to the haulers.

[26] These routes were identified by the hauler that preceded CWS, which serviced the same districts (A and C).

Exhibit 13: Single-Family Diversion Rates and Major City and Hauler Outreach Activities



Source: Council memoranda and interviews with ESD and haulers
* A 2007 diversion rate is not available due to the change in haulers during 2007-08. We used an average of the 2006 and 2008 diversion rates as an estimate.

Notes:

a) Eco Team is a multilingual group that inspects recycling carts for unrecyclable materials. The group leaves notices on carts considered contaminated or overfilled and cart hangers explaining the recycling program.
b) The Recycle Right outreach program seeks to reduce food and garbage in recycling carts through means such as displaying advertisements on recycling trucks and redesigning flyers and notices.

Since 2008, the City has Increasingly Relied On its Haulers for Outreach

Since 2008, the City has largely relied on its contracted haulers to lead recycling education efforts. As stipulated in the contracts, haulers must develop an annual Public Education and Outreach Program (PEOP) with four campaigns, or themes, addressing issues of concern such as anti-contamination and illegal dumping. Hauler outreach activities during the year are to focus on one or a combination of these campaigns and can include developing and distributing flyers, tabling at community events, giving presentations, creating radio advertisements, and leading residents on MRF tours.

ESD's ongoing role in outreach involves working with haulers to develop and approve their annual PEOPs; developing and distributing a Recycle Guide, flyers, and other materials; and maintaining a website (sjrecycles.org) and social media presence. More recently, ESD implemented the Recycle Right program, which expanded outreach to include displaying advertisements on recycling trucks and redesigning flyers and notices (see Appendix A, B, and C for redesigned courtesy notice, non-collection notice, and cart hanger).

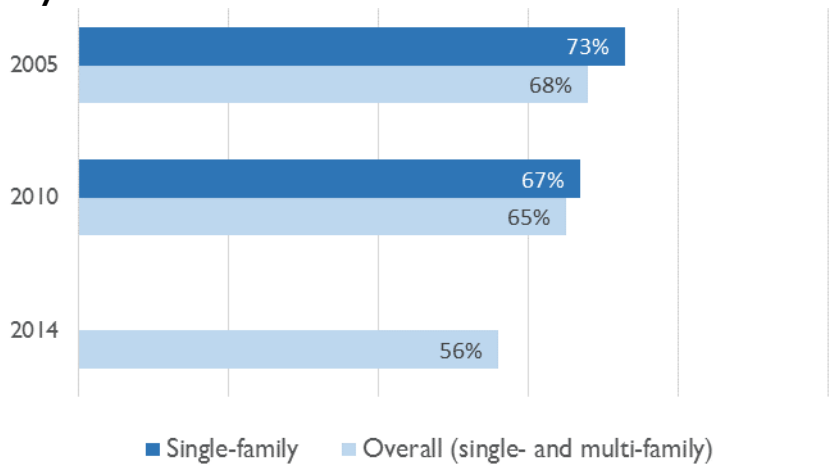
In the past, ESD also distributed newsletters to customers (220,000 newsletters were mailed in 2012). However, the newsletter went online in 2013 in order to reduce costs, workload, and reliance on paper; according to ESD, the newsletter's effectiveness was also unclear. Now, a postcard is mailed each year with information about schedule or billing changes and program tips, and directs readers to the City's website for more information.

Public Education and Outreach Activities

Industry standards recommend that cities spend $1 per household per year for education and outreach for existing recycling programs, and $3 or $4 per household per year for new programs or major program changes.[27] ESD's 2014 residential outreach budget, including hauler outreach budgets was roughly $1.50 per household.[28]

Based on a 2014 survey on various ESD services, just over half of residents (56 percent) feel the City does a good job explaining how to recycle (see Exhibit 14).[29] This is down from 65 percent as reported in a 2010 survey and 68 percent in a 2005 survey. The decrease in ratings suggests that although the City and haulers may be setting aside adequate funds for outreach, current outreach strategies can still be improved.

Exhibit 14: Percent Agreeing that the City Does a Good Job Explaining How to Recycle



Sources: 2005 and 2010 surveys by Goodwin Simon Strategic Research, 2014 survey by EMC Research.

[27] "Managing Recycling Systems." Solid Waste Association of North America (2010).

[28] ($210,000 from the City + $252,000 from CWS + $4,000 from GreenTeam) / (213,000 single-family households served + 103,000 multi-family households served) = $1.47 per household

[29] This 2014 survey did not differentiate between single-family and multi-family residences. ESD periodically conducts surveys to gauge customer attitudes about Recycle Plus services.

Scope of Public Education and Outreach Activities Is Limited

Haulers reported completing several types of outreach activities, which included booths at events, school MRF tours, and presentations to community groups. However, these activities were minimal and limited in scope. Exhibit 15 shows the haulers' outreach activities in calendar year 2014:

Exhibit 15: Summary of Reported 2014 Hauler Single-Family Outreach Activities

Activity	California Waste Solutions	GreenTeam
School MRF tours/presentations	8	4
Events (sponsorship, information booth, etc.)	19	11
Community group (presentation, information booth, etc.)	0	2
Other (Boy/Girl Scouts, resident MRF tours, etc.)	0	2
Total	27	19

Source: Auditor analysis of hauler monthly and quarterly reports.

In 2014, both haulers reported attending events. Haulers may act as an event sponsor, donate recycling carts, set up information booths, and pass out free giveaways. In some cases, such as larger events including Christmas in the Park or Earthquakes soccer games, ESD will request that a hauler be in attendance.

Both haulers reported giving presentations or leading MRF tours for students. Incorporating students into a general outreach strategy is accepted as a best practice since students are seen as potential advocates and translators for recycling programs at home. Haulers appear to engage with schools primarily upon request. In 2014, haulers gave just 12 presentations or MRF tours for only 6 unique schools. This was less than 2 percent of the 330 public and private schools in San José.

Finally, from time to time, haulers may attend community groups to talk about a specific service (e.g., bulky item pickup), answer questions, or set up an information booth. Presentations for community groups are also mainly set up by request. For 2014, CWS reported zero presentations; GreenTeam reported two presentations.

Public Education and Outreach Efforts in Other Cities Are Broader in Scope

Based on phone interviews, it appears that other cities have broader outreach efforts to educate students and residents about recycling. For example:

- Fresno's recycling staff seek out additional outreach opportunities by coordinating with the Parks and Recreation Department to identify events ranging from block parties to larger events. Staff also reach out to schools for presentations. In FY 2013-14, 110 presentations were given to over 3,000 students.
- San Diego contracts with the San Diego County Office of Education for public education efforts. Up to eleven "EnviroTours" are available to high school and junior high/middle school students (and up to six additional tours); students go on field trips to a local landfill, composting facility, and buy back and hazmat centers. Half-day programs covering environmental issues such as recycling are also available to these students (up to 34 programs in the most recent agreement). Recycling assemblies are also conducted for elementary school aged children (up to 16 assemblies), as well as other small group recycling presentations.
- San Francisco's Environment Now[30] had a program to check carts, conduct door-to-door outreach, and perform Zero Waste assessments to ensure proper service. In terms of public education, staff give presentations, do waste assessments, and lead field trips to the locations such as the MRF or transfer station. Last year, there were about 35 assemblies, 25 classroom presentations, and 40 field trips.
- StopWaste, a joint powers authority in Alameda County responsible for reducing the waste stream, uses many different strategies in its outreach. These include paid media campaigns (e.g., ads at BART stations), educational games and pledges online, random waste audits of hauler routes in participating cities and sharing results with customers, and community outreach mini-grants to nonprofit organizations to help StopWaste spread its message. The organization also provides about 250 MRF tours a year for fourth and fifth graders and collaborates with the Alameda County Office of Education to integrate recycling education into the classroom.

[30] Environment Now is a workforce development program that prepares workers for jobs in the green industry. It is housed within the San Francisco Department of the Environment.

One Hauler's Outreach Strategy Emphasizes Distributing Non-Collection Notices

CWS, the only hauler with a specified outreach budget, is required to spend a minimum of $156,000 on outreach annually.[31] In addition to supporting the presentations and events listed earlier, much of CWS' outreach spending has centered around the Eco Team, a multilingual group that visits neighborhoods during the day to inspect recycling carts for unrecyclable materials, attach notices to carts considered contaminated or overfilled, and leave cart hangers (see Appendix C for an example of the cart hangers) explaining the recycling program (i.e., which materials are and are not recyclable).[32] Although residents may approach team members with questions or complaints, the Eco Team does not knock on doors to speak with residents. In 2014, CWS reported spending about $160,000, out of a total of $275,000, on Eco Team staffing (60 percent).[33]

The second recycling hauler, GreenTeam, does not have a specific outreach budget requirement, nor does it have an equivalent to Eco Team in its hauler district. Courtesy notices, NCNs, and cart hangers are distributed on a much more limited basis by truck drivers and route supervisors. See Finding 3 for more information on enforcement efforts related to NCNs.

Two types of notices are distributed by both recycling haulers: a courtesy notice and a non-collection notice. Courtesy notices are used to describe non-recyclable materials (e.g., pizza box, shoes), proper set out of carts, oil filters and jugs, and extra garbage or recycling. When a courtesy notice is distributed, truck drivers are still expected to pick up the recycling container. NCNs are attached to carts with unacceptable types of waste (e.g., diapers, food waste, and hazardous waste) as well as large or bulky items. These notices double as an enforcement tool by identifying to truck drivers which carts not to empty for fear of contaminating the whole truck load.

There Appears to be Little Face-to-Face Interaction Between Haulers and Residents

Current outreach methods seem to employ little face-to-face or interpersonal methods, which, as described earlier, were a key component of outreach efforts prior to 2008. In its annual PEOP, CWS has described its Eco Team as "door to door customer contact via cart audits" or "personalized interaction." However,

[31] When CWS' contract was renegotiated in 2010, they were required to expend outreach funds carried over from the prior contract (totaling $209,000) by the end of 2013, in addition to its yearly obligation of $156,000. $55,000 remained unspent by the deadline and was added to the hauler's 2014 outreach budget. Shortfalls in CWS' outreach spending occurred during 2007, 2008, and 2010; the 2014 reconciliation has not yet been completed.

[32] Before Eco Team, route auditors would mark contaminated recycling carts with a colored pen to signal to truck drivers which carts should not be picked up. ESD later developed notices and flyers for route auditors to distribute instead.

[33] CWS' 2014 outreach budget was $252,000.

as discussed above, it appears the team primarily distributes NCNs; it is not clear how much personal interaction with residents takes place.

Interpersonal methods are often cited as a best practice. Furthermore, a well-designed door-to-door outreach effort can be much more cost effective on a dollars per ton basis than other methods.[34] In prior years, the City and County of San Francisco had a "lid flipping" program, where Environment Now trainees checked garbage, recycling, and organic waste carts and tagged those with issues. Later in the day, representatives visited homes associated with the tagged carts to speak directly with residents. According to staff, these visits had an impact on changing behavior. StopWaste has also found that face-to-face interaction works best.

ESD has already incorporated proactive, individualized outreach into its contract with the City's commercial hauler, Republic Services. That contract requires the hauler to "proactively and continually work with Customers to adjust the level of Solid Waste Service, Recyclable Material and Organic Material Collection to achieve the most efficient system and highest diversion rate." For example, Republic Services does this by following up on new service accounts with a driver and site visit to confirm correct bin usage. The hauler's 2014 "Boots on the Ground" campaign involved meeting with businesses across all City Council districts in order to speak with business owners about the waste collection program, the City's goals, and respond to questions. In addition, the commercial hauler also must invite public affairs representatives from the businesses it serves to MRF tours. ESD should incorporate similar expectations during their review and sign-off process for residential haulers' PEOPs.

Outreach Could Better Focus Efforts on Identified Problems or Neighborhoods

Prior to 2008, ESD made several attempts to gauge and increase awareness about its recycling program. It conducted door-to-door outreach during the 2002-03 transition to single-stream recycling, in 2004 on routes with contamination issues, and again in 2007-08 with the change in recycling haulers. In addition, during the spring and summer of 2004, ESD undertook market research in neighborhoods with reported contamination issues in order to understand Recycle Plus awareness and recycling behavior.

It has been several years since ESD last led a door-to-door outreach effort. As a part of expanding meaningful, face-to-face contact with customers, current outreach methods should be refocused to identify and address barriers to recycling. In 2013, ESD developed an internal contamination outreach plan that

[34] Lisa Skumatz and Juri Freeman, "Spending Your Outreach Dollar Wisely: Increasing Recycling Using Community-Based Social Marketing," *Waste Advantage,* 3(2): 48 – 52, February 2012.

also included steps to identify "targeted" neighborhoods;[35] that plan has been partly implemented.

In addition, notices and flyers were recently redesigned to more clearly illustrate non-recyclable materials (e.g., pizza boxes, diapers, containers still filled with liquid) and have been available in three languages – Spanish, Vietnamese, and English – for several years. However, other methods are available that may better bridge the gap in understanding and increase the quantity and quality of (i.e., cleaner) recyclable materials.

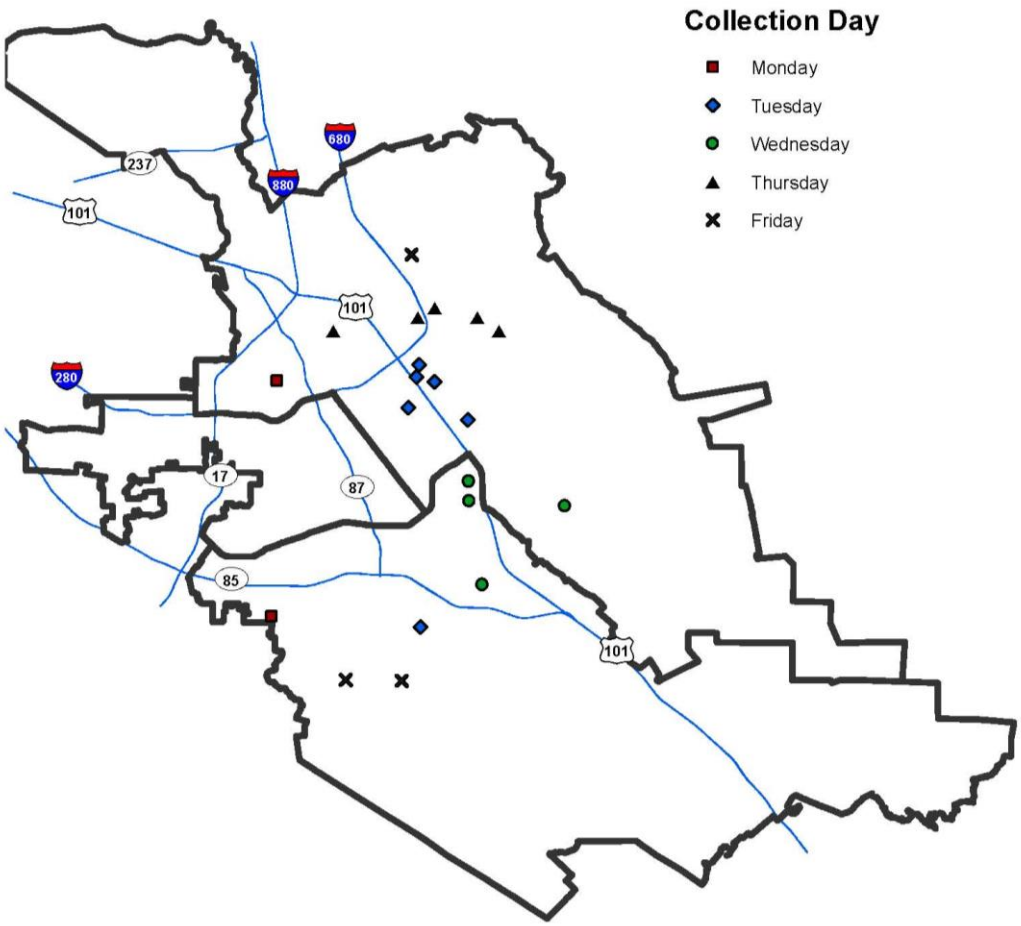
Identifying the Audience

Existing outreach could be improved by incorporating an understanding of barriers and motivations for a specific ("target") audience. Increasing residents' understanding of the recycling program will help decrease contamination that may contribute to the City's falling curbside residential diversion rate. According to CWS and ESD, heavier truck loads can serve as a proxy to identify contamination (solid waste is typically heavier than recyclables).

According to hauler observations, not all neighborhoods and routes have a contamination problem; to identify routes that do, we calculated the 20 heaviest routes on a per household basis based on three years of incoming recycling tonnages. Exhibit 16 shows such routes. Using such information, the City can begin directing limited resources to routes that demonstrate higher levels of contamination.

[35] The City's contracts with the haulers also stipulate that outreach campaigns should "target certain Recyclable Material, contamination, or "problem" areas of Contractor's Service Districts where improvements can be maximized." According to CWS, in 2014, they began to focus Eco Team efforts on neighborhoods that had the greatest opportunities for improvement.

Exhibit 16: Twenty Heaviest Routes in Districts A and C on a Per Household Basis, FY 2012 to 2014

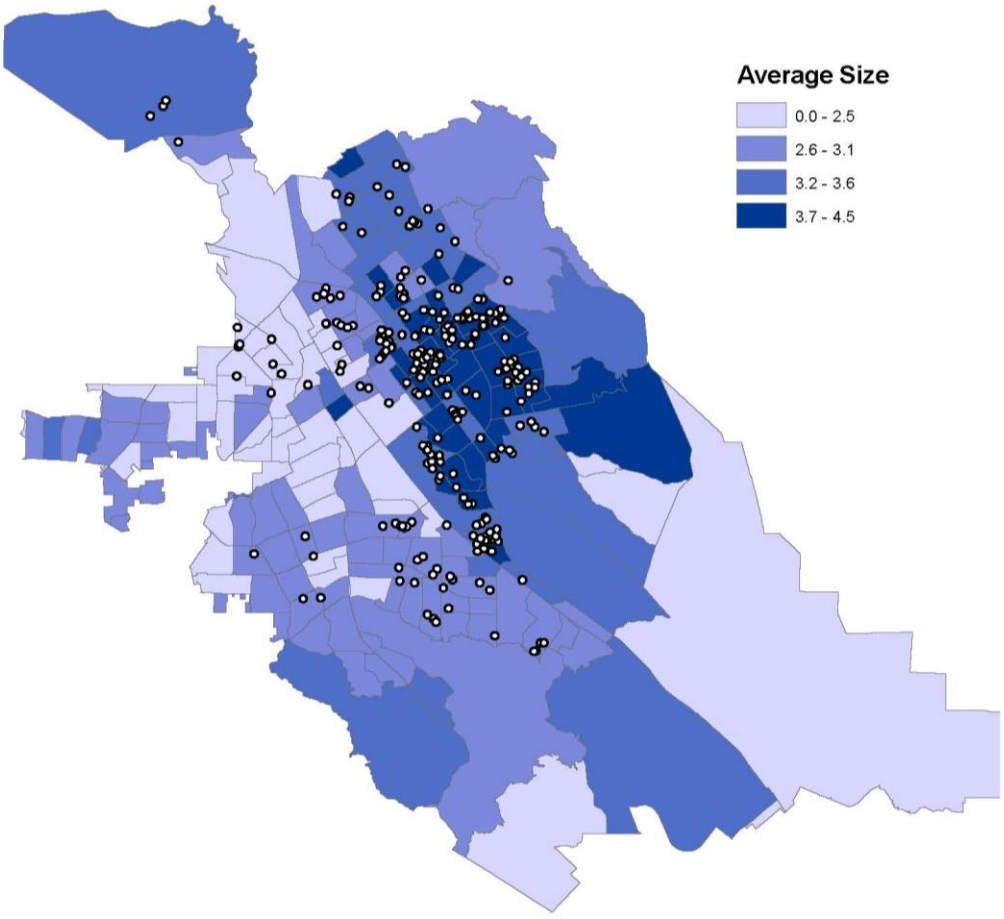


Source: Auditor analysis of CWS incoming weight tags for 2012 to 2014, and residences per route.

The Solid Waste Association of North America (SWANA) recommends identifying a target audience when developing goals for an outreach program. Once the target audience has been defined, information must be gathered to understand the audience, including what barriers may be preventing them from recycling as well as what might motivate them. This information could influence how a message is conveyed. Furthermore, the message that most resonates with an audience may be unexpected. For example, as part of its effort to increase composting in Alameda County, StopWaste learned that messaging about the drought and climate change, not keeping things out of landfills, was what connected with its customers. More in-person, face-to-face interaction with residents in neighborhoods with high levels of contamination could help the City and its haulers better understand what messages can influence recycling behavior.

Earlier, Exhibit 16 mapped the 20 heaviest routes on a per household basis. Another way to narrow down a target audience would be to identify areas with households that repeatedly receive non-collection notices. Exhibit 17 shows households that received twelve or more NCNs during 2013 and 2014.

Exhibit 17: Households That Received 12 or More Non-Collection Notices and Average Household Size (2013 and 2014)



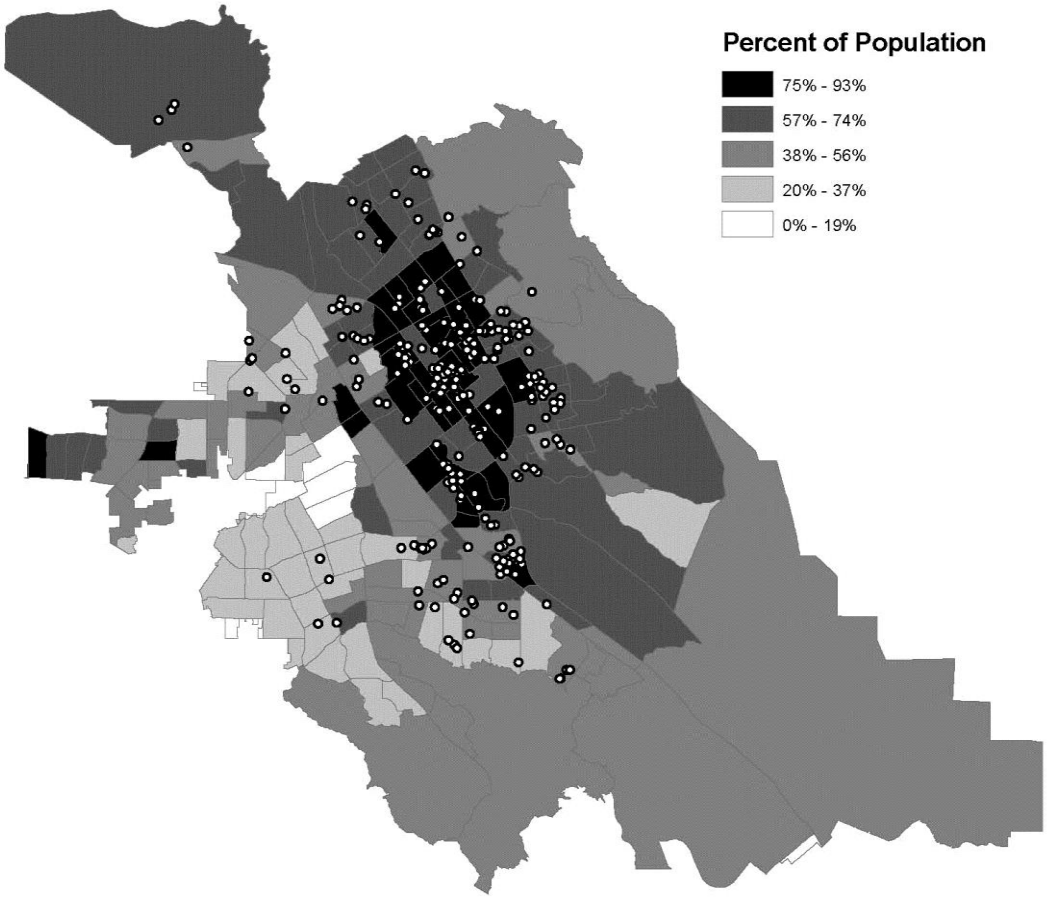
Sources: Auditor analysis of hauler monthly reports, and auditor analysis of 2012 American Community Survey 5-year estimates, Table B11016.

Exhibit 17 shows that households receiving 12 or more NCNs are concentrated in areas with more densely populated households. In our opinion, households with too small of a garbage cart may be placing excess garbage in the recycle bin. In a 2014 Council resolution, garbage cart guidelines based on household size were established for a soon-to-be retired program - the Service Rates for Low Income Rate Assistance. Specifically, a household of three to four people should have a 32-gallon garbage cart, and a 64-gallon garbage cart for households with five or more residents. As of January 2015, approximately 90 percent of

residents use a 32-gallon garbage cart.[36] Outreach material could provide guidance to customers about what cart size would be appropriate for their household size.[37]

Exhibit 18 shows that many households that received 12 or more NCNs in 2013 and 2014 are in neighborhoods where a large percentage of the population speak a language other than English at home. ESD already produces materials in the City's three primary languages and also relies on illustrations to convey its message. However, continued contamination may signify that existing education efforts are not reaching these communities.

Exhibit 18: Percent of Population That Speaks a Language Other Than English At Home



Source: Auditor analysis of hauler records, 2012 American Community Survey 5-year estimates Table B16001.

[36] ESD discontinued the smallest cart option (20-gallons) in January 2015.

[37] The commercial division of IWM is piloting a right size, right cart program where inspectors investigate cases of repeatedly overfilled carts and recommend cart changes. Depending on the results, this program may be expanded to single-family residences.

In order to improve its outreach program, ESD should communicate more specific requirements to its haulers through its yearly PEOP process. The contracts require:

> *Contractor shall submit the proposed [Public Education and Outreach Program], including a budget for each component, annually for City approval no later than September 30 for the next calendar year.*

Once a PEOP has been submitted, City staff discuss the plans with the hauler and provide advice and direction before the plan is finalized and approved. In addition, City staff meet with the haulers throughout the year.

Recommendation #4: As a part of their Public Education and Outreach Programs, the Environmental Services Department should require haulers to:

a) Increase the number of presentations to schools and community groups, and

b) Design and implement an in-person, door-to-door outreach campaign that targets neighborhoods known to have contamination problems. This could include ensuring large households have the right garbage container size and integrating demographic differences across neighborhoods.

Finding 3 The City Can Better Enforce Municipal Code Provisions Surrounding Repeat Contamination in Recycling Carts

Summary

NCNs issued by haulers serve as the primary enforcement method to reduce contamination in recycling carts. By refusing to pick up contaminated carts, the haulers can prevent non-recyclable waste from contaminating otherwise clean recyclables. Haulers track NCN issuance by residence and report it to the City. Most residences have never received an NCN, but in cases of repeat violations, the contracts require the City to work with haulers to resolve the situation. Although ESD has drafted residential recycling enforcement procedures, they have not been implemented to date. To ensure consistent enforcement, we recommend ESD work with the haulers to clarify under what circumstances NCNs are issued and finalize and implement enforcement procedures.

Municipal Code Provides Authority to Enforce Recycling Standards

As noted in Finding 1, contamination, such as garbage, organics, motor oil, etc., has been a concern for the Recycle Plus Program. The San José Municipal Code requires proper handling and storage of solid waste generated on a premise, as well as recyclable containers be utilized only for their intended use. To ensure recyclable containers are utilized properly, ESD may:

- **Charge a fee for collection of contaminated cart.** If a container is too contaminated to be collected as recyclable, the ESD director may authorize the cart be picked up as solid waste and the owner of the premise be charged a fee set forth by City Council resolution, currently set at $15 per collection. Presently, it is up to the customer to request a pick up.
- **Upsize garbage cart.** The ESD director, or director's designee, may require the owner of a residential premise to subscribe to and pay for solid waste collection services as determined is necessary, including "requiring solid waste containers in such sizes and numbers as needed to store all the solid waste generated at the premises during the periods between collections…"

Should the resident be unable, or choose not to, place garbage in the proper bin, the Administrative Citation Schedule of Fines allows a $50 fine to be assessed for a failure to put garbage in a designated garbage container. On occasion – about two or three times a month – a $15 collection fee has been assessed for collecting a recycling cart as solid waste. It is not clear whether there have been

instances of a mandatory garbage cart upsize or a $50 citation issued related to single-family residential recycling.

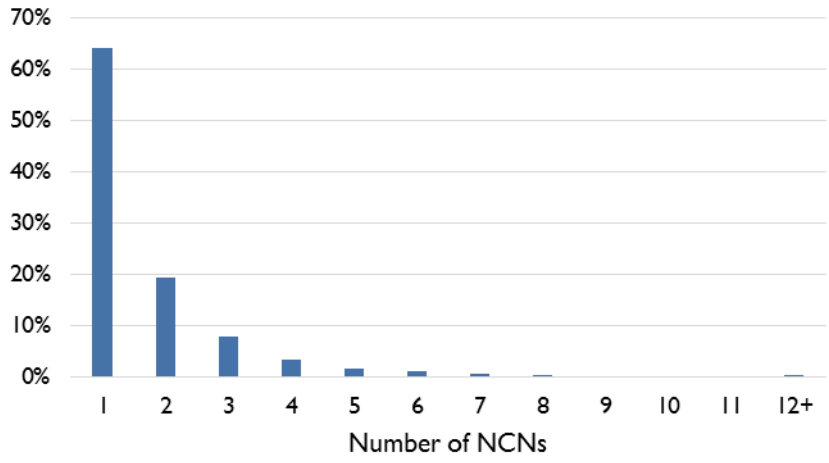
Non-Collection Notices Issued by the Haulers Currently Serve as the Primary Enforcement Method

According to the agreements with the haulers, the "CONTRACTOR shall not be required to collect Recyclable Material if the Service Recipient does not segregate the Recyclable Material from Residential Solid Waste." In order to curb contamination, the agreements provide haulers the option to refuse collection of non-recyclable materials – either specific items in the recycling cart and/or the entire cart when it is deemed to be too contaminated. In either case, the hauler is to leave an NCN that must contain instructions on proper set-out and how to request collection of recyclable material as solid waste. As shown in Appendix B, the NCN also specifies the reason for non-collection through a series of checked boxes.

During 2013 and 2014, haulers issued approximately 102,000 NCNs to 57,000 single-family residences, or about a quarter of all households, across the City. About 3 percent of those households were located in district B; all others were in districts A or C – 58 percent and 39 percent, respectively.

Exhibit 19 shows the distribution of residences receiving NCNs by the number of NCNs issued during the two-year time period. Of those residences that received an NCN, about 16 percent received more than two NCNs.

Exhibit 19: Distribution of Residences Receiving NCNs by Number Received, 2013 and 2014



Source: Auditor analysis of hauler monthly reports to ESD.

Contracts Require the City to Address Cases of Repeat Contamination

There are, however, residences where repeat contamination of the recycling cart persists. During 2013 and 2014, nearly 300 residences received 12 or more NCNs, or approximately one NCN every other month. Although this represents less than 1 percent of households receiving an NCN, contamination can undermine the good recycling habits of others by making otherwise recyclable materials unrecoverable.

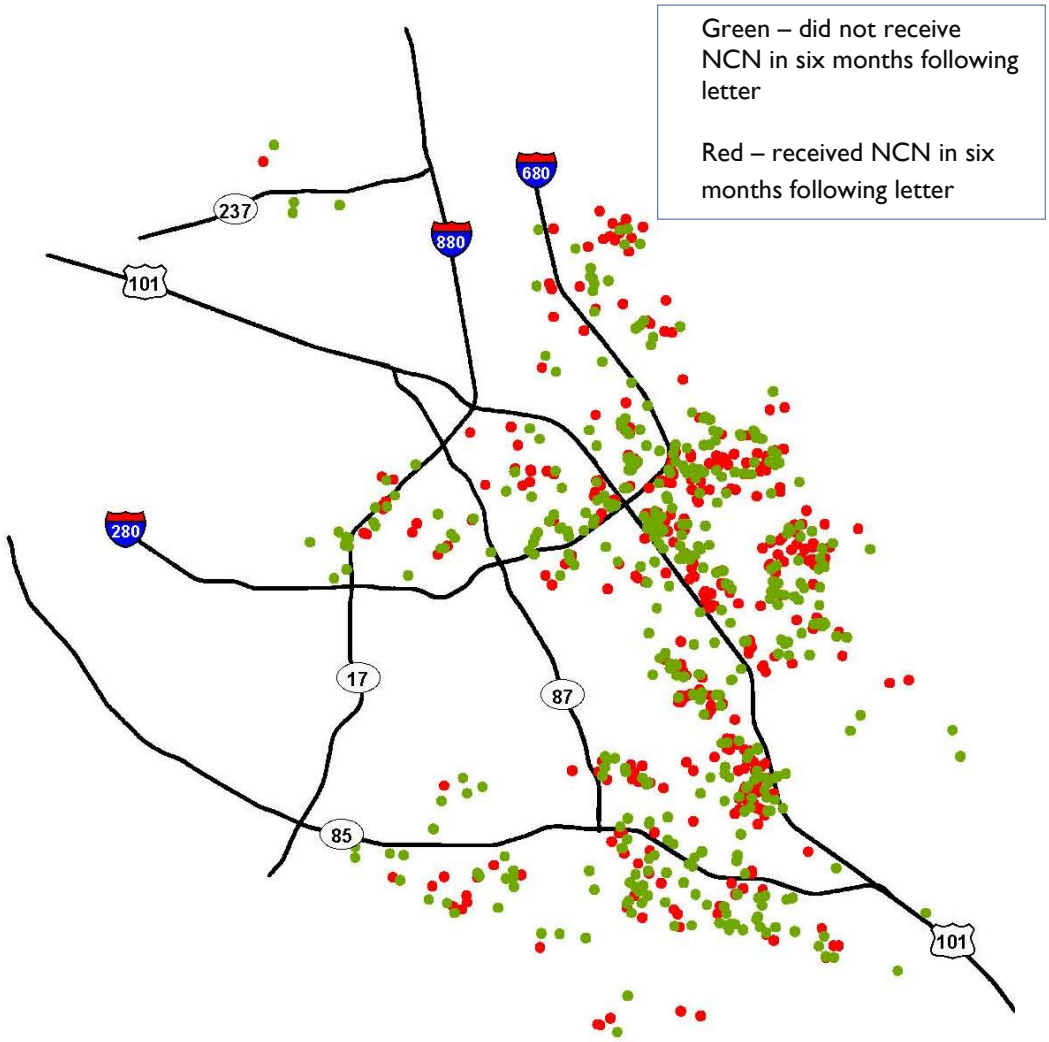
In the event the recycling cart is left un-emptied more than three times during three consecutive months, the contracts state that the City will work with the contractor to resolve the situation. According to ESD, contract managers work with haulers to resolve issues on a case-by-case basis, averaging one escalation per month in 2013 and once every two months in 2014.

Haulers report NCNs through the City's integrated billing system as well as monthly reports to ESD. In each monthly report, CWS separately lists those residences receiving more than one NCN in the current quarter.

The City's One-Time Effort Was Successful

In August 2014, the City mailed a trilingual letter to approximately 800 households in districts A and C in August, 2014 that had received three or more NCNs within three consecutive months. Included in the mailer was additional educational materials on recycling. Exhibit 20 displays those residences that received the letter. According to ESD, staff is planning to conduct another mailing in June 2015.

Exhibit 20: Residents That Received August 2014 City Contamination Letter



Source: Auditor analysis of ESD and hauler monthly reports.

As shown in Exhibit 20 above (in green), approximately 54 percent of those residences that received the August letter did not receive another NCN in the six months following. This suggests the letter and accompanying educational materials had a positive effect on the majority of residents at improving contamination of carts.

Given the results from the 2014 letter, the City should use the haulers' monthly reports to track residences that show up in multiple quarters and proactively address contamination.

ESD Has Developed Draft Recycling Enforcement Procedures

Consistent with the Municipal Code, ESD has drafted residential recycling procedures detailing expectations for haulers and City staff in documenting and responding to contamination. Under these draft procedures, haulers must, "if practical," remove non-recyclable material from recycling cart, and if impractical, haulers must photographically document the contamination. After a series of NCNs, City staff is to issue a letter to the resident. A citation with a penalty of $50 is incurred after the sixth NCN, and a possible upsize of garbage cart after the ninth NCN. These procedures, however, are still in draft format. According to ESD, they had planned to pilot it with roughly 100 households, but it has yet to be implemented.

Other jurisdictions have implemented enforcement policies to address contamination at the curbside.

- Fresno issued $50 citations on a residence's third instance of contamination.
- San Bernardino issues a $25 fine after the second notice.
- Beginning in July 2015, Oakland – where CWS also provides recycling collection service – will allow its recycling contractors the right to assess a "contamination surcharge" equal to $25 for the first surcharge and $50 for the second that occurs within six months of the first.

In addition, Sacramento is piloting an enforcement program which, according to staff, upsizes the garbage cart on the third instance a residence is tagged for contamination in the recycle bin.[38]

Additional Steps Needed Prior to Implementation of Recycling Enforcement Procedures

NCNs are a pivotal component of the City's enforcement procedures. Certain criteria must be met in order for NCNs to be enforceable; namely, NCNs must be clearly documented, issued consistently, by adequately trained staff, and proper quality assurance and quality control measures must be in place. In addition, residents must have a right to contest NCNs.

Haulers Employ Different Practices in How They Issue NCNs

Currently, NCN issuance differs across districts and haulers. In 2013, for instance, CWS issued 32 and 25 NCNs per 1,000 households per month in districts A and C, respectively. GreenTeam, on the other hand, issued 2 per

[38] Non-collection notices are issued by city staff for Sacramento, Fresno, and San Bernardino. The Fresno enforcement program is currently on hold because of a reduction in enforcement staff resulting from budget cuts.

1,000 households per month in district B. It is unclear how much the differences in issuance result from hauler interpretation of contract obligations or differences in recycling behavior of residents across districts.

One reason for the difference in the number of NCNs issued may be due to differing interpretations of contract requirements, which state:

> *If Recyclable Material is contaminated through commingling with Residential Solid Waste, CONTRACTOR shall,* ***if practical*** *[emphasis added], separate the Residential Solid Waste from the Recyclable Material. The Recyclable Material shall then be collected and the Residential Solid Waste shall be left in the Recycling Cart along with a Non-Collection Notice explaining why the Residential Solid Waste is not considered a Recyclable Material.*

In such cases, all material less the unrecyclable is collected by the hauler. However, there are instances that allow the hauler to leave the entire recycling cart. The agreements state:

> *… in the event the Recyclable Material and Residential Solid Waste are commingled to the extent that they* ***cannot easily be separated*** *[emphasis added] by Contractor or the nature of the Residential Solid Waste renders the entire contents of the Recycling Cart contaminated, CONTRACTOR will leave a Non-Collection Notice that contains instructions to the Service Recipient on the proper procedures for setting out Recyclable Material, and how to request collection of Recyclable Material as Residential Solid Waste.*

According to ESD, concerns exist over whether these procedures are followed and followed consistently by the haulers prior to the issuance of an NCN. The haulers and City staff have differing opinions about the practicality of removing non-recyclables from carts. For instance, City staff may view it practical for drivers to check carts for non-recyclables, whereas drivers may view it impractical due to workload or safety concerns.

In order to ensure consistent and proper issuance of NCNs, ESD should work with the haulers to clarify when it is - and when it is not - practical for non-recyclable material to be removed from the recycling cart.

Minimum Documentation Requirements Should Be Established

The contracts require haulers, at minimum, to provide the City with the following data each month for each NCN issued:

- NCN work order number
- Date issued
- Day of the week issued
- Route number

- Recipient address
- Service district (A, B, or C)
- Reason for non-collection

ESD should determine if additional documentation is required and update its draft recycling enforcement policy accordingly.

Quality Assurance and Quality Control Measures Are Required

As stated earlier, ESD must ensure that quality assurance and quality control measures are in place. ESD should ensure systematic hauler activities that follow contractual guidelines are implemented. Furthermore, ESD should regularly monitor hauler NCN issuance to confirm NCNs are issued consistently and aligned with the agreed-upon methods.

The draft single-family residential recycling enforcement procedures would require involvement from ESD's integrated waste management inspectors after the fourth NCN in six months. Currently, there are three inspectors, but they are focused on commercial and multi-family waste management. The single-family recycling enforcement procedures may require in-person meetings and hand-delivery of educational material. CWS, for example, had over 1,000 residences with four or more NCNs in 2014, so ESD will need to plan accordingly in order to implement the procedures.

In addition, ESD should document the processes by which garbage carts would be upsized (i.e., replaced with a larger cart) or appeals heard.

Recommendation #5: To ensure consistent enforcement, ESD should work with its haulers to clarify under what circumstances non-collection notices are issued, and ESD should regularly monitor the haulers' process of issuing NCNs.

Recommendation #6: ESD should work with the City Attorney's Office to address enforcement of the Municipal Code recycling requirements. This includes finalizing and implementing procedures that contain minimum documentation requirements for non-collection notices and establish thresholds for taking enforcement actions.

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Conclusion

The City has six main sources of waste: City operations, commercial enterprises, single-family residences, multi-family residences, yard waste, and construction and demolition activities. Single-family residential households have the lowest diversion rate of the City's main waste streams, and established diversion goals are not being met. Diversion rate methodologies differ, so ESD should define a standard diversion calculation and apply it across the City. Furthermore, since many factors can affect whether the City is able to meet its diversion goals, ESD should use the waste characterization and residue study it plans to conduct to set a baseline for future diversion goals as well as determine whether its haulers are meeting contractual processing obligations. In addition, the City can seek to increase diversion by changing customer behavior. The City could do this by working with its haulers to enhance its existing public education and outreach programs, as well as improve enforcement of Municipal Code provisions surrounding repeat contamination in recycling carts.

RECOMMENDATIONS

Recommendation #1: The Environmental Services Department should utilize the results of its upcoming Waste Characterization and Residue Study to:

a) Provide baselines for single-family curbside diversion goals in future contracts, and

b) Work with its haulers to determine where program improvements can be made.

Recommendation #2: If the upcoming Waste Characterization and Residue Study shows that clean recyclables are present in the residue from either MRF, the Environmental Services Department should require the contractor either:

a) Improve its MRF processing procedures to ensure compliance with the terms of their contract, or

b) Explore backend sorting its residue to recover any materials which were not recovered during processing.

Recommendation #3: To better track progress in single-family curbside recycling and inform the development of performance targets, the Environmental Services Department should define a standard diversion calculation and apply it consistently across all garbage and recycling districts in future recycling contracts.

Recommendation #4: As a part of their Public Education and Outreach Programs, the Environmental Services Department should require haulers to:

a) Increase the number of presentations to schools and community groups, and

b) Design and implement an in-person, door-to-door outreach campaign that targets neighborhoods known to have contamination problems. This could include ensuring large

households have the right garbage container size and integrating demographic differences across neighborhoods.

Recommendation #5: To ensure consistent enforcement, ESD should work with its haulers to clarify under what circumstances non-collection notices are issued, and ESD should regularly monitor the haulers' process of issuing NCNs.

Recommendation #6: ESD should work with the City Attorney's Office to address enforcement of the Municipal Code recycling requirements. This includes finalizing and implementing procedures that contain minimum documentation requirements for non-collection notices and establish thresholds for taking enforcement actions.

APPENDIX A

Courtesy Notice

Source: Environmental Services Department

APPENDIX B

Non-Collection Notice

Non-Collection Notice

Para español, lea el otro lado.
Muốn đọc bằng tiếng Việt, xin xem mặt sau.

Consider upgrading to a larger garbage cart if you repeatedly have excess garbage that does not fit in your cart.

☐ **Garbage** ☐ **Recycling**
could not be collected at your home this week. Use the following solutions checked below for next week's collection:

1 Take these items out of your recycling cart and place them in your garbage cart:
- ☐ Food waste
- ☐ Containers with liquid inside
- ☐ Garden hoses
- ☐ Diapers
- ☐ Toilet paper
- ☐ _____

- You have the option to request your recycling cart to be picked up before next week's collection for a fee — call (408) 282-4400.

2 Take these items out of your cart and visit www.hhw.org or call (408) 299-7300 for a free drop-off appointment.
- ☐ Pressurized tanks
- ☐ Biohazard/medical waste
- ☐ Needles/syringes
- ☐ Batteries
- ☐ _____

3 Use an *Extra Garbage Sticker* for excess garbage.
- Stickers can be purchased at San José Libraries, City Hall, Safeway, Lucky, and Save Mart stores.
- ☐ Overflowing garbage in cart — place extra garbage in a plastic bag no larger than 32 gallons and attach an *Extra Garbage Sticker.*
- ☐ Must attach an *Extra Garbage Sticker* to the extra garbage bag.

Extra Garbage Sticker

☐ **4 Remove heavy or large items from cart.**
- Call (408) 282-4400 for disposal options, including large item pickup for a fee.

5 Properly dispose of used motor oil and/or oil filters.
- ☐ Must use free official motor oil jugs and filter bags.
  - Call (408) 282-4400 to order motor oil jugs and filter bags.
- ☐ Do not dispose of other fluids (e.g. automotive, cooking oil) in the motor oil jug.
  - Visit **www.hhw.org** or call (408) 299-7300 for a free drop-off appointment.

For questions or to order a free recycling guide in English, Spanish or Vietnamese:
(408) 282-4400
www.greenteam.com

Green Team of San Jose

REASON

1 Non-recyclable item
- ☐ a. Food waste
- ☐ b. Containers with liquid inside
- ☐ c. Garden hoses
- ☐ d. Diapers
- ☐ e. Toilet paper
- ☐ f. _____

2 Household hazardous waste
- ☐ a. Pressurized tanks
- ☐ b. Biohazard/medical waste
- ☐ c. Needles/syringes
- ☐ d. Batteries
- ☐ e. _____

3 Use *Extra Garbage Sticker*
- ☐ a. Overflowing garbage in cart
- ☐ b. No sticker

☐ **4 Heavy or Large Items**

5 Automotive fluids
- ☐ a. Non-City oil jug/filter bag
- ☐ b. Other fluids

Route # _____ Date: _____
Cart: G_____ R_____ Driver Initials: _____
Address:

Notes: _____

Aviso de no recogida
Thông Báo Không Thu Gom

Si a menudo tiene exceso de basura que no cabe en su recipiente actual considere un recipiente de basura más grande.
Nếu quý vị liên tục có quá nhiều rác không vừa với thùng xe đựng rác của quý vị thì hãy xét đến việc nâng cấp lên thùng xe đựng rác lớn hơn.

☐ **La basura** ☐ **El reciclaje** no se pudo recoger esta semana. Use las siguientes soluciones marcadas para la recogida de la próxima semana:

☐ **Rác** ☐ **Đồ tái chế** không được thu gom tại nhà của quý vị tuần này. Dùng các giải pháp đánh dấu dưới đây để được thu gom vào tuần tới:

1 Saque estos artículos de su recipiente de reciclaje y colóquelos en su recipiente de basura:
- ☐ Desechos de alimentos
- ☐ Contenedores con líquido
- ☐ Mangueras
- ☐ Pañales
- ☐ Papel higiénico
- ☐ _____

- Usted puede solicitar que su recipiente de reciclaje se recoja antes de la próxima semana pagando una tarifa — llame a GreenTeam al (408) 282-4400.

1 Lấy các đồ vật sau đây ra khỏi thùng xe đựng đồ tái chế và bỏ chúng vào thùng xe đựng rác của quý vị:
- ☐ Đồ ăn bỏ đi
- ☐ Tã lót
- ☐ Các đồ dựng có chất lỏng bên trong
- ☐ Giấy đi cầu
- ☐ Vòi xịt nước ngoài vườn
- ☐ _____

- Quý vị được lựa chọn yêu cầu hãng rác đến thu gom thùng xe tái chế của quý vị trước kỳ thu gom vào tuần sau mà phải trả một lệ phí — xin gọi số (408) 282-4400.

2 Saque estos artículos de su recipiente y visite www.hhw.org o llame al (408) 299-7300 para programar una cita gratuita para deshacerse de ellos.
- ☐ Tanques presurizados
- ☐ Residuos de riesgo biológico/médicos
- ☐ Agujas/jeringas
- ☐ Pilas
- ☐ _____

2 Lấy các món đồ sau đây ra khỏi thùng xe của quý vị và truy cập trang mạng www.hhw.org hoặc gọi số (408) 299-7300 để lấy hẹn đem bỏ tận nơi miễn phí.
- ☐ Các thùng khí nén
- ☐ Phế liệu y khoa/nguy hiểm sinh học
- ☐ Kim tiêm/ống dịch
- ☐ Các bình điện
- ☐ _____

3 Use un adhesivo *Extra Garbage (basura adicional)* para el exceso de basura.
- Los adhesivos se pueden comprar en las bibliotecas de San José, el ayuntamiento y las tiendas Safeway, Lucky y Save Mart.
- ☐ Coloque la basura que desborda del recipiente en una bolsa de plástico de no más de 32 galones y colóque le un adhesivo *Extra Garbage.*
- ☐ Tiene que colocar un adhesivo *Extra Garbage* a la bolsa de basura adicional.

3 Dùng Nhãn Rác Dư *(Extra Garbage Sticker)* họ rác dư.
- Các nhãn dán này có thể mua tại các thư viện của San José, Tòa Thị Chính Thành Phố, các tiệm Safeway, Lucky và Save Mart.
- ☐ Rác đầy tràn ra ngoài thùng xe — bỏ rác dư vào trong một bao ny lông không quá 32 ga lông và dán lên đó một Nhãn Rác Dư *(Extra Garbage Sticker).*
- ☐ Phải dán Nhãn Rác Dư *(Extra Garbage Sticker)* vào bao ny lông đựng rác dư.

☐ **4 Retire los objetos pesados o de gran tamaño del recipiente.**
- Para informarse de sus opciones de desecho, incluso el servicio de recolección de artículos de gran tamaño por un pequeño costo, llame al (408) 282-4400.

☐ **4 Lấy các món nặng nề hoặc lớn ra khỏi thùng xe.**
- Gọi số (408) 282-4400 để biết các lựa chọn thải bỏ, bao gồm thu gom đồ vật cồng kềnh với một lệ phí.

5 Deseche correctamente el aceite para motor y/o los filtros de aceite usados.
- ☐ Debe usar los recipientes para aceite de motor usado y las bolsas para filtros proporcionados por GreenTeam.
- Llame al (408) 282-4400 para pedir recipientes para aceite de motor y bolsas para filtros.
- ☐ No vierta otros líquidos (por ejemplo otros líquidos para automóviles, aceite de cocina) en el recipiente para aceite de motor.
- Visite **www.hhw.org** o llame al (408) 299-7300 para programar una cita gratuita.

5 Vứt bỏ thích hợp dầu nhớt xe cũ và/hoặc các bộ lọc dầu.
- ☐ Phải dùng các bình đựng dầu nhớt xe và các bao đựng bộ lọc được cung cấp miễn phí.
- Gọi số (408) 282-4400 để xin các bình đựng dầu nhớt xe và các bao đựng bộ lọc.
- ☐ Không bỏ các dung dịch khác (như dầu phanh, dầu nấu ăn) trong các bình đựng dầu nhớt xe.
- Truy cập trang mạng **www.hhw.org** hoặc gọi số (408) 299-7300 để lấy hẹn đem bỏ tận nơi miễn phí.

Para preguntas o para pedir una guía de reciclaje gratuita en Inglés, Español o Vietnamés:
(408) 282-4400 | www.greenteam.com

Nếu có thắc mắc hoặc muốn xin một cuốn sổ hướng dẫn tái chế miễn phí bằng tiếng Anh, tiếng Tây Ban Nha hoặc tiếng Việt:
(408) 282-4400 | www.greenteam.com

Printed on at least 30% post-consumer recycled paper with soy-based inks. 0614/7/FK

Source: Environmental Services Department

APPENDIX C

Recycle Right Cart Hanger

Source: Environmental Services Department

Notice

Garbage, such as leftover food and diapers, cannot be placed in recycling carts. This ruins recyclables and creates hazards for workers who hand sort recyclables.

Make sure your carts are collected:

- Use extra garbage stickers, available at San José Libraries, City Hall, Save Mart, Lucky and Safeway stores.
- Find out what's recyclable or order a larger garbage cart by contacting your collection company listed below:

Aviso

Basura tal como desechos de comida y pañales no deben colocarse en el recipiente de reciclaje. La basura daña el material reciclable y pone en peligro a los trabajadores que apartan los reciclables a mano.

Asegúrese que sus recipientes se recojan:

- Compre etiquetas para Basura Extra en las bibliotecas o en las tiendas Save Mart, Lucky's, y Safeway en la Ciudad de San José.
- Familiarícese con los materiales que son reciclables u ordene un recipiente de basura más grande. Comuníquese con su compañía de recolección, detallados en la siguiente lista:

Thông Báo

Rác thải, chẳng hạn như thức ăn thừa và tã lót, không được phép bỏ vào trong thùng xe đựng vật liệu tái chế. Nếu không, rác thải sẽ hủy hoại vật liệu tái chế và tạo ra mối nguy hiểm cho những công nhân dùng tay lựa ra để tái chế.

Để đảm bảo các thùng xe của bạn được thu gom:

- Hãy sử dụng nhãn rác dư, có bán tại các thư viện, Tòa Thị Chính, các tiệm Save Mart, Lucky và Safeway ở San José.
- Hãy tìm hiểu xem những đồ vật gì có thể tái chế được hoặc yêu cầu thùng rác lớn hơn bằng cách liên lạc công ty thu gom của bạn được liệt kê dưới đây:

Downtown, north, east, and south San José
Centro, Norte, Este, y Sur de San José
Trung tâm, phía bắc, phía đông và phía nam San José

CALIFORNIA WASTE SOLUTIONS
Recycling Specialists

California Waste Solutions
(408) 213-7800
www.calwaste.com

West San José
Oeste de San José
Phía tây San José

GreenTeam of San Jose

GreenTeam of San José
408) 282-4400
www.greenteam.com

Keep household hazardous waste out of your carts.

No tire los desechos domésticos peligrosos en sus recipientes.
Đừng bỏ các chất thải gia dụng độc hại vào các thùng xe của bạn.

Schedule a free drop-off appointment.

Haga su cita gratuita para deshacerse de estos artículos.

Hãy làm một cuộc hẹn đem bỏ miễn phí.

www.hhw.org
(408) 299-7300

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Source: Environmental Services Department

APPENDIX D

Waste Characterization and Residue Studies Draft Scope of Work

San José Single-Family Recycling Characterization
Consultant Study 2015

Objective and Overview

As an update to the 2008 waste characterization study conducted in San José, this waste characterization scope aims to provide data for evaluating the current single-family curbside recycling program. The field work will be completed by the same contractor used in the 2008 study. Although the waste stream is constantly evolving, which can make comparisons between years less robust, having the same contractor reduces one possible source of variation in the data and enhances the comparability of results between the two studies.

Elements of Scope

- **Recyclable Material Characterization**
  - Hand sorts of 60-70 samples of recyclable material collected from single-family curbside recycling route trucks upon arrival at the Material Recovery Facility (MRF); 20-25 single-family curbside recycling samples from each collection district, randomly selected. Each sample will weigh between 125 and 150 pounds.

- **Material Recovery Facility (MRF) Residuals Characterization**
  - Hand sorts of 12 samples of MRF residuals: four samples from MRF that processes district B recyclables and eight samples from MRF that processes districts A and C recyclables. Each sample will weigh between 125 and 150 pounds.

- **Reports and Data:**
  - Study design document; daily progress reports during the field work; a detailed report with an executive summary at the conclusion of field work; and copies of all field forms, digital photos, and data tables.

Source: Environmental Services Department

APPENDIX E

Processing Study Draft Scope of Work

San José Recyclables Processing Evaluation
Consultant Study 2015

Objective and Overview

San José contracts with two facilities for processing single-family curbside recyclables. The City may direct a consultant to study one or both of these processing operations for the purpose of determining effectiveness and providing recommendations for improvements. This study would assess equipment, labor, and operational practices and efficiencies.

Elements of Scope

- **Material Recovery Facility (MRF) Equipment Condition Inspection and Maintenance Evaluation**
  - Inspection of all mechanical apparatus for evaluation of current condition and remaining useful life, including recommendations for maintenance, repair, or replacement.

- **Assessment of Current MRF Operations and Management Practices**
  - Observing plan operations and evaluating active MRF operation practices, equipment maintenance practices, and hand sorting effectiveness.

- **Recommendations for Technological/Mechanical MRF Modification**
  - Recommend current technologies that may be readily applied to the respective MRF and the potential to improve MRF productivity and the quality of MRF outputs, with consideration of the age of the current systems.

- **Final Report**
  - Existing equipment condition report, current MRF management practices, Best Management Practice recommendations, recommendations for technological/mechanical MRF modifications.

Source: Environmental Services Department

T&E AGENDA: 06/01/2015
ITEM: d.4

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: SHARON ERICKSON
CITY AUDITOR

FROM: Kerrie Romanow

SUBJECT: **RESPONSE TO THE AUDIT OF CURBSIDE RECYCLING**

DATE: May 21, 2015

Approved D-DSyL Date 5/21/15

The Environmental Services Department (ESD) requested an audit of single-family curbside recycling to assess opportunities to improve program performance. ESD works closely with the Recycle Plus haulers to ensure all contract requirements are met, however the single-family waste diversion rate has stagnated (and even decreased in some areas) in recent years, while diversion in other sectors has increased. The Department greatly appreciates the important work of the City Auditor and her staff for this evaluation and looks forward to improving both the current performance and future programs. The following are the Administration's responses to each recommendation.

BACKGROUND

The Recycle Plus program is one of the largest privatized solid waste systems in the United States. The City has contracted with the single-family recycling haulers, GreenTeam of San Jose and California Waste Solutions since 2003 and 2007, respectively. In June 2010, Council approved new agreements with the Recycle Plus haulers with terms through June 2021.

The Recycle Plus agreements specify the intent to provide the highest caliber collection services, customer satisfaction, maximum diversion levels, highest and best use of collected items, and timely and accurate services. Since Recycle Plus began in 1993, staff has incorporated many innovative recycling efforts and the program has maintained a high recycling rate of approximately 61 percent for several years; however, in fiscal year 2013-2014, diversion decreased to 57.8 percent. The single-family recycling rate continues to be the lowest of the five main sources of waste generated in San José: City operations; commercial; single-family; multi-family; and construction and demolition.

RECOMMENDATIONS AND ADMINISTRATION'S RESPONSE

Recommendation #1: The Environmental Services Department should utilize the results of its upcoming Waste Characterization and Residue Study to:
a) Provide baselines for single-family curbside diversion goals in future contracts, and
b) Work with its haulers to determine where program improvements can be made.

Administration Response to Recommendation #1: The Administration agrees with this recommendation. Planning for the solid waste consultant studies is well under way and the studies are anticipated to be completed by fall 2015. Staff will work with the haulers to ensure that any facility or operational issues uncovered by the studies are addressed as required in the agreements. Staff agrees with using the results of the studies as a baseline for future contract planning. The current Recycle Plus agreements expire in June 2021, and planning for the next solid waste and recycling procurements is expected to begin in 2016.

Recommendation #2: If the upcoming Waste Characterization and Residue Study shows that clean recyclables are present in the residue from either MRF, the Environmental Services Department should require the contractor either:
a) Improve its MRF processing procedures to ensure compliance with the terms of their contract, or
b) Explore backend sorting its residue to recover any materials which were not recovered during processing.

Administration Response to Recommendation #2: The Administration conceptually agrees with this recommendation. The planned consultant study of Material Recovery Facility (MRF) operations will inform the development of processing operational procedures to ensure compliance with the current contracts. As a part of developing the next generation of Recycle Plus services for 2021, staff can assess processing MRF residue, along with other technology solutions, to potentially recover more recyclables.

Recommendation #3: To better track progress in single-family curbside recycling and inform the development of performance targets, the Environmental Services Department should define a standard diversion calculation and apply it consistently across all garbage and recycling districts in future recycling contracts.

Administration Response to Recommendation #3: The Administration generally agrees with this recommendation. The current Recycle Plus agreements expire in June 2021, and planning for the next solid waste and recycling procurements is expected to begin in 2016. As part of the

procurement planning process, staff will target standardizing diversion calculations across all recycling contracts.

Recommendation #4: As a part of their Public Education and Outreach Programs, the Environmental Services Department should require haulers to:
a) Increase the number of presentations to schools and community groups, and
b) Design and implement an in-person, door-to-door outreach campaign that targets neighborhoods known to have contamination problems. This could include ensuring large households have the right garbage container size and integrating demographic differences across neighborhoods.

Recommendation #5: To ensure consistent enforcement, ESD should work with its haulers to clarify under what circumstances non-collection notices are issued, and ESD should regularly monitor the haulers' process of issuing NCNs.

Recommendation #6: ESD should work with the City Attorney's Office to address enforcement of the Municipal Code recycling requirements. This includes finalizing and implementing procedures that contain minimum documentation requirements for non-collection notices and establish thresholds for taking enforcement actions.

Administration Response to Recommendations #4, #5, and #6: The Administration views these three recommendations as a single, three-tier approach to ensure customer compliance with the recycling program. Staff will work with the haulers to improve performance.
The recycling agreements were established to focus the haulers first on outreach; second, individual customer notification of non compliance; and then, as a last resort, City enforcement.
For Recommendation #4, the Administration agrees that staff should more aggressively enforce existing contract provisions with the haulers to require more robust outreach campaigns. As required by the contracts, this would include addressing specific issues with contamination and recycling..
The Administration agrees with Recommendation #5. Staff will continue to enforce the terms of the agreements to ensure that the haulers adhere to the progressive education and enforcement process. First, if practical, the hauler must separate solid waste from the recyclables, collect the recyclables, and leave the solid waste in the recycling cart along with a Non-Collection Notice ("NCN") explaining why the solid waste is not considered recyclable. Second, if solid waste and recyclables are commingled to the extent that they cannot easily be separated, or if the nature of the solid waste renders the entire contents of the cart contaminated, the hauler must leave an NCN with instructions on the proper procedure for setting out recyclables and how to request collection of the contents of the carts as residential solid waste.

Staff will work with the recycling haulers to develop guidelines to better define what can be practicably separated and operational guidelines for implementation. Staff will also improve the process to monitor the haulers' issuance of NCNs to ensure consistency, and will enforce the

agreement requirements for the progressive education and enforcement process. As required in the agreements, staff will also work with the haulers to resolve situations in which the contractor leaves a recycling cart un-emptied more than three times in three consecutive months. In support of this, staff is planning to repeat the successful 2014 mailing to repeat offenders in early summer 2015.

The Administration generally agrees with Recommendation #6. Staff will work with the City Attorney's Office over the next six months to finalize procedures for enforcement of Municipal Code recycling requirements, which already exist in draft form.

CONCLUSION

Staff will begin planning for the next generation of residential solid waste collection and recycling contracts in 2016. As part of that process, staff will take into account the recommendations from this audit and the results of solid waste characterization and residue studies currently underway.

We thank the City Auditor and her staff for recommending ways to improve the single-family curbside recycling program.

/s/
KERRIE ROMANOW
Director, Environmental Services

For questions, please contact Jo Zientek, Deputy Director, Environmental Service Department, at (408) 535-8557.