FINAL REPORT
Phase 2 of Study to Examine Practices for Selecting Refuse Collection, Hauling and Disposal Providers

Prepared for:
San Francisco Local Agency Formation Commission

May 26, 2011

R3 Resources, Respect, Responsibility
Consulting Group, Inc.

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1.0 Purpose of the Study

1.1 Introduction

The San Francisco Local Agency Formation Commission (LAFCo) engaged R3 Consulting Group, Inc. (R3) to analyze the policies and procedures that jurisdictions within the Greater Bay Area, including the City and County of San Francisco (San Francisco), use to select refuse collection, transfer, recycling and disposal service providers. To address LAFCo's request, R3 surveyed the procurement practices of jurisdictions in the Greater Bay Area in order to compare those practices to those currently used by San Francisco. R3 also examined jurisdictions outside of the Greater Bay Area that use barge and rail as a way to transport waste. The Final Report for that study (Phase One report) was released on April 14, 2011.

LAFCo has extended the scope of the study to include: 1) a comparison of the fees and "free" or discounted solid waste services received by San Francisco and other local jurisdictions from their exclusive collection service provider along with a comparison of the total of those fees and services as a percentage of gross revenues from the provision of the exclusive services (the Fee and Service Percentage); 2) a comparison of reported diversion rates and current residential and commercial rates for selected jurisdictions to determine if there is any quantifiable correlation between the reported diversion, the Fee and Service Percentage and the residential and commercial rates; 3) a description of the fixed assets that are held by Recology in San Francisco, including original and book value of each property if available; and 4) and a summary of the potential benefits and consequences of barging various materials from the Port of San Francisco based on the current report commissioned by the San Francisco Department of the Environment and information received from Port of San Francisco staff and Recology. This report addresses the expanded scope.

1.2 Limitations

The study was limited to those jurisdictions in the Greater Bay Area Bay that were willing and able to provide the requested information or whose service provider was willing and able to provide the requested information. The fee and service data included in this portion of the study was provided by the City of San Francisco, the City of San Jose, Recology, and Waste Management of Alameda County. The data has been accepted

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as presented and has not been subjected to independent audit or verification.

This study is not intended to analyze San Francisco's solid waste system, nor is it intended to be used as a basis to revise the current system.

2.0 Data Sources and Methodology

2.1 Data Sources

R3 used a combination of phone and e-mail surveys, interviews, and Internet research to compile the information used in this report. Data compiled for this report was gathered from the following sources:

- Surveys and discussions with agencies and service providers;
- Data gathered in previous studies and projects by R3 including Alameda County, South Bayside Waste Management Authority, and the previous report prepared by R3 for LAFCo;
- Interviews with San Francisco agencies, including the San Francisco Port Authority (Port), the Department of Public Works and the Department of the Environment (DOE);
- Interviews with the Department of Sanitation New York City (DSNY);
- Interviews with Visy Paper Mill;
- Documents provided by various entities; and
- Internet research.

2.1.1 Jurisdiction and Hauler Surveys

A total of 13 jurisdictions in the Greater Bay Area and two franchised solid waste service providers were contacted by phone and/or by email. Information was received from the City and County of San Francisco, City of San Jose, Recology, and Waste Management of Alameda County.

Table 1 lists the jurisdictions in descending order by population for which complete information was received and which are included in this report.

TABLE 1 Jurisdictions Included in this Report		
City	***County***	***Population***
San Jose	Santa Clara	1,023,083
San Francisco	San Francisco	856,095
Oakland	Alameda	430,666
Hayward	Alameda	153,104
San Mateo	San Mateo	97,535
Redwood City	San Mateo	78,568
East Palo Alto	San Mateo	33,524
Menlo Park	San Mateo	32,185
Foster City	San Mateo	30,719
Burlingame	San Mateo	29,342
San Carlos	San Mateo	29,155
Belmont	San Mateo	26,507
Emeryville	Alameda	10,227

The key information that was gathered from jurisdictions and service providers is listed below:

- Fees included in rates that are exclusive to the provision of the franchised services;
- Value of "free" or discounted services included in rates; and
- Gross revenues of haulers from the provision of .exclusive collection services.

Appendix A provides data collection forms used in the surveys.

2.1.2 Documents Provided by Various Entities

Documents provided by various entities for this study include:

- The Technical Memorandum, Comparison of Waste Transportation Methods from San Francisco to the Ostrom Road Landfill, prepared by HDR Engineering, Inc. for the San Francisco Department of the Environment (DOE);
- RFP for the Ports of Stockton, West Sacramento M-580/180 Marine Highway Corridor Project;
- New York City's Solid Waste Management Plan; and
- The 2010 DSNY Annual Report.

2.1.3 Internet Research

R3 conducted Internet research to collect information on the diversion rates of jurisdictions in Alameda County and San Jose and information related to New York City's barge system.

2.2 Methodology

2.2.1 Fees and Free or Discounted Services Received by San Francisco and Other Local Jurisdictions

For this study R3 requested information on public agency fees, free or discounted services, and gross revenue from collection services from public agencies and service providers for San Francisco, Oakland, San Jose and other selected municipalities in the Greater Bay Area.

Customer Billing Services

In most cases, the service providers for the municipalities included in this report are responsible for providing customer billing services. Therefore, the various service fees implemented by the municipalities are collected by the service provider and remitted to the municipality.

However, there are two exceptions noted in this study. The City of San Jose is responsible for customer billing services; therefore, all funds are remitted directly to San Jose from the customer. The solid waste service provider for the City of Oakland is responsible for collecting the fees needed to pay a separate contractor who performs a portion of the recycling collection services. These monies are remitted to the City which uses them to pay the second contractor. Even though these fees are collected by a service provider and remitted to the City they are not considered fees for purposes of this study.

Fees

With three exceptions, fees included in this report were limited to those fees that were collected by the service provider and remitted directly to the municipality. The first and second exceptions relate to the cities of San Jose and Oakland and were discussed above. The third exception relates to Alameda County where Measure D monies are collected through customer rates and remitted to StopWaste.Org. Portions of those funds are then remitted to the municipalities by StopWaste.Org. Those fees remitted to the municipalities have been included in this study.

Free or Discounted Services

Free or discounted services were limited to those services that are provided to a municipality by the service provider as part of the provision of exclusive residential and commercial collection services for which there is no charge or a reduced charge.

In most cases, this category does not include standard services that may be bundled into a single rate. For example, many residential collection rates include the cost of collecting solid waste, recyclables, organics, used oil and bulky items. The single rate covers the cost of providing each of the services even though the individual costs are not segregated in the rate.

However, certain services, such as holiday tree collection, which were incorporated into the initial service data provided for San Francisco, have been included in the study in order to provide for fair comparison of the value of free or discounted services.

Gross Revenue

Gross revenue was limited to those revenues directly related to the provision of exclusive residential and commercial collection services. It does not include gross revenues from the provision of non-exclusive services, such as the collection of construction and debris boxes or the sale of recyclable materials.

Fee and Service Percentage Methodology

Using the gross revenue from exclusive collection operations and the value of the fees and free or discounted services provided R3 calculated the "Fee and Service Percentage" for each jurisdiction by dividing the value of the fees and services received by the gross revenues.

R3 also compared reported diversion rates and current residential and commercial rates for the selected jurisdictions to determine if there is any quantifiable correlation between the reported diversion, the Fee and Service Percentage, and the customer rates.

2.2.2 Recology Fixed Assets in San Francisco

R3 met with and toured Recology-owned facilities in order to gather information on the fixed assets owned by Recology in San Francisco that are being, or have been, paid for with funds received from the ratepayers of San Francisco. Financial data on these assets were obtained from Recology.

2.2.3 Barging as a Way to Transport Waste

This report provides an analysis of the potential benefits and consequences of various options in regards to barging solid waste from San Francisco. The analysis is based mainly on a review of the report prepared for the DOE by HDR, and discussions with staff of the Port of San Francisco and other San Francisco Agencies. For this analysis R3 also interviewed DSNY staff regarding New York City's current operations and future plans in regards to using barge and rail as a way to transport waste, as well as Visy Paper Mill staff.

3.0 Analysis

3.1 Fees and Free or Discounted Services Received by San Francisco and Other Local Jurisdictions

Information on fees, free and discounted services and gross revenues were collected in order to calculate a Fee and Service Percentage. That percentage, along with diversion and customer rates, was then used for comparison purposes in order determine if any correlation exists between the three factors (Section 3.1.2). Table 2 summarizes the fee and service information gathered.

TABLE 2
Comparison of Fees and Services

City	*Total Fees Paid Directly to City*	*Total Free Services Received by City*	*Total Value of Fees & Services*	*Gross Revenue From Collection Operations*	*Fee and Service %*
Emeryville	$ 918,126	$ 174,100	$ 1,092,226	$ 3,181,000	34.34%
Oakland [(1)]	$ 23,548,211	$ 1,326,231	$ 24,874,442	$ 80,886,000	30.75%
Belmont	$ 1,465,292	$ 114,150	$ 1,579,442	$ 5,394,156	29.28%
East Palo Alto	$ 786,384	$ 156,114	$ 942,498	$ 4,639,960	20.31%
Hayward	$ 4,884,992	$ 438,154	$ 5,323,146	$ 27,521,000	19.34%
San Mateo	$ 2,553,963	$ 421,275	$ 2,975,238	$ 16,506,640	18.02%
Redwood City	$ 2,177,316	$ 323,040	$ 2,500,356	$ 15,951,066	15.68%
Burlingame	$ 1,084,272	$ 239,622	$ 1,323,894	$ 8,686,950	15.24%
Menlo Park	$ 1,171,139	$ 226,123	$ 1,397,262	$ 9,630,852	14.51%
San Francisco	$ 12,465,689	$18,755,087	$ 31,220,776	$ 219,515,497	14.22%
San Carlos	$ 771,576	$ 97,655	$ 869,231	$ 6,333,212	13.72%
San Jose	$ 9,193,621	$ 415,696	$ 9,609,317	$ 99,887,184	9.62%
Foster City	$ 386,072	$ 89,336	$ 475,408	$ 5,548,318	8.57%

Note 1 - The City's service provider remitts $30,348,211 in fees to the City of Oakland. $6,800,000 of these fees are used to pay the City's second recycling contractor and have been subtracted from the total fees paid directly to the City leaving a balance of $23,548,211.

3.1.1 Fee and Free or Discounted Services Comparison

Fees and Free or Discount Services for the 13 jurisdictions were reported by service providers and/or jurisdictions. The data form used to collect fee and service information is included in Appendix A.

As discussed previously, with the exception of Measure D fees and San Jose and Oakland customer billings, the fees used in this study are limited to those fees which were collected directly by the service provider and remitted directly to the municipality. Fees reported in this study include:

- Franchise Fee;
- Franchise Extension Fee;
- Impound Account/Balancing Account;
- City Fees/Administrative Fees;
- Recycling Fees/Program Fees;
- Vehicle License Fees;
- Vehicle Impact Fees;
- Disposal Facility Tax;
- Route License/Permit Fees;
- Performance and Billing Review Fees;
- Administrative Enforcement Contribution Fees;
- Street Sweeping Fees;
- Public Education Fees;
- Measure D Fees;
- Rate Stabilization Fees; and
- Landfill Closure Fees.

Many franchise agreements require service providers to offer "free" or discounted services. The cost of these services was calculated by the service providers or the jurisdiction in order to determine the total value of "free" services. Free services reported in this study include:

- City Litter Can and Recycling Collection;
- City Sponsored and Non-Profit Events;
- City Collection Services;
- DPW Collection & Disposal;

- Holiday Tree Collection;
- Clean Team Event/Neighborhood Cleanup;
- Free Disposal;
- Battery Collection;
- Compost Give-a-Ways;
- Compact Fluorescent Light (CFL) Collection;
- Sharps Program; and
- Free Collection for Public Schools.

R3 added the total dollar amount of fees paid to the cities to the total value of services in order to quantify the total value of fees and services received by each city. We noted that while Oakland receives the largest amount of fees, San Francisco receives much more in free or discounted services; with the total value of fees and services for the two cities being nearly equal and considerably higher than those of the other cities included in this study. Chart 1 and Table 3 illustrate the total amount of fees and free or discounted services that each of the jurisdictions receive.

CHART 1
Total Value of Fees and Services

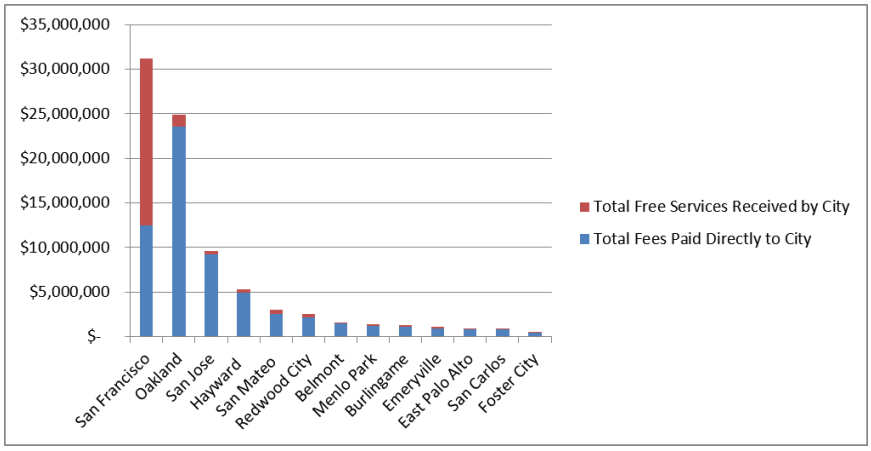

TABLE 3 Total Value of Fees and Services			
City	*Total Fees Paid Directly to City*	*Total Free Services Received by City*	*Total Value of Fees & Services*
San Francisco	$ 12,465,689	$18,755,087	$ 31,220,776
Oakland [(1)]	$ 23,548,211	$ 1,326,231	$ 24,874,442
San Jose	$ 9,193,621	$ 415,696	$ 9,609,317
Hayward	$ 4,884,992	$ 438,154	$ 5,323,146
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East Palo Alto	$ 786,384	$ 156,114	$ 942,498
San Carlos	$ 771,576	$ 97,655	$ 869,231
Foster City	$ 386,072	$ 89,336	$ 475,408

Note 1 - The City's service provider remitts $30,348,211 in fees to the City of Oakland. $6,800,000 of these fees are used to pay the City's second recycling contractor and have been subtracted from the total fees paid directly to the City leaving a balance of $23,548,211.

Gross Revenue

The service provider's gross revenue was collected for the 13 jurisdictions. These amounts reflect only those revenues associated with exclusive collection services. Gross revenue is used in calculating the Fee and Service Percentage for each city. Chart 2 shows a comparison of those revenues and Table 3 lists the gross revenues of each jurisdiction along with population and the calculated gross revenues per capita. For the majority of the jurisdictions included in this report gross revenues are related to the provision of exclusive residential solid waste, recycling and organics collection services and exclusive commercial solid waste and recycling services.

However, commercial solid waste, recycling and organics collection service in the City of San Jose are not exclusive but are provided by a variety of companies on a free market basis and thus the gross revenues for San Jose are only related to the provision of exclusive residential solid waste, recycling and organics collection services. We noted that commercial collection services in the City of San Jose will be regulated under the terms of an exclusive Franchise agreement in 2012. In addition, commercial recycling and organics collection services in the City of Oakland are not exclusive but are provided by a variety of

companies on a free market basis and thus the gross revenues for Oakland are only related to the provision of exclusive residential solid waste, recycling and organics collection services and exclusive commercial solid waste collection services

CHART 2
Gross Revenues of Service Providers

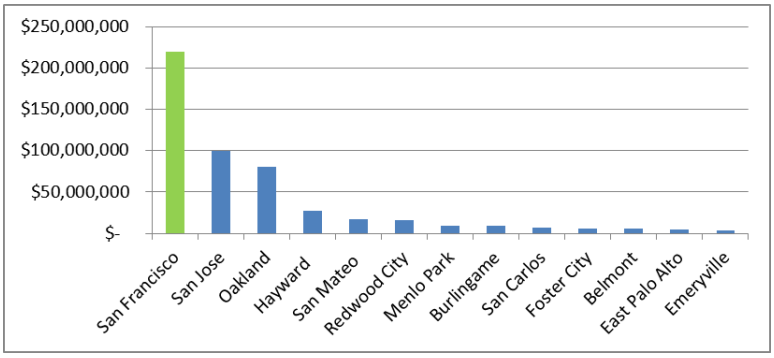


TABLE 4 Gross Revenue of Service Providers				
City	***Gross Revenue From Collection Operations***		***Population***	***Per Capita Gross Revenue***
San Francisco	$	219,515,497	856,095	$ 256.41
San Jose	$	99,887,184	1,023,083	$ 97.63
Oakland	$	80,886,000	430,666	$ 187.82
Hayward	$	27,521,000	153,104	$ 179.75
San Mateo	$	16,506,640	97,535	$ 169.24
Redwood City	$	15,951,066	78,568	$ 203.02
Menlo Park	$	9,630,852	32,185	$ 299.23
Burlingame	$	8,686,950	29,342	$ 296.06
San Carlos	$	6,333,212	29,155	$ 217.23
Foster City	$	5,548,318	30,719	$ 180.62
Belmont	$	5,394,156	26,507	$ 203.50
East Palo Alto	$	4,639,960	33,524	$ 138.41
Emeryville	$	3,181,000	10,227	$ 311.04

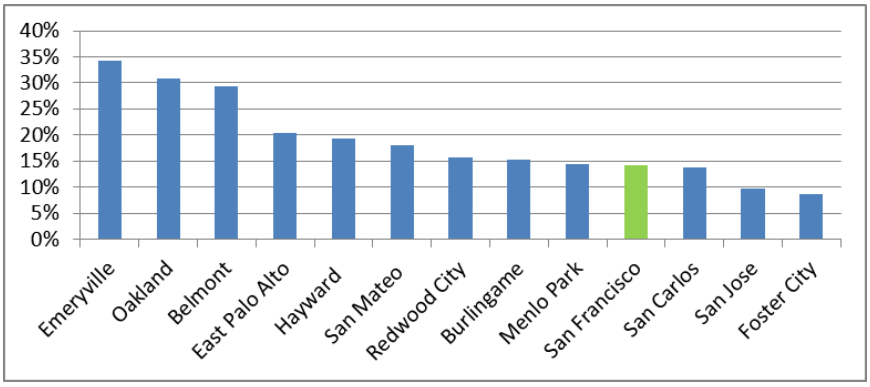
Fee and Service Percentage

Fee and Service Percentages were calculated for each of the 13 jurisdictions by dividing the total value of the fees and services received by each city by the service provider's gross revenues. The higher the percentage, the more free services and fees are being received by the city in comparison to the gross revenues of the service provider.

As shown in Chart 3 below, and previously in Table 2, San Francisco's Fee and Service Percentage is lower than the majority

of jurisdictions included in this study, while Emeryville has the highest Fee and Service Percentage of the cities included in this study.

CHART 3
Fee and Service Percentage



3.1.2 Diversion Rate, Fee and Service Percentage and Customer Rate Comparison

Diversion Rate

Hauler and/or city reported diversion rates were gathered for the 13 jurisdictions included in this study in order to determine if there is any obvious relationship between diversion rates, customer rates and the Fee and Service Percentage.

Diversion rates for this report were obtained from the following sources:

- Recology reported the diversion rates for the jurisdictions located in San Francisco and San Mateo County;
- Stopwaste.org lists the diversion rates of jurisdictions located in Alameda County; and
- San Jose's reported diversion rate was obtained from a city staff report available on the city's website.

Table 5 lists the diversion rates reported for the jurisdictions included in this study.

TABLE 5 Diversion Rates of Jurisdictions	
City	***Diversion Rate***
East Palo Alto	82%
San Francisco	77%
Emeryville	70%
Hayward	68%
Oakland	67%
San Jose	62%
Belmont	61%
Redwood City	61%
Burlingame	60%
Menlo Park	55%
San Mateo	55%
Foster City	50%
San Carlos	47%

Customer Rates

The customer rates used in this study were taken from our Phase One report. As part of that report, residential customer rates were gathered for 20 gallon, 32 gallon, 64 gallon, and 96 gallon carts and commercial customer rates were gathered for once a week collection of 1 cubic yard, 2 cubic yard, and 4 cubic yard bins. As was discussed in more detail in the Phase One report, according to the San Francisco Department of the Environment (DOE), a 50% discount placed on commercial customer rates is the most common commercial customer rate paid in San Francisco; for this reason the San Francisco 50% discounted rate was used in this report. Charts 4, 5 & 6 present a comparison of the 20 and 32 gallon residential rates and the 2 cubic yard commercial rates. A complete list of customer rates is available in Appendix B.

CHART 4
20 Gallon Rate

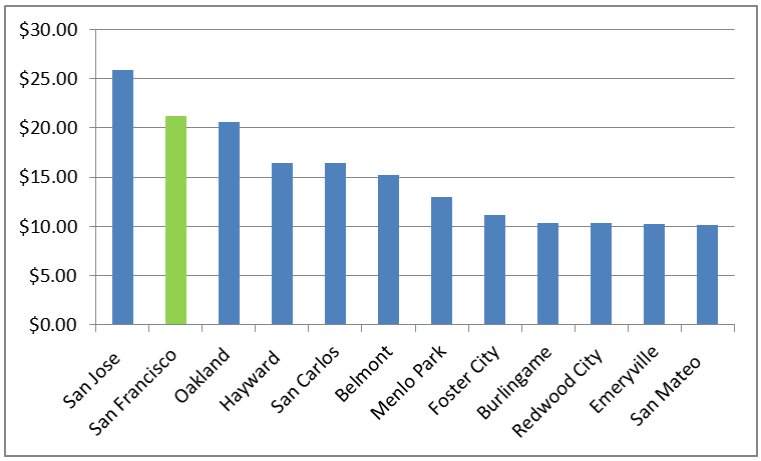


CHART 5
32 Gallon Rate

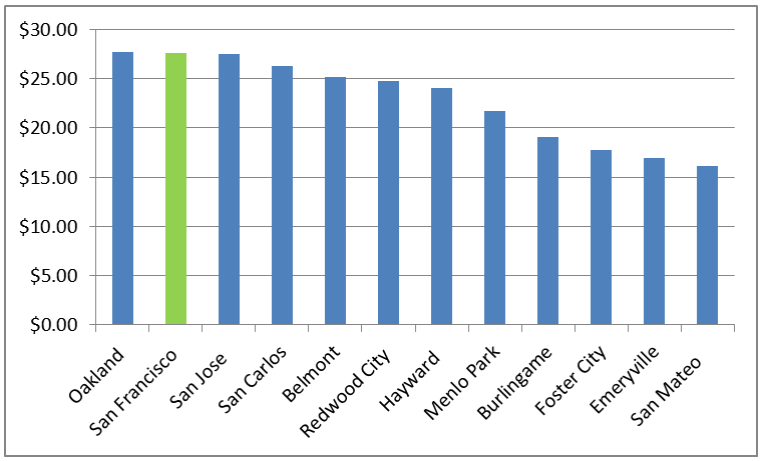
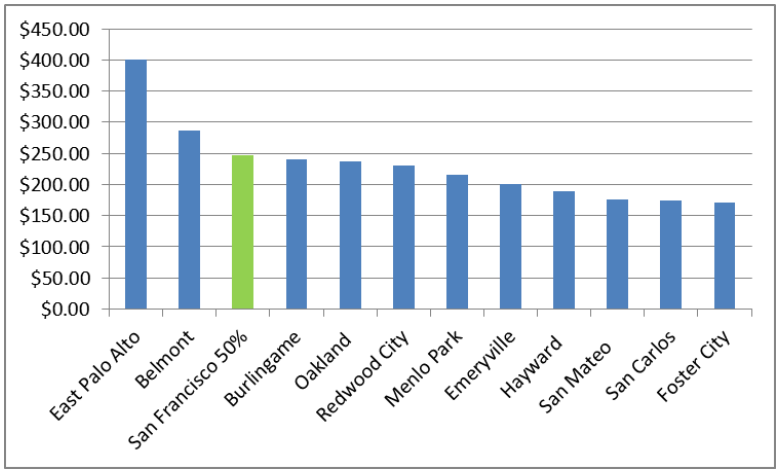


CHART 6
2 Cubic Yard Rate



Correlation of Data

The costs associated with the development and implementation of programs to obtain high diversion rates along with fees and free or discounted services are two of the larger factors that can affect customer rates. Other factors include items such as basic services provided, disposal fees, residential versus commercial customer makeup, and collection density. This study is limited to considering the potential correlation between rates, reported diversion rates and fees and free or discounted services received. It does not include any consideration of the other factors that may affect customer rates.

In addition customer rates are often set to achieve a specific purpose as opposed to representing the actual cost of service. For example many jurisdictions structure customer rates to encourage recycling by setting rates for smaller solid waste containers below the actual cost of service and setting rates for larger solid waste containers above the actual cost of service. In addition some jurisdictions subsidize residential customer rates by increasing commercial customer rates or vice versa.

We have presented the results of our analysis in Charts 8, 9, and 10 below. These charts are sorted by in descending order by customer rate and compare the customer rates to the diversion rate and the Fee and Service Percentage to show the correlation, or lack thereof, between the customer rates and the diversion rate and Fee and Service Percentage. If there is a direct correlation between customer rates and diversion rates and Fee and Service Percentages, we would expect to find that those cities with the highest customer rates would also have the highest diversion

rates and Fee and Service Percentages. Chart 7 presents an example of what the data would look like if there was a direct correlation between these items. However, as can be seen in Charts 8, 9, and 10 it appears that there is no direct correlation between customer rates, diversion rates and Fee and Service Percentages. For example, San Jose has the highest rate for 20 gallon residential service and close to the highest rate for 32 gallon residential service but has the second lowest Fee and Service Percentage. While San Mateo has the lowest rate for 20 gallon and 32 gallon residential service but has a Fee and Service Percentage that is above the median.

CHART 7
Example of Data with Correlation

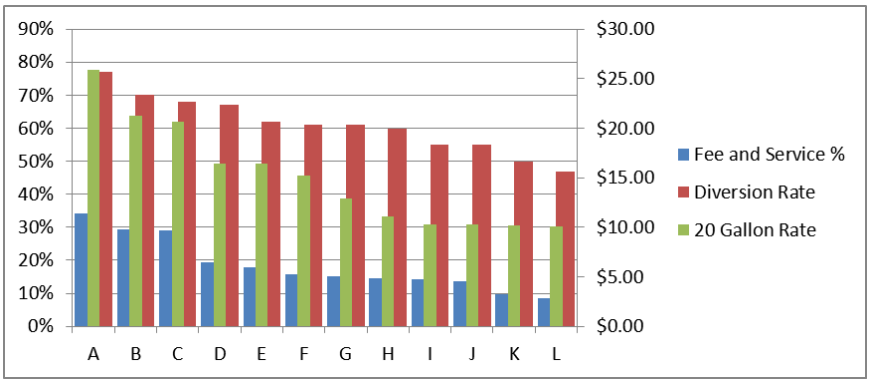


CHART 8
Residential Customer Rate for 20 Gallon Cart vs. Diversion Rate and Fee and Service Percentage

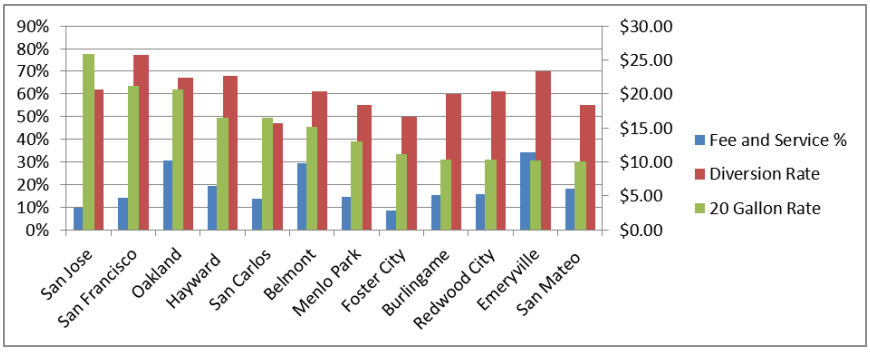


CHART 9
Residential Customer Rate for 32 Gallon Cart vs. Diversion Rate and Fee and Service Percentage

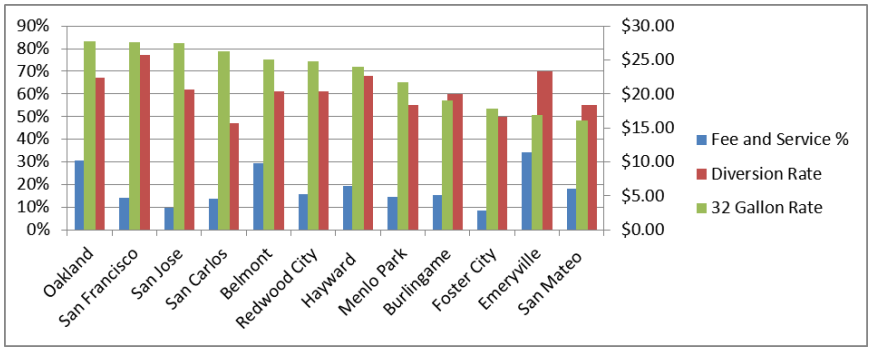
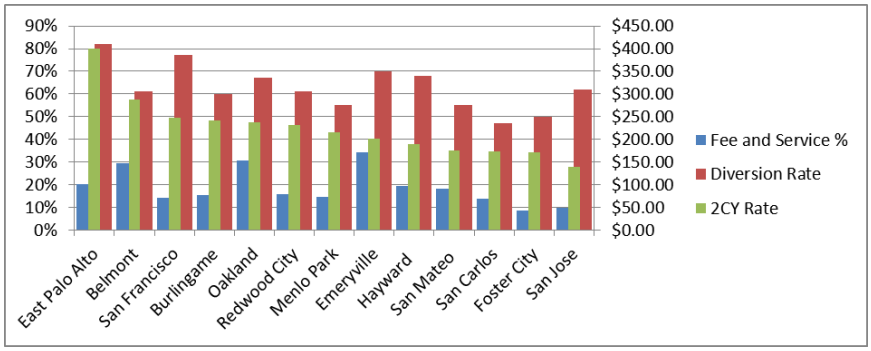


CHART 10
Commercial Customer Rate for 2 Cubic Yard Bin vs. Diversion Rate and Fee and Service Percentage



3.2 Recology Fixed Assets in San Francisco

Recology reports that the company's operations take place at five locations in San Francisco. Three of the five properties are leased:

- **250 Executive Park, Suite 2100** is 20,000 square feet of office space to accommodate Sunset Scavengers operating needs. The rent is recovered through customer rates;
- **Pier 96** is leased from the Port of San Francisco and is the site of Recycle Central. Rent is recovered through customer rates and capital improvements to the site are recovered through a lease charge from a Recology subsidiary, or through depreciation for those assets funded by Recology's operating entity at Recycle Central; and

- **50 California Street, 24th Floor** is the location of Recology's headquarters. A portion of the rent allocable to San Francisco operations is recovered through customer rates.

The remaining two properties are Recology owned:

- **Tunnel and Beatty Complex** consists of approximately 42 acres of land located partially in San Francisco and partially in Brisbane. Several Recology entities own the property as it has been accumulated over time beginning in approximately 1950. Located on the property are a transfer station, construction materials recovery facility, organics annex, household hazardous waste facility, public disposal facility, maintenance facilities for Sunset Scavenger, office facilities, warehouses, scale systems and equipment parking area.
    - Cost: $53,783,625
    - Net Book Value: $39,341,209
    - Assessed Value: $35,923,559
- **900 7th Street** has been the location of Golden Gate Disposal since 1974. The property consists of office and maintenance facilities with storage for equipment. The property has expanded three times and now consists of 6.72 acres. Rent paid to a Recology subsidiary is recovered through customer rates.
    - Cost: $15,673,652
    - Net Book Value: $13,681,056
    - Assessed Value: $10,790,079

The two properties have a combined cost of $69,457,277, a net book value of $53,022,265, and an assessed value of $46,713,638. These numbers include land, buildings, and leasehold improvements.

3.3 Barging as a way to Transport Waste

3.3.1 HDR Memo, San Francisco

HDR released a technical memorandum on April 15, 2011, prepared for the City and County of San Francisco, titled *Comparison of Waste Transportation Methods from San Francisco to the Ostrom Road Landfill* (Memo). The Memo was prepared in order to provide the San Francisco with an overview of the cost and feasibility of various intermodal options. As requested this

section of our report includes a summary of portions of the HDR Memo.

3.3.1.1 Origin Considerations

The Memo focused on transporting waste by barge from to two points of origin (Tunnel Avenue Transfer Station and Port of San Francisco) and one destination (Ostrom Road Landfill (Ostrom)). In both scenarios the waste would be transported by truck to the point of origin where it would be loaded into the barge and then transported to the receiving port. Once at the receiving port the refuse would be taken by either truck or rail to Ostrom.

The following are the associated costs of the Tunnel Avenue Transfer Station if it were to be the point of origin:

- The purchase of the containers used to barge the waste;
- Possible cost for appropriate transfer trucks (although the trucks currently being used to transfer waste to Altamont Landfill could potentially be used);
- Barge terminal improvements; and
- Additional equipment in order to load containers onto the barge.

In order to transport waste by barge from the Port of San Francisco, a new transfer station will have to be built. HDR compared two separate options: a Marine Barge Transfer Station (MTS) and a transfer station located on dry land designed for the same purpose as the MTS. Capital costs for the MTS would be significantly higher than that of a transfer station built over dry land due to the need for the following:

- Significant structural reinforcement;
- Intensive underwater work, including potential dredging;
- Reinforcement of the deck and water wharf;
- Embankment protection and restructuring;
- Ties to the embankment using key wall;
- Seismic retrofit; and
- More substantial electrical connectivity including a substation.

The operating costs of the MTS would also be higher, and it is uncertain that an MTS would be operational by 2015 due to unknown factors such as the amount of permitting and underwater work that would be required.

3.3.1.2 Refuse Loading and Handling Considerations

Transporting the waste in containers is generally accepted to be the easiest way to transport as well as the most environmentally friendly. Rigid Containers would be needed to haul refuse as they are able to hold larger quantities of refuse than other loading methods; and the materials can be compacted due to the more rigid standards than that of common sea containers. The containers exist in 8-foot or 10-foot widths and heights, 20-foot and 40-foot common lengths, and a maximum weight of approximately 20 tons of refuse. An advantage to using these types of containers is that standardized handling equipment and methods are used in all aspects of the transportation, including trucks, vessels, and rail. Disadvantages include the initial cost of the system development and ongoing maintenance of the containers and the barges are limited in the ability to transport other cargo on the return trip.

Once the refuse is compacted into the containers, the containers would be delivered to the marine facility and kept in storage. When ready, they are loaded by crane from the berth area into the vessel. The easier handling reduces loading and unloading times at the dock. Once on the barge, the containers are interlocked forming a rigid connection, and are able to be transferred using open deck barges. Containers may be stacked up to three or four levels, if necessary although the stacking subjects the containers to more environmental forces.

3.3.1.3 Receiving Port and Barge Transport Considerations

The cost of transporting waste by barge ranges depending on the type and size of the barge, the number of equipment units, and the chosen transportation cycle. The tug and barge are usually provided by the contracted marine transportation company. For contracts involving long extended periods of time, barges can be purchased or purpose built for this service which reduces the cost over a period of time for the contract. Initially smaller barges could be used until an increase in the waste stream occurs, although the most effective economies would be used by a larger barge in the initial phase (after the demand increased the flow could be handled with the existing capacity). As capacity demand increased, a second barge could then be employed on either route. The Memo examined two receiving ports; the Port of Oakland and the Port of Sacramento.

The Port of Oakland is 8 nautical miles away from San Francisco and 177 rail miles away from Ostrom. A route between San Francisco and the Port of Oakland could utilize a single tug by dropping off and picking up loaded or unloaded barges thereby reducing the transit cycle. This would work best with three barges which could be of a smaller size to meet demand periods.

The Port of Sacramento is 79 nautical miles away from San Francisco and 50 miles away from Ostrom. Due to the longer route, a second set of units, including a barge with more horsepower and a larger barge, would work effectively.

3.3.1.4 Conclusions

HDR concluded that overall, the cost for using the existing Tunnel Avenue Transfer Station are lower than using the Port of San Francisco owing to the additional infrastructure needed at the Port of San Francisco, which already exists at the Tunnel Avenue site. Also, due to the handling costs associated with additional changes between modes of transportation, all options that use barge transportation are higher in cost ($ 57- $99 per ton) than the base proposal offered by Recology ($30.41 per ton)[1] which uses only truck and rail transportation.

3.3.2 Barging, San Francisco

According to the San Francisco Port Authority (Port), the company that has provided most of the barges for the bay bridge project owns numerous barges of various sizes that could potentially be used to transport solid waste. The first step would be to determine the best method for moving the waste (bulk, container or trailer) and then discuss the volume requirements, destinations, frequency, etc. which will help the company determine the optimal size of the barge.

As mentioned in the HDR Memo, the company indicated that if they did not have the optimal-size barge equipment on hand, the equipment could be easily acquired on the open-market system, providing that the customer be willing to enter into a long-term contract.

It should also be noted that the Ports of Stockton and West Sacramento released a Request for Proposals (RFP) seeking a multimodal and logistics company to oversee and manage a business model supporting the Container on Barge Service known as the M-580/I80 Marine Highway Corridor Project. The America's Marine Highway program is a congressionally approved initiative to transport cargo and passengers, when possible, on designated water routes to relieve traffic congestion on land and reduce greenhouse gas emissions. In August of 2010, $7 million of federal funding became available for the existing 18 rivers and

[1] The $30.41 is the number included in Recology's proposal. The HDR report calculated the cost per ton at $38 using the cost estimate based on the same cost assumptions used for the barge options.

coastal routes throughout the nation.[2] Additionally, a $30 million Transportation Investment Generating Economic Recovery (TIGER) grant from the U.S. Department of Transportation was awarded to the California Marine Highway Project, which connects Oakland, Stockton, and West Sacramento.[3] The goal of the project is to have inaugural service established between the Port of Stockton and terminal operator(s) at the Port of Oakland.

According to the 2011 America's Marine Highway Report to Congress, the public benefits to the M-580/I 80 Marine Highway Corridor are reduced miles of truck travel on congested regional highways; less wear-and-tear on highways and bridges by removing heavy and overweight loads; lower fuel consumption by shipping via barge than via exclusive truck movements; reduced GHG production, improved air quality by reducing diesel emissions from trucks, and improved public safety by reducing truck traffic.

Also according to the report, in general, barging is the most energy efficient mode of transportation; however, origin-to-destination trucking can have energy efficiency advantages over water and rail transportation, particularly for short haul freight movements where goods must be trucked to and from vessel and rail loading facilities. The constructions and maintenance of waterways, in particular dredging, can also have adverse environmental effects, including impacts in downstream waters, wetlands and estuaries. Barging may also increase corrosion along waterways and impair aquatic habitats.

Proposals for the Marine Highway Corridor Project are due June 30, 2011 and the Port has indicated they will be monitoring the project closely and hope to model their own potential barge system after the project. According to a press release from the Port of Stockton, vessel operations for the project are scheduled to begin in early 2012.

3.3.3 Barging, New York

3.3.3.1 Fresh Kills

Before the closing of Fresh Kills Landfill on Staten Island in 2001, New York barged approximately 20,000 tons of solid waste daily from nine different transfer stations around the city. The 650-ton

[2] United State Department of Transportation Maritime Administration "America's Marine Highway Program." http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm#

[3] Department of Transportation Final TIGER Grant Report. http://www.dot.gov/documents/finaltigergrantinfo.pdf

capacity barges were transferred through the New York Harbor down the Arthur Kill, a major navigable waterway between Staten Island and New Jersey to NYC's marine unloading facility. The refuse was then unloaded by four 10 cubic yard clamshell crawler cranes onto side-dumping tracked vehicles and then transported to the landfill itself.

3.3.3.2 Visy Paper Mill

Presently, New York is only barging a portion of residential curbside collected mixed paper. Visy Paper Mill signed a 30 year contract with New York City in 1997 for the processing of the paper and use of the mill's barges; the city issues annual Request for Proposals to contract out tugboat services.

The barge travels from a MTS in Manhattan to the Visy Paper Mill on Staten Island, approximately 10 nautical miles away. Visy Paper Mill owns four barges; one barge is unloaded per day, while one is loaded and another is ready to depart. The barge carries approximately 450 tons of loose paper which is covered by net in order to prevent the paper from being blown away. Once the barge arrives at the paper mill, it is pulled into the facility and the loose paper is offloaded by a five ton crane/grab system and dropped into a storage facility where is stays until it is ready to be fed into the pulper. After the barge arrives, another empty barge is returned to Manhattan.

3.3.3.3 The Future of Barging in New York

New York's future plans for the barging of MSW includes converting four MTSs, the opening of a Materials Recovery Facility (MRF) that will accept recyclables by barge and a barge to rail facility at Greenville Yards in Jersey City, New Jersey.

Converted MTS Facilities

Future plans for the transporting of solid waste are outlined in New York's Solid Waste Management Plan (SWMP). The SWMP is designed to reduce truck traffic through the use of barge and rail. The conversion of two of the four planned MTSs haves begun and are scheduled to be completed in 2013. The following outlines the organization of the four Converted MTS facilities:

- Facility Operations:
  - Collection vehicles enter a tipping floor at the uppermost level and tip waste onto a second level loading floor 12 feet below;
  - On the loading floor waste is sorted and pushed by front-end loaders through slots in the floor directly

over the intermodal containers, located on the first level of the processing building;

- Equipment operating over the slots in the loading floor evens and tamps the waste in the containers which are then lidded with leak-proof gasketed covers and moved by trolley to the external pier of the facility;
- A gantry crane on the pier loads full containers onto and unloads the empty containers off of a flatbed barge moored to the pier;
- Each barge has a capacity for 48 containers; and
- Tugboats move full/empty barges directly to an out of city disposal site or between the MTS and an intermodal transloading facility where they are loaded onto rail cars or a large ocean barge for transport to a disposal facility.

- Containers:
  - Approximately 20-foot long, 12-foot high and 8.5-foot wide;
  - Hold approximately 62 cubic yards of refuse;
  - Density of the container is increased from approximately 450 lbs. per cubic yard to approximately 700 lbs. per cubic yard by tamping; and
  - On average it is estimated that each container will contain approximately up to 22 tons of waste.
- Capacities:
  - Tipping floor can accommodate 30 collection vehicles per hour; and
  - Loading level will be able to process and containerize 220 tons of municipal solid waste per hour and 4,290 tons per day.

Material Recovery Facility

In 2004, New York City selected Simms Metal Management to process and market recyclable materials collected. Simms will build and operate the Sunset Park Material Recovery Facility which will be located at the South Brooklyn Marine Terminal in Sunset Park, Brooklyn. The facility will process barged recyclables and will also be capable of shipping out the processed materials by barge and rail. Construction for this facility is scheduled to begin later this year.

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Greenville Yards

Greenville Yards in New Jersey will be one of the two barge-to-rail transfer stations that New York's refuse will be barged to. The Port Authority of New York and New Jersey approved the purchase and redevelopment of the yards in May, 2010, and the project is scheduled for completion by 2013. New York will ship an estimated 60,000 to 90,000 containers per year through the site; which will eliminate 1,000 collection vehicles per day that travel between the two cities. The refuse will be sealed in water tight containers. The other receiving port has yet to be decided on.

3.3.4 Summary of the Potential Benefits and Consequences of Barging

A potential benefit of barging is that less environmental impacts are associated with water transportation then other forms of transport. If barging waste reduces the amount of trucks on the road there will be a decrease in damage to city streets, bridges and highways, lower fuel consumption, reduced greenhouse gas emissions due to garbage trucks, improved air quality and reduced traffic congestion due to garbage trucks. Also, according to the 2011 America's Marine Highway Report to Congress, in general, barging is the most energy efficient mode of transportation; however, origin-to-destination trucking can have energy efficiency advantages over water and rail transportation, particularly for short haul freight movements where goods must be trucked to and from vessel and rail loading facilities. The construction and maintenance of waterways can also have adverse environmental effects and barging may increase corrosion along waterways and impair aquatic habitats. Another potential consequence of barging waste is that, according to the HDR memo, the cost of transporting waste by barge is considerably higher than that of Recology's proposal which uses only rail and truck. The Memo points out that if barging was to be used to transport waste, the cost for using the existing Tunnel Avenue Transfer Station as a point of origin are lower than using the Port of San Francisco.

Appendix A

Data Collection Form

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CITY		
Fees and Services	**Amount**	**Notes**
Fees Paid Directly to City		
Franchise Fee		
Franchise Extension Fee		
Impound Account		
City Fees		
Recycling Fees/Program Fees		
Vehicle License Fees		
Vehicle Impact Fees		
Debris Box Permit Fees		
Business Tax		
Facility Permit Fees		
Performance and Billing Review		
Annual Service Contribution		
Administrative Enforcement Contribution		
Transition Services		
Street Sweeping		
Public Education		
Measure D Fees		
Total Fees Paid Directly to City		
Free Services Received by City		
City Litter Can and Recycling Collection		
City Sponsored and Non-Profit Events		
City Collection Services		
Street Sweeping		
Holiday Tree Collection		
Clean Team Event/Neighborhood Cleanup		
Free Disposal		
Battery Collection		
Compost Give-a-Ways		
CFL Collection		
Cell Phone Collection		
Abandoned Waste Collection		
Free Collection for Public Schools		
E-waste/U-waste Collection Event		
Total Free Services Received by City		
Total Value of Payments & Services		
Gross Revenue		
Fee and Service %		

Appendix B

Customer Rates

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APPENDIX B
Customer Rates

City	*Residential Rates*				*Commercial Rates*		
	20 Gallon	32 Gallon	64 Gallon	96 Gallon	1CY/Week	2CY/Week	4CY/Week
Belmont	$15.17	$25.12	$53.35	$89.48	$142.74	$287.12	$591.11
Burlingame	$10.32	$19.08	$38.17	$56.64	$120.42	$240.82	$481.63
East Palo Alto	N/A	N/A	N/A	$41.18	$211.10	$400.57	$543.14
Emeryville	$10.21	$16.91	$33.80	$50.71	$100.67	$201.34	$402.68
Foster City	$11.11	$17.78	$35.56	$53.34	$85.30	$170.59	$341.19
Hayward	$16.45	$24.03	$42.87	$61.67	$105.16	$189.95	$356.48
Menlo Park	$12.95	$21.67	$51.84	$77.52	$107.90	$215.81	$431.62
Oakland	$20.63	$27.68	$60.36	$93.00	$129.95	$237.75	$439.06
Redwood City	$10.30	$24.73	$49.46	$74.18	$115.60	$231.20	$462.40
San Carlos	$16.44	$26.30	$54.72	$83.72	$86.92	$173.84	$347.68
San Francisco	$21.21	$27.55	$55.10	$82.65	$277.44	$494.01	$861.39
San Francisco 50%					$138.72	$247.01	$430.70
San Jose	$25.90	$27.50	$55.00	$82.50	$91.01	$138.21	$231.62
San Mateo	$10.10	$16.16	$35.61	$55.28	$87.72	$175.48	$350.97

Appendix C

Comparison of Fees and Services

APPENDIX C
Comparison of Fees and Services

Comparison of Fees and Services													
	San Francisco	**Belmont**	**Burlingame**	**East Palo Alto**	**Emeryville**	**Foster City**	**Hayward**	**Menlo Park**	**Oakland**	**Redwood City**	**San Carlos**	**San Jose**	**San Mateo**
Fees Paid Directly to City													
Franchise Fee		$ 539,412	$ 588,541	$ 353,848	$ 668,010	$ 259,001	$ 3,723,975	$ 1,065,924	$ 4,779,816	$ 2,073,636	$ 556,164		$ 558,148
Franchise Extension Fee					$ 25,000								
Impound Account/Balancing Account	$ 11,798,284		$ 67,606										
City Fees/Administrative Fees								$ 52,500	$ 17,413,816	$ 39,876		$ 6,707,657	
Recycling Fees/Program Fees		$ 413,440	$ 147,135	$ 200,000		$ 39,516		$ 52,715	$ 6,800,000	$ 63,804	$ 52,260		$ 862,371
Vehicle License Fees	$ 587,478												
Vehicle Impact Fees		$ 134,852											
Disposal Facility Tax												$ 2,485,964	
Route License/Permit Fees	$ 79,927												
Performance and Billing Review					$ 35,000								
Administrative Enforcement Contribution					$ 150,000						$ 61,556		
Street Sweeping		$ 323,648	$ 75,000	$ 232,536		$ 87,555	$ 688,025				$ 101,596		$ 320,000
Public Education					$ 10,000		$ 20,000		$ 80,000				
Measure D Fees					$ 30,116		$ 452,992		$ 1,274,579				
Rate Stabilization Fee		$ 53,940											
Landfill Closure Fees			$ 205,990										$ 813,444
Total Fees Paid Directly to City	**$ 12,465,689**	**$ 1,465,292**	**$ 1,084,272**	**$ 786,384**	**$ 918,126**	**$ 386,072**	**$ 4,884,992**	**$ 1,171,139**	**$ 30,348,211**	**$ 2,177,316**	**$ 771,576**	**$ 9,193,621**	**$ 2,553,963**
Free Services Received by City													
City Litter Can and Recycling Collection	$ 7,579,386		$ 65,739	$ 3,420	$ 85,000	$ 7,421	$ 290,000	$ 40,119		$ 46,717	$ 2,187	$ 405,060	$ 40,683
City Sponsored and Non-Profit Events		$ 2,938	$ 9,018	$ 4,791	$ 20,000	$ 2,751	$ 50,000	$ 3,826	$ 50,000	$ 7,324	$ 2,591		$ 13,070
City Collection Services	$ 1,506,133	$ 67,624	$ 45,097	$ 119,919	$ 15,000	$ 38,776		$ 17,662	$ 580,000	$ 62,619	$ 41,465		$ 214,906
DPW Collection & Disposal	$ 8,670,253												
Holiday Tree Collection	$ 313,971				$ 15,000		$ 11,154		$ 89,231				
Clean Team Event/Neighborhood Cleanup	$ 176,491	$ 43,588										$ 10,636	
Free Disposal			$ 119,768	$ 27,984	$ 4,000	$ 40,388	$ 80,000	$ 164,516	$ 600,000	$ 206,380	$ 51,412		$ 152,616
Battery Collection	$ 227,449				$ 22,500		$ 5,000		$ 5,000				
Compost Give-a-Ways	$ 47,471				$ 600		$ 2,000		$ 2,000				
CFL Collection					$ 10,000								
Sharps Program	$ 233,933												
Free Collection for Public Schools					$ 2,000								
Total Free Services Received by City	**$ 18,755,087**	**$ 114,150**	**$ 239,622**	**$ 156,114**	**$ 174,100**	**$ 89,336**	**$ 438,154**	**$ 226,123**	**$ 1,326,231**	**$ 323,040**	**$ 97,655**	**$ 415,696**	**$ 421,275**
Total Value of Payments & Services	**$ 31,220,776**	**$ 1,579,442**	**$ 1,323,894**	**$ 942,498**	**$ 1,092,226**	**$ 475,408**	**$ 5,323,146**	**$ 1,397,262**	**$ 31,674,442**	**$ 2,500,356**	**$ 869,231**	**$ 9,609,317**	**$ 2,975,238**
Gross Revenue From Collection Operations	**$ 219,515,497**	**$ 5,394,156**	**$ 8,686,950**	**$ 4,639,960**	**$ 3,181,000**	**$ 5,548,318**	**$ 27,521,000**	**$ 9,630,852**	**$ 80,886,000**	**$ 15,951,066**	**$ 6,333,212**	**$ 99,887,184**	**$ 16,506,640**
Fee and Service %	14.22%	29.28%	15.24%	20.31%	34.34%	8.57%	19.34%	14.51%	39.16%	15.68%	13.72%	9.62%	18.02%
Fee and Service % Using Total Value, Net of Recycling Contractor Fees as Base									**30.75%**				