



Local Hazardous Waste Management Program in King County

RECOMMENDED RATE DESIGN FOR SOLID WASTE FEE



Final Report
December 2013

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Redmond Town Center
7525 166th Ave. N.E., Suite D215
Redmond, WA 98052
T: 425.867.1802 ♦ F: 425-867-1937

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December 6, 2013

Lynda Ransley
Program Director
Local Hazardous Waste Management Program in King County
150 Nickerson Street, Suite 204
Seattle, WA 98109

Subject: Recommended Rate Design for Solid Waste Fee

Dear Ms. Ransley:

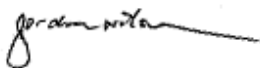
We are pleased to submit our final report to the Local Hazardous Waste Management Program in King County (LHWMP), with recommendations on a rate design for the LHWMP solid waste fee.

Our work benefitted from the assistance and support of Liz Tennant throughout the process of developing the current proposal. We also appreciate the cooperation of the private haulers and cities in King County who have solid waste accounts. They have met with us and helped us understand their billing systems. They also provided a download of all solid waste accounts in the county, so we could analyze customer data and create a revenue-neutral alternative fee structure.

Currently, the LHWMP solid waste fee is a flat fee for residential accounts and a flat fee for commercial accounts. For single family residential accounts, we recommend that the charge continue as a single flat fee. For commercial and multi-family accounts, we recommend that LHWMP adopt a three-tiered rate design based on the type of container—carts/cans, dumpsters, or rolloff containers—with the rate for each tier based on its average monthly solid waste volume. More information about the tiered rate design and its rationale is contained in the attached final report. If the LHWMP Management Coordination Committee and the King County Board of Health agree that a tiered rate design should be adopted, we recommend lead time of at least six months for implementation by the haulers and cities in the County with solid waste accounts.

If you have questions, feel free to contact me at (425) 867-1802 ext. 224.

Sincerely,



Gordon Wilson
Project Manager

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INTRODUCTION

The Local Hazardous Waste Management Program (LHWMP) is an intergovernmental partnership among the cities and tribes in King County and the County government, providing programs to reduce the production, use, and improper disposal of hazardous materials and hazardous wastes into the municipal solid waste stream, the wastewater system, and the local environment. It was established in 1990 in response to Washington State legislation requiring local jurisdictions to develop programs to manage hazardous waste from residents and small volume business generators (RCW 70.105.220).

The majority of LHWMP's revenue comes from a fee applied to all solid waste accounts in King County.¹ LHWMP does not perform its own customer billing; instead, its solid waste fee is collected by private haulers and cities with solid waste accounts and then remitted quarterly to LHWMP. (For convenience, throughout this report we use the term "haulers" to refer to both private haulers and cities with solid waste accounts.)

Exhibit 1 shows the haulers and number of services within King County as of the end of 2012.² The haulers vary widely in the size of their customer base and flexibility of their billing systems.

Exhibit 1: Number of Services – Haulers and Cities with Solid Waste Accounts

Number of Services	Commercial	Multi-Family	Residential	Total
Republic Services	6,321	1,106	127,589	135,016
Auburn	1,394	660	12,174	14,228
CleanScapes	1,308	552	27,528	29,388
Enumclaw	341	160	2,947	3,448
Kirkland	902	716	20,980	22,598
Renton	1,086	551	17,194	18,831
Seattle	8,332	5,425	152,877	166,634
Skykomish	25	1	177	203
Vashon	158	-	1,711	1,869
Waste Management	5,269	1,333	104,285	110,887
Total Services	25,136	10,504	467,462	503,102
Services with >1 container:				
Number of services	1,584	2,547	4,719	8,849
% of Total Services	6.3%	24.2%	1.01%	1.8%

The LHWMP solid waste fee is currently assessed at a flat rate, \$1.08 per month for residential accounts and \$11.24 per month for commercial accounts. Revenue from multi-family accounts

¹ King County Board of Health Code 11.40.060 (previously 2.08.90 as recodified by Board of Health Rule and Regulation 13-02).

²A "service" is a unit that refers to the level of service, defined by a certain container size, collection frequency, number of containers, and whether the container has a compactor. An account is the unit of billing and payment. Most accounts correspond to one service, but commercial or multi-family accounts sometimes have more than one service. For instance, a single account may be charged for one two-yard dumpster collected weekly and two four-yard dumpsters collected weekly; that account would correspond to two services. Our detailed data is by service.

is intended to support residential hazardous waste programs. However, in practice, many jurisdictions classify and report multi-family accounts as commercial.

The current flat rate design has the advantage of simplicity and stability, but it has an obvious and significant disadvantage. It is inequitable because it is not “scalable”; in other words, a small store with one 30-gallon can pays the same as a large business park with four 40-yard containers. The LHWMP fees for wastewater and solid waste disposal are already based on the amount of wastewater or solid waste delivered, but the solid waste fee does not have that characteristic. This lack of scalability means that the current LHWMP fee is inequitable to the smaller customers. For example, assuming weekly collection, a small store with one 30-gallon can currently pays LHWMP over \$17 per month per cubic yard of solid waste, while a large business park with four 40-yard containers pays LHWMP less than \$.02 per month per cubic yard of solid waste. As a result, LHWMP contracted with FCS GROUP to help develop a rate design for its solid waste fee that would take into account the amount of solid waste generated by a given customer, while still being administratively feasible for the haulers.

The main challenge with this task comes from the fact that any change to the rate design has to be implemented with ten different billing systems, each with its own constraints. In addition, the haulers vary in their method of passing through the LHWMP fee. Three haulers embed the LHWMP fee in their solid waste rates, while the other seven separately itemize the LHWMP fee on the bill and collect it in addition to their stated solid waste rates.

STUDY APPROACH AND HISTORY

The proposal presented in this report is the result of a long process of consultation with haulers and LHWMP staff, generating ideas and modeling them for their financial impacts, in order to balance the competing objectives of simplicity and equity.

An initial study in 2009-2010 examined the various types of solid waste billing systems used by haulers in the County, and examined the advantages and disadvantages of converting to a volume-sensitive rate design. It explored alternatives and recommended that a volumetric rate be developed, expressed in dollars per cubic yard.³ Following the initial study, data was downloaded from all of the haulers and used to construct a customer database for the entire county. This step was needed in order to develop a revenue-neutral volume-based rate.

The effort to create an alternative rate design was put on hold while LHWMP went through the process of considering a rate increase, so as to keep the question of the overall level of rates separate from the question of how the rates are constructed. When the rate design project was resumed, we worked with LHWMP staff to address shortcomings of the volumetric design. In order to respond to administrative concerns raised by haulers and to create an effective cap on the amount paid by the largest generators, we developed a tiered approach in which a single rate would be charged within a given tier. The tiered approach would be a step toward greater scalability and equity, because the fee for each tier would be in proportion to the average monthly solid waste volume for the various accounts falling in that tier.

³ FCS Group, *Local Hazardous Waste Management Program in King County, Analysis of Solid Waste Fee Design*, (Redmond: FCS Group, June 2010).

Over the past year we worked with haulers and refined the tier rate proposal to simplify the treatment of on-call accounts and multi-family accounts. We then prepared two types of tier designs for LHWMP consideration—one based on monthly volume and the other based on container type—which are discussed in this report. We worked with LHWMP staff to gather hauler feedback about the impact of changing from a flat fee per account to a tier-based approach and to find out which of the two tier options would be easier to implement. We reported our preliminary findings to LHWMP's Management Coordination Committee (MCC) in October. Since then we have gathered additional hauler feedback and done further analysis on a variety of issues. The results of this additional analysis have shaped our final recommendations.

GOALS OF THE RATE DESIGN

The effort to define a new rate design for the LHWMP solid waste fee has several goals.

- ◆ The rate design should improve equity by making the fee responsive to scale.
- ◆ The fee should be administratively manageable for the haulers.
- ◆ The charge should be capped for the largest generators.
- ◆ All multi-family accounts should be treated the same regardless of jurisdiction.
- ◆ The new rates should be revenue-neutral.
- ◆ The revenue stream should still be relatively stable.

RELATIONSHIP BETWEEN SOLID WASTE AND HAZARDOUS WASTE

Why cap the fee for the largest generators? That goal is based on a basic assumption specified by LHWMP staff: that the relationship between solid waste volume and hazardous waste volume is approximate but not directly proportionate. For commercial customers, the amount of hazardous waste is affected more by the type of business than by the amount of solid waste. However, no customer billing system can accurately track the type of business operating at a given address, so we use solid waste volume as a proxy variable. As a proxy variable, solid volume has limitations. For example, we can assume that a large dry cleaner would generate more hazardous waste than a small dry cleaner and a large dental office would generate more hazardous waste than a small dental office, but we cannot say that a large office building would necessarily generate more hazardous waste than a small dry cleaner or a small dental office. At the same time, the more solid waste that is generated, the more total hazardous waste is generated. One reason to use tiers instead of a direct volumetric rate is to recognize that solid waste volume matters but is not an entirely reliable predictor of the volume of hazardous waste.

With residential customers, the tiered rate design reflects another basic assumption specified by LHWMP staff. Many of the hazardous products that are diverted from the waste stream through the Household Hazardous Waste program are products used in maintaining single family homes, which tend to average more square feet per dwelling than multi-family units. So the assumption guiding this rate design is that apartment dwellers—while they do benefit from LHWMP services—do not generate as much hazardous waste per unit of solid waste as do single family residents. For both multi-family and commercial accounts, the tiered approach gives us the ability to increase the fee for higher generators without making it directly proportional.

BACKGROUND ABOUT SOLID WASTE ACCOUNTS

Following is some background information about solid waste accounts.

- ◆ Container sizes range from 10 gallons to 50 cubic yards (CY). (A cubic yard is 202 gallons.) Cans or carts are 96 gallons (approximately half of a cubic yard) or less. “Dumpsters” range in size from .75 CY to 8 CY. Containers of 10 CY or more are referred to as “rolloff containers” or “drop boxes.”
- ◆ Some containers have compactors, which increases the density of the solid waste. Seattle Public Utilities uses a 2.03 “compacting factor” in its rate studies, which we have adopted for this analysis as well. So an 8-yard dumpster that is compacted actually contains more solid waste ($2.03 \times 8 = 16.06$ CY) than a 10-yard rolloff container.
- ◆ For scheduled service, frequency of collection varies from monthly to daily. The most common frequency of collection is weekly (4.33 pickups per month).
- ◆ There are two types of service for which there is not a scheduled frequency of collection: on-call accounts and the Clear Alleys Program (CAP) in Seattle.
- ◆ There can be multiple containers per service, and there can be multiple services per account.
- ◆ For LHWMP purposes, multi-family revenue should be classified as residential. The City of Seattle currently classifies and reports its multi-family accounts in that way. However, all of the other haulers currently classify and report multi-family accounts as commercial, and it would be a significant challenge for their billing systems to treat multi-family as residential. Fixing this discrepancy is one of the purposes of this study.

TIER RATE DESIGN

TWO ALTERNATIVES – VOLUME TIERS VS. CONTAINER TIERS

We developed two types of tier designs for LHWMP consideration—one based on monthly volume and the other based on container type. Both tier rate designs take solid waste volume into account and both would:

- ◆ Be revenue neutral;
- ◆ Retain a flat charge for single family residents;
- ◆ Change from a flat charge per account to a volume-based tier charge for multi-family and commercial services; and
- ◆ Charge all multifamily services at the commercial rate, which is lower than an equivalent tiered residential rate would have been.

The two rate designs differ in several ways.

The volume tier design is based on the amount of solid waste that is generated in a month. Monthly volume is a function of container size, frequency of collection, number of containers, and whether the container is compacted.

The container tier design is based only on the type of container—whether it is a can or cart, a dumpster, or a rolloff container. For a given customer, the container tier fee does not vary with frequency of collection, number of containers, or whether the container is compacted.

With container tiers, the rate charged for a given tier is based on the average monthly volume of all customers in that tier, but it does not vary with the volume of any particular customer. In contrast, with volume tiers, the charge paid by any given customer is directly tied to the monthly volume for that customer. (The exception is on-call and CAP accounts, for which both methods rely on averaging the number of pickups for the entire customer class in order to generate a rate.)

Because of its more direct linkage with monthly volume, we believe that the volume tier method would be the more equitable of the two approaches, but it would also be more complicated to administer. **Based on feedback from the haulers about administrative feasibility, our recommendation is to adopt the container tiers approach.** Compared with the status quo, the container tiers approach would still be a clear step toward greater equity, and it would be easier to understand and successfully implement than the volume tiers approach. Both tier design alternatives are described in this report, but our main focus is on the container tiers method.

DEFINITION OF TIERS

Below is a description of both the container tiers and volume tiers.

- ◆ *Single family accounts:* Under both methods, nearly all single family accounts fall in the lowest tier, so the LHWMP fee continues to be a flat charge for single family accounts.
- ◆ *Commercial accounts:* The rate design would contain either four volume-based tiers or three container-based tiers, and the rate for each tier would be based on the average monthly volume of the customers in that tier.
- ◆ *Multi-family accounts:* Multi-family accounts would be charged based on commercial tier rates, then multi-family revenue credited to the Household Hazardous Waste program.
- ◆ Yard debris, recycling, and extra containers above scheduled service are excluded.
- ◆ *Monthly volume for scheduled service:*

Monthly volume = container size X frequency of pickups X number of containers.

- If the container is compacted, then container size is multiplied by 2.03.

- ◆ *Volume-based tier ranges:* The ranges (expressed in cubic yards per month) for the four volume tiers are shown on Exhibit 2. For scheduled service, volume-based tiers are defined so that one 96-gallon cart with weekly service is within Tier 1. Tier 2 begins at 2.2 CY/month. Tiers 3 and 4 begin at 10 and 31 CY/month, respectively.

Exhibit 2: Volume Tier Ranges (CY/Month)

Scheduled		On-Call	
Tier	At Least	Tier	At Least
1	-	1	-
2	2.2	2	2.2
3	10.0		
4	31.0	4	10.0

CAP bags are Tier 2.

- ♦ *Volume tiers for on-call and CAP accounts:* For on-call and CAP accounts, we used actual 2012 data on the average number of hauls (or CAP bags sold) to create volume tiers. These tiers are shown in Exhibit 2 and in Appendix A. For on-call accounts, volume tiers are defined by cubic yards per container, rather than cubic yards per month. Based on 2012 average volumes, there is no Volume Tier 3 for on-call accounts. With the volume tier method, all CAP customers are in Tier 2, based on the average number of bags picked up for the entire customer class during 2012.
- ♦ *Container-based tier ranges:* Container tiers are simple to define: carts and cans are Tier 1, dumpsters are Tier 2, and rolloff containers are Tier 3. Container size is the only criterion that determines the tier, so CAP bags would be in Tier 1. For the same reason, a compacted dumpster would be counted in Tier 2 even if it has a greater monthly volume than a rolloff container. Container tiers are shown in Exhibit 3 and in Appendix A.

Exhibit 3: Container Tier Definitions

Tier	Description	Container Size
1	Cans & Carts	-
2	Dumpsters	At least .75 CY
3	Rolloff Containers	At least 10 CY

CAP bags are Tier 1.

- ♦ *Multiple containers:* With the volume tier method, multiple containers within a given service can move that service to a higher tier. With the container tier method, multiple containers within a given service makes no difference to what the customer is charged.

TREATMENT OF MULTI-FAMILY ACCOUNTS

Both tier designs assume that all multi-family accounts should be charged the same rate as commercial accounts. Why should the commercial tier rates be used for multi-family customers? This accomplishes two objectives: greater simplicity for the haulers, and an intentional discount for multi-family compared with single family customers, because of the basic assumption that apartment-dwellers generate proportionately less hazardous waste than single family residents.

How is the discount for multi-family customers created? Multi-family customers are assigned the same tier rates as commercial customers, which are lower on average than residential tier rates would have been. The difference in revenue between what multi-family customers pay using commercial tier rates and what they would have paid using separate residential tier rates is made up by the single family customer class. The result is that single family customers end up paying an average of \$1.08 per cubic yard (CY), while multi-family customers pay an average of \$.57 per CY, the same as commercial customers and 53% of what single family customers pay. With this approach, there is no cross-subsidy between commercial and residential—which would not have been appropriate—but there is a cross-subsidy between single family and multi-family, which is appropriate.

This approach also eliminates the existing discrepancy in the treatment of multi-family accounts without disrupting current practices of nine of the haulers. Rather than ask most haulers to change their billing systems to link multi-family accounts to residential tier rates, LHWMP can ask the City of Seattle to report multi-family as commercial accounts. Then, as tier rate revenue is reported and remitted to LHWMP by the haulers, the multi-family share can be credited to the

Household Hazardous Waste program. Haulers will be asked to give LHWMP an updated customer data download each year so that this calculation can be kept current.

PRELIMINARY CALCULATION OF CONTAINER TIER RATES

We created preliminary tier rates using a customer data download as of the end of 2012. This data was based on total services, with no adjustment for accounts with multiple services.

After correcting for the misclassification of multi-family customers, the average monthly volume is 588,000 cubic yards for residential and 587,000 cubic yards for commercial. In order to be revenue-neutral, the new rate design needs to generate about \$509,000/month from residential and \$336,000/month from commercial customers. The separate revenue requirements are important, because the two revenue streams support different programs: the Household Hazardous Waste (HHW) program targeted at single family and multi-family customers, and the Small Quantity Generators (SQG) program targeted at commercial customers.

The preliminary container tier rates are shown in Exhibit 4. In the rate codes, “SF” stands for “Single family,” “C” refers to “Commercial” and the numeral after the “C” is the tier number.

Exhibit 4: Preliminary Rates - Container Tiers

Preliminary Container Tier Rates					
Rate Code	Tier	Current Rate	Proposed Rate	Increase/ (Decrease)	Average \$ / CY
SF		\$ 1.08	\$ 0.84	\$ (0.24)	\$ 1.08
C1	1	\$ 11.24	\$ 1.46	\$ (9.78)	\$ 0.57
C2	2	\$ 11.24	\$ 12.01	\$ 0.77	\$ 0.57
C3	3	\$ 11.24	\$ 46.15	\$ 34.91	\$ 0.57
<i>Multi-family charged as commercial.</i>					
Avg \$/CY: Multi-family as % of Single Family:					53%
Multi-family share of combined					
Multi-family/Commercial Revenue:					25%

In the preliminary tier rates, single family customers would be charged less—\$.84 per month instead of the current \$1.08. Among commercial and multi-family customers, dumpsters would be charged \$12.01 per month, which is \$.77 more than the current commercial rate of \$11.24. The most significant change would be for the largest and smallest commercial customers. Those with cans and carts would be charged \$1.46, a decrease of \$9.78 per month, while those with rolloff containers would be charged \$46.15, an increase of \$34.91 per month.

For commercial accounts, the tier rates are proportionate among the tiers; the weighted average charge is \$.57/CY for all three tiers, using volume data from commercial customers only.

ISSUE – MULTIPLE SERVICES PER ACCOUNT

Some commercial or multi-family accounts have more than one service, and this presents a challenge in creating a tiered rate. While the *service* is the unit that defines the amount of solid waste volume, the *account* is the unit of payment. If an account has more than one service, there must be a way to determine how much to charge that account based on its individual services. Furthermore, if the method for charging the account is anything *other* than charging each service individually, then an adjustment must be made to the tier rates to ensure revenue-neutrality.

Incidence of Accounts with Multiple Services

How frequently does this occur? The December 2012 customer data download focused on services, not accounts, so we had little information on accounts with multiple services. However, in November 2013, we received and analyzed more detailed data for Republic Services, Waste Management, Auburn, Kirkland, and Renton. This is summarized in Exhibit 5.

Exhibit 5: Incidence of Accounts with Multiple Services

	Total Accounts (Nov 2013)	Total Services (Jan 2013)	MF/Comm Accounts w >1 Svc	% MF/Comm Accounts w >1 Svc	MF/C Svcs where Accts have >1 Svc	% MF/C Svcs where Accts have >1 Svc
Multi-family and Commercial Accounts						
Republic	6,700	7,427	348	5.2%	861	11.6%
Waste Management	6,112	6,602	249	4.1%	732	11.1%
City of Auburn	1,899	2,054	88	4.6%	228	11.1%
City of Kirkland	1,412	1,618	124	8.8%	319	19.7%
City of Renton	1,519	1,637	93	6.1%	210	12.8%
Total Sample	17,642	19,338	902	4.7%	2,350	12.2%
Countywide Multi-family/Comm Services		35,640				
Sample as % of Countywide Services		54%				

This sample represents about 54% of countywide commercial and multi-family services. Within that sample, almost 5% of the accounts have more than one service, and over 12% of the services belong to an account that has more than one service. The incidence of multiple-service accounts is large enough that two questions should be considered: how to determine the charge for an account with multiple services, and how the chosen method might affect the rates.

Potential Methods for Charging Accounts with Multiple Services

We examined four ways to calculate the total charge for accounts that have multiple services.

1. *Charge a separate LHWMP fee for each service.* This is the default method; the preliminary rates assume that each service is counted separately. It is also the method preferred by most haulers with whom we have discussed the question. However, it means that the Tier 3 rate is not really the maximum charge—some accounts would have to pay a much higher monthly fee, which undercuts one of LHWMP's policy goals.
2. *Choose the highest-tier service and charge the fee based on that tier.* This is the most administratively complex option. It would probably require custom programming from most haulers and might not be feasible at all.
3. *Charge a separate LHWMP fee for each service, but limit the total charge for any given account to the Tier 3 rate.* None of the haulers has a billing system that can automatically apply a cap to the LHWMP fee, so any account maximum would require customer billing staff to manually adjust accounts that are over the maximum. If the account maximum were set at the Tier 3 rate, haulers might have to make a large number of manual adjustments, both initially and on an ongoing basis.
4. *Charge a separate LHWMP fee for each service, with a maximum charge per account set at a high enough level to minimize the number of exceptions to be maintained by customer billing staff.* This is the option that seems most promising. It is an attempt to balance two objectives: limiting the amount paid by the largest generators, but also keeping the administrative demands manageable for the haulers. The question becomes, then: what is the optimal level for the account maximum?

Exhibit 6 summarizes the results of each method for the Container Tiers rate model.

Exhibit 6: Options for Charging Accounts with Multiple Services (Container Tiers)

	A	B	C	D	E	F	G
Method:	Charge by Individual Service	Choose Highest Service	Account Maximum Tier 3 Rate	Set Account Maximum at:	Set Account Maximum at:	Set Account Maximum at:	Set Account Maximum at:
Account Maximum:			\$47.41	\$80.00	\$90.00	\$100.00	\$120.00
Monthly LHWMP Charges:							
Maximum Charge to Account	\$ 459.62	\$ 46.48	\$ 47.41	\$ 80.00	\$ 90.00	\$ 100.00	\$ 120.00
Minimum Charge to Account	2.93	1.47	2.93	2.96	2.95	2.93	2.94
Average Charge to Account	36.35	15.58	27.67	32.45	33.58	34.11	34.57
Impact of Account Maximum:							
\$ Impact of Acct Max - Est. Countywide			\$ 14,431	\$ 6,840	\$ 4,737	\$ 3,733	\$ 2,869
Impact of Acct Max as % of Rev Requirement			2.73%	1.29%	0.90%	0.71%	0.54%
If Rates are Adjusted for Impact of Cap:							
Top Tier Rate - Container Tiers	\$ 46.15		\$ 47.41	\$ 46.75	\$ 46.56	\$ 46.48	\$ 46.40
Number of Accounts Over the Maximum							
(Potential Number of Manual Adjustments to Billing System Needed)							
Waste Management Billing System:							
City of Auburn			15	14	14	4	4
City of Kirkland			11	4	4	-	-
City of Renton			14	9	9	1	1
Waste Management			49	32	32	5	5
Total Waste Mgt Billing System			89	59	59	10	10
Republic Services			108	50	49	16	10
Total Sample			197	109	108	26	20

Exhibit 6 shows several notable things. First, it confirms that the first method (Column A)—charging each service individually, regardless of whether it is part of an account with multiple services—sharply increases the amount that the largest generators would have to pay, which runs counter to one of LHWMP’s policy goals. In this sample, the highest amount that a single account would need to pay using that method is \$459.62 per month, which is considerably higher than the preliminary Tier 3 rate of \$46.15.

Rate Impact of Capping the Account Charge

Exhibit 6 also shows the estimated rate impact of a given account maximum. In order to estimate the rate impact, we assumed that the sample used to analyze the multiple-service accounts is representative of the countywide customer data. This is a conservative assumption, since we know that the Republic Services, Waste Management, and the City of Renton are the three haulers with the highest percentages of Tier 3 services.

Why would there be an impact on the rates? For a large generator whose total account charge is limited to a certain maximum, the difference between that maximum and the sum of the charges for its individual services represents revenue that will not be collected by LHWMP. We assumed that the total revenue foregone by LHWMP due to the creation of an account maximum is recovered through an across-the-board adjustment in the commercial/multi-family rates. So, if the cap is set at the Tier 3 rate (Column C), then the adjusted rates would need to be 2.73% higher than the preliminary rates. (This adjustment is why Column C shows the Tier 3 cap as \$47.41 rather than the preliminary Tier 3 rate of \$46.15. The \$47.41 rate represents a 2.73% increase over \$46.15.) With a higher cap of \$80 (Column D), the rate adjustment would need to be only 1.29%. Column F shows that with a cap of \$100, rates would need to be increased by only .71% in order to make up the revenue loss attributable to that cap.

Impact on Haulers from Capping the Account Charge

Finally, for any given account maximum, Exhibit 6 also shows the number of accounts that would be above the maximum. Based on feedback from Waste Management and Republic Services, we are assuming that capping the total charge for any given account will require the customer billing staff to make a manual adjustment to each of those accounts, so the number of accounts over the maximum is an approximate measure of the degree of imposition on the haulers. With a cap of \$47.41 (Column C), customer billing staff for Waste Management and Republic Services would have to create and maintain 197 exceptions to the normal rules for charging services individually. Having to make that many manual adjustments increases the risk of error in the implementation of tier rates, and it costs the haulers staff time on an ongoing basis. (Waste Management and Republic Services are the largest of the haulers that separately identify the LWHMP fee on customer bills. Waste Management maintains accounts not only for its own billing but also for the cities of Auburn, Kirkland, and Renton.) Exhibit 6 shows that increasing the account maximum to \$80 (Column D) reduces the number of exceptions that these two haulers would have to manage from 197 to 109. With a \$90 cap (Column E), the number of exceptions is practically the same as with an \$80 cap. However, with a \$100 cap (Column F), the number of exceptions drops to 26, and with a \$120 cap, the number is further reduced to 20.

Recommended Account Maximum

Our recommendation is that an account maximum be set at \$100/month. That represents just over twice the preliminary Tier 3 rate, but it is significantly less than \$459.62/month. With a \$100 account maximum, the across-the-board rate adjustment would be minimal—less than 1%—so the top tier rate would end up being \$46.48, which is only \$.33 more than the \$46.15 preliminary Tier 3 rate. There would be some degree of additional imposition on the haulers from having an account maximum at all. However, if the two largest haulers who separately itemize the LHWMP fee have to make manual adjustments to a combined total of only 26 accounts, then the additional work required of haulers due to the account maximum should be manageable.

TIER RATES AFTER ADJUSTMENT FOR ACCOUNT MAXIMUM

Exhibit 7 shows the adjusted tier rates—based on container tiers—after creating a \$100 maximum account charge. The adjusted rates are within pennies of the preliminary rates.

Exhibit 7: Adjusted Container Tier Rates Assuming \$100 Account Maximum

Adjusted Container Tier Rates					
Rate Code	Tier		Current Rate	Preliminary Rate	Adjusted Rate
SF		\$	1.08	\$ 0.84	\$ 0.84
C1	1	\$	11.24	\$ 1.46	\$ 1.47
C2	2	\$	11.24	\$ 12.01	\$ 12.09
C3	3	\$	11.24	\$ 46.15	\$ 46.48
<i>Multi-family charged as commercial.</i>					
Avg \$/CY: Multi-family as % of Single Family:					53%
Multi-family share of combined					
Multi-family/Commercial Revenue:					25%

IMPACT OF TIER RATES ON CUSTOMERS

Exhibit 8 shows the impact that the adjusted container tier rates would have for customers with a variety of types of service.

Exhibit 8: Impact of the Container Tier Rates on Sample Customer Bills

SAMPLE BILLS - ADJUSTED RATES	Status Quo	Container Tiers
Single Family		
32 - Gallon Weekly	\$ 1.08	\$ 0.84
Multi-Family (Seattle)		
1 Yard Weekly	\$ 1.08	\$ 12.09
From 2 to 3 Yard 2X/Week	\$ 1.08	\$ 12.09
From 4 to 6 Yard Weekly	\$ 1.08	\$ 12.09
From 25-40 Yd Compact On-call	\$ 1.08	\$ 46.48
Multi-Family (outside Seattle)		
1 Yard Weekly	\$ 11.24	\$ 12.09
From 2 to 3 Yard 2X/Week	\$ 11.24	\$ 12.09
From 4 to 6 Yard Weekly	\$ 11.24	\$ 12.09
From 25-40 Yd Compact On-call	\$ 11.24	\$ 46.48
Commercial		
96 Gallon Weekly	\$ 11.24	\$ 1.47
From 1 to 2 Yard Weekly	\$ 11.24	\$ 12.09
From 4 to 8 Yard 2X/Week	\$ 11.24	\$ 12.09
From 10 to 20 Yard On-call	\$ 11.24	\$ 46.48
From 25 to 40 Yard On-call	\$ 11.24	\$ 46.48

With container tier rates, single family customers would see no difference except a small reduction in their rate, from \$1.08 to \$.84. With the adjusted container tier rates, the smallest commercial customers would see a noticeable decrease (from \$11.24 to \$1.47 per month) and the largest commercial customers would see a noticeable increase from (\$11.24 to \$46.48 per month). The middle group would see a modest increase, from \$11.24 to \$12.09 per month. Multi-family customers would be charged the same rates as commercial. Because Seattle now counts multi-family as residential, the change would be more significant for Seattle multi-family customers—from \$1.08 to \$12.09. Elsewhere, multi-family would increase from \$11.24 to \$12.09 per month, an increase of \$.85 per month.

With container tier rates, customers with the highest solid waste volumes would be receiving a steep increase in the LHWMP fee. However, as Exhibit 9 shows, those customers are already paying a large solid waste charge. In this survey of solid waste rates, even the Tier 3 LHWMP rate would be less than 3% of the total solid waste bill paid by those customers. For commercial customers with 96-gallon carts, the LHWMP fee currently ranges from 9% to 22% of their solid waste bill; with tier rates, it would be 3.6% or less.

Exhibit 9: LHWMP Rates as % of Solid Waste Rates (Container Tiers, Adjusted Rates)

Jurisdictional Rate Survey	Container Size (CY)	Tier	Monthly LHWMP Fee	Republic Svcs (Kent)	Auburn	Kirkland	Seattle	CleanScapes	Waste Mgmt (Redmond)	Renton
Residential										
Existing LHWMP Fee				\$ 1.08	\$ 1.08	\$1.08	\$1.08	\$1.08	\$1.08	\$1.08
32 or 35 Gallon Can - Weekly Service	0.17	SF	\$0.84							
Monthly Hauler's Service Charge	(35 gallon)			\$16.94	\$15.05	\$22.25	\$28.05	\$17.37	\$12.73	\$20.11
Existing LHWMP Fee ÷ Total Bill				6.0%	6.7%	4.6%	3.7%	5.9%	7.8%	5.1%
Proposed LHWMP Fee ÷ Total Bill				4.7%	5.3%	3.7%	2.9%	4.6%	6.2%	4.0%
96 Gallon (or Equiv) - Weekly Service	0.48	SF	\$0.84							
Monthly Hauler's Service Charge				\$55.69	\$46.43	\$60.99	\$89.40	\$40.31	\$40.23	\$52.09
Existing LHWMP Fee ÷ Total Bill				1.9%	2.3%	1.7%	1.2%	2.6%	2.6%	2.0%
Proposed LHWMP Fee ÷ Total Bill				1.5%	1.8%	1.4%	0.9%	2.0%	2.1%	1.6%
Commercial										
Existing LHWMP Fee				\$11.24	\$11.24	\$11.24	\$11.24	\$11.24	\$11.24	\$11.24
96 Gallon - Weekly Service	0.48	Tier 1	\$1.47							
Monthly Hauler's Service Charge				\$42.93	\$39.29	\$60.99	\$115.05	\$48.19	\$47.20	\$60.52
Existing LHWMP Fee ÷ Total Bill				20.7%	22.2%	15.6%	8.9%	18.9%	19.2%	15.7%
Proposed LHWMP Fee ÷ Total Bill				3.3%	3.6%	2.3%	1.3%	3.0%	3.0%	2.4%
1 Yard - Weekly Service	1.00	Tier 2	\$12.09							
Monthly Hauler's Service Charge				\$62.84	\$123.09	\$89.10	\$189.67	\$98.60	\$95.88	\$103.50
Existing LHWMP Fee ÷ Total Bill				15.2%	8.4%	11.2%	5.6%	10.2%	10.5%	9.8%
Proposed LHWMP Fee ÷ Total Bill				16.1%	8.9%	12.0%	6.0%	10.9%	11.2%	10.5%
6 Yard - Weekly Service	6.00	Tier 2	\$12.09							
Hauler's Service Charge				\$305.78	\$460.41	\$315.28	\$716.85	\$497.23	\$368.34	\$478.80
Existing LHWMP Fee ÷ Total Bill				3.5%	2.4%	3.4%	1.5%	2.2%	3.0%	2.3%
Proposed LHWMP Fee ÷ Total Bill				3.8%	2.6%	3.7%	1.7%	2.4%	3.2%	2.5%
6 Yard <u>Compactor</u> - Weekly Service	6.00	Tier 2	\$12.09							
Hauler's Service Charge				\$766.34	\$1,366.94	\$1,595.45	\$1,367.65	\$1,005.25	\$887.68	\$1,325.59
Existing LHWMP Fee ÷ Total Bill				1.4%	0.8%	0.7%	0.8%	1.1%	1.3%	0.8%
Proposed LHWMP Fee ÷ Total Bill				1.6%	0.9%	0.8%	0.9%	1.2%	1.3%	0.9%
High Usage Customer	<i>Various Size & Frequency per Jurisdiction</i>	Tier 3	\$46.48							
Hauler's Service Charge				\$2,014.78	\$2,706.03	\$2,341.72	\$2,287.22	\$3,135.12	\$2,125.88	\$3,083.12
Selected Customer Description					(8 Yd,5X / Wk)	(8 Yd,6X / Wk)	(8 Yd,6X / Wk)	(8 Yd,5X / Wk)	(8 Yd,5X / Wk)	(8 Yd,5X / Wk)
Existing LHWMP Fee ÷ Total Bill				0.6%	0.4%	0.5%	0.5%	0.4%	0.5%	0.4%
Proposed LHWMP Fee ÷ Total Bill				2.3%	1.7%	1.9%	2.0%	1.5%	2.1%	1.5%

IMPACT OF TIER RATES ON HAULERS

For the haulers, the current rate design is the simplest possible method for calculating the fee. For LHWMP's purposes, a revised rate design does not necessarily need to be more *desirable* to the haulers than the status quo—nothing will meet that criterion. However, any change in the rate design has to at least be *manageable* for the haulers, because they have to be able to correctly identify the amount owed, collect that amount, and remit the money to LHWMP.

The most important variable in assessing the impact on haulers is whether they embed the LHWMP fee in their solid waste rates or separately itemize the fee and add it to the customer bills.

HAULERS WHO EMBED THE LHWMP FEE IN SOLID WASTE RATES

The cities of Seattle, Renton, and Enumclaw embed the LHWMP fee in their solid waste rates. For these jurisdictions, the amount they remit to LHWMP is based on a snapshot of their customer base at a given point in time, either quarterly or annually. If tier rates are adopted by LHWMP, their quarterly or annual report would become longer, because it would need to identify the services by container size, compacted or not, frequency of pickup, and number of containers for each individual service. This is more complicated than just reporting the number “residential” vs. “commercial” accounts. However, preparing a quarterly or annual download of information is a straightforward task, and none of these three jurisdictions has expressed significant reservations about the prospect of moving to a tier rate design.

HAULERS WHO SEPARATELY ITEMIZE THE FEE ON CUSTOMER BILLS

The cities of Kirkland and Auburn, the Town of Skykomish, and the four private haulers in the County—CleanScapes, Republic Services, Waste Connections (which owns Vashon Disposal), and Waste Management—all separately itemize the LHWMP fee and add that amount to the stated solid waste rates with every customer bill. The billing frequency ranges from monthly to once every three months. Each quarter, they remit to LHWMP whatever they have collected from their customers.

For these haulers, changing to a tiered rate design would be more complicated, because they have to calculate the correct amount for every customer for each billing period. When a customer changes service levels, these haulers must update their customer database so that the correct LHWMP fee continues to be collected. The initial conversion to a tier rate design would require staff time and possible out-of-pocket customer programming, and the ongoing maintenance of the tier rate design would also take staff time and the development of internal exception reports to help catch errors.

LHWMP would still require an annual download from these haulers, even though the download would not be used to calculate their quarterly remittance. The annual data download from all haulers will have analytical value, allowing LHWMP staff to monitor collections, prepare its own revenue forecasts, and update the rates when needed.

SOLID WASTE HAULER FEEDBACK

During September and October we met with each of the haulers except the Town of Skykomish (who declined to meet) to obtain their feedback about the impact of changing from a flat fee per account to a tier-based approach and to find out which of the two tier options would be easier to implement. We solicited their written feedback about how much time and cost a tier rate design would require of them, both up-front and on an ongoing basis.

Following is a brief summary of the major themes from these meetings.

- ◆ *A tier-based model is feasible.* The private haulers and four of the five cities think that switching to a tier-based system is feasible, although they differ in preferences and in projected costs. The fifth city is waiting to hear back from their vendor regarding costs and feasibility. LHWMP staff believes that financial and technical assistance could be provided to help address implementation issues.
- ◆ *Not all haulers have a preference between volume tiers and container tiers, but those who do prefer the container tiers.* Two of the solid waste haulers prefer the container-based option, and the container based system will cost less in custom programming for a third hauler. Waste Management has determined that container tiers will have less of an impact on their billing system, and Waste Management's implementation also affects the billing systems of Auburn, Kirkland, and Renton.
- ◆ *Changes to hauler billing systems will be needed in order to implement a tiered rate design.* Most haulers and cities do not see the change as being costly to them and have not asked for financial assistance in the implementation of tiered rates. However, some systems are expected to need custom programming to accommodate a change in the LHWMP rate design.
- ◆ *The implementation lead time should be at least six months.* In addition to custom programming, lead time will be needed in order for haulers to develop new rate codes and reporting formats, convert accounts to the new codes, develop and test procedures, train customer service personnel, and notify customers. So if the Board of Health acts in the first half of 2014, a reasonable effective date would be January 2015.

FLEXIBILITY FOR THE HAULERS

Because LHWMP is piggybacking off ten different customer billing systems, there are several areas where the different haulers either already have or should have some flexibility in implementing the LHWMP fee.

- ◆ The main point of flexibility has to do with allowing haulers who embed the fee and those who itemize the fee to use different methods for calculating the remittance. For haulers who embed the LHWMP fee in their solid waste rates, LHWMP allows the remittance to be based on a periodic snapshot of their customer base. For haulers who separately itemize the LHWMP fee on the bills, the remittance should be based on actual collections.

- ◆ When a snapshot is used to calculate the fee, it may be done either quarterly or annually. If it is performed annually, the resulting customer profile determines the following four quarterly remittances. We recommend that the annual download be performed between January and February of each year, and that it include the actual number of hauls for on-call accounts (and number of CAP bags sold) for the preceding year.
- ◆ For those haulers who separately itemize the LHWMP fee on the customer bills, mid-month account changes may be either pro-rated or made effective at the beginning or end of the month. The method for the LHWMP fee should follow the method the billing system already uses.
- ◆ Haulers define differently the boundary between single family and multi-family, often based on different city codes. Some jurisdictions define multi-family as any residential structure with more than four units, whereas others define it as more than two units or more than one unit. LHWMP accepts whatever definition is used by the local jurisdiction.

IMPACT ON LHWMP STAFF

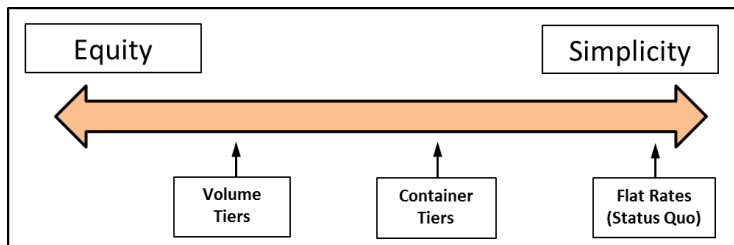
Changing to a more volume-sensitive rate design would have an impact on LHWMP staff. They would need to develop new methods for monitoring and forecasting revenues from the solid waste fee. They will need to continue working with the haulers in the early years of the implementation, to fix any bugs in the execution of the new rate design.

In addition, while a rate design based on tiers is a more stable revenue source than a purely volumetric rate, it still will probably have some degree of increased variability compared to the status quo, as businesses expand and contract their level of solid waste service in response to economic cycles. The LHWMP staff will need to monitor the variability of the revenue stream over time, in case LHWMP reserve policies need to be adjusted.

SUMMARY AND RECOMMENDATIONS

As shown in Exhibit 10, the effort to create a new rate design for the LHWMP solid waste fee has meant balancing the competing objectives of simplicity and equity.

Exhibit 10: Competing Objectives of Revised Rate Design



Because no billing system can realistically track commercial solid waste accounts by type of business, we rely on solid waste volume as a proxy variable. Because of the limited flexibility of the many different billing systems through which the fee is collected, we have to allow some “ragged edges” in any rate design that is chosen.

The argument against changing the rate design is that it represents too little equity improvement for too much administrative hassle. However, there are also some arguments in favor of making a change:

- ◆ The current inequities in the LHWMP solid waste fee are quite dramatic, so even a modest improvement is worthwhile.
- ◆ Utility rates *usually* involve great complexity for the sake of equity; things seem straightforward only after everyone gets used to them.
- ◆ Most of the complexity consists of the up-front conversion—the definition of the tiers (which should not change over time) and the initial coding or programming of the various billing systems. The recommended rate design does have ongoing time requirements, but they are not as significant as the up-front requirements.
- ◆ Through the process of discussing these potential changes with the haulers and with LHMWP staff, we have arrived at an approach that addresses many of their concerns. It is because of hauler feedback that we developed a simpler way to deal with multi-family accounts and selected the container tier method as the recommended approach.

Taking those arguments into consideration, our recommendations are the following:

- ◆ LHWMP should adopt a tier rate design for commercial and multi-family accounts. Single family accounts should continue to have a flat fee.
- ◆ Because of the feedback received from haulers about administrative issues, we recommend the “container tiers” approach, with the tiers defined in Exhibit 11. The tier is based only on container size; it does not vary with frequency of collection, number of containers per service, or whether the container is compacted.

Exhibit 11: Recommended Commercial/Multi-family Tiers

Tier	Description	Container Size
1	Cans & Carts	-
2	Dumpsters	At least .75 CY
3	Rolloff Containers	At least 10 CY

CAP bags are Tier 1.

- ◆ We recommend that accounts with more than one service be charged for each service, provided that no account is charged more than \$100 per month.
- ◆ We estimate that if these recommendations are accepted, the revenue-neutral rates applicable to commercial and multi-family services will be as shown in Exhibit 12.

Exhibit 12: Recommended Tier Rates

Rate Code	Proposed Rate
SF	\$ 0.84
C1	\$ 1.47
C2	\$ 12.09
C3	\$ 46.48

- ◆ Multi-family should be charged the same rates as commercial customers, and 25% of the combined commercial/multi-family revenue should be treated as residential revenue.
- ◆ Haulers should provide an annual customer data download in a form to be specified by LHWMP, so that LHWMP staff can monitor revenues and update the rates as needed.
- ◆ The haulers should be given lead time of at least six months after the Board of Health decision in order to implement a new rate design.
- ◆ If the new rate structure moves forward, LHWMP should provide technical assistance to the haulers as needed to assist them with implementing the new rates.
- ◆ LHWMP should consider assisting haulers with the upfront cost of custom programming to their billing systems, where such assistance is necessary for a successful implementation of the recommended rate design.

APPENDIX A: NUMBER OF SERVICES BY CONTAINER SIZE AND COLLECTION FREQUENCY

The following four tables show the number of services by container size and collection frequency, for commercial and multi-family accounts. A “service” is a unit that refers to a single level of service, defined by a certain container size, collection frequency, number of containers, and whether the container has a compactor.

The rows represent the size of the containers, while the columns represent the frequency with which those containers are collected.

In the first two tables, the bands of color indicate the container-based tier that would apply to a service with a given container type. The rows are sorted by container size. This means, for example, that a compacted 8-yard dumpster is listed before a 10-yard drop box.

In the third and fourth tables, the bands of color indicate the volume-based tier that would apply to *one container* at the given size and collection frequency. In fact, there can be multiple containers for a given service, which could push that service to a higher tier. Only about 6% of the commercial services have multiple containers, but over 24% of the multi-family services have multiple containers. Our ability to show the actual number of services in each tier is limited by the two-dimensional nature of this illustration. So with volume tiers, there would actually be more services at the higher volume tiers than this graphic depiction reveals, particularly for multi-family customers.

In the third and fourth tables, the rows are sorted by the compacted volume of a container. This means that a 10-yard drop box is listed before a compacted 8-yard dumpster, because the compacted 8-yard dumpster can hold more solid waste.

Container Tiers			Tier 1 - Carts & Cans			Tier 2 - Dumpsters			Tier 3 - Rolloff Containers						
Number of Commercial Services (including Industrial/Government) in King County														Color bands indicate the applicable tier for a given container.	
Number of Services by Container Size and Collection Frequency															
Services are Sorted by Container Size	No. pickups per week:		On-Call On-Call	0.23	0.33	0.5	1	2	3	4	5	6	7	Totals	
	Gallons	Cubic Yards		Monthly	Every 3rd Week	Biweekly	Weekly	2x/week	3x/week	4x/week	Daily	6x/week	7x/week		
10-gal	10.00	0.05	-	-	-	-	36	-	-	-	-	-	-	36	
15-gal	15.00	0.07	66	-	-	-	-	-	-	-	-	-	-	66	
20-gal	20.00	0.10	-	-	-	-	69	-	-	-	-	-	-	69	
30-gal	30.00	0.15	537	-	-	-	-	-	-	-	-	-	-	537	
32-gal	32.00	0.16	-	19	-	62	463	32	9	1	3	-	0	589	
35-gal	35.00	0.17	-	2	-	1	347	-	-	-	-	-	-	350	
45-gal	45.00	0.22	-	10	-	-	35	-	-	-	-	-	-	45	
60-gal	60.00	0.30	-	-	-	-	175	-	-	-	-	-	-	175	
64-gal	64.00	0.32	-	21	-	135	691	1	3	1	0	1	1	852	
90-gal	90.00	0.45	1	-	-	6	558	1	-	-	1	-	-	567	
96-gal	96.00	0.48	-	39	-	259	1,862	97	31	6	9	1	13	2,318	
3/4-yard	Number of Commercial Services	0.75	0	-	-	1	2	-	1	-	-	-	-	4	
1-yard		1.00	18	95	-	420	2,565	80	20	3	3	-	3	3,207	
1.25-yard		1.25	7	-	-	-	95	4	1	-	1	-	-	108	
1.5-yard		1.50	2	7	-	68	786	85	20	3	23	-	-	994	
2-yard		2.00	36	56	-	289	2,489	218	61	9	9	2	1	3,169	
2-yard compacted		4.06	1	-	-	-	16	5	11	1	0	0	1	35	
3-yard		3.00	36	35	-	151	1,552	332	100	15	12	9	2	2,243	
3-yard compacted		6.09	-	-	-	1	21	9	3	1	1	-	0	36	
4-yard		4.00	66	50	-	157	2,040	614	241	53	46	23	8	3,298	
4-yard compacted		8.12	2	-	-	1	30	19	1	1	2	1	-	57	
5-yard		5.00	-	1	-	-	0	-	-	-	-	-	-	1	
5-yard compacted		10.15	-	-	-	3	10	5	2	-	-	-	-	20	
6-yard		6.00	77	32	-	82	1,134	410	121	13	11	2	0	1,882	
6-yard compacted		12.18	3	3	-	5	34	19	6	-	-	-	-	70	
8-yard		8.00	30	26	-	70	901	398	172	26	31	2	0	1,658	
8-yard compacted		16.24	1	-	-	-	-	-	-	-	-	-	-	1	
10-yard		10.00	52	-	-	1	2	-	-	-	1	-	-	56	
10-yard compacted		20.30	25	-	-	-	-	-	-	-	-	-	-	25	
12-yard		12.00	5	-	-	-	-	-	-	-	-	-	-	5	
12-yard compacted		24.36	3	-	-	-	-	-	-	-	-	-	-	3	
15-yard		15.00	28	-	-	-	-	-	-	-	-	-	-	28	
15-yard compacted		30.45	66	-	-	1	-	-	-	-	-	-	-	67	
20-yard		20.00	428	-	-	-	-	-	1	-	-	-	-	429	
20-yard compacted		40.60	235	-	-	2	2	1	-	-	-	-	-	240	
25-yard		25.00	217	-	-	-	-	-	-	-	-	-	-	217	
25-yard compacted	50.75	207	-	-	-	2	-	-	-	-	-	-	209		
30-yard	30.00	513	-	-	-	3	-	-	-	-	-	-	516		
30-yard compacted	60.90	366	-	1	8	2	1	-	-	-	-	-	378		
35-yard compacted	71.05	3	-	-	-	-	-	-	-	-	-	-	3		
40-yard	40.00	423	-	-	-	1	-	-	-	-	-	-	424		
40-yard compacted	81.20	147	-	-	-	-	-	-	-	-	-	-	147		
50-yard	50.00	4	-	-	-	-	-	-	-	-	-	-	4		
TOTAL			3,603	398	1	1,723	15,921	2,331	804	132	154	40	30	25,136	

Number of
Commercial
Services

Container Tiers			Tier 1 - Carts & Cans				Tier 2 - Dumpsters				Tier 3 - Rolloff Containers					
Number of Multi-family Residential Services in King County														Color bands indicate the applicable tier for a given container.		
			Number of Services by Container Size and Collection Frequency													
Services are Sorted by Container Size	No. pickups per week:		On-Call	0.23	0.33	0.5	1.00	2	3	4	5	6	7	Totals		
	Gallons	Cubic Yards	On-Call	Monthly	Every 3rd Week	Biweekly	Weekly	2x/week	3x/week	4x/week	Daily	6x/week	7x/week			
10-gal	10.00	0.05	-	-	-	-	8	-	-	-	-	-	-	8		
20-gal	20.00	0.10	-	-	-	-	51	-	-	-	-	-	-	51		
32-gal	32.00	0.16	-	-	-	-	164	8	1	1	-	-	-	174		
35-gal	35.00	0.17	-	-	-	-	688	-	-	-	-	-	-	688		
45-gal	45.00	0.22	-	-	-	-	1	-	-	-	-	-	-	1		
60-gal	60.00	0.30	-	-	-	-	28	-	-	-	-	-	-	28		
64-gal	64.00	0.32	-	-	-	-	295	-	-	-	-	-	-	295		
90-gal	90.00	0.45	-	-	-	-	88	9	-	-	-	-	-	97		
96-gal	96.00	0.48	-	-	-	-	326	2	-	-	-	-	-	328		
3/4-yard		0.75	-	-	-	-	157	1	-	-	-	-	-	158		
1-yard		1.00	1	-	-	1	1,812	275	67	4	1	-	-	2,162		
1-yard compacted		2.03	-	-	-	1	6	3	-	-	-	-	-	10		
1.25-yard		1.25	-	-	-	-	26	6	-	-	-	-	-	32		
1.5-yard		1.50	-	-	-	1	953	265	61	8	-	-	-	1,289		
1.5-yard compacted		3.05	-	-	-	-	3	2	1	-	-	-	-	6		
2-yard		2.00	-	-	-	2	1,250	470	138	4	6	2	-	1,873		
2-yard compacted		4.06	-	1	-	1	89	67	9	-	1	-	-	168		
2.5-yard compacted		5.08	-	-	-	-	1	3	1	-	-	-	-	5		
3-yard		3.00	-	-	-	-	613	303	45	2	-	-	-	963		
3-yard compacted		6.09	-	-	-	-	71	29	2	-	-	-	-	102		
4-yard		4.00	2	-	-	-	584	332	66	4	1	-	-	989		
4-yard compacted		8.12	-	-	-	-	15	18	2	-	-	-	-	35		
5-yard compacted		10.15	-	-	-	-	1	1	-	-	-	-	-	2		
6-yard		6.00	1	-	-	-	342	156	23	1	1	-	-	524		
6-yard compacted		12.18	-	-	-	-	5	6	1	-	-	-	-	12		
8-yard		8.00	1	-	-	-	173	121	33	1	-	1	0	329		
10-yard compacted		20.30	8	-	-	-	-	-	-	-	-	-	-	8		
12-yard compacted		24.36	-	-	-	1	-	-	-	-	-	-	-	1		
15-yard		15.00	2	-	-	-	-	-	-	-	-	-	-	2		
15-yard compacted		30.45	4	-	-	0	3	-	-	-	-	-	-	7		
20-yard		20.00	5	-	-	-	1	-	-	-	-	-	-	6		
20-yard compacted		40.60	23	-	-	3	1	-	-	-	-	-	-	27		
25-yard		25.00	1	-	-	-	-	-	-	-	-	-	-	1		
25-yard compacted		50.75	39	2	1	6	1	1	-	-	-	-	-	50		
30-yard		30.00	7	-	-	-	-	-	-	-	-	-	-	7		
30-yard compacted		60.90	53	-	-	1	-	-	-	-	-	-	-	54		
35-yard compacted		71.05	4	-	-	-	-	-	-	-	-	-	-	4		
40-yard	40.00	3	-	-	-	-	-	-	-	-	-	-	3			
40-yard compacted	81.20	6	-	-	-	-	-	-	-	-	-	-	6			
TOTAL			159	4	1	17	7.757	2.078	451	24	10	3	0	10,504		

Number of
Multi-Family
Services

Volume Tiers			Tier 1		Tier 2		Tier 3		Tier 4					
Number of Commercial Services (including Industrial/Government) in King County														Color bands indicate tier that would apply to 1 container at the given size and collection frequency.
			Number of Services by Container Size and Collection Frequency											
Services are Sorted by Monthly Volume	No. pickups per week:		On-Call	0.23	0.33	0.5	1	2	3	4	5	6	7	Totals
	Gallons	Cubic Yards	On-Call	Monthly	Every 3rd Week	Biweekly	Weekly	2x/week	3x/week	4x/week	Daily	6x/week	7x/week	
10-gal	10.00	0.05	-	-	-	-	36	-	-	-	-	-	-	36
15-gal	15.00	0.07	66	-	-	-	-	-	-	-	-	-	-	66
20-gal	20.00	0.10	-	-	-	-	69	-	-	-	-	-	-	69
30-gal	30.00	0.15	537	-	-	-	-	-	-	-	-	-	-	537
32-gal	32.00	0.16	-	19	-	62	463	32	9	1	3	-	0	589
35-gal	35.00	0.17	-	2	-	1	347	-	-	-	-	-	-	350
45-gal	45.00	0.22	-	10	-	-	35	-	-	-	-	-	-	45
60-gal	60.00	0.30	-	-	-	-	175	-	-	-	-	-	-	175
64-gal	64.00	0.32	-	21	-	135	691	1	3	1	0	1	1	852
90-gal	90.00	0.45	1	-	-	6	558	1	-	-	1	-	-	567
96-gal	96.00	0.48	-	39	-	259	1,862	97	31	6	9	1	13	2,318
3/4-yard		0.75	0	-	-	1	2	-	1	-	-	-	-	4
1-yard		1.00	18	95	-	420	2,565	80	20	3	3	-	3	3,207
1.25-yard		1.25	7	-	-	-	95	4	1	-	1	-	-	108
1.5-yard		1.50	2	7	-	68	786	85	20	3	23	-	-	994
2-yard		2.00	36	56	-	289	2,489	218	61	9	9	2	1	3,169
3-yard		3.00	36	35	-	151	1,552	332	100	15	12	9	2	2,243
4-yard		4.00	66	50	-	157	2,040	614	241	53	46	23	8	3,298
2-yard compacted		4.06	1	-	-	-	16	5	11	1	0	0	1	35
5-yard		5.00	-	1	-	-	0	-	-	-	-	-	-	1
6-yard		6.00	77	32	-	82	1,134	410	121	13	11	2	0	1,882
3-yard compacted		6.09	-	-	-	1	21	9	3	1	1	-	0	36
8-yard		8.00	30	26	-	70	901	398	172	26	31	2	0	1,658
4-yard compacted		8.12	2	-	-	1	30	19	1	1	2	1	-	57
10-yard		10.00	52	-	-	1	2	-	-	-	1	-	-	56
5-yard compacted		10.15	-	-	-	3	10	5	2	-	-	-	-	20
12-yard		12.00	5	-	-	-	-	-	-	-	-	-	-	5
6-yard compacted		12.18	3	3	-	5	34	19	6	-	-	-	-	70
15-yard		15.00	28	-	-	-	-	-	-	-	-	-	-	28
8-yard compacted		16.24	1	-	-	-	-	-	-	-	-	-	-	1
20-yard		20.00	428	-	-	-	-	-	-	1	-	-	-	429
10-yard compacted	20.30	25	-	-	-	-	-	-	-	-	-	-	25	
12-yard compacted	24.36	3	-	-	-	-	-	-	-	-	-	-	3	
25-yard	25.00	217	-	-	-	-	-	-	-	-	-	-	217	
30-yard	30.00	513	-	-	-	-	3	-	-	-	-	-	516	
15-yard compacted	30.45	66	-	-	1	-	-	-	-	-	-	-	67	
40-yard	40.00	423	-	-	-	1	-	-	-	-	-	-	424	
20-yard compacted	40.60	235	-	-	2	2	1	-	-	-	-	-	240	
50-yard	50.00	4	-	-	-	-	-	-	-	-	-	-	4	
25-yard compacted	50.75	207	-	-	-	2	-	-	-	-	-	-	209	
30-yard compacted	60.90	366	-	1	8	2	1	-	-	-	-	-	378	
35-yard compacted	71.05	3	-	-	-	-	-	-	-	-	-	-	3	
40-yard compacted	81.20	147	-	-	-	-	-	-	-	-	-	-	147	
TOTAL			3,603	398	1	1,723	15,921	2,331	804	132	154	40	30	25,136

Number of
Commercial
Services

Volume Tiers			Tier 1		Tier 2		Tier 3		Tier 4					
Number of Multi-family Residential Services in King County													Color bands indicate tier that would apply to 1 container at the given size and collection frequency.	
Services are Sorted by Monthly Volume	No. pickups per week:		Number of Services by Container Size and Collection Frequency											
	Gallons	Cubic Yards	On-Call	0.23	0.33	0.5	1.00	2	3	4	5	6	7	Totals
			On-Call	Monthly	Every 3rd Week	Biweekly	Weekly	2x/week	3x/week	4x/week	Daily	6x/week	7x/week	
10-gal	10.00	0.05	-	-	-	-	8	-	-	-	-	-	-	8
20-gal	20.00	0.10	-	-	-	-	51	-	-	-	-	-	-	51
32-gal	32.00	0.16	-	-	-	-	164	8	1	1	-	-	-	174
35-gal	35.00	0.17	-	-	-	-	688	-	-	-	-	-	-	688
45-gal	45.00	0.22	-	-	-	-	1	-	-	-	-	-	-	1
60-gal	60.00	0.30	-	-	-	-	28	-	-	-	-	-	-	28
64-gal	64.00	0.32	-	-	-	-	295	-	-	-	-	-	-	295
90-gal	90.00	0.45	-	-	-	-	88	9	-	-	-	-	-	97
96-gal	96.00	0.48	-	-	-	-	326	2	-	-	-	-	-	328
3/4-yard		0.75	-	-	-	-	157	1	-	-	-	-	-	158
1-yard		-	1	-	1	1,812	275	67	4	1	-	-	-	2,162
1.25-yard		-	-	-	-	26	6	-	-	-	-	-	-	32
1.5-yard		-	-	-	1	953	265	61	8	-	-	-	-	1,289
2-yard		-	-	-	2	1,250	470	138	4	6	2	-	-	1,873
1-yard compacted		-	-	-	1	6	3	-	-	-	-	-	-	10
3-yard		-	-	-	-	613	303	45	2	-	-	-	-	963
1.5-yard compacted		-	-	-	-	3	2	1	-	-	-	-	-	6
4-yard		2	-	-	-	584	332	66	4	1	-	-	-	989
2-yard compacted		-	1	-	1	89	67	9	-	1	-	-	-	168
2.5-yard compacted		-	-	-	-	1	3	1	-	-	-	-	-	5
6-yard		1	-	-	-	342	156	23	1	1	-	-	-	524
3-yard compacted		-	-	-	-	71	29	2	-	-	-	-	-	102
8-yard		1	-	-	-	173	121	33	1	-	1	0	-	329
4-yard compacted		-	-	-	-	15	18	2	-	-	-	-	-	35
5-yard compacted		-	-	-	-	1	1	-	-	-	-	-	-	2
6-yard compacted		-	-	-	-	5	6	1	-	-	-	-	-	12
15-yard		2	-	-	-	-	-	-	-	-	-	-	-	2
20-yard		5	-	-	-	-	1	-	-	-	-	-	-	6
10-yard compacted		8	-	-	-	-	-	-	-	-	-	-	-	8
12-yard compacted		-	-	-	-	1	-	-	-	-	-	-	-	1
25-yard		1	-	-	-	-	-	-	-	-	-	-	-	1
30-yard		7	-	-	-	-	-	-	-	-	-	-	-	7
15-yard compacted		4	-	-	-	0	3	-	-	-	-	-	-	7
40-yard		3	-	-	-	-	-	-	-	-	-	-	-	3
20-yard compacted		23	-	-	-	3	1	-	-	-	-	-	-	27
25-yard compacted		39	2	1	6	1	1	-	-	-	-	-	-	50
30-yard compacted		53	-	-	1	-	-	-	-	-	-	-	-	54
35-yard compacted	4	-	-	-	-	-	-	-	-	-	-	-	4	
40-yard compacted	6	-	-	-	-	-	-	-	-	-	-	-	6	
TOTAL			159	4	1	17	7,757	2,078	451	24	10	3	0	10,504

Number of
Multi-Family
Services