



King County

Department of
Natural Resources and Parks
Solid Waste Division

Waste Monitoring Program

2000-2001 Waste Facility
Customer Surveys

FINAL REPORT 2002

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PREPARED BY:
Cascadia Consulting Group, Inc.
In association with:
Cunningham Environmental Consulting, Inc.

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1. Customer Survey Overview

1.1 PROJECT PURPOSE AND HISTORY

A primary role of the King County Solid Waste Division is to provide for the transfer and disposal of mixed municipal solid waste (MMSW) generated within King County, outside the City of Seattle. Most of the MMSW generated in King County for disposal is first taken to one of 12 facilities: eight transfer stations and two drop boxes, which the Solid Waste Division owns; and two privately owned transfer stations.

The County-owned transfer stations include Algona, Bow Lake, Enumclaw, Factoria, First Northeast, Houghton, Renton, and Vashon. The private transfer stations are both located in Seattle: Eastmont, operated by Waste Management, and Third & Lander, operated by Rabanco. The two County drop boxes are located at Cedar Falls and Skykomish. Most of these facilities are situated in urban areas, except for the two County-owned drop boxes and the Vashon transfer station, which are in more rural locations. The MMSW brought to these 12 facilities is disposed at the Cedar Hills Regional Landfill, which the Solid Waste Division also owns.

To learn more about the types and quantities of MMSW disposed, the King County Solid Waste Division initiated the Waste Monitoring Program in 1990. This ongoing program seeks to characterize the County's MMSW stream and to understand the customers using County transfer facilities.

To assess the waste stream, the Waste Monitoring Program evaluates the types and quantities of materials that both residents and businesses dispose. The studies gather information by using waste sorts to collect and analyze samples of waste from selected customers bringing materials to King County transfer stations and drop boxes. The County typically conducts these waste characterization studies every few years.

The Waste Monitoring Program also tracks information on the customers who use the 12 waste facilities. Administering regular customer surveys at the transfer stations and drop boxes throughout the county provides data on waste facility users. This information helps the County to monitor changes in its customer base and to provide efficient and effective services for its customers.

Between April 2000 and March 2001, the Waste Monitoring Program conducted customer surveys at the eight County transfer stations, two private transfer stations, and two drop boxes in King County. This report summarizes the results of those customer surveys. Cascadia Consulting Group served as the primary contractor for this research, and Cunningham Environmental provided additional assistance.

1.2 SUMMARY OF FINDINGS

The data obtained from the customer surveys were analyzed to determine customer profiles, including:

- the source of the waste (residential, non-residential, or mixed);
- whether the waste was commercially collected or self-hauled;
- information on self-haul customer use of curbside garbage service; and
- the type of waste brought into the facilities (for example, mixed garbage, yard waste, or construction/demolition waste).

Section 1.3 of this chapter provides a brief overview of the customer survey methods, and more detail appears in the appendices. Chapters 2 through 6 present the customer survey findings in more detail.

Key findings from the 2000-2001 customer surveys include the following:

- Self-hauled vehicles accounted for the majority of vehicles at all sites; most of these were passenger vehicles. Among self-haulers of both residential and non-residential waste, “cleaning home or workplace” was the most common reason for bringing loads to the waste facilities.
- The proportions of commercially collected loads from non-residential and residential sources varied among facilities, though more loads came from non-residential sources overall. The vast majority of self-hauled loads at all facilities were from single-family residences. A relatively small portion of both commercial and self-hauled loads came from mixed sources – both non-residential and residential.
- Urban and rural facilities differed with respect to waste type and self-hauler use of garbage service. At the rural facilities – Cedar Falls, Skykomish, and Vashon – a slightly larger proportion of self-hauled loads was mixed garbage, rather than yard waste or construction/demolition waste. At these facilities, a smaller percentage of customers subscribed to garbage service.
- Almost all commercially collected loads consisted of mixed garbage; but among self-haulers, construction/demolition waste and yard waste comprised a sizable proportion of the loads at most facilities. Self-haulers who were not contractors or landscapers accounted for the majority of those construction/demolition waste and yard waste loads.
- Only a small number of self-haul customers reported that their loads contained TVs or computer equipment. The majority of these loads were from single-family residential sources.

In general, these findings are consistent with those from the 1999-2000 study, with one exception. In the previous study, the most common reason for bringing self-hauled residential loads to waste facilities was “do not have garbage service,” and no single category stood out as the most common reason for self-hauling non-residential waste. For the 2000-2001 study, “cleaning home or workplace” was the most common reason for bringing both residential and non-residential loads to the waste facilities.

1.3 SURVEY METHODS

The customer survey was administered to vehicles entering the 10 public and two private waste facilities in King County, including the Cedar Falls and Skykomish drop boxes. The purpose of the customer survey is to obtain information about customers who use the facilities in categories such as collection type (commercial or self-hauled) or generator type (residential or non-residential).

For the purposes of this study, waste brought to the facilities was assigned to one of three substreams, as shown in Table 1-1:

- commercially collected residential waste;
- commercially collected non-residential waste; and
- self-hauled waste, which can be from residential or non-residential sources.

Table 1-1. Waste Substream Definitions

	Commercially Collected Loads	Self-hauled Loads
Residential generated	Commercially collected waste from residential sources (including single-family and multi-family dwellings ¹)	Self-hauled waste, including: <ul style="list-style-type: none"> ▪ residential loads ▪ non-residential loads
Non-residential generated	Commercially collected waste from non-residential sources (e.g., businesses, schools, government offices)	

Surveys were conducted at each of 10 County facilities for one day each quarter between April 2000 and March 2001, for a total of 41 survey days.² The two private facilities at Eastmont and Third & Lander were surveyed four days each over the year-long study period. This report presents customer survey results from the 10 County facilities; it does not include site-specific results from the two private facilities.

The survey days occurred during randomly selected weeks of each month. The exact survey dates were identified through a systematic process designed to ensure that, over the year-long study period, each facility would be surveyed on various days of the week. Table 1-2 shows the number of surveys collected per month at each of the 10 County facilities, for a total of 5,751 customer surveys completed during the 2000-2001 study period.

¹ For waste monitoring purposes, single-family dwellings are considered to include residences with up to four units. Multi-family dwellings are buildings that contain five or more residences.

² In the survey plan, 40 days of surveying were scheduled at the 10 County facilities, but the April 2000 surveying at Cedar Falls was split into two separate days because circumstances warranted the surveyor leaving early on the regularly scheduled day. The surveyor returned the next day to complete the survey.

Based on the total number of 5,751 surveys, the expected margin of error for overall results is about $\pm 1\%$, though the error range is higher for subsets of the total, such as calculations by waste facility, generator, hauler, vehicle type, or waste type. For most individual facilities, the error range for the overall survey results is less than $\pm 5\%$ at a 90% confidence level. At the three facilities with the fewest transactions – Cedar Falls, Skykomish, and Vashon – the error range is higher but remains less than $\pm 10\%$. Error ranges also increase for small subsets of the total survey population, such as loads containing TVs or computer waste.

Table 1-2. Number of Surveys Collected per Site, by Month
Surveyed Vehicles, April 2000 – March 2001

	Algona	Bow Lake	Cedar Falls	Enumclaw	Factoria
January			21		
February	327			83	
March		198			176
April			39		
May	207			52	
June		237			265
July			92	104	
August	270				
September					184
October			24		
November	204	179		77	
December		256			217
Total	1,008	870	176	316	842

	First NE	Houghton	Renton	Skykomish	Vashon	Total
January	151			22		194
February		257			28	695
March			98			472
April	196			50		285
May		275			42	576
June			101			603
July	238			28		462
August		268			40	578
September						184
October	193			33		250
November		245	110		71	886
December			93			566
Total	778	1,045	402	133	181	5,751

Before the surveying took place, all surveyors attended a training session in which they conducted mock interviews using the customer survey form. A copy of the survey is included in Appendix C, *Field Forms and Survey Instructions*.

During the surveying, the surveyors administered the questionnaire to every vehicle entering the transfer station during their shift, except in rare instances when the traffic became so heavy that the surveyor needed to wave some of the vehicles past to avoid undue congestion. At most facilities, a second surveyor was also present to record the vehicle's ticket number as the vehicle exited the facility. Those ticket numbers were later compared with the County's accounting records to determine each vehicle's net weight.

Further details regarding information collected and how the survey was administered are provided in Appendix A, *Customer Survey Methodology*.

The customer surveys collected data from facility users to determine the following information for each public facility:

- Generator types (residential and non-residential) for commercially collected and self-hauled loads;
- Proportion of self-haul customers bringing yard waste or construction/demolition waste who were contractors or landscapers;
- Whether self-haul customers also subscribed to curbside garbage pick-up service;
- Effect of subscription to curbside garbage service on self-hauling;
- Reasons for self-hauling;
- Vehicle types;
- Waste types, including yard waste, construction/demolition waste, as well as televisions and computers; and
- Cities of origin.

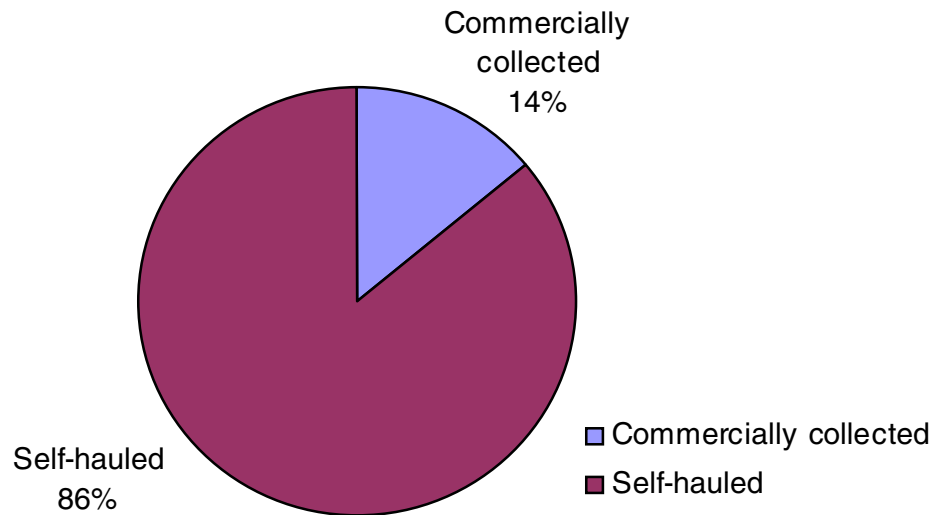
Chapters 2 through 6 of this report cover the issues outlined in the list above.

2. Generator Types

In the customer survey study, vehicles entering waste facilities were categorized as bringing either commercially collected or self-hauled loads. Commercially collected loads included only those waste loads collected and delivered by a licensed commercial hauler of municipal solid waste, such as Rabanco or Waste Management. Appendix C provides a list of the commercial collection companies operating in King County at the time of the study. Self-hauled loads included those materials brought to a facility by anyone other than a licensed commercial hauler of waste.

Figure 2-1 below illustrates the hauler type of waste loads delivered to the 10 County facilities. As shown, self-haul customers comprised the vast majority of vehicle trips (86%), while commercial waste haulers represented a much smaller share (14%). However, commercial collectors typically have much larger vehicles and waste loads, so their share of the overall waste tonnages delivered exceeds their share of transactions at waste facilities. The customer survey study did not include an assessment of waste tonnages; a companion study characterizing the waste stream provides more information on the amounts and composition of waste loads in King County.³

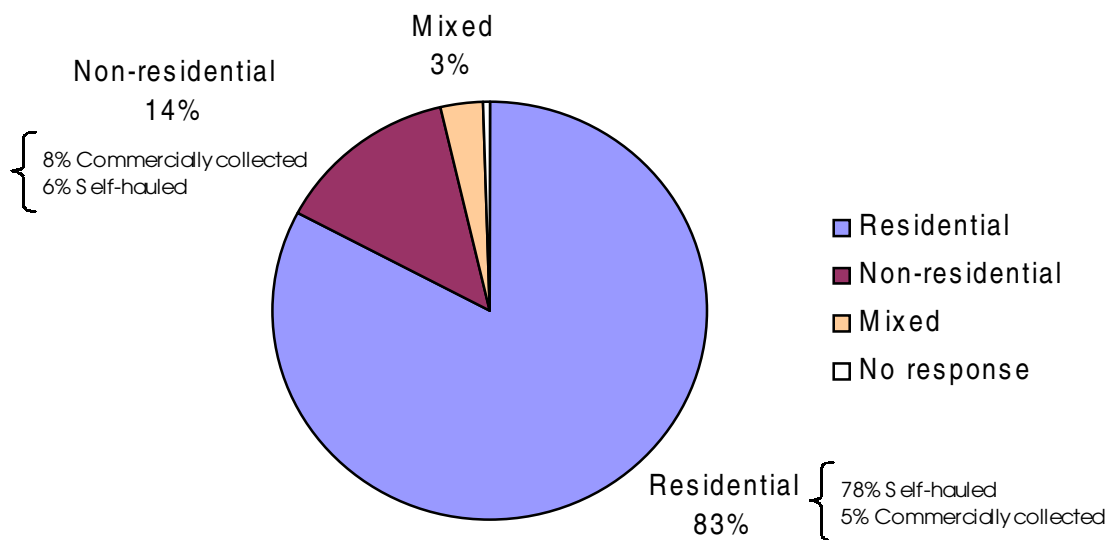
Figure 2-1. Hauler Type of Waste Loads at County Facilities
Surveyed Vehicles, April 2000 – March 2001



³ King County Department of Natural Resources, *Waste Monitoring Program: 1999/2000 Comprehensive Waste Stream Characterization and Transfer Station Customer Surveys – Final Report*, prepared by Cascadia Consulting Group, August 2000.

The customer survey study asked drivers arriving at the waste facilities where their loads were generated. Responses included single-family residential, multi-family residential, mixed residential (both single-family and multi-family), residential and non-residential, or non-residential (business). Figure 2-2 shows the breakdown of these customer trips, clustered into residential, non-residential, or mixed residential and non-residential sources. Wastes from residential sources comprised 83% of the loads delivered, and non-residential sources contributed 14% of the waste loads. Self-haul customers delivered the vast majority of the residential loads, while licensed commercial haulers brought more than half of the non-residential waste loads. Again, these results focus on the number of waste loads delivered, rather than the volume or weight of those loads. Because commercial collection vehicles are typically larger than self-hauled vehicles, they can deliver larger amounts of waste with fewer vehicle trips.

Figure 2-2. Generator Type of Waste Loads at County Facilities
Surveyed Vehicles, April 2000 – March 2001



The remainder of this chapter provides more details on the generator types of commercially collected and self-hauled waste loads.

2.1 COMMERCIALY COLLECTED LOADS

The customer survey results were used to determine the proportion of commercially collected loads (trips) – those loads collected by a licensed commercial hauler of municipal solid waste – brought from residential and non-residential sources to each of the County’s facilities. As shown in Table 2-1, the proportions of residential and non-residential loads varied among facilities.⁴

⁴ Commercial collection vehicles do not use the Cedar Falls or Skykomish drop boxes, so these sites were not included in the results. The number of commercial samples obtained at Vashon (one) was too small to provide statistically valid results.

At Algona, Bow Lake, Factoria, and First Northeast, the majority of commercially collected loads came from non-residential sources, ranging from 55% to 62%. The residential sector generated only about one-third of the loads at those sites. In contrast, at Renton and Houghton, non-residential sources contributed only 29% and 49% of the commercially collected waste loads at those sites, respectively. The majority of commercially collected waste taken to those two sites originated from the residential sector. Loads delivered to the Enumclaw facility were divided evenly between residential and non-residential sources. Vashon is not included in these results due to the small number of commercially collected loads that the site received.

Vehicles with waste from mixed sources (both residential and non-residential) accounted for relatively small percentages of surveyed vehicles at six of the facilities, ranging from 4% to 13%. The one exception was First Northeast, where 21% of the loads originated from mixed residential and non-residential sources.

Table 2-1. Generator Type of Commercially Collected Loads, by Facility⁵
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Enumclaw		Factoria	
Single-family	30	21%	35	18%	7	39%	25	25%
Multi-family	12	9%	19	10%			6	6%
Both single- and multi-family	5	4%	2	1%			1	1%
Non-residential	87	62%	118	62%	9	50%	54	55%
Residential and non-residential	5	4%	17	9%	1	6%	13	13%
No response	1	1%			1	6%		
Total	140	100%	191	100%	18	100%	99	100%

	First NE		Houghton		Renton		Total	
Single-family	2	7%	89	36%	34	40%	222	28%
Multi-family	4	14%	19	8%	12	14%	72	9%
Both single- and multi-family			6	2%	3	4%	17	2%
Non-residential	17	59%	121	49%	25	29%	431	53%
Residential and non-residential	6	21%	10	4%	11	13%	63	8%
No response							2	0%
Total	29	100%	245	100%	85	100%	807	100%

2.2 SELF-HAULED LOADS

Table 2-2 shows the proportions of self-hauled loads – those brought to a facility by anyone other than a licensed commercial hauler of waste – originating from residential and non-residential sources at each of the County’s facilities. The overwhelming majority of the self-hauled traffic came from single-family residential sources, ranging from 84% at Bow Lake to 92% at Cedar Falls. At all facilities, less than 10% of the self-

⁵ Note that percentages throughout this report may not total to 100 percent due to rounding.

hauled loads came from non-residential sources. The number of vehicles carrying waste from multi-family units made up only a small percentage of total self-hauled traffic, ranging from 1% to 4% depending on the facility. Loads of mixed residential and non-residential waste represented 1% to 6% of the self-hauled loads, depending on the site.

Table 2-2. Generator Type of Self-hauled Loads, by Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Single-family	757	87%	572	84%	162	92%	259	87%	650	87%
Multi-family	32	4%	25	4%	2	1%	6	2%	22	3%
Both single- and multi-family	3	0%	1	0%			2	1%	3	0%
Non-residential	53	6%	62	9%	9	5%	15	5%	49	7%
Residential and non-residential	19	2%	13	2%	2	1%	8	3%	17	2%
No response	4	0%	6	1%	1	1%	8	3%	2	0%
Total	868	100%	679	100%	176	100%	298	100%	743	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Single-family	646	86%	702	88%	272	86%	116	87%	160	89%	4,296	87%
Multi-family	32	4%	15	2%	8	3%	5	4%			147	3%
Both single- and multi-family	2	0%	1	0%	1	0%					13	0%
Non-residential	55	7%	62	8%	29	9%	8	6%	9	5%	351	7%
Residential and non-residential	14	2%	18	2%	7	2%	4	3%	11	6%	113	2%
No response			2	0%							23	0%
Total	749	100%	800	100%	317	100%	133	100%	180	100%	4,943	100%

The County is also interested in monitoring the proportion of self-haulers that are contractors/builders or landscapers.⁶ Therefore, self-haul customers carrying yard waste or construction/demolition waste (C&D) were also asked if they were a contractor/builder or a landscaper. Table 2-3 presents a summary of the results for self-haulers who indicated that their loads contained either yard waste or C&D waste, categorizing whether the self-haulers were contractors/builders, landscapers, or other self-haulers.⁷ (For summaries of yard waste and C&D waste presented separately, Table 5-3 provides the proportions of self-hauled yard waste brought by landscapers and other self-haulers, while Table 5-4 provides the breakdown for C&D waste brought by contractors and other self-haulers.)

Together, contractors/builders and landscapers accounted for about a third of all self-hauled loads containing yard waste or C&D waste. Of these loads, contractors/builders and landscapers accounted for 28% of loads from residential sources, 71% from non-residential resources, and 72% from mixed sources. The proportion of residential yard waste or C&D waste loads that contractors self-hauled ranged from 0% at Skykomish to

⁶ A self-haul contractor/builder was a customer who reported providing construction, demolition, and/or renovation service. A self-haul landscaper was a customer who reported providing landscaping service. All other self-haulers included those who were not licensed commercial haulers, such as residents bringing waste from their homes or employees and business owners bringing waste from their companies.

⁷ Self-haul customers who did not indicate the generator type (residential, non-residential, or mixed) of their loads were excluded from this portion of the analysis.

32% at Enumclaw. In comparison, the largest proportion of residential waste loads that landscapers hauled was 9% at First Northeast.

For non-residential loads, the proportions of contractors/builders and landscapers were significantly higher, though not at all facilities. Four locations – Enumclaw, Renton, Skykomish, and Vashon – had either one or no contractors carrying loads from non-residential sources. For the remaining facilities, contractors comprised 46% to 70% of the surveyed vehicles carrying non-residential waste. Landscapers carrying non-residential waste at all facilities represented only 18 loads, or about 13%, of the 134 vehicles surveyed carrying non-residential waste. The largest share of these – seven landscapers – disposed of their waste at the First Northeast facility.

Table 2-3. Self-hauled Loads with Yard Waste or Construction/Demolition Waste, by Hauler Type, Facility, and Generator Type
Surveyed Vehicles, April 2000 – March 2001

	Algona								Bow Lake							
	Residential		Non-residential		Mixed		Total		Residential		Non-residential		Mixed		Total	
Contractors	35	17%	16	70%	1	25%	52	22%	35	18%	20	69%	5	63%	60	26%
Landscapers	6	3%	2	9%	2	50%	10	4%	13	7%	4	14%	1	13%	18	8%
All others	164	80%	5	22%	1	25%	170	73%	142	75%	5	17%	2	25%	149	66%
Total	205	100%	23	100%	4	100%	232	100%	190	100%	29	100%	8	100%	227	100%

	Cedar Falls						Enumclaw					
	Residential		Non-residential		Mixed		Residential		Non-residential		Mixed	
Contractors	3	8%	3	50%			6	13%				
Landscapers	2	5%					2	4%				
All others	35	88%	3	50%	1	100%	39	83%	23	68%	3	100%
Total	40	100%	6	100%	1	100%	47	100%	34	100%	3	100%

	Factoria						First NE					
	Residential		Non-residential		Mixed		Residential		Non-residential		Mixed	
Contractors	68	23%	9	50%			77	25%	64	24%	11	46%
Landscapers	21	7%	1	6%			22	7%	25	9%	7	29%
All others	202	69%	8	44%			210	68%	182	67%	6	25%
Total	291	100%	18	100%			309	100%	271	100%	24	100%

	Houghton						Renton					
	Residential		Non-residential		Mixed		Residential		Non-residential		Mixed	
Contractors	82	26%	18	69%	5	71%	105	30%	15	23%	1	33%
Landscapers	19	6%	3	12%	1	14%	23	7%	3	5%		
All others	216	68%	5	19%	1	14%	222	63%	46	72%	2	67%
Total	317	100%	26	100%	7	100%	350	100%	64	100%	3	100%

	Skykomish				Vashon			
	Residential		Non-residential		Residential		Non-residential	
Contractors					12	26%		
Landscapers							1	100%
All others	9	100%	1	100%	35	74%		
Total	9	100%	1	100%	47	100%	1	100%

	TOTAL						Total	
	Residential		Non-residential		Mixed		Total	
Contractors	325	22%	78	58%	16	55%	419	26%
Landscapers	89	6%	18	13%	5	17%	112	7%
All others	1,054	72%	38	28%	8	28%	1,100	67%
Total	1,468	100%	134	100%	29	100%	1,631	100%

3. Curbside Garbage Subscription

Curbside garbage service is available to nearly all King County residents and businesses. About 90 percent of King County residents subscribe to curbside garbage collection service, and in 14 King County cities garbage service is mandatory.⁸ The customer surveys asked residential self-haul customers whether they subscribed to curbside garbage service.

3.1 SERVICE LEVELS

Table 3-1 summarizes the garbage subscription levels for self-haulers whose waste originated from residential sources.⁹ The percentage of self-haulers who did not subscribe to curbside garbage service is generally higher at the rural facilities than at the urban locations.

Customers without curbside garbage service accounted for the largest share of self-haulers at Vashon (79%) and Skykomish (75%), which are both rural facilities. At Cedar Falls, the other rural site, the percentage of self-haulers who subscribed to garbage service was slightly higher (48%) than the percentage of non-subscribers (46%). At six of the seven urban sites, the majority of the residential self-haulers subscribed to garbage service, ranging from 49% to 67%. At Enumclaw, the remaining urban site, the percentage of non-subscribers was higher (56%) than the percentage of subscribers (36%).

Table 3-1. Residential Self-haul Customers Reported Usage of Curbside Garbage Collection Service, by Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Subscribe	505	64%	334	56%	78	48%	97	36%	451	67%
Do not subscribe	230	29%	210	35%	75	46%	150	56%	121	18%
No answer	57	7%	54	9%	11	7%	20	7%	103	15%
Total	792	100%	598	100%	164	100%	267	100%	675	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Subscribe	435	64%	479	67%	138	49%	29	24%	17	11%	2,563	58%
Do not subscribe	134	20%	123	17%	116	41%	91	75%	127	79%	1,377	31%
No answer	111	16%	116	16%	27	10%	1	1%	16	10%	516	12%
Total	680	100%	718	100%	281	100%	121	100%	160	100%	4,456	100%

⁸ King County Department of Natural Resources and Parks, *Final 2001 Comprehensive Solid Waste Management Plan*, November 2001, Chapter 5, "Collection of Curbside Recyclables and Mixed Municipal Solid Waste."

⁹ Few self-haulers whose waste originated from non-residential or mixed residential and non-residential sources responded to this question, most likely because they did not know the answer. Therefore, self-haulers carrying loads from these two generator types were not included in Table 3-1. Self-haul customers who did not indicate the generator type were also excluded from this analysis. Note that the proportions are based on vehicle traffic, not individual customers – accordingly, the same customer may have been surveyed more than once during the survey period.

3.2 EFFECT OF GARBAGE SERVICE ON TRIP FREQUENCY

The survey asked self-haulers how often they visited the waste facilities. Self-haul customers typically answered with how many times they used the facilities within a particular time period, such as a day, week, month, year, or ever. To determine the typical trip frequency of self-haulers, the responses were converted to an annualized basis (e.g., “once a month” equals 12 visits per year), and the average results were calculated for each facility.

Note that these trip frequency calculations included all self-haulers surveyed, including landscapers, contractors, and others who haul wastes as a regular part of their business activities. Some of these self-haulers reported making multiple trips each day to waste facilities. Accordingly, these overall averages are likely significantly higher than the trip frequency for a typical King County residential customer.

The analysis compared the frequency of visits with whether the customers reported that they subscribed to curbside garbage collection service. Overall, typical non-subscribers made about twice as many trips per year to waste facilities than average subscribers to garbage service. On average across the 10 County waste facilities, non-subscribers made nearly 32 trips per year, while subscribers made fewer than 16 trips per year.

At nearly all of the sites, customers who did not subscribe to garbage collection reported more frequent trips to the waste facilities than subscribers did. The only exception was at the Skykomish site, where subscribers to garbage collection reported that they made more trips per year to the drop box than non-subscribers did.

Table 3-2. Trip Frequency of Self-haulers, by Garbage Service Level and Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw	
	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year
Residential								
Subscribe to garbage service	505	12.7	334	7.3	78	5.2	97	7.4
Do not subscribe	230	25.5	210	25.7	75	20.2	150	22.0

	Factoria		First NE		Houghton		Renton	
	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year
Residential								
Subscribe to garbage service	451	22.5	435	15.8	479	20.4	138	9.9
Do not subscribe	121	90.8	134	28.6	123	26.7	116	12.2

	Skykomish		Vashon		Total	
	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year	Survey Count	Avg Trips per Year
Residential						
Subscribe to garbage service	29	83.8	17	6.1	2,563	15.8
Do not subscribe	91	72.3	127	13.8	1,377	31.9

4. Reasons for Self-hauling

All self-haulers were asked why they were transporting their loads themselves, rather than having the materials picked up by commercial haulers. Table 4-1 summarizes the responses for loads from residential and non-residential sources.¹⁰

For self-hauled loads carrying residential waste, the responses varied depending on the facility. At the rural Skykomish facility, for example, the most common answer was “do not have garbage service” (39%), followed by “waste is from vacation home” (23%). At the Vashon site, “convenience” (25%) and “cheaper/saves money” (24%) were the most common responses among the residential self-haulers surveyed.

Overall, the most common responses from residential self-haulers at the 10 County waste facilities included the following explanations:

- cleaning home or workplace (23%);
- cheaper/saves money (12%);
- remodeling (10%); and
- yard debris (10%).

Non-residential waste represented only a small portion of the total number of self-hauled loads, accounting for about 5% of those loads. For non-residential loads, answers varied across sites, and the smaller sample sizes made it difficult to draw valid generalizations for particular waste facilities.

Among non-residential self-haulers, common responses included the following answers (percentages are not listed below in light of the small sample sizes):

- cleaning home or workplace;
- large amount of garbage;
- cheaper/saves money; and
- roadside litter removal.

¹⁰ The question was open-ended. If the response matched one of the 22 pre-coded responses, the surveyor recorded that code. In some cases (less than 5% of the total), the customer’s answer was not similar to the coded list. The miscellaneous comments included “just a habit” and “don’t want to wait for regular garbage pick-up.”

Table 4-1. Reasons Given by Facility Users for Self-hauling

Surveyed Vehicles, April 2000-March 2001

	Algona	Bow Lake	Cedar Falls	Enumclaw	Factoria	First NE	Houghton	Renton	Skykomish	Vashon	Total
Residential											
Cheaper/saves money	101 14%	84 15%	21 14%	52 21%	37 6%	55 10%	26 4%	47 18%		36 24%	459 12%
Cleaning home or workplace	231 31%	134 25%	41 26%	37 15%	125 22%	129 23%	140 23%	52 20%	11 9%	9 6%	909 23%
Convenience	34 5%	42 8%	17 11%	25 10%	46 8%	28 5%	32 5%	25 10%	6 5%	37 25%	292 7%
Disaster-related (e.g., flood, mudslide)	1 0%	4 1%			2 0%		2 0%	4 2%			13 0%
Demolition trucking company	8 1%	10 2%	1 1%	3 1%	6 1%	6 1%	4 1%	7 3%	1 1%	1 1%	47 1%
Dissatisfied with regular collection service	28 4%	6 1%	13 8%	15 6%	3 1%	5 1%	25 4%	7 3%	47 39%	4 3%	153 4%
Do not have garbage service	1 0%						1 0%			1 1%	3 0%
Dogs get into garbage if left on curb	14 2%	16 3%	5 3%	9 4%	7 1%	12 2%	6 1%	15 6%	4 3%	4 3%	92 2%
Favor for friend/neighbor/family member	8 1%	4 1%	1 1%	2 1%	3 1%	6 1%	4 1%	1 0%	5 4%	1 1%	35 1%
Forgot or missed the regular collection service	18 2%	14 3%	4 3%	11 4%	17 3%	15 3%	6 1%	2 1%			88 2%
Garbage hauler will not pick up this type of waste	2 0%		1 1%			2 0%					5 0%
Habit											
Independent hauler		3 1%	3 2%		17 3%	13 2%	8 1%	1 0%		1 1%	46 1%
Items too big to fit into garbage can	14 2%	16 3%	5 3%	3 1%	51 9%	20 3%	62 10%	3 1%	1 1%	1 1%	176 4%
Large amount of garbage	55 7%	27 5%	5 3%	19 8%	42 7%	68 12%	35 6%	16 6%	3 2%	2 1%	272 7%
Moving home or workplace	56 8%	33 6%	6 4%	16 6%	53 9%	39 7%	48 8%	18 7%	3 2%	3 2%	275 7%
Remodeling	83 11%	40 7%	13 8%	13 5%	80 14%	60 10%	85 14%	23 9%		17 11%	414 10%
Self-sufficiency/do not like government		2 0%		1 0%	1 0%	2 0%			2 2%		8 0%
Small amount of garbage/recycle almost everything	6 1%	7 1%	9 6%	7 3%	1 0%	9 2%	4 1%	8 3%	2 2%	6 4%	59 1%
Waste is from vacation home		1 0%			1 0%				28 23%	1 1%	31 1%
Yard debris	57 8%	73 13%	6 4%	5 2%	71 12%	84 15%	93 15%	17 7%	3 2%	3 2%	412 10%
Other	23 3%	27 5%	4 3%	29 11%	13 2%	18 3%	22 4%	12 5%	4 3%	20 14%	172 4%
Refused to answer	1 0%	1 0%		1 0%	3 1%	2 0%			1 1%		9 0%
No response	2 0%	1 0%		5 2%				3 1%			11 0%
Subtotal	743 100%	545 100%	155 100%	253 100%	579 100%	573 100%	603 100%	261 100%	121 100%	148 100%	3,981 100%
Non-residential											
Cheaper/saves money	1 4%	4 12%		1 8%	4 11%	4 12%	1 3%	1 4%		4 50%	20 9%
Cleaning home or workplace	2 7%	7 21%	2 40%		9 24%	9 26%	6 18%	2 8%	2 25%	1 13%	40 18%
Convenience	1 4%	2 6%	1 20%	1 8%		3 9%	2 6%	1 4%	1 13%		12 5%
Demolition trucking company											
Disaster-related (e.g., flood, mudslide)	2 7%			1 8%	1 3%		1 3%			1 13%	1 0%
Do not have garbage service							4 12%				6 3%
Favor for friend/neighbor/family member	4 14%	2 6%	1 20%		3 8%	2 6%	2 6%				5 2%
Garbage hauler will not pick up this type of waste	1 4%				3 8%	5 15%					11 5%
Independent hauler	1 4%				4 11%	1 3%	1 3%				12 5%
Items too big to fit into garbage can	7 25%	6 18%	1 20%		4 11%	4 12%	7 21%	5 21%	1 13%	1 13%	37 17%
Large amount of garbage		1 3%			1 3%		1 3%		2 25%		3 1%
Moving home or workplace	3 11%	2 6%		1 8%	2 5%		1 3%	1 4%			9 4%
Remodeling		4 12%		2 17%			4 12%	9 38%	1 13%		20 9%
Roadside litter removal					1 3%						1 0%
Small amount of garbage/recycle almost everything	1 4%				2 5%	2 6%		1 4%			6 3%
Yard debris	4 14%	3 9%		5 42%	1 3%	4 12%	4 12%	4 17%	1 13%		26 12%
Other	1 4%	2 6%		1 8%	2 5%						7 3%
No response											
Subtotal	28 100%	34 100%	5 100%	12 100%	38 100%	34 100%	33 100%	24 100%	8 100%	8 100%	224 100%
Total	771 100%	579 100%	160 100%	265 100%	617 100%	607 100%	636 100%	285 100%	129 100%	156 100%	4,205 100%

5. Vehicle and Waste Types

5.1 VEHICLE TYPES

As shown in Table 5-1, self-haul customers accounted for the majority of vehicles transporting waste loads to facilities, representing about 86% of all drivers surveyed. Houghton (77%), Bow Lake (78%), and Renton (79%) had the lowest percentage of self-haulers among customers surveyed, while 100% of customers surveyed at Cedar Falls and Skykomish were self-haulers.¹¹ Passenger vehicles (including cars, pick-up trucks, and sport-utility vehicles) comprised the majority of self-hauled loads and accounted for the majority of all trips surveyed at each site, ranging from 71% at Houghton to 99% at Cedar Falls.¹² In the table, a small percentage of self-hauled vehicles were grouped into a “large other” category, which includes flatbed trucks and other trucks larger than pick-ups, such as semi trucks. Packer trucks and drop boxes comprised only a negligible portion of the self-hauled vehicles.

Commercial vehicles represented only 14% of the vehicles surveyed at the 10 County waste facilities, though they typically deliver significantly more waste per trip than self-haulers. Nearly all the commercial loads surveyed arrived in drop boxes or packer trucks. Drop boxes included both compacted and loose loads, with the loose loads representing more than two-thirds of the drop boxes surveyed. Packer trucks included front, rear, and side packers, with front packers comprising more than two-thirds of the packers surveyed. Only a negligible number of commercial loads arrived in other types of vehicles.

¹¹ The Town of Skykomish collects municipal solid waste from within its borders. Because the town is not a licensed commercial hauler of waste, like Rabanco or Waste Management, its collection vehicles are included as self-haulers in the customer survey.

¹² Waste loads brought to the Houghton transfer station include contents of the Skykomish drop box.

Table 5-1. Overview of Vehicle Types, by Collection Type and Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Commercial										
Packer	57	6%	65	7%			9	3%	43	5%
Drop box	81	8%	126	14%			9	3%	56	7%
Large other	1	0%								
Passenger vehicle	1	0%								
No response										
Subtotal	140	14%	191	22%			18	6%	99	12%
Self-haul										
Packer	5	0%	2	0%			10	3%	1	0%
Drop box	4	0%	8	1%					5	1%
Large other	44	4%	40	5%	2	1%	9	3%	59	7%
Passenger vehicle	814	81%	629	72%	174	99%	279	88%	678	81%
No response	1	0%								
Subtotal	868	86%	679	78%	176	100%	298	94%	743	88%
Total	1008	100%	870	100%	176	100%	316	100%	842	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Commercial												
Packer	7	1%	131	13%	57	14%			1	1%	370	6%
Drop box	20	3%	113	11%	27	7%					432	8%
Large other	1	0%			1	0%					3	0%
Passenger vehicle											1	0%
No response	1	0%	1	0%							2	0%
Subtotal	29	4%	245	23%	85	21%			1	1%	808	14%
Self-haul												
Packer	2	0%	1	0%	4	1%			2	1%	27	0%
Drop box	1	0%	7	1%	1	0%			3	2%	29	1%
Large other	36	5%	46	4%	14	3%	4	3%	13	7%	267	5%
Passenger vehicle	710	91%	746	71%	298	74%	129	97%	162	90%	4619	80%
No response											1	0%
Subtotal	749	96%	800	77%	317	79%	133	100%	180	99%	4,943	86%
Total	778	100%	1045	100%	402	100%	133	100%	181	100%	5,751	100%

Vehicle types also varied according to whether the waste load originated from residential or non-residential sources. As shown in Figure 5-1 below, most residential waste loads were delivered to the County waste facilities in passenger vehicles (89%). This figure includes both commercially collected and self-hauled loads. Passenger vehicles carry significantly smaller loads but are far more plentiful than packer trucks. Due to their much larger size, however, packer trucks delivered a significant portion of residential waste tonnages to the waste facilities despite their smaller numbers.

Figure 5-1. Residential Waste Loads, by Vehicle Type
Surveyed Vehicles, April 2000 – March 2001

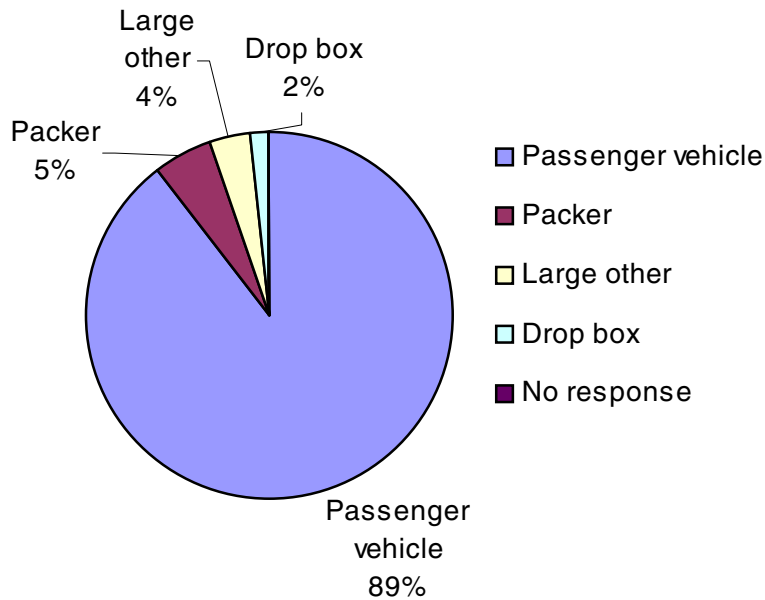
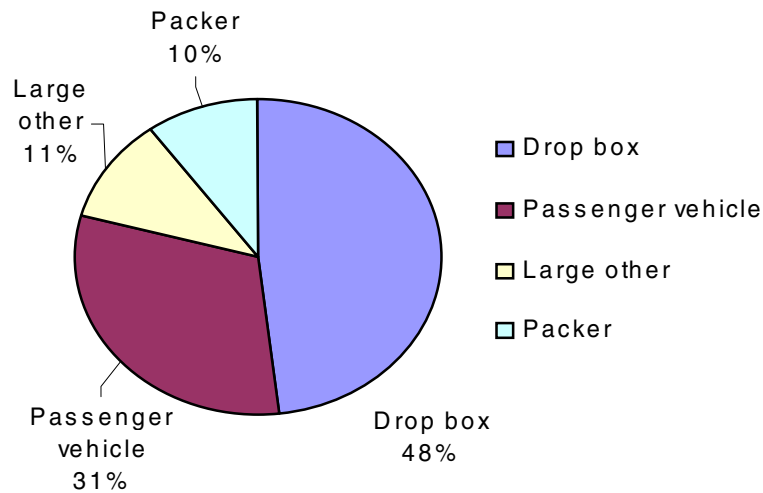


Figure 5-2 below shows the distribution of vehicle types that brought non-residential waste loads to the County waste facilities. Drop boxes (48%) comprised nearly half of these vehicle trips, and passenger vehicles (31%) represented the next largest share. Though packer trucks and other large vehicles were less frequent customers at the facilities, their large size enabled them to deliver significant portions of the waste.

Figure 5-2. Non-residential Waste Loads, by Vehicle Type
Surveyed Vehicles, April 2000 – March 2001



5.2 WASTE TYPE OVERVIEW

In the surveys, customers were asked to identify the main component of their loads from among four basic waste types: mixed garbage, yard waste, construction/demolition waste (C&D), and special waste. Special waste includes petroleum-contaminated soil, sludge, or asbestos; only one of the 5,751 loads surveyed was reported to contain special waste. Table 5-2 presents a summary of the loads surveyed for each waste type at the 10 County facilities for both commercial and self-haul customers.

Commercial haulers brought almost nothing but mixed garbage to the waste facilities, with mixed garbage accounting for about 98% of the commercial loads surveyed.¹³ The majority of self-hauled vehicles contained mixed garbage, but a considerable share brought yard waste or C&D waste. Self-hauled vehicles carrying C&D waste comprised 17% of all vehicles surveyed at the 10 County facilities, with a range of 3% of vehicles at Skykomish to 24% at Vashon. Self-hauled vehicles with yard waste comprised 11% of all vehicles surveyed, with a range of 3% at Vashon to 19% at First Northeast.

¹³ Commercial haulers did not use the Cedar Falls or Skykomish facilities during the survey, and only one commercial load was surveyed at the Vashon site.

Table 5-2. Overview of Waste Types, by Collection Type and Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Commercial										
Mixed garbage	138	14%	187	21%			16	5%	97	12%
Yard waste										
Construction/demolition	2	0%	3	0%					1	0%
Special waste										
No response			1	0%			2	1%	1	0%
Subtotal	140	14%	191	22%			18	6%	99	12%
Self-haul										
Mixed garbage	632	63%	447	51%	129	73%	253	80%	432	51%
Yard waste	84	8%	116	13%	18	10%	6	2%	115	14%
Construction/demolition	147	15%	110	13%	29	16%	30	9%	194	23%
Special waste										
No response	5	0%	6	1%			9	3%	2	0%
Subtotal	868	86%	679	78%	176	100%	298	94%	743	88%
Total	1,008	100%	870	100%	176	100%	316	100%	842	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Commercial												
Mixed garbage	27	3%	239	23%	84	21%			1	1%	789	14%
Yard waste	1	0%									1	0%
Construction/demolition			6	1%	1	0%					13	0%
Special waste												
No response	1	0%									5	0%
Subtotal	29	4%	245	23%	85	21%			1	1%	808	14%
Self-haul												
Mixed garbage	447	57%	447	43%	249	62%	123	92%	131	72%	3290	57%
Yard waste	148	19%	125	12%	21	5%	6	5%	5	3%	644	11%
Construction/demolition	153	20%	224	21%	47	12%	4	3%	44	24%	982	17%
Special waste			1	0%							1	0%
No response	1	0%	3	0%							26	0%
Subtotal	749	96%	800	77%	317	79%	133	100%	180	99%	4,943	86%
Total	778	100%	1,045	100%	402	100%	133	100%	181	100%	5,751	100%

5.3 SELF-HAULED YARD WASTE

Table 5-3 summarizes the self-hauled loads containing yard waste brought by landscapers and all other self-haulers, including contractors/builders. At each of the 10 County waste facilities, the majority of customers with yard waste loads were not landscapers but rather fell into the category of “other self-haulers.” Of those surveyed, non-landscapers brought 83% of the self-hauled loads that contained yard waste. The percentage of yard waste loads from other self-haulers varied among sites, ranging from 78% at First Northeast to 100% at Skykomish and Enumclaw.

Landscapers delivered 17% of the yard waste loads overall. The highest percentages of landscapers brought yard waste to Factoria (19%), First Northeast (22%), and Houghton (18%). The high percentage of landscapers at Factoria may be due to the site’s evening yard waste service.¹⁴ Though the Enumclaw facility offers yard waste service, only six yard waste loads were observed at that site during the study, and no landscapers were surveyed. Cedar Falls also provides yard waste service, and even with the small sample size, it appears that landscapers are using this service. Vashon’s sample size was too small for drawing any conclusions.

Table 5-3. Yard Waste Loads from Landscapers and Other Self-haulers, by Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Landscapers	10	12%	18	16%	2	11%			22	19%
Other self-haulers	74	88%	98	84%	16	89%	6	100%	93	81%
Total	84	100%	116	100%	18	100%	6	100%	115	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Landscapers	33	22%	23	18%	2	10%			1	20%	111	17%
Other self-haulers	115	78%	102	82%	19	90%	6	100%	4	80%	533	83%
Total	148	100%	125	100%	21	100%	6	100%	5	100%	644	100%

¹⁴ Source-separated yard waste disposal is available at the Enumclaw and Factoria transfer stations as well as the Cedar Falls drop box. Factoria is the only County waste facility that is regularly open late (until 11:30 p.m. on weeknights). The source-separated yard waste service available in the evenings may help draw landscapers to the facility.

5.4 SELF-HAULED CONSTRUCTION AND DEMOLITION WASTE

Table 5-4 summarizes the self-hauled loads containing construction/demolition (C&D) waste brought by contractors/builders and other self-haulers (including landscapers). Overall, contractors/builders accounted for 42% of the self-hauled C&D waste loads surveyed at the 10 County facilities, while non-contractors brought 58% of the loads. The proportion of the C&D waste loads brought by contractors/builders ranged from 0% at Skykomish and 21% at Cedar Falls to 50% at First Northeast and 55% at Bow Lake.

Table 5-4. Construction/Demolition Waste Loads from Contractors/Builders and Other Self-haulers, by Facility

Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Contractors	52	35%	60	55%	6	21%	11	37%	75	39%
Other self-haulers	95	65%	50	45%	23	79%	19	63%	119	61%
Total	147	100%	110	100%	29	100%	30	100%	194	100%

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Contractors	76	50%	105	47%	17	36%			13	30%	415	42%
Other self-haulers	77	50%	119	53%	30	64%	4	100%	31	70%	567	58%
Total	153	100%	224	100%	47	100%	4	100%	44	100%	982	100%

5.5 SELF-HAULED TVs AND COMPUTERS

The 2000-2001 customer surveys included a new question asking waste facility customers whether they were disposing of any televisions or computer equipment, such as TV sets, monitors, computers, or laptops (but not keyboards, disk drives, mouse pads, or other computer accessories). This question was designed to provide information about cathode ray tubes (CRTs) and other electronic equipment containing materials that can be recycled rather than disposed. Table 5-5 summarizes the number of self-hauled loads reported to contain TVs or computer equipment.

During the survey, 149 self-haul customers, or about 3% of the 4,943 self-hauled loads surveyed, reported that their waste loads contained TVs or computer equipment.¹⁵ The sources of those 149 loads included 131 loads from single-family residential locations (88%) and 14 non-residential (9%). Multi-family residential and mixed residential/non-residential represented only a negligible contribution to the total. Accordingly, single-family residential sources generated the large majority of self-hauled waste loads reported to contain TVs or computer equipment.

Table 5-5. Self-hauled Loads Containing TVs and Computer Equipment Waste, by Generator Type and Facility
Surveyed Vehicles, April 2000 – March 2001

	Algona		Bow Lake		Cedar Falls		Enumclaw		Factoria	
Generator type										
Single-family residential	13		18		4		9		20	
Multi-family residential			1				1			
Mixed residential/non-res.	1									
Non-residential	1		1				1		4	
No response			1							
Loads with computers/TVs	15	2%	21	3%	4	2%	11	4%	24	3%
Self-hauled loads	868		679		176		298		743	

	First NE		Houghton		Renton		Skykomish		Vashon		Total	
Generator type												
Single-family residential	22		28		10		4		3		131	
Multi-family residential											2	
Mixed residential/non-res.											1	
Non-residential	4		2		1						14	
No response											1	
Loads with computers/TVs	26	3%	30	4%	11	3%	4	3%	3	2%	149	3%
Self-hauled loads	749		800		317		133		180		4,943	

¹⁵ Though an extensive statistical analysis was not conducted, the relatively large sample size allows us to assume with confidence that about 3 percent of all self-hauled loads bring TVs and computer equipment to the County transfer system. At the individual stations, however, the smaller sample sizes increase the margin of error, making it more difficult to report definitive results at those stations where fewer vehicles were surveyed.

It is important to note that the results reflect only what self-haulers reported during the survey; this study did not include an actual examination of the waste loads delivered. The survey results may reflect some underreporting if self-haulers felt it was wrong or not environmentally friendly to bring in TVs or computer equipment. In addition, self-haulers were not asked about other waste they were bringing in, so one cannot assume that TVs and computers represent 3% of the self-hauled waste stream, as these materials may comprise only a portion of a self-hauler's total waste load. Waste composition studies can provide more quantitative data regarding the amount of TVs and computer equipment in the waste stream.

6. Cities of Origin

Customers bringing loads to the 10 County facilities and two private facilities were asked from which city their loads originated. Surveyors recorded the responses according to a list of locations, including both cities and unincorporated areas, within King County as well as additional areas located outside the county. The list of 39 incorporated cities and towns in King County displayed in this report reflects the recent incorporations of Kenmore in 1998 and Sammamish in 1999. (Previous reports included data from these areas in the “unincorporated King County” totals.)

King County’s 39 cities include Bothell and Milton, though only portions of these jurisdictions are located within the boundaries of King County. Though slightly less than half of Bothell’s land area lies within King County, the entire city participates in King County’s regional solid waste management system. The City of Milton, with only about one-quarter of its land area within King County, takes its waste to the Pierce County system. Also, please note the number of loads originating from the City of Seattle may be over-reported in Table 6-1 and Table 6-2, particularly for self-haulers. This situation may occur as some customers are inclined to identify themselves as residents of Seattle, even though they technically live outside of the city limits, such as in adjoining areas like Shoreline.

The following sections present waste data by reported city of origin for both commercial waste haulers and self-haulers.

6.1 COMMERCIAL HAULERS

Commercial haulers indicated that the loads they collected originated from within King County, and the vast majority came from cities. Table 6-1 shows the cities of origin for loads collected by commercial haulers.

**Table 6-1. Origins of Loads from Commercial Haulers
Surveyed Vehicles, April 2000 – March 2001**

	Algona	Bow Lake	Enumclaw	Factoria	First NE	Houghton	Renton	Vashon	Total
Incorporated King County									
Algona	4 3%								4 0%
Auburn	61 44%								61 8%
Bellevue	1 1%			60 61%		14 6%	1 1%		76 9%
Black Diamond	1 1%								1 0%
Bothell						33 13%			33 4%
Burien		3 2%					1 1%		4 0%
Carnation						2 1%			2 0%
Covington	4 3%								4 0%
Des Moines		23 12%							23 3%
Duvall						9 4%			9 1%
Enumclaw			15 83%				1 1%		16 2%
Federal Way	39 28%	5 3%							44 5%
Issaquah				23 23%					23 3%
Kenmore					2 7%	3 1%			5 1%
Kent	18 13%	111 58%					1 1%		130 16%
Kirkland				3 3%		53 22%			56 7%
Lake Forest Park					3 10%				3 0%
Maple Valley	5 4%	3 2%					1 1%		9 1%
Mercer Island				5 5%					5 1%
Newcastle							2 2%		2 0%
Normandy Park		6 3%							6 1%
North Bend	1 1%	1 1%					1 1%		3 0%
Pacific	2 1%								2 0%
Redmond					1 3%	65 27%			66 8%
Renton		2 1%					60 71%		62 8%
Sammamish						5 2%			5 1%
SeaTac		10 5%							10 1%
Seattle		1 1%			5 17%				6 1%
Shoreline					16 55%				16 2%
Skykomish					2 7%		1 1%		3 0%
Snoqualmie				4 4%					4 0%
Tukwila		24 13%							24 3%
Woodinville				1 1%		41 17%			42 5%
Subtotal	136 97%	189 99%	15 83%	96 97%	29 100%	225 92%	69 81%		759 94%
Unincorporated King County	4 3%	2 1%	2 11%	2 2%		15 6%	16 19%	1 100%	42 5%
All over King County				1 1%		5 2%			6 1%
No response			1 6%						1 0%
Total	140 100%	191 100%	18 100%	99 100%	29 100%	245 100%	85 100%	1 100%	808 100%

6.2 SELF-HAUL CUSTOMERS

At the 10 County waste facilities, 93% of self-hauled loads originated from within King County. At seven of the facilities – Bow Lake, Cedar Falls, Factoria, Houghton, Renton, Skykomish, and Vashon – 97% to 99% of the self-hauled loads came from King County locations. At First Northeast, 91% of the self-hauled loads originated in King County. At Algona and Enumclaw, 80% and 83% of self-hauled loads, respectively, had King County origins.

**Table 6-2. Origins of Loads from Self-haulers
Surveyed Vehicles, April 2000 – March 2001**

	Algona	Bow Lake	Cedar Falls	Enumclaw	Factoria	First NE	Houghton	Renton	Skykomish	Vashon	Total
Incorporated King County											
Algona	16 2%										16 0%
Auburn	254 29%	20 3%		9 3%				1 0%			284 6%
Beaux Arts					1 0%						1 0%
Bellevue	2 0%	2 0%	1 1%		346 47%	1 0%	95 12%	3 1%	1 1%		451 9%
Black Diamond	2 0%			16 5%							18 0%
Bothell				1 0%		10 1%	70 9%				81 2%
Burien	2 0%	93 14%			1 0%						96 2%
Carnation			3 2%		5 1%		7 1%				15 0%
Clyde Hill					4 1%		1 0%				5 0%
Covington	35 4%	8 1%		11 4%				3 1%			57 1%
Des Moines	5 1%	78 11%									83 2%
Duvall					5 1%	1 0%	21 3%		2 2%		29 1%
Enumclaw				132 44%							132 3%
Federal Way	167 19%	38 6%									205 4%
Hunts Point					1 0%		1 0%				2 0%
Issaquah	1 0%		2 1%		100 13%		4 1%	13 4%			120 2%
Kenmore					1 0%	29 4%	17 2%				47 1%
Kent	109 13%	182 27%		9 3%		1 0%		8 3%			309 6%
Kirkland		1 0%			3 0%	7 1%	215 27%				226 5%
Lake Forest Park						51 7%			1 1%		52 1%
Maple Valley	8 1%	4 1%	2 1%	24 8%	3 0%			16 5%			57 1%
Medina					7 1%		9 1%	1 0%			17 0%
Mercer Island		1 0%			76 10%		4 1%				81 2%
Milton	15 2%										15 0%
Newcastle					24 3%			5 2%			29 1%
Normandy Park		26 4%						1 0%			27 1%
North Bend			93 53%		1 0%						94 2%
Pacific	31 4%										31 1%
Redmond		2 0%	1 1%		28 4%		157 20%	1 0%			189 4%
Renton	8 1%	27 4%		1 0%	10 1%	1 0%		185 58%			232 5%
Sammamish					64 9%		21 3%				85 2%
SeaTac		85 13%				1 0%					86 2%
Seattle	3 0%	39 6%		1 0%	22 3%	281 38%	17 2%	10 3%	1 1%	1 1%	375 8%
Shoreline					1 0%	290 39%	2 0%				293 6%
Skykomish								2 1%	74 56%		76 2%
Snoqualmie			24 14%		2 0%						26 1%
Tukwila		33 5%			1 0%			2 1%			36 1%
Woodinville					3 0%	4 1%	103 13%	1 0%			111 2%
Yarrow Point						1 0%	4 1%				5 0%
Subtotal Incorp. King County	658 76%	639 94%	126 72%	204 68%	709 95%	678 91%	748 94%	252 79%	79 59%	1 1%	4,094 83%
Unincorporated King County	34 4%	22 3%	45 26%	43 14%	24 3%	1 0%	30 4%	55 17%	50 38%	178 99%	482 10%
All over King County	4 0%	7 1%	0%	1 0%	1 0%	3 0%	1 0%	7 2%	1 1%	0%	25 1%
Subtotal King County	696 80%	668 98%	171 97%	248 83%	734 99%	682 91%	779 97%	314 99%	130 98%	179 99%	4,601 93%
Outside King County	165 19%	7 1%	5 3%	39 13%	6 1%	66 9%	19 2%	1 0%	3 2%	1 1%	312 6%
Unknown	1 0%	1 0%		1 0%		1 0%		2 1%			6 0%
No Response	6 1%	3 0%		10 3%	3 0%		2 0%				24 0%
Total	868 100%	679 100%	176 100%	298 100%	743 100%	749 100%	800 100%	317 100%	133 100%	180 100%	4,943 100%

Appendix A

Customer Survey Methodology

The customer survey was administered to vehicles entering 10 public and two private waste facilities in King County between April 2000 and March 2001. Copies of the data collection forms are included in Appendix C.

SAMPLING PLAN

Each transfer station and drop box was surveyed one day per quarter for a total of 41 survey days.¹⁶ Survey days were identified through a systematic process designed to ensure that over the year-long study period all facilities would be surveyed throughout the week.

Facilities were assigned to survey dates based on the 1999-2000 schedule in that the same four sites were scheduled together within a single month. For example, if Cedar Falls, Skykomish, First Northeast, and Eastmont were surveyed during the same month in the 1999-2000 study, these sites were surveyed together in the 2000-2001 study.

However, all survey sites were shifted one month ahead from the 1999-2000 study. For example, Cedar Falls, Skykomish, First Northeast, and Eastmont were surveyed in June, September, December, and March for the 1999-2000 study. In 2000-2001, these sites were scheduled for the months of July, October, January, and April.

CONDUCTING CUSTOMER SURVEYS

One or two surveyors were assigned to each survey day, depending on the expected traffic level at the site. At sites with two surveyors, the first surveyor administered the questionnaire to vehicles entering the facility, and the second recorded the vehicle's ticket number as it exited the facility. (Ticket numbers are used for determining the vehicle's net weight.) At Vashon, Cedar Falls, and Skykomish, only one surveyor was needed.¹⁷

To link the vehicle's ticket number to the survey information, the first surveyor placed a uniquely numbered card on the vehicle's dashboard and recorded the number on the questionnaire. The second surveyor obtained this card as the vehicle exited the facility. At the end of the project, King County merged the ticket number data with the facility cashier records to retrieve the corresponding vehicle net weights.

¹⁶ In the survey plan, 40 days of surveying were scheduled at the 10 County facilities, but the April 2000 surveying at Cedar Falls was split into two separate days because circumstances warranted the surveyor leaving early on the regularly scheduled day. The surveyor returned the next day to complete the survey.

¹⁷ No scale house exists at Skykomish, and therefore a second surveyor was not needed to record ticket numbers. At Vashon and Cedar Falls, traffic flow was light enough that one surveyor was able to administer the survey and record the ticket numbers.

The surveyors administered the questionnaire to every vehicle entering the facility during their shift, except in rare instances when the traffic became so congested that the surveyor needed to wave some of the vehicles past to avoid further delays.

Before the surveying took place, all surveyors attended a training session in which they conducted mock interviews using the customer survey. The surveys were then checked for accuracy, completeness, and legibility. Any record that did not meet all three criteria was corrected or dropped from the sample.

The protocol used by the surveyors is described in more detail below.

INFORMATION COLLECTED ON THE SURVEY FORM

As the Vehicle Approached

- The surveyor determined whether the approaching vehicle was a commercial garbage truck or a self-hauler. (Surveyors were provided with a list of all companies licensed to haul municipal solid waste; see coding sheet in Appendix C.)
- The surveyor recorded the vehicle type, according to the nine categories listed below:
 1. Rear packer
 2. Front packer
 3. Side packer
 4. Drop box, loose
 5. Drop box, compacted
 6. Pick-up, van, sport-utility vehicle
 7. Large other (large truck, flatbed truck)
 8. Car
 9. Semi truck
- The surveyor also noted whether the vehicle was pulling a trailer.

To All Drivers

The surveyor let the driver know that the King County Solid Waste Division was conducting a customer survey. The surveyor placed a number card on the windshield and explained that the card would be collected when the driver left the facility.

- The surveyor first asked the driver from which city the load originated. The surveyor was given a list of King County cities and other areas. If the driver's response was not on the list, the surveyor asked whether the location was a rural area within King County or a city outside King County. Other possible answers included "Skykomish drop box" and "Cedar Falls drop box."
- The surveyor asked the driver to describe the type of waste brought to the facility, according to the four categories below:
 - yard waste
 - construction or demolition debris
 - special waste (petroleum-contaminated soil, sludge, or asbestos)
 - mixed garbage
- The surveyor also asked the driver whether he/she was disposing of any TV or computer equipment, such as television sets, monitors, computers, or laptops. This question was added in the 2000-2001 study period.
- If the waste type was yard waste or construction/demolition waste, the surveyor asked if the driver was a contractor/builder or a landscaper.

From the following list, the drivers were asked to pick the category that best described the source of their load:

- Single-family
- Multi-family
- Both single-family and multi-family (mixed residential)
- Residential and business/non-residential
- Non-residential (business)

Self-Haulers Only

In addition to the questions listed above, self-haulers were also asked the following questions:

- How often does the driver visit any transfer station? The surveyor recorded the number of visits per day, week, month, or year (or ever).
- Does the driver subscribe to curbside garbage collection? (This question was not asked if the driver was a contractor/builder or a landscaper.)

- Why is the driver self-hauling waste today? (This question was not asked if the driver was a contractor/builder or a landscaper.)

As the Vehicle Exited the Facility

When departing the facility, the vehicle was stopped a second time. The surveyor retrieved the numbered card, requested to see the customer's receipt, and then recorded the ticket number from the receipt.

Appendix B

Quality Control Plan

This quality control plan for the customer survey study was prepared at the start of the King County Waste Monitoring Program to ensure quality and consistency throughout the fieldwork, data-entry, and reporting processes.

TRAINING CREWS

All surveyors were trained on-site before administering their first survey. The training consisted of a review of the survey form and the possible responses, and it also included practice administering the questionnaire to customers. A debriefing of the training occurred immediately following the practice surveys to discuss any issues that arose during the training.

To obtain consistency with the data, the same surveyors were used throughout the project.

ADMINISTERING THE SURVEYS

Each surveyor was supplied with a packet of materials that included color photos of the different vehicle types, a list of all commercial waste haulers within King County, and a brief methodology explaining how to collect the information in the survey. The methodology included a verbatim script of how to ask each question.

The surveyors were provided with a list of all possible “city of origin” responses. If the respondent’s waste was from a city or neighborhood not on this list, the surveyor was instructed to clarify whether the waste was from a King County city, unincorporated King County area, outside King County, or all over King County. These steps reduced the number of misspelled or unknown cities.

The surveyor was also supplied with a list of possible responses and appropriate codes for the question, “Why are you self-hauling today?”

A “Survey in Progress” sign was posted in front of the gatehouse so that drivers were alerted to the survey. Surveyors also wore hard hats and safety vests to ensure that vehicles recognized them and stopped to answer the questionnaire.

VERIFYING THE ACCURACY OF THE SURVEYS COLLECTED

Each surveyor’s work was checked in the morning of his or her first day on the job. During the field check, all collected data were verified for accuracy, and any questions or issues that arose were discussed. The Cascadia Project Manager was available to the survey crew by phone to address any issues that arose after the training and the field check.

The monthly data obtained from the surveyors were reviewed for accuracy, completeness, and legibility before being entered into the database. Any record that did not meet these three criteria was dropped.

ENTERING SURVEY DATA

Survey data were entered into the database using electronic data-entry forms. To increase accuracy, the data-entry forms included validation rules that prevented “out of range” values. For example, the database will only allow the numbers 1 through 9 to be entered as the vehicle type. These are the only numbers corresponding to specific vehicle types on the survey form.

Other validation rules prevent extraneous information from being included. For example, only self-haul drivers are asked how often they visit the transfer station, if they subscribe to garbage service, and why they are self-hauling their load. These fields only appear on the data-entry form if “self-haul” is entered as the collection type.

Appendix C

Field Forms & Survey Instructions

SURVEY FIELD FORMS

The following forms appear on the subsequent pages of this appendix:

- **Survey Instruction Guide** (Figure C-1)
- **Customer Survey Instrument** (Figure C-2)
- **Exit Form** (Figure C-3)
- **Coding Sheet** (Figure C-4)

Figure C-1. Survey Instruction Guide

King County Monitoring Program: Survey Instructions

AS THE VEHICLE APPROACHES:

- *At all sites except Skykomish, Third & Lander, and Eastmont:* Select a **numbered card**; record the number.
 - Decide whether the vehicle is a commercial hauler or self-hauler (review the list of garbage companies on the reverse of this page) and record the **collection type**.
 - Observe and record the **vehicle type** (from the list on the survey form; ask driver if you are uncertain.)
 - Observe and record whether they are pulling a **trailer** (“X” if yes).
-

STOP THE VEHICLE, THEN BEGIN QUESTIONS:

ALL DRIVERS:

- Introduction: “Hello, King County is conducting a customer survey today.”
- *At all sites except Skykomish, Third & Lander, and Eastmont:* Hand the driver the numbered card. “This card will be collected when you leave the facility. Please don’t leave without returning the card.”
- Ask where the load is from. Refer to the sheet entitled “City of Origin.” If the load is from somewhere not on the list of cities, verify whether the load is from unincorporated King County, all over King County, or outside King County. Record the **city** on the survey form.
- Ask the driver whether the load is yard waste, construction/demolition (C&D), mixed garbage, or special waste (refer to attached coding sheet for definition of special waste). Record the **waste type**.
- Ask the driver whether or not they are carrying any **TV or computer equipment** (such television sets, monitors, computers, or laptops, but NOT keyboards, mouse pads, disk drives, and the like). Record as “yes,” “no,” or leave blank if driver does not know.
- If the waste type is yard waste or construction/demolition, ask the driver if he/she is a contractor/builder or a landscaper. Record only if he/she is **contractor/builder or landscaper**.

Ask the driver where the load was generated: single-family residential, multi-family residential, mixed residential, residential and business, or non-residential (business). Record the **generator** type.

Figure C-1. Survey Instruction Guide, Continued

SELF-HAUL DRIVERS ONLY:

- Ask the driver how often he/she visits any transfer station. Record the **trips/period** in terms of XX times per DAY, WEEK, MONTH or YEAR only. (For example, write down 3/year if he/she says “once every four months.”)
- Ask the driver whether he/she has curbside **garbage service** (yes/no—do not leave “no” as a blank). [This question pertains to: a) home if the driver indicated the load is from his/her home, or b) business if the driver indicated the load is from his/her business.]
- Ask the driver **why** he/she is **self-hauling** today. Refer to the list provided to code the answer.

ALL DRIVERS

Record any additional comments the driver may offer. Thank the driver for their responses.

AS THE VEHICLE DEPARTS THE FACILITY:

Not required at Skykomish, Third & Lander, or Eastmont.

- Remove the numbered card and ask for the transaction receipt.
- *If you have a two-person survey team*, the second person will record the **numbered card**'s number and the **ticket number** on the exit form.

If only one person is conducting the survey, you will record the **ticket number** on the survey form, making sure to write it next to the correct **numbered card** number.

Figure C-2. Customer Survey Instrument (Back)

Complete this section for every page

Date _____

Surveyor (s) _____

Circle the site:

	<i>Public</i>	<i>Private</i>
Algona	First NE	Eastmont
Bow Lake	Houghton	Third & Lander
Cedar Falls	Renton	
Enumclaw	Skykomish	
Factoria	Vashon Island	

Complete this section for first page only

Start Time _____

Start Ticket _____

Increment Weather? _____

Stop Time _____

End Ticket _____

Other Notes about Today's Surveying:

If found, please call Cascadia Consulting Group at 206/343-9759. Reward offered.

Figure C-4. Coding Sheet (Front)

CITY OF ORIGIN

Possible King County answers (Bold are incorporated cities)

Algona	Hunts Point	Palmer	Arlington	Gold Bar	Peshastin
Allentown	Issaquah	Pine Lake	Bainbridge Island	Graham	Plain
Auburn	Juanita	Preston	Bonney Lake	Greenwater	Puyallup
Baring	Kenilworth	Ravensdale	Brier	Hyak	Roslyn
Beaux Arts	Kenmore	Redmond	Brown's Point	Index	Roy
Bellevue	Kent	Redondo	Buckley	Lacey	Selah
Black Diamond	Kingsgate	Renton	Camano Island	Lake Stevens	Silverdale
Bothell	Kirkland	Richmond Beach	Canon Park	Lake Tapps	Silver Lake
Bryn Mawr	Lake Forest Park	Sahalee	Carbonado	Lake Wenatchee	Smokey Point
Burien	Lake Hills	Sammamish	Chelan	Leavenworth	Snohomish
Carnation	Lake Sammamish	Scenic	Cle Elum	Livingston	Spanaway
<i>Cedar Falls Drop Box</i>	Lakewood Park	Seahurst	Clearview	Lynnwood	Stanwood
Clyde Hill	Maple Heights	SeaTac	Clinton	Maltby	Steilacoom
Covington	Maple Valley	Seattle	Dash Point	Marysville	Steven's Pass
Cumberland	Mauzy Island	Shoreline	Edmonds	McMillan	Sultan
Des Moines	Medina	Skyway	Edgewater	Mill Creek	Summer
Duvall	Mercer Island	Skykomish	Edgewood	Monroe	Tacoma
Eastgate	Meridian Heights	<i>Skykomish Drop Box</i>	Ellensburg	Mountlake Terrace	Wenatchee
Enumclaw	Milton	Spring Lake	Everett	Mukilteo	Whidbey Island
Factoria	Newport Hills	Snoqualmie	Fairview	Olympia	Wilkinson
Fairwood	Newport Shores	Tukwila	Fife	Orting	Woodway
Fall City	Newcastle	Vashon Island	Fort Lewis	Parkland	Yelm
Federal Way	Normandy Park	West Seattle	Gig Harbor		
Grotto	North Bend	Woodinville			
Haller Lake	North City	Yarrow Point			
Hobart	Pacific				

If city is not on either list, determine if it is:

- Unincorporated King County
- All over King County
- Outside King County

Figure C-4. Coding Sheet (Back)

COMMERCIAL COLLECTION VS. SELF-HAUL

If one of these company names is printed on the vehicle, it is a **COMMERCIAL COLLECTION** vehicle:

BFI	Nick Raffoe Garbage Company
Container Hauling	Rainier Disposal
Eastside Disposal	Rabanco
Emerald City Disposal	RST Disposal
Federal Way Disposal	SeaTac Diposal
Lawson Disposal	Seattle Disposal
Kent Disposal	Sno-King Disposal
Meridian Valley Disposal	Tri-Star Disposal
Murray Disposal	Waste Management

If none of these names appears on the vehicle, it is **SELF-HAUL**

Waste Type "Special Wastes"

"Special wastes" are petroleum-contaminated soil, sludge, or asbestos. These wastes are rarely (if ever) hauled to the transfer stations.

REASONS FOR SELF-HAULING

Ask the *drivers for the MAIN (only one) reason why they are self-hauling today*

1. Large amount of garbage
2. Cheaper / saves money
3. Cleaning home or workplace
4. Don't have garbage service
5. Items too big to fit into garbage can
6. Convenience (often: "driveway is too long")
7. Yard debris
8. Remodeling
9. Moving home or workplace
10. Garbage hauler won't pick up this type of waste
11. Small amount of garbage / recycle almost everything
12. Dissatisfied with regular collection service
13. Forgot or missed the regular collection service
14. Disaster-related (flood, mudslide, earthquake, etc.)
15. Self-sufficiency / don't like government
16. Favor for a friend/neighbor/family member
17. Dogs get into garbage if left on curb
18. Waste is from vacation home
19. Roadside litter removal
20. Other
21. Refused to answer

For Third & Lander and Eastmont Only

22. Demolition trucking company