



King County

Department of Natural Resources & Parks

Solid Waste Division

Waste Monitoring Program

2006 Transfer Station Recycling
Survey

Final Report

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Appendix – Recycling Survey Form

1. Introduction

Surveys were conducted of customers bringing recyclable materials to King County transfer stations during a two-month period in 2006. The information and data gathered through this survey will supplement the County's existing customer databases and aid in planning for future recycling programs.

1.1 Survey Objectives & Overview of Methodology

The main objective of the Transfer Station Recycling Survey was to better understand why self-haul customers bring recyclables to County facilities instead of using other options, such as curbside collection and private recycling facilities. While the County has surveyed commercial and self-haul customers bringing waste to their facilities, this marks the first time that the County has surveyed recycling customers. Other survey objectives were to gather information on the quantity of materials, source of the loads (residential or nonresidential), frequency of trips, and current subscription to garbage and recycling collection.

Customer surveys were conducted in April and May, 2006 at seven King County transfer stations that provide recycling drop boxes. The First Northeast transfer station offers recycling but was closed during this time for renovation. Surveys occurred at each facility during one week day and one week-end day, for a total of 14 survey days. The survey days were identified through a systematic process designed to ensure that all facilities would have the same likelihood of being surveyed on any given day. The survey days assigned to each facility were randomly selected in order to ensure unbiased sampling and statistically representative results. Error ranges and confidence intervals were not calculated and the report does not address statistically significant differences among the seven facilities. The data reveal key trends in recycling at the County facilities and can be used to identify county-wide recycling issues. The customer survey form is included as Appendix A of this report.

1.2 Key Findings

The results of the surveys show that residential customers in the more rural areas of King County rely on the recycling facilities at the transfer stations more than residential customers in the more urbanized parts of the County. The key findings are listed below.

- **Loads of recyclables came predominantly from single-family residences (90%).**
- **The majority of customers (74%) did not subscribe to recycling collection service.** The proportion of non-subscribers was higher at the rural transfer stations than at the urban stations.
- **Slightly more than one-half (52%) did not subscribe to garbage collection service.** Non-subscribers at the rural stations represented the majority, where subscribers were the majority at the urban stations.
- **Customers brought an average of .93 cubic yards of recyclables with each trip.**

- **Customers generally brought more materials to rural transfer stations than to the urban transfer stations.** Customers made on average 22 - 31 trips per year to the four rural stations compared to 13 – 19 trips per to the three urban stations. Larger loads were generally found at the rural stations led by Cedar Falls (1.26 cubic yards per trip), and Enumclaw (1.19 cubic yards per trip). The smallest loads, on average, were at Renton (.65 cubic yards per trip).
- **By volume, residential customers who subscribed to recycling collection brought mainly cardboard (61%), followed by mixed glass (12%), plastic (10%), and mixed paper (9%).**
- **Among nonresidential generators, two materials, cardboard (88%) and mixed paper (9%) represented 97% of all materials.**
- **The majority of customers (51%) said they would recycle paper, glass, plastic and cans if the County no longer accepted these materials at the transfer stations.** The option of throwing these materials away was reported by 38% of the customers.

2. Overview of Survey Results

This section presents for each facility and overall the distribution of surveys by weekend and weekday, the proportion of recycling loads by generator type, and the reported zip code of origin.

2.1 Survey Counts by Facility

Table 1 summarizes the total number of surveys collected during the April – May, 2006 survey period. A total of 1,023 customers were surveyed during the 14 survey days. Overall, more surveys were collected on weekends (56%) than during the weekdays (46%).

**Table 1. Count of Surveys by Weekday & Weekend
April - May 2006 n=1,023**

	Bow Lake		Cedar Falls		Enumclaw		Houghton	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Weekday	67	39%	34	45%	78	41%	28	35%
Weekend	105	61%	41	55%	111	59%	53	65%
Total	172	100%	75	100%	189	100%	81	100%

	Renton		Skykomish		Vashon		Overall	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Weekday	75	45%	5	36%	166	51%	453	44%
Weekend	93	55%	9	64%	158	49%	570	56%
Total	168	100%	14	100%	324	100%	1023	100%

2.2 Customers by Generator Type

Table 2 shows the proportion of recycling loads arriving at each facility by generator type. Overall, 93% of the loads came from residential customers, including 90% from single-family residences and 3% from multi-family residences. Nonresidential loads accounted for 4% and mixed residential and nonresidential loads accounted for 3% of the total loads.

The percentage of residential loads at all the facilities, except for Skykomish, represented from 91% to 96% of all loads. The data from Skykomish should be treated anecdotally since only 14 vehicles brought recycling loads to the facility during the two-day survey period.

Table 2. Reported Generator Types
April - May 2006 n=1,023

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Residential	92%	91%	96%	93%
Single-family residential	88%	91%	94%	90%
Multifamily residential	5%	0%	3%	2%
Mixed single-family & multifamily residential	0%	0%	0%	0%
Nonresidential	6%	7%	1%	6%
Mixed residential & nonresidential	1%	3%	3%	1%
Total	100%	100%	100%	100%
<i>No response</i>	0%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Residential	95%	79%	91%	93%
Single-family residential	91%	79%	89%	90%
Multifamily residential	4%	0%	2%	3%
Mixed single-family & multifamily residential	1%	0%	0%	0%
Nonresidential	4%	14%	4%	4%
Mixed residential & nonresidential	1%	7%	5%	3%
Total	100%	100%	100%	100%
<i>No response</i>	0%	0%	0%	0%
Total	100%	100%	100%	100%

2.3 Customers by location

Table 3 presents the reported zip code of origin for up to five of the most commonly reported zip codes at each facility. Overall, 58% of the loads came from five zip codes. The majority of loads came from rural parts of the County. Loads from the zip codes corresponding to Vashon Island, Enumclaw, North Bend, and Maple Valley represented 55% of all loads.

**Table 3. Customers in Top 5 Zip Codes
April - May 2006 n=1,023**

Bow Lake		Cedar Falls		Enumclaw		Houghton	
Zip Code	Percent	Zip Code	Percent	Zip Code	Percent	Zip Code	Percent
98198	16%	98045	75%	98022	62%	98052	19%
98188	15%	98065	13%	98038	8%	98034	10%
98031	12%	98024	7%	98092	8%	98033	10%
98166	9%			98042	7%	98077	9%
98042	5%			98010	4%	98004	6%
Total	56%		95%		89%		53%

Renton		Skykomish		Vashon		Overall	
Zip Code	Percent	Zip Code	Percent	Zip Code	Percent	Zip Code	Percent
98059	37%	98288	71%	98070	100%	98070	32%
98056	13%	98224	21%			98022	12%
98055	10%	98155	7%			98059	6%
98058	9%					98045	5%
98038	7%					98038	3%
98027	7%						
Total	82%		100%		100%		58%

3. Garbage and Recycling Subscription Levels

This section shows by site and for the overall system the proportion of recycling customers who subscribe to garbage collection and recycling collecting services, the frequency of recycling trips, and the frequency of bringing garbage and recyclables in the same trip. The data on subscription levels are also presented by generator type.

3.1 Use of Curbside Recycling and Recycling Collection Services

Table 4 shows the proportion of recyclers that subscribed and did not subscribe to curbside recycling collection (residential) or recycling collection services (businesses and other nonresidential customers). Overall, 26% subscribed and 74% did not subscribe to recycling collection services. The percentage of people bringing in recyclables who did not subscribe to recycling collection was higher at the rural facilities than at the urban locations. Nearly all (98%) of the recyclers at Vashon Island did not subscribe to recycling collection, followed by 86% at Enumclaw who did not subscribe. Houghton was the only facility where subscribers (63%) outnumbered non-subscribers (37%).

**Table 4. Reported Usage of Recycling Collection Service
April - May 2006 n=1,023**

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Subscribe	41%	39%	14%	63%
Do not subscribe	56%	61%	86%	37%
<i>No response</i>	2%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Subscribe	48%	0%	2%	26%
Do not subscribe	51%	100%	98%	74%
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

3.2 Use of Recycling Collection Services by Generator Type

Table 5 shows the proportion of recycling customers arriving at each facility by generator type. Overall, 24% of the recycling loads came from residential generators who subscribe to curbside recycling collection, compared to 68% who did not subscribe. Non-subscribers also outnumbered subscribers with both the nonresidential generators and the mixed residential and nonresidential generators. There was a higher proportion of non-subscribers to subscribers among residential generators at all facilities except for Houghton.

**Table 5. Reported Use of Recycling Collection Services by Generator Type
April - May 2006 n=1,023**

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Residential	91%	91%	96%	93%
Subscribe	39%	35%	13%	59%
Do not subscribe	52%	56%	84%	33%
Nonresidential	6%	7%	1%	6%
Subscribe	2%	4%	0%	2%
Do not subscribe	3%	3%	1%	4%
Mixed residential & nonresidential	1%	3%	3%	1%
Subscribe	0%	0%	1%	1%
Do not subscribe	1%	3%	2%	0%
Subtotal				
<i>No response</i>	2%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Residential	95%	79%	91%	93%
Subscribe	45%	0%	2%	24%
Do not subscribe	50%	79%	89%	68%
Nonresidential	3%	14%	4%	4%
Subscribe	2%	0%	0%	1%
Do not subscribe	1%	14%	4%	3%
Mixed residential & nonresidential	1%	7%	5%	3%
Subscribe	1%	0%	0%	1%
Do not subscribe	0%	7%	5%	2%
Subtotal				
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

3.3 Use of Curbside Garbage and Garbage Collection Services

Table 6 shows the proportion of recyclers that subscribed and did not subscribe to garbage collection services. Overall, 47% subscribed and 52% did not subscribe to garbage collection. The percentage of non-subscribers was higher at the rural facilities than at the urban locations. Non-subscribers outnumbered subscribers at all the rural facilities (Vashon Island, Cedar Fall, Skykomish and Enumclaw). Recycling customers without garbage service accounted for the largest share at Vashon (67%), followed by Skykomish (64%) and Enumclaw (63%). In comparison, the proportion of recycling customers that subscribed to garbage service was largest at Houghton (72%), Bow Lake (64%), and Renton (58%).

**Table 6. Reported Usage of Garbage Collection Service
April - May 2006 n=1,023**

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Subscribe	64%	49%	37%	72%
Do not subscribe	35%	51%	63%	28%
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Subscribe	58%	36%	33%	47%
Do not subscribe	42%	64%	67%	52%
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

3.4 Use of Garbage Collection Services by Generator Type

Table 7 shows the proportion of garbage collection customers arriving at each facility by generator type. Overall, 43% of the recycling loads came from residential generators who subscribed to curbside garbage collection, while 49% of the recycling loads came from residential generators who did not subscribe. Among residential generators, the proportion of non-subscribers was higher at the four rural facilities, including Enumclaw (61%), Vashon (60%), Skykomish (57%), and Cedar Falls (48%). The proportion of residential customers that subscribed to curbside garbage service was largest at Houghton (67%), Bow Lake (59%), and Renton (54%).

Among nonresidential generators, 3% subscribed to garbage collection compared to 1% who did not subscribe.

Table 7. Reported Use of Garbage Collection Services by Generator Type
April - May 2006 n=1,023

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Residential	92%	91%	96%	93%
Subscribe	59%	43%	35%	67%
Do not subscribe	33%	48%	61%	26%
Nonresidential	6%	7%	1%	6%
Subscribe	5%	5%	1%	4%
Do not subscribe	1%	1%	0%	2%
Mixed residential & nonresidential	1%	3%	3%	1%
Subscribe	0%	1%	1%	1%
Do not subscribe	1%	1%	2%	0%
Subtotal				
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Residential	95%	79%	91%	93%
Subscribe	54%	21%	31%	43%
Do not subscribe	42%	57%	60%	49%
Nonresidential	3%	14%	4%	4%
Subscribe	3%	14%	1%	3%
Do not subscribe	0%	0%	3%	1%
Mixed residential & nonresidential	1%	7%	5%	3%
Subscribe	1%	0%	1%	1%
Do not subscribe	0%	7%	4%	2%
Subtotal				
<i>No response</i>	1%	0%	0%	0%
Total	100%	100%	100%	100%

3.5 Frequency of Recycling Trips

The next section shows the annualized average number of trips all customers took to each facility. Table 8 splits the customers into two groups, including those that subscribed to garbage collection service and those that did not. For the survey, the customers reported the number of visits on a per day, month, or year basis. These responses were then converted to visits per year (e.g. 2 trips per month equals 24 visits per year).

Customers who did not subscribe to garbage collection service made, on average, 22.6 trips per year, or nearly two per month. Customers who subscribed to garbage collection made, on average, 18.7 trips per year, or 3.9 fewer trips per year than the non-subscribers.

The combined average of trips overall was 22.5 per year. Customers with the highest average number of trips per year were at Skykomish (30.6), Vashon (28.2) and Cedar Falls (27.3). Customers at Houghton had the lowest average number of trips per year (13.1).

Table 8. Average Trips per Year by Customers With & Without Garbage Collection Service
April - May 2006 n=1,020

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Subscribe to garbage service	17.4	33.1	24.2	11.1
Do not subscribe	17.5	21.6	20.3	18.2
Combined Average	17.4	27.3	21.7	13.1

	Renton	Skykomish	Vashon	Overall
Subscribe to garbage service	20.2	28.8	30.6	18.7
Do not subscribe	18.2	31.7	27.0	22.6
Combined Average	19.4	30.6	28.2	22.5

Table 9 shows the same data grouped by whether customers subscribed to recycling collection or not. Overall, customers not subscribing to recycling collection service made, on average, more than twice as many trips per year than the subscribers. Non-subscribers made on average 24.5 trips per year, or slightly more than two per month compared to recycling subscribers at 17 trips per year. The average number of trips for recycling subscribers covered a range of 10.6 at Enumclaw to 33.2 at Cedar Falls.

**Table 9. Average Trips per Year by Customers With & Without Recycling Collection Service
April - May 2006 n=1,018**

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Subscribe to recycling service	15.4	33.2	10.6	10.7
Do not subscribe	19.3	23.6	23.5	17.0
Combined Average	17.6	27.3	21.7	13.1

	Renton	Skykomish	Vashon	Overall
Subscribe to recycling service	18.9	0.0	12.1	17.0
Do not subscribe	19.7	30.6	28.5	24.5
Combined Average	19.4	30.6	28.1	22.5

3.6 Frequency of Bringing Recyclables and Garbage in the Same Trip

Table 10 shows frequency of bringing recyclables and garbage in the same trip in qualitative terms. The surveyor asked customers to choose one of the four possible responses. Overall, nearly one-half (48%) of the customers said they never bring recyclables and garbage in the same trip. The “never” response was given most often at all of the facilities, ranging from 42% at Enumclaw to 57% at Skykomish. Overall, 12% reported always bringing recyclables and garbage in the same trip.

Table 10. Reported Frequency of Bringing Recyclables and Garbage in the Same Trip
April - May 2006 n=1,023

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Always	15%	7%	17%	15%
Often	9%	23%	16%	11%
Sometimes	22%	25%	24%	26%
Never	52%	45%	42%	48%
<i>No response</i>	2%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Always	15%	0%	7%	12%
Often	14%	29%	10%	13%
Sometimes	24%	14%	31%	26%
Never	47%	57%	52%	48%
<i>No response</i>	0%	0%	1%	0%
Total	100%	100%	100%	100%

4. Materials Recycled

This section presents data on the quantity and types of materials recycled, the proportion recycled by customers who subscribe to recycling collection services, the use of private recycling facilities, and alternative recycling practices should the County discontinue acceptance of certain materials.

4.1 Quantity of Recyclables

The quantities of materials were estimated by measuring the volume of each load and visually estimating the proportion of each type of material.

Table 11 shows the average volume (in cubic yards) of recyclables per vehicle trip for single-family residences and the total for all generator types. Overall, customers brought almost a cubic yard, (.93 cubic yards) of recyclables to the facilities with each trip. Single-family residential customers brought on average .90 cubic yards of recyclables to the facilities with each trip.

Larger loads were generally found at the rural stations led by Cedar Falls (1.26 cubic yards per trip), and Enumclaw (1.19 cubic yards per trip). The smallest loads, on average, were at Renton (.65 cubic yards per trip).

**Table 11. Average Quantity of Recyclables per Vehicle,
Single-family Residences and Total
April - May 2006**

Transfer Station	Cubic Yards per Vehicle	
	Single-family Residences n=920	Total n=1,023
Bow Lake	0.91	0.93
Cedar Falls	1.29	1.26
Enumclaw	1.23	1.19
Houghton	0.85	0.98
Renton	0.61	0.65
Skykomish	1.11	1.00
Vashon	0.77	0.81
Overall	0.90	0.93

4.2 Materials Brought by Recycling Subscribers

Table 12 shows the mix of materials brought by recycling subscribers and generator type. The most common materials brought by residential generators were cardboard (61%), mixed glass (12%), plastic (10%), and mixed paper (9%). Among nonresidential generators, two materials, cardboard (88%) and mixed paper (9%) represented 97% of all materials. Cardboard (86%) was the predominant material brought by mixed residential and nonresidential generators.

Table 12. Materials Brought by Customers Who Subscribe to Recycling Collection (by volume)
April - May 2006 n=1,018

	Residential	Nonresidential	Mixed residential & nonresidential
Newspaper	3%	0%	0%
Mixed Paper	9%	9%	3%
Cardboard	61%	88%	86%
Mixed Glass	12%	0%	4%
Plastic	10%	0%	4%
Tin/Steel Cans	1%	3%	4%
Aluminum	5%	0%	0%
Textiles	0%	0%	0%
Total	100%	100%	100%

4.3 Recycling at Private Sector Facilities

The use of private sector recycling facilities in the last six months was reported to be very low. Of the 1,023 customers, only 7% had recycled materials at facilities other than King County transfer stations. Customers who did not subscribe to recycling collection services (73%) were approximately three times more likely to use private sector facilities than customers who subscribed to recycling collection (27%).

4.4 Alternative Practices for Paper, Glass, Plastic and Cans

Table 13 shows the results when asked what customers would mainly do with paper, glass, plastic, and cans if they were no longer accepted at County transfer stations. The most common response overall was to use some form of recycling (51%), either King County curbside collection (20%) or non-King County (private) recycling facilities (31%). Overall 38% of the customers said they would throw these materials away. About 50% of the customers at Skykomish, Enumclaw, and Vashon chose the throw away option as their preferred option. Customers at Houghton, Renton, Bow Lake, and Cedar Falls were more likely to choose recycling as their main option.

**Table 13. Reported Options for Recycling Paper, Glass, Plastic and Cans
April - May 2006 n=858**

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Use recycling collection	63%	60%	43%	75%
King County curbside collection	30%	30%	10%	31%
Non-County recycling	33%	30%	34%	44%
Throw them away	31%	34%	47%	17%
Other	3%	3%	6%	8%
<i>No response</i>	4%	3%	4%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Use recycling collection	66%	29%	41%	51%
King County curbside collection	26%	7%	17%	20%
Non-County recycling	40%	21%	23%	31%
Throw them away	22%	50%	46%	38%
Other	6%	21%	9%	7%
<i>No response</i>	6%	0%	4%	4%
Total	100%	100%	100%	100%

4.5 Materials Recycled

Table 14 shows the proportion of materials brought by generator type. Overall, 90% of the materials, by volume, came from residential customers, including 88% from single-family residences and 2% from multi-family residences. Recyclables from nonresidential loads accounted for 7% and mixed residential and nonresidential accounted for 3% of the total volume of recyclables delivered to the transfer stations.

The percentage of recyclables from the residential sector exceeded 85% at all facilities except for Houghton, where residential recyclables accounted for 79% of material recycled. The highest volume of nonresidential recyclables was found at Houghton (17%), followed by Skykomish (12%).

Table 14. Percent of Materials Brought by Residential & Nonresidential Customers (by volume)
April - May 2006 n=1,023

	Bow Lake	Cedar Falls	Enumclaw	Houghton
Residential				
Single-family residential	85%	93%	97%	79%
Multi-family residential	3%	0%	1%	2%
Mixed single-family & multifamily residential	0%	0%	0%	0%
Nonresidential	9%	6%	1%	17%
Mixed residential & nonresidential	2%	1%	2%	2%
Subtotal	100%	100%	100%	100%
<i>No response</i>	0%	0%	0%	0%
Total	100%	100%	100%	100%

	Renton	Skykomish	Vashon	Overall
Residential				
Single-family residential	86%	88%	84%	88%
Multi-family residential	3%	0%	3%	2%
Mixed single-family & multifamily residential	1%	0%	0%	0%
Nonresidential	8%	12%	8%	7%
Mixed residential & nonresidential	2%	1%	6%	3%
Subtotal	100%	100%	100%	100%
<i>No response</i>	0%	0%	0%	0%
Total	100%	100%	100%	100%

Appendix A – Recycling Survey Form

