

SURVEY OF ORANGE COUNTY SOLID WASTE CONVENIENCE CENTER USERS



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EXECUTIVE SUMMARY

Orange County Solid Waste Management (OCSWM) contracted with the H.W. Odum Institute for Research in Social Science at the University of North Carolina—Chapel Hill (Odum) to assist with the design and analysis of a survey of users of the County’s five Solid Waste Convenience Centers (SWCCs). The primary purpose was to collect data with which to apportion the usage of the SWCCs into two parts: usage by residents who live in the incorporated areas of the county, and usage by residents who live outside the incorporated areas. Other information regarding recycling behavior and preferences was also collected. Odum statisticians worked with OCSWM staff to devise a sampling and data collection plan to provide a “snapshot” view of SWCC usage over a one week period for each site. OCSWM staff entered data from the collected surveys into an application provided by the Odum Institute, and Odum statisticians analyzed the data and wrote the report.

Across all days and sites, 89% of SWCC uses during the data collection period were made by customers who live outside town limits and 11% by customers residing within town limits. Eubanks Road SWCC received 30% of its uses by in-town residents. The other four SWCCs were used almost exclusively by residents outside town limits, with 4% or less attributable to in-town customers.

Forty-eight percent of surveyed customers reported having access to curbside recycling services. Of these, 51% were nonetheless recycling at the SWCC the day they were surveyed, most often because they were coming to the SWCC anyway to drop off trash or other items. Of the customers who reported not having access to curbside recycling, 62% indicated that if they did have it, they would use it. For both groups, reasons for not using (or wanting) curbside recycling primarily had to do with the SWCC being more convenient, often because they have to drop off trash anyway or because they have a long driveway or other reason that maneuvering recyclables to the curb is difficult.

Thirty-two percent of surveyed customers report using a SWCC more than once a week, and 39% do so about once a week, meaning that (taking into account rounding) nearly 72% of SWCC customers visit at least weekly.

INTRODUCTION

Orange County Solid Waste Management (OCSWM) contracted with the H.W. Odum Institute for Research in Social Science at the University of North Carolina—Chapel Hill (Odum) to assist with the design and analysis of a survey of users of the County’s five Solid Waste Convenience Centers (SWCCs). The primary purpose of the survey was to collect data with which to apportion the usage of the SWCCs into two parts: usage by residents who live in the incorporated areas of the county, and usage by residents who live outside the incorporated areas. Information about recycling behavior and preferences was also collected. Odum statisticians worked with OCSWM staff to devise a sampling and data collection plan to provide a “snapshot” view of SWCC usage for a finite time period. OCSWM staff chose a time period that was free of holidays or other events that might cause aberrations in SWCC usage, and implemented the data collection plan. OCSWM staff entered data from the collected surveys into an application provided by the Odum Institute, and Odum statisticians analyzed the data and wrote this report.

METHOD OVERVIEW

The following sections describe the survey instrument, sample design, and data collection procedures for the survey.

SURVEY INSTRUMENT

OCSWM staff drafted the questions to be asked in the survey. Odum reviewed the draft for adherence to best practices in survey methodology (clarity, unbiased wording, completeness of response categories, etc.) and provided assistance with forms design. A copy of the questionnaire is included as Appendix A.

IN/OUT OF TOWN LIMITS

The first and most important survey question asked the customer “Do you live within the town limits of one of the towns?” Though seemingly a straightforward question, a significant number of Orange county residents do not know whether they live inside town limits. Therefore the survey form itself and the training of the data collectors focused on additional questions and techniques to confirm/clarify the customer’s response.

The first clarification question asked whether the customer has curbside recycling available to them. Unless they live in an apartment, the answer should be “yes” for all customers who live in the incorporated areas; if it was not, the data collector was trained to delve further by asking the customer’s street name and consulting a list of street names in the incorporated areas in

order to make a final determination of whether that customer should be recorded as living inside or outside the incorporated areas.

A second clarification question was asked of customers who reported having access to curbside recycling. The survey asked the nature of their recycling container—whether they had an orange bin or a blue rolling cart, and if a rolling cart, the color of its lid. Since the orange bins are used only by the rural recycling program, this was an indicator that the customer likely did **not** live inside town limits, and if this contradicted their earlier response, data collectors were trained to use the street name method. Similarly, blue rolling carts used in the incorporated areas have blue lids, while the newly distributed rolling carts in the rural areas have black lids, and this distinction provided an additional check and opportunity for verification/clarification of the customer’s initial response.

Through these clarification questions and careful training of data collectors, OCSWM staff made every effort to ensure that the final answer recorded on each survey form properly characterized the customer’s residence as being inside or outside the incorporated areas of the county.

ADDITIONAL SURVEY TOPICS

The survey contained questions on three additional topics relevant to SWCC usage. Customers who reported that they do **not** currently have access to curbside recycling services were asked whether, if they had such service, they thought they would use it, and if not, why not. Customers who reported having access to curbside recycling were asked whether they had brought recycling to the SWCC that day, and if so, why. Finally, all customers were asked how often they typically use any of the SWCCs.

SAMPLE DESIGN

The unit of analysis for this survey is the instance of use of a SWCC. The survey was designed to estimate the proportion of usage (not users) of the SWCCs attributed to persons living inside town limits and outside them. This proportion is inherently variable on any given day, depending on which users happen to come to the SWCC that day. The survey was designed to take a “snapshot” of the usage of each SWCC over a one week period. A one week period was chosen for two primary reasons: usage rates vary by day of week (making one week the shortest meaningful period), and the need to avoid undue burden on the public. Since the unit of analysis was the instance of use, every time a customer entered the SWCC, that instance of use was eligible for the survey. There could be no “skipping over” customers who already responded to the survey, as this would bias the estimates of usage. OCSWM staff suspected (and it is confirmed by the survey data), that most SWCC users come to the site once a week or

more. A data collection period longer than one week would result in a large number of customers being asked to do the survey a second, third, or even fourth time. Cooperation rates would be expected to be poor in such situations, which would lead to missing data that could potentially bias the survey results. Further, given that most customers use the SWCC at least once a week, no new information would likely have been gleaned by a longer data collection period: in expectation, since most users come to the SWCC once a week or more, one week is the same as any other week, provided no holidays or severe weather situations cause unusual aberrations.

Having identified one week as the appropriate period of data collection, we turned our attention to how customers would be selected for the survey. In order to make proper usage estimates, we would either need to survey every single customer (infeasible given the large numbers of customers entering the site in a very short period of time at some SWCCs), or we needed a scientifically rigorous way to select customers—a random probability sample. In a random probability sample, every element of the target population (instance of use of an SWCC, in this case) must have a known probability of being selected into the sample. For the SWCC survey, the way to implement this would be to “count cars” as customers entered the site, and to systematically survey every “nth” customer. The “n” needed to be a number that generated sufficient surveys for a reliable survey estimate, but also one that the data collection staff could feasibly implement. We estimated that it would take 2-3 minutes for the data collector to follow a selected customer to their stopping point, wait for them to get out of the vehicle, and then administer the survey. At some sites at some hours, several vehicles may enter the SWCC during that 2-3 minutes when one data collector was unavailable. Through discussion with OCSWM staff, it was determined that data collection staff could reliably survey every 5th customer at most SWCCs on most days. The exceptions were Eubanks Road and Walnut Grove Church Road sites on the weekend days when these sites receive heavy usage. For those sites on those days, a sampling rate of every 15th customer was planned. These sampling ratios were expected to yield sufficient surveys for reliable estimation of the parameters of interest.

DATA COLLECTION

OCSWM staff hired, trained and supervised the data collectors. Surveys were conducted at the Eubanks Road and Walnut Grove Church Road SWCCs for the one-week period spanning Thursday, January 22 to Tuesday, January 27, 2015. (All SWCCs are closed on Wednesdays). Surveys were conducted at Ferguson Road, Bradshaw Quarry Road, and High Rock Road SWCCs on Friday, January 30 through Sunday, February 1 and on Tuesday, February 3—a period encompassing all operating days in a one week period for these centers, since they are closed on Mondays, Wednesdays and Thursdays.

Paper surveys were used. When the data collector was unable to obtain a completed survey from the sampled customer, he/she attempted to survey the next customer instead. Situations requiring this type of substitution included customers who did not speak English, refused to participate in the survey, or did not live in Orange County. Substitution was discouraged and data collectors were trained to be persistent and try to get at least the key piece of information from the sampled customer. A survey was deemed “complete enough” if the data collector was able to ascertain whether or not the customer lives inside town limits; substitutes were not sought in situations where this information was determined, even if the respondent was unable or unwilling to answer the remainder of the survey questions. The number of substitutions at all sites was low, ranging from 0 to a maximum of 3 per site per day.

In total, 1,335 surveys were completed during the 2 week data collection period. The number of surveys completed at each site by day of week is shown in Table 1.

Table 1. Number of Surveys Completed by Site and Day

	Monday	Tuesday	Thursday	Friday	Saturday	Sunday	Total
Bradshaw Qu.		31		27	37	31	126
Eubanks	70	86	88	73	35	24	376
Ferguson		55		44	65	61	225
High Rock		59		49	75	20	203
Walnut Grove	76	92	86	83	38	30	405
Total	146	323	174	276	250	166	1,335

OCSWM staff reviewed the survey forms and keyed the data into an online data entry program provided by the Odum Institute. Only six forms had to be omitted due to data collector error making it unclear whether the customer lived inside or outside town limits; all other forms were of good quality.

WEIGHTING

Data collectors recorded the total number of customers who entered each site each day of data collection. These totals allowed us to generate precise weights for each survey date and site. The weight was generated simply by dividing the total number of uses for the day/site by the number of surveys completed for that day/site. Due to good fidelity to prescribed data collection procedures, the weights varied little from the expected values based on the sampling design—that is, a weight of “5” for surveys at most days/sites and “15” for Eubanks Rd and Walnut Grove Church Rd on Saturday and Sunday. One exception was that the Bradshaw

Quarry Rd SWCC was intended to be sampled at a 1 in 5 rate on Sunday, but data collectors mistakenly implemented a 1 in 15 procedure. Thus, fewer surveys were collected for Bradshaw Quarry Rd on that date than were expected and we were required to use the higher weight for that date/site.

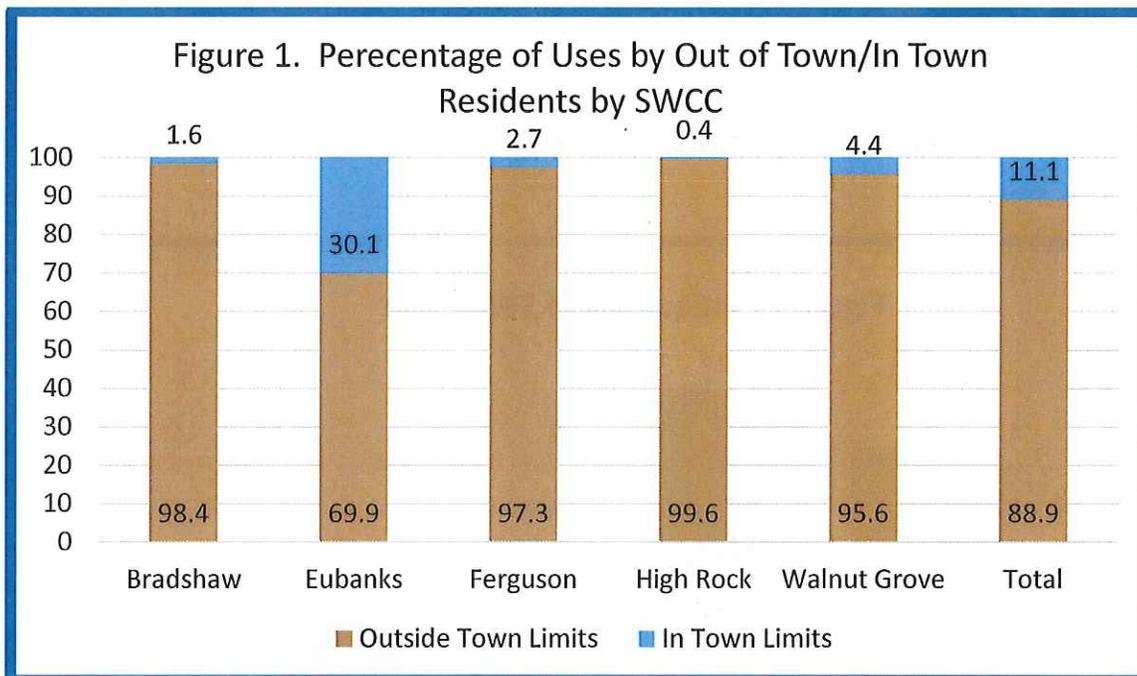
Weight calculation and data analysis were conducted in SAS Version 9.3.

RESULTS

All results are weighted as described above. Appendix B provides 95% confidence intervals for each estimate. Here we present point estimates.

IN/OUT OF TOWN LIMITS

Across all days and sites, 89% of SWCC uses during the data collection period were made by customers who live outside town limits and 11% by customers residing within town limits. Usage by individual SWCC is shown in Figure 1. Four of the sites were used almost exclusively by residents outside town limits. Only the Eubanks Road site received more than 5% of its uses by customers residing inside town limits.



Most of the customers who reported living inside town limits reside in Chapel Hill. Chapel Hill accounted for 54% of in town customers, while Carrboro accounted for 26% and Hillsborough for 20%. No customers reported being from the incorporated area of Mebane lying within Orange County.

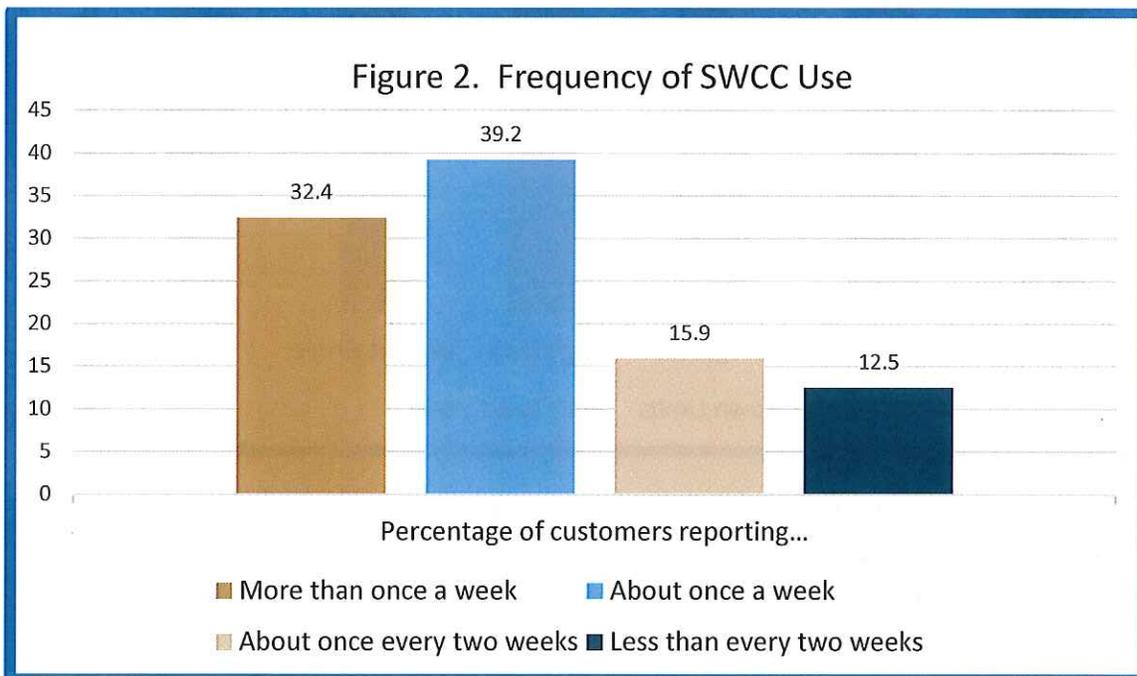
CURBSIDE RECYCLING

Forty-eight percent of customers during the data collection reported having access to curbside recycling services. Of these, 51% were nonetheless recycling at the SWCC the day they were surveyed. When asked why, 66% said it was because they were coming to the SWCC anyway to drop off trash or other items, 10% said it was because their recycling containers were full before their curbside collection day, 1% said they missed their regular curbside collection day, and 22% said they had “other” reasons. Almost all the “other” reasons reflected a stated or implicit belief that the SWCC is more convenient, either because the customer has a long driveway, finds it difficult to maneuver a rolling cart to their curb, or for some other unspecified reason finds the SWCC more convenient.

Customers who reported not having access to curbside recycling were asked whether, if they had it, they thought they would use it. Sixty-two percent said yes. The reasons given by those who said they would not use it focused primarily on convenience—that they were coming to the SWCC anyway to deposit trash, that they have a long driveway, that the SWCC is just “more convenient” or they prefer to do it the way they always have.

FREQUENCY OF SWCC USE

Most surveyed customers (72%) reported using a SWCC at least once a week. Figure 2 displays responses for this item



CONCLUSION

The Orange County SWCC survey used rigorous statistical methods and accepted weighting and analysis procedures to derive estimates of SWCC usage by customers residing inside and outside town limits. In addition, it provided useful information about recycling habits and preferences of Orange County residents. While these results accurately portray the nature of SWCC usage during the January 22 – February 3, 2015 data collection period, readers are cautioned that the survey provides a snapshot into this single period of time and should not be treated as a forecast for the future. Many factors both within the SWCCs themselves and in the environment they operate in could change usage patterns over time, such as influx and geolocation of new residents and developments, changes to curbside recycling programs, changes to operating hours or services available at the SWCCs, seasonal variations, or physical improvements/modernization of the SWCC(s), to name just a few. Nonetheless, the “snapshot in time” provided by this survey provides useful information to the County and the public as they consider how future solid waste management plans may both impact and be impacted by the SWCCs.

Appendix A. Questionnaire

SOLID WASTE CONVENIENCE CENTER SURVEY

PRINT CLEARLY!

Center Location: _____ Day of Week: _____ Date: _____ Click # _____ Initials: _____

1. Do you live within the town limits of one of the towns?

- _____ Yes → **Which one?** _____ Carrboro _____ Chapel Hill _____ Hillsborough _____ Mebane
- _____ No, outside town limits
- _____ Uncertain/Can't Determine → What street do you live on? _____

2. Do you have access to curbside recycling services?

_____ **YES**



_____ **NO** because "outside town limits" in Q1
Continue with Q5 below.

3. Do you have an orange bin or a blue rolling cart?

_____ Orange bin (may have other color bins-just check orange)
Q1 should be "outside limits." If not, record street name.

_____ Blue cart → **Does it have a blue lid or black lid?**

_____ Blue lid (weekly collection)
Q1 should be "inside limits." If not, record street name.

_____ Black lid (every other week and NEW!)
Q1 should be "outside limits." If not, record street name.

_____ Neither or don't know type of container

4. Are you recycling here today?

_____ Yes → **Since you have access to curbside recycling, why did you bring recycling here?**

- _____ Coming here anyway to drop off trash or other items
- _____ Recycling containers were full before my curbside collection day
- _____ Missed my regular curbside day
- _____ Other: _____

_____ Not recycling today



_____ **NO** because in apartment. Skip to Q6 at bottom

5. If you had access to curbside recycling, do you think you would use it

_____ Yes → Skip to Q6 at bottom

_____ No → **Why not?**

CONTINUE WITH Q6



6. How often do you typically use any of the convenience centers? Is it...

- _____ More than once a week,
- _____ About once a week,
- _____ About every two weeks, or
- _____ Less than every two weeks?

Surveyor Notes: _____

Appendix B. Weighted point estimates with 95% confidence intervals

Confidence intervals are indicators of the precision of the survey estimates, taking into account sampling and weighting. The confidence interval can be interpreted as “If we drew 100 independent samples of the target population, in expectation 95 times the result we would get would be within this interval.”

Variable	Response	Percent (95% Confidence Interval)
Do you live within the town limits of one of the towns? (If Uncertain/Can't Determine is marked,... (n=1335))	Yes	11.09 (9.36-12.82)
	No, outside town limits	88.91 (87.18-90.64)
Do you live within the town limits of... (n=128)	Carrboro	25.70 (17.20-34.21)
	Chapel Hill	54.31 (45.59-63.03)
	Hillsborough	19.99 (15.94-24.03)
Do you have access to curbside recycling services? (n=1305)	Yes	47.61 (45.17-50.05)
	No because outside town limits	51.20 (48.77-53.63)
	No because in apartment	1.19 (0.49-1.90)
Are you recycling here today? (n=600)	Yes	50.96 (47.00-54.91)
	Not recycling today	49.04 (45.09-53.00)
Since you have access to curbside recycling, why did you bring recycling here? (n=277)	Coming here anyway to drop off trash or other items	66.42 (60.36-72.49)
	Recycling containers were full before my curbside collection day	9.89 (6.29-13.50)
	Missed my regular curbside day	1.47 (0.31-2.63)
	Other, specify:	22.21 (16.53-27.90)
If you had access to curbside recycling, do you think you would use it? (n=659)	Yes	62.02 (58.22-65.82)
	No	37.98 (34.18-41.78)
How often do you typically use any of the convenience centers? Is it... (n=1317)	More than once a week	32.38 (29.85-34.91)
	About once a week	39.21 (36.44-41.99)
	About once every two weeks	15.88 (13.74-18.02)
	Less than every two weeks	12.52 (10.67-14.38)

Center location	Response	Percent (95% Confidence Interval)
Bradshaw Quarry	Yes	1.60 (0.00-3.61)
Bradshaw Quarry	No, outside town limits	98.40 (96.39-100.0)
Eubanks	Yes	30.14 (25.00-35.28)
Eubanks	No, outside town limits	69.86 (64.72-75.00)
Ferguson Rd	Yes	2.71 (0.78-4.64)
Ferguson Rd	No, outside town limits	97.29 (95.36-99.22)
High Rock Rd	Yes	0.41 (0.00-1.12)
High Rock Rd	No, outside town limits	99.59 (98.88-100.0)
Walnut Grove Ch Rd	Yes	4.44 (2.27-6.60)
Walnut Grove Ch Rd	No, outside town limits	95.56 (93.40-97.73)

The Odum Institute

The Odum Institute for Research in Social Science was founded in 1924 by Howard Washington Odum, making it the oldest university-based interdisciplinary social science research institute in the United States. We provide education, training, data collection, and archive services to researchers both within and beyond UNC—Chapel Hill. Our mission is to facilitate scientifically rigorous social science research that contributes to better lives for the citizens of North Carolina and the world.

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