

City of Fitchburg

2009 Waste Sort Results Report



<http://www.eeinwisconsin.org/net/org/info.aspx?s=67481.0.0.2209>



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Introduction

This report outlines the results of a solid waste and recycling sort for single family residences in the City of Fitchburg. Pellitteri Waste Systems collected refuse and recycling from forty houses at random on June 24th, 2009.

Study Objectives

1999 FITCHBURG WASTE AND RECYCLE CHARACTERIZATION STUDY OBJECTIVES

In 1999, Fitchburg hired Recycle Worlds Consulting to oversee a characterization study to answer two major objectives:

1. Assess how well Fitchburg was succeeding at diverting recyclables from the landfill.
2. Highlight areas where Fitchburg's refuse and recycling program might be expanded upon.

Conclusions from the 1999 study included:

1. Especially high diversion rates were noticed for newspaper and metal and glass containers, however, improvements were needed to in the categories of corrugated cardboard and plastic bottles.
2. The next frontier lies in the recycling or reuse of foodwaste, which constituted 24% of the waste stream to the landfill.

2009 STUDY OBJECTIVES

This study was conducted to expand on the 1999 results and see if any improvements or setbacks have occurred since then.

2009 Study Design

Tim Bolhuis and Rick Eilertson jointly organized this year's sort to incorporate previous as well as new methods. By closely following the 1999 study, a comparison could be reached on Fitchburg's refuse and recycling trends from 1999 to 2009.



SAMPLE SIZE

Due to a limit of funds, both studies required a restricted sample size. According to the Wisconsin Department of Administration, Fitchburg had an estimated population of 23,420 citizens in 2008. For a clear representation of the Fitchburg area, the following subdivisions were chosen to most accurately characterize Fitchburg's refuse and recycling practices: Lacy Heights, Seminole Ridge, Tower Hill, and Wildwood. As shown below in *Table 1: 2009 Fitchburg Housing Breakdown*, Fitchburg is primarily composed of single family residences. The forty sample homes chosen in the selected subdivisions all were single family residences.

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Type of dwelling	Number of dwelling units	Percent (%)
Single family residency	4,456	78.59
Condominiums	495	8.73
Apartment Buildings	356	6.28
Duplexes	248	4.37
Trailers	47	0.83
Assisted Living Facilities	3	0.05
Correctional Facilities	65	1.15
Total	5,670	100

* As of July 21, 2009 from Fitchburg's Planning and Zoning Department.

The forty homes selected at random by Pellitteri Waste Systems all included a refuse and recycling cart that were set out on the Wednesday collection date. The goal was to collect 1,000 pounds of each category. From Pellitteri's past data, refuse has been averaging 24-25 pounds per home with the 10,800 plus homes serviced in Dane County. Pellitteri chose recyclables from the same homes to assist in providing an accurate recycling rate. The study involved only single family residence and thus, may not provide an accurate representation for other dwelling types. Note the recycling carts are only collected by Pellitteri every other week while refuse carts are collected weekly. In 2009, Fitchburg offered brush collection sixteen times a year and yard waste collection four times a year. Neither brush nor yard waste collection were included in this study.

STUDY DIFFERENCES

A few differences in the studies configuration included a greater range of sort categories and housing subdivisions. Twenty-five categories were created for the refuse and recycling streams versus twenty-two categories in 1999. *Table 2 of page 8* displays how the refuse and recycling stream categories were separated. The previous study did not include the Seminole Ridge subdivision. With the change in refuse trucks, the sorting involved one recycling and one refuse pile. A total of 935 pounds of material from 40 recycling carts and 981 pounds of material from the 40 refuse carts were collected. In 1999 using random selections, stakes divided the "bread loaf" or refuse and recycling piles into approximately 8 cells, 3 feet by 3 feet by 3 feet for the waste stream, and slightly larger for the container stream and slightly smaller for the paper stream. This method was used to approximate a volume for the density of material with an intended weight of 200-300 pounds. The average weight of the waste samples was 204.2 pounds, paper at 141.5 pounds, and containers at 118.6 pounds.



Refuse Pile surrounded by carts.

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DIVERSION AND RECYCLING RATES

The differences in diversion rate and recycling rate are differentiated by the Environmental Protection Agency (EPA) as follows. The recycling rate is the total amount of Municipal Solid Waste (MSW) recycled divided by the total amount of MSW generated where the MSW generated equals the amount of recycled MSW plus the amount of disposed MSW. Whereas the diversion rate, measures the total amount of material diverted from MSW disposal facilities, and also includes brush and yardwaste in the numerator and denominator. Thus during winter months when no brush or yard waste is collected the recycling rates and diversion rates are equal. During spring to fall, diversion rates may rise considerably while recycling rates are generally stable. Both the diversion and recycling rates are calculated in Table 2 of page 8. The capture rate is defined as the percentage of recyclable collected for recycling divided by the total amount of recyclables generated. Ideally, Fitchburg is aiming for a 100 percent capture rate and non-recyclables a 0 percent capture rate.

The Collection

Pellitteri used a Volvo chassis with a Heil packer to collect the forty refuse and forty recycling carts from the randomized homes on June 24th between 7:20 and 8:45 AM. The selected homes in the Lacy Heights, Seminole Ridge, Tower Hill, and Wildwood subdivisions were informed of their participation in the sort with a half sheet note. The sheet was placed on each of the recycling carts after the refuse cart was collected. This measure was implemented to ensure residents did not remove recycling carts before the Pellitteri crew returned for the carts. The material was then delivered to Fitchburg's Public Works salt shed at 2373 S. Fish Hatchery Rd.



The Sort

DAY

The sort took place on June 24, 2009 from approximately 1 to 5:30 PM. Volunteers finished final sorting on June 25th. The mean temperature for the day was 79°F with a dew point of 68°F. Twelve volunteers assisted with the sort from the Department of Natural Resources, Pellitteri Waste Systems, Resource Conservation Commission, and City Staff members. The sort was covered by Fitchburg Access Cable Television (FACTv) which included interviews with the volunteers, Pellitteri staff, and City Staff. FACTv is Fitchburg's Public, Educational, and Government TV resource on Channels 95, 97 and 98 Analog as well as 985, 986, 987 in Fitchburg. The coverage was aired on July 14th and July 21st at 4PM. Copies of the sort video are available upon request from the FACTv office for a small fee.

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RANDOM SELECTION



Pellitteri Waste Systems sent one collection truck to gather first refuse and later recycling items in independent loads. The neighborhoods sampled are believed to represent an accurate representation of Fitchburg's single family residence. The collection gathered a total of 935 pounds of material from 40 recycling carts and 981 pounds of material from the 40 refuse carts.

SORTING

The material was placed on the Public Works salt shed floor (2373 S. Fish Hatchery Rd) surrounded by the twenty-five designated containers. Rick Eilertson and Tim Bolhuis gave a brief overview of the project and procedure to the volunteers. The twelve volunteers sorted the material into the appropriate carts for measurement. The weight and volume was then recorded for statistical analysis as displayed in *Table 2*.



Observations

The largest components of the refuse stream were “food waste” (~27% by weight) and “contaminated mixed paper” (~15% by weight). “Food waste” includes fruits, vegetables, grains, meats, fats, and bones. “Contaminated mixed paper” includes soiled napkins, pizza boxes, and other paper items that had too much food waste, dirt, or debris on them to be recyclable back into paper products. Fitchburg and Pellitteri are currently researching options for diverting these items from the landfill including organic composting and/or anaerobic digestion. The amount of plastic film (bags) in both the recyclables (2.1% by weight, 4.7% by volume) and refuse (7.1% by weight, 23.6% by volume) was also significant.



Recycling pile

The recycling rate (~33% by weight) derived from the forty homes collected in this study correlates well with the average recycling rate from all homes collected so far in 2009 (~34% by weight) by Pellitteri.

This study shows that if residents actually recycled all of the potentially recyclable items, they could achieve up to a **48%** (by weight) recycling rate.

Additionally, if residents were able to implement reuse or recycling through all the available options (e.g.: per recommendation of the Fitchburg Recycling

Guide at: http://www.city.fitchburg.wi.us/refuse_recycling/documents/2009-11RecyclingGuide2009-04-01.pdf) the potential diversion rate from the landfill could be raised up to **87%**!

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Statistical Comparison between the 1999 and 2009 Sorts

The term 'diversion rate' is referenced throughout the 1999 sort. One may note the 2009 sort includes a diversion rate and recycling rate. The method in 1999 to calculate diversion rate is effectively the equivalent of the 2009 term recycling rate. In 1999 the recycling rate was 37.1% while 2009 revealed a 32.3% recycling rate. Another record tracked by Fitchburg's Public Works department collects recycling rate via monthly reports from the City's hauler. The 1999 recycling rate was averaged at 35.9% while 2009 to date is 32.8%. The data range for 1999 includes percentages from 32-39.1%.

Recommended Actions

Food Waste: The 1999 and 2009 Waste Sorts indicated a large percent of food waste by weight in the refuse pile. Option 1: Continue encouraging residents to install home composting bins for food waste. Pros: minimizes transportation and staff costs; Cons: Doesn't address meats, fats, bones. Option 2: Evaluate alternatives for residential curbside food waste collection pilot study. The bins could consist of a five gallon bucket collected weekly. Option 2a could involve anaerobic digestion with the Madison Metropolitan Sewerage District (MMSD). MMSD would collect the methane from the anaerobic decomposition process that can be burned to create energy. Pros: addresses meats, fats, bones, captures methane for energy use; Cons: potentially high transportation and staff costs. Option 2b could be an aerobic composting process with Second Season Recycling, LLC. Pros: addresses meats, fats, bones; Cons: potentially high transportation and staff costs, carbon dioxide and other greenhouse gasses are released and not captured for energy use.

Plastic film (bags): The City could consider implementing an ordinance to reduce the amount of plastic bags in the recycling and refuse streams along with enhanced education to residents of better available options.

Improving Recycling Capture Rate: Fitchburg would ideally like to achieve a 100 percent recycling capture rate. In order to approach such a rate, an increase in the education of recyclable materials and outlets is essential. For example below are possible stickers that could be placed on the recycling carts. The sticker would serve as a continual reminder to residents of proper recycling techniques in order to create a greater capture rate.



Examples of stickers for recycling carts

**Table 2: City of Fitchburg
June 24, 2009 Waste Sort - Refuse & Recycling Data**

	Recycling Stream					Refuse Stream					Capture Rate
	Weight (lbs)	Volume (gallons)	Weight/Vol (lb/gal)	% by Weight	% by Volume	Weight (lbs)	Volume (gallons)	Weight/Vol (lb/gal)	% by Weight	% by Volume	% by Weight
OCC (Old Corr. Cardboard)	134.5	535	0.25	14.39%	29.57%	61.0	370	0.16	6.22%	24.24%	69%
Newspapers	246.0	245	1.00	26.32%	13.54%	17.0	30	0.57	1.73%	1.97%	94%
Magazines & Catalogs	106.0	50	2.12	11.34%	2.76%	10.5	15	0.70	1.07%	0.98%	91%
White Office Paper	30.0	45	0.67	3.21%	2.49%	43.0	40	1.08	4.38%	2.62%	41%
Cont. Mixed Paper	10.0	85	0.12	1.07%	4.70%	144.5	132	1.09	14.73%	8.65%	6%
Uncont. Mixed Paper	98.0	115	0.85	10.49%	6.36%	18.0	75	0.24	1.83%	4.91%	84%
Plastic # 1 PETE	25.0	130	0.19	2.68%	7.19%	18.5	48	0.39	1.89%	3.14%	57%
Plastic # 2 HDPE	29.5	125	0.24	3.16%	6.91%	7.0	15	0.47	0.71%	0.98%	81%
Plastic # 3 PVC, #4 LDPE, & #7 Other Resin	19.5	50	0.39	2.09%	2.76%	4.0	14	0.29	0.41%	0.92%	83%
Plastic # 5 Polypropylene	9.0	50	0.18	0.96%	2.76%	1.0	5	0.20	0.10%	0.33%	90%
Plastic # 6 PS	2.0	25	0.08	0.21%	1.38%	0.5	6	0.08	0.05%	0.39%	80%
Plastic # 6 Block PS (Exp. Foam)	0.5	8	0.06	0.05%	0.44%	2.5	38	0.07	0.25%	2.49%	17%
Plastic film (bags)	19.5	85	0.23	2.09%	4.70%	69.5	360	0.19	7.08%	23.58%	22%
Bulk Plastic (Toys, furniture, etc.)	1.5	1	1.50	0.16%	0.06%	0.0	0		0.00%	0.00%	100%
Tin	19.5	30	0.65	2.09%	1.66%	2.5	15	0.17	0.25%	0.98%	89%
Aluminum	18.5	95	0.19	1.98%	5.25%	7.0	17	0.41	0.71%	1.11%	73%
Glass	127.0	70	1.81	13.59%	3.87%	39.0	16	2.44	3.98%	1.05%	77%
Scrap Metal	0.0	0		0.00%	0.00%	0.0	0		0.00%	0.00%	0%
Textiles, Clothing, Shoes	0.0	0		0.00%	0.00%	60.0	90	0.67	6.12%	5.90%	0%
Food Waste	0.0	0		0.00%	0.00%	268.5	55	4.88	27.37%	3.60%	0%
Brush	0.0	0		0.00%	0.00%	0.0	0		0.00%	0.00%	0%
Yardwaste	0.0	0		0.00%	0.00%	25.0	33	0.77	2.55%	2.13%	0%
Construction & Demolition Mat'l	0.0	0		0.00%	0.00%	2.5	4	0.63	0.25%	0.26%	0%
Pet Waste	0.0	0		0.00%	0.00%	13.0	9	1.44	1.33%	0.59%	0%
Non-Recyclables	38.5	65	0.59	4.12%	3.59%	166.5	140	1.19	16.97%	9.17%	19%
Totals	935	1,809	0.52	100.00%	100.00%	981.0	1527	0.64	100.00%	100.00%	49%
Recycling Rate 1/2 *Total Recyclables/(1/2 Total Recyclables + Total Refuse)											32.26%
Potential Recycling Rate											48.25%
Potential Diversion Rate											87.17%

Notes: OCC included cardboard, paperboard, and brown paper bags, Contaminated Mixed Paper included soiled napkins, pizza boxes, and other paper items that had too much food waste, dirt, or debris on them to be recyclable back into paper products. Plastics in the Refuse Stream: Weights and volumes of the #3, #4, #5, #6 (non-expanded PS), and #7 were initially grouped together. The weights and volumes of each component were later broken down based on estimates made by Rick Eilertson so that the weights and volumes could be correlated to the Recycling Stream. The Construction & Demolition Mat'l category initially had 50.5 lbs and 32 gallons included in it; however, since ~48 lbs and ~28 gallons of this category was treated lumber scraps and is virtually non-reusable and non-recyclable, Rick Eilertson decided to reallocate this amount to the "Non-Recyclables" categories.

References

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