2018 DPW Annual Residential Recycling Report

File 190514

Submitted July 12, 2019
Revised September 3, 2019

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Introduction and Commentary

After nearly a decade run of increases in recycling weights recovered from Milwaukee households, metrics have been steady the last few years. The 2018 curbside recycling collection program tonnage represents a sustained 15% increase in recycling tons compared to the program's low year of 2009. The overall landfill diversion rate was 25.7%, an increase of 0.4 percentage points over the year prior.

Turbulent market changes occurred in 2018 in large part due to changes affecting international markets. The Chinese government put into force import restrictions as well as increased quality parameters for recyclable commodities. Commodity prices are expected to stay lower in the near term until the market has more time to adjust to the changes in the industry. Costs to produce quality materials out of a Materials Recovery Facility have increased and many processing contracts nationally have been adjusted to reflect the new business model, just as the City of Milwaukee's contract was amended in 2019. The City of Milwaukee and its recycling partners in Waukesha County and private operator Republic Services are focused on producing and supplying quality recyclables to sustain and grow recycling through industry changes.

-Rick Meyers, Sanitation Services Manager, DPW Operations Division

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Resource Recovery Program Results

Recycling Results and Achievements

Materials Recovery Facility

Citywide in 2018, DPW collected just over 25,451 tons of residential recyclables, an increase of 26 tons over 2017. With a flattening of the tons collected, Milwaukee residents have sustained a 15% increase in recycling tons and 21% increase on a pounds per household basis compared to the program's lowest tonnage year of 2009.

Five-year results and comparisons from 2013-2018:

- Recycling tons ↑2.2%
- Recycling pounds per household ↑1.7%

Residents' participation in the household recycling program avoided over $1,112,000 in landfill disposal costs in 2018 and earned over $1.3 million in revenue from the sale of recyclables. Without including the cost of collection services, the City realized a savings of $56 per ton of materials recycled instead of sent to a landfill. The net benefit per ton decreased primarily due to lower market rates and revenue.

The City's residential landfill diversion rate was 25.7% in 2018, an increase of 0.4% over 2017.

Electronics Recycling

Over 2.5 million pounds of electronics were collected at Self-Help Drop Off Centers in 2018, the eighth full calendar year of the *E-Cycle Wisconsin* producer responsibility program that was created through state legislation in 2009. (See graph of e-scrap recycled 2008 – 2019, page 16.) This total represents an 11.4% decrease from 2017, the 2nd year of decreases after experiencing a decade of annual increases. This decrease can be contributed in large part to the expected, eventual decline of cathode ray tube (CRT) television sets brought to Drop Off Centers. 2018 collections translate to 4.2 pounds of electronics recycled per capita in the City of Milwaukee. Once considered "City dumps," DPW continues to diversify and expand recycling services at the Drop Off Centers to maintain high-functioning resource recovery parks.

Drop Off Center Recovery Programs

37% of the material managed through Drop Off Centers was diverted from landfills in 2018. The drop-off facilities allow residents to recycle, compost, or safely dispose of over a dozen material categories. Well over 200,000 visits are made to the Drop Off Centers every year and an additional 20,000 visits were made in 2018 over the previous year.

Recycled	Composted
• Antifreeze • Car batteries • Motor oil and filters • Tires (5 passenger tires per trip) • Appliances • Scrap Metal • Asphalt Shingles • Concrete • Electronics (3 TVs per trip) • Cooking oil • Shoes • Curbside recyclables • Large corrugated cardboard	• Brush and branches • Grass clippings • Garden debris • Leaves • Logs **Landfilled** • Construction and remodeling debris* • Old furniture and mattresses • Garbage *This material stream is routinely sent to a private construction & demolition debris processing facility for recovery of a large portion and landfill disposal of rest.

Organics Composting

Final compost product produced at Blue Ribbon Organics

The organics collection pilot program collected food and yard waste from 500 participating residents. Items are collected in a 65-gallon brown cart by a private hauler that was selected through a competitive RFP process. The average set out rate was 73% (percentage of people placing their cart out for collection).

The pilot program price has remained the same with residents paying $12.75 per month to cover the cost of service. DPW provides a $1 per-month participant credit to, in-part, recognize the cost savings from landfill diversion. DPW also covered the cost of the carts, education, and program recruitment. The program continues to see a low turnover rate primarily due to moving out of pilot zones. Contamination increased from 23 in 2017, 105 educational reminder tags in 2018. 17 carts were rejected due to contamination. The higher rates of contamination stemmed in part from litter in yard material and charcoal during summer months.

In 2018, the second full calendar year of the program, 373,540 pounds of material were collected, an increase of over 14,800 pounds from the previous year. The average pounds per household also increased to 780.

Compliance Enforcement

DPW sanitation inspectors conduct and the recycling office administers enforcement of the local recycling ordinances. These ordinances are required by Wisconsin state law requires these ordinances as well as the maintenance of a compliance enforcement plan. Throughout the enforcement process, education and guidance is offered to property owners to assist in the implementation and operation of recycling programs. Below is a summary of recycling enforcement activity by DPW in 2018.

Property Type	Written warnings	Citations	Fines and Late Fees
1-4 units residential	798	332	$16,150
5+ units residential	1	0	$0
Non-residential (business)	0	0	$0

Education and Outreach

Educational Classes

Recycling education to schoolchildren remains a strong component of the recycling outreach program and is maintained by an ongoing partnership between DPW and Keep Greater Milwaukee Beautiful (KGMB). 33 different schools in the City of Milwaukee participated in KGMB's educational programs and tours of Milwaukee's recycling facility. 1,824 students (an increase from 1,073 students in 2017) and 170 adults attended in 2018.

Students view the MRF during a KGMB class

Doors Open Milwaukee

For the fourth year, the Materials Recovery Facility (MRF) was a participating location in Doors Open Milwaukee. Over 500 visitors attended to learn about the City's recycling program and tour the facility, including over 400 attendees that did not have a pre-booked tour. Five advance-ticketed tours were provided, including one newly added Spanish-language tour in partnership with Core El Centro. The 34-person tours allow for a deeper tour of the MRF. All attendees viewed an introductory video inside the Keep Greater Milwaukee Beautiful space and those without a tour ticket were guided to the elevated education space inside the MRF to learn more from this viewing location.

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Recycling and Waste Reduction

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Don't Get Left Behind, Recycle Right Milwaukee!

Thank You Milwaukee, your efforts have generated over $1.8 million in revenue for the City to help offset the cost of municipal services in 2017. How? By being responsible and participating in the City of Milwaukee's recycling program. Not only that, but recycling in Milwaukee has diverted 25,340 tons from the landfill and avoided over $1.1 million in landfill disposal costs in 2017 alone. Together, we're achieving great things through recycling, but you can help us accomplish even more. Recent market trends have lowered the value of recyclables which makes it even more important to Recycle Right Milwaukee!

Following proper recycling practices means including only accepted recyclable materials in your recycling cart or bin. Trash and materials not specifically accepted for recycling belong in the garbage. By recycling right and reducing contamination in the recycling cart, we produce a cleaner stream of recyclable material that can be safely handled and correctly sorted at the City's Materials Recovery Facility (MRF). This in turn keeps costs down and helps produce quality material sold as feedstock to industries to recycle into new products and packaging. This provides benefits on an individual, community, and global scale.

How to Recycle Right:

• Know the Top 12

The Top 12 are the most commonly accepted recyclable items. Some of these items include aluminum cans, cardboard, paper, newspaper/magazines, and plastic bottles.

• Properly Prepare Recyclables for Collection

◦ Place items loose in carts

Recyclables should be loose in the recycling cart or bin. Items collected and left in plastic bags can be sorted incorrectly and mistakenly sent to landfill. Plastic bags get caught in moving gears and parts, causing costly downtime and risking equipment breakdown. Workers must halt operations several times a day so that they can cut these intrusions out of the intricate moving parts of the equipment.

◦ Breakdown cardboard boxes

Cardboard boxes should be broken down for collection and all Styrofoam and plastic bags should be removed and discarded. Styrofoam, plastic bags and plastic packaging are not recyclable through the Milwaukee MRF.

◦ Rinse all food residues from recyclable material

Clean aluminum bales are a result of Recycling Right and generate greater revenue for the City.

Avoid Recycling Wrong:

• Know the Dirty Dozen

The Dirty Dozen are the most common and damaging contaminants found in recycling carts. Some of these include plastic bags, tanglers, needles/sharps, scrap metal, hazardous chemicals,

2018 Fall Mailer front page

Recycle for Good Fall Mailer

DPW utilized its annual Recycling and Waste Reduction fall mailer to educate residents on the importance of recycling the right materials to help produce a clean recycling stream. The featured article discussed the City's partnership with the Associated Recyclers of Wisconsin (AROW) on the Recycle Right campaign. The campaign aims to reboot recycling by empowering citizens to be the solution to recycling challenges. Included were tips on how to recycle right and common mistakes to avoid.

The mailer included a new image illustrating common items that should be recycled, donated, composted, taken to drop offs, or treated as hazardous waste. Additional content included brush and fall leaf collection, seasonal

recycling dates, information on scheduling tours at the MRF, items that create fire hazards at the MRF, and some 2017 "at a glance" recycling statistics. DPW's annual fall mailer is available online at www.MilwaukeeRecycles.com in the "Media Room" under "Resources".

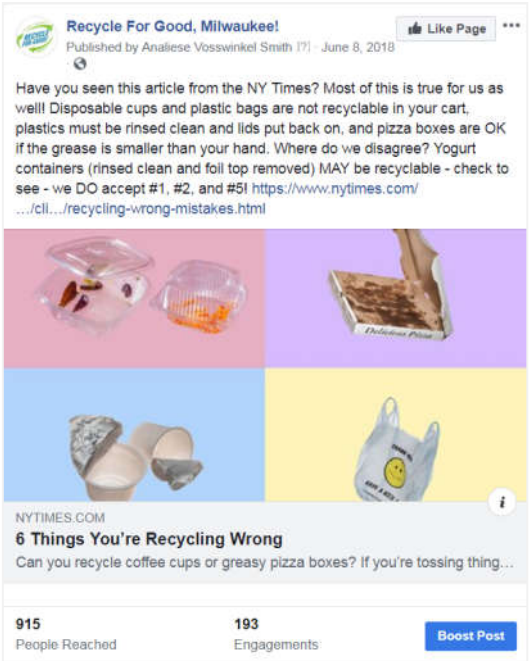
Press Releases

Press releases and e-blasts highlighted various waste reduction, reuse, and recycling topics including the following:

- Composting Christmas trees through the City's Drop Off Centers
- Winter collection rules
- Electronics recycling guidelines
- Earth Day Celebrations including free recycling tours and online events
- Organics Pilot study year 1 results
- Compost bin and rain barrel sale promotion & organics pilot collection schedule changes
- Reminders about curbside recycling including keeping recyclables loose in bins and tips on properly disposing of hangers

Social Media

The @MilwaukeeRecycles Facebook page had 849 followers as of December 31, 2018, an increase of 16% that year. Regular posts included recycling tips, news, and special event advertising. 2018 posts collectively reached an average of 193 individuals. "Reach" is the number of people who had the post enter their screen. Reach is most often increased when followers share Milwaukee Recycles content. Some of the highest reaching posts of 2018 included the following content:



Example of a 2018 Facebook post

1. NYTimes article share on "6 Things You're Recycling Wrong" - 915 lifetime reach to date

2. Report on Milwaukee's 1st year of the organics collection pilot study - 809 lifetime reach

3. Image of 400k recycling schedule tags ready for delivery - 798 lifetime reach

Milwaukee Recycles Website

The MilwaukeeRecycles.com homepage alone saw 29,882 pageviews in 2018. This site focuses on curbside recycling for City residents. Top pages of interest included recycling schedule look-up, the disposal and recycling database, recycling guidelines, electronics recycling, and the household collection navigation page.

2018 Compost Bin & Rain Barrel Sale

In 2018, DPW held its seventh compost bin and rain barrel sale to promote composting and rainwater harvesting at private residences. The sale was held at Estabrook Park for the 2nd year, providing a northern location as all sales prior to 2017 were held in southern locations. As first established in 2017, the sale used an online preordering system to minimize day-of purchases and allow for more organization prior to the sale start.

2018 Sale Flyer

Compost bins and rain barrels were offered at significant savings from regular retail prices. The sale resulted in 214 compost bins and 116 rain barrels purchased, an increase from 108 compost bins and 74 rain barrels sold the previous year. Compost tumblers, kitchen pail collectors, rodent screens, compost aerators, and an educational guide were also available for purchase.

MRF-Shed Harmonization Project and AROW Award

MRF-Shed Workshop at Retzer Nature Center

In 2018, the City of Milwaukee DPW and Waukesha County collaborated with The Recycling Partnership to co-host a "MRF-shed" workshop at the Retzer Nature Center in Waukesha. A MRF-shed is a group of communities that funnel material into the same MRF. Regional stakeholders including processors, haulers, local municipalities, community organizations, and the WI DNR officials gathered to discuss harmonization of recycling messaging across the parties to create consistent education, promote understanding, and reduce contamination in recycling streams.

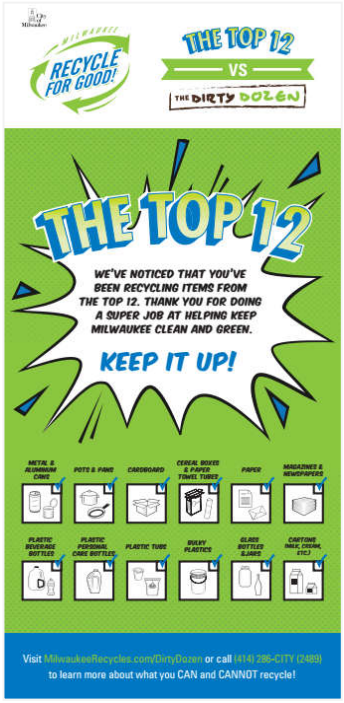
The effort demonstrated that when regional recycling efforts are coordinated and complementary, program participants are less confused and less likely to throw something in the cart that doesn't belong there. Eliminating contamination from the bin is particularly critical in today's recycling markets.

Stemming from the success of the program, the City of Milwaukee, Waukesha County, and The Recycling Partnership were invited to present their strategies for a U.S. EPA Sustainable Materials Management Web Academy webinar in October of that year.

In February of 2019, the City of Milwaukee and Waukesha County received The Associated Recyclers of Wisconsin (AROW) Award For Outstanding Achievement In Education for their work in 2018.

Cart Tagging Exercise

In the summer of 2018, sanitation staff and DPW summer youth interns experimented with an exercise aimed at lowering contamination in recycling carts. As part of the cart tagging exercise, prior to recycling pick up that day, individuals walked with a map of the neighborhood in a particular route. Participants marked if the recycling cart was set out for collection, then lifted lids to visually inspect materials. If the cart was full of accepted materials, the residents received a "thank you" tag showing accepted materials with a note of thanks and encouragement. If non-recyclable materials were found, an "oops" tag was left with a mark on the particular non-accepted items that were found to help educate. The inspectors returned on the next pick up day and performed the same exercise to determine if the educational tags helped to encourage recycling right. Four areas were identified for the tagging project and one area's findings are outlined below.



"Thank you" recycling tag

The tagging area below included 14 daily routes and 1,334 households. Two routes (highlighted in grey) are not included in the statistics below as they had one day during the tagging exercise when a large number of carts were not set out for review. Many of the included routes had slightly varying set out rates between their first and second checks, but their compliance percentages are based on those carts that were set out and available for review.

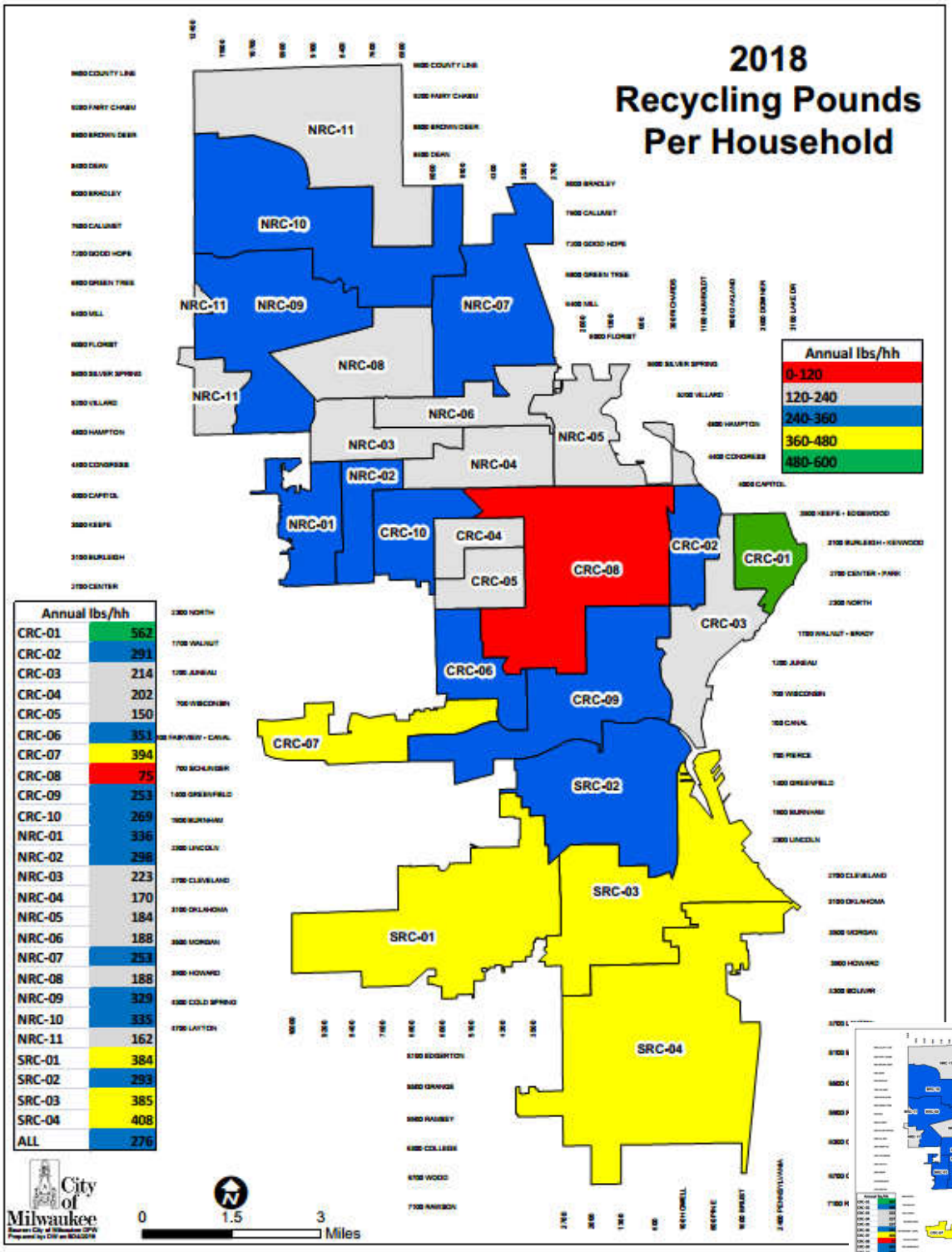
<u>Key Findings</u>

- **10/12 routes showed improved compliance after 1st tagging**
- 1/12 routes decreased from 100% compliance to 99% after tagging
- 1/12 routes remained the same (100% each visit)
- The average route compliance at 1st tagging was 89% with the lowest compliant route at 45% and two at 100%
- **After the 2nd tagging, average route compliance increased by 10% to 99%**

# of households	1 Compliance %	2 Compliance %	Compliance % Increase
89	96%	100%	4%
83	88%	100%	12%
96	98%	No set out	-
97	84%	99%	15%
100	95%	99%	4%
77	86%	100%	14%
108	98%	100%	2%
71	92%	99%	7%
106	99%	100%	1%
106	100%	99%	-1%
99	71%	96%	25%
86	No set out	100%	-
108	100%	100%	0%
108	45%	100%	55%

Additional References

Recycling Pounds Per Household



Annual lbs/hh	
CRC-01	562
CRC-02	291
CRC-03	214
CRC-04	202
CRC-05	150
CRC-06	351
CRC-07	394
CRC-08	75
CRC-09	253
CRC-10	269
NRC-01	336
NRC-02	298
NRC-03	223
NRC-04	170
NRC-05	184
NRC-06	188
NRC-07	253
NRC-08	188
NRC-09	329
NRC-10	335
NRC-11	162
SRC-01	384
SRC-02	293
SRC-03	385
SRC-04	408
ALL	276

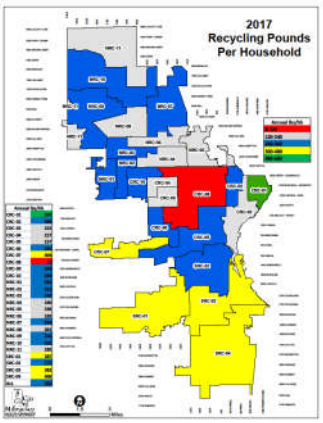


Table 1: Residential Tons Collected

	2017	2018	Change Tons	Change Percent
Recycling Materials - household				
Combined Paper	11,123	10,853	-270	-2.4%
Corrugated Cardboard	3,788	4,405	617	16.3%
Aluminum Cans	304	254	-50	-16.4%
Steel Cans	571	622	51	8.9%
Scrap Metal	301	287	-14	-4.6%
Glass Containers	6,286	6,388	103	1.6%
Plastic Containers	3,053	2,641	-412	-13.5%
Subtotal	25,426	25,452	26	**0.1%**
Recycling Materials - other residential*				
Appliances with Refrigerants	173	165	-8	-4.6%
Lead Acid Batteries	15	13	-2	-13.3%
Waste Tires	722	920	198	27.4%
Waste Oil	162	142	-20	-12.3%
Electronics	1,425	1,262	-163	-11.4%
Scrap Metal	986	960	-26	-2.6%
Miscellaneous	60	48	-12	-20.0%
Subtotal	3,543	3,510	-33	**-0.9%**
Yard Waste & Organics				
Subtotal	32,249	33,272	1,023	**3.2%**
Total Diverted	61,218	62,234	1,016	**1.7%**
Household Solid Waste				
Cart collection (1-4 unit HHs)	158,553	157,817	-736	-0.5%
Dumpster service (>4 unit HH)	13,092	12,438	-654	-5.0%
Skid loader	4,922	5,259	337	6.8%
Clean & Green program	1,516	1,630	114	7.5%
Miscellaneous	2,939	2,366	-573	-19.5%
Subtotal	181,022	179,510	-1,512	**-0.8%**
Total Residential Solid Waste	242,240	241,743	-497	**-0.2%**

*Does not include 1,385 tons of concrete and 556 tons of asphalt shingles recycled in 2018 through the Drop Off Centers. The State of Wisconsin does not include these categories as residential in annual reporting.

Table 2: Residential Program Metrics

Effectiveness Measures	2017	2018	Change
Household Material Recycling Rate*	10.5%	10.5%	0.0%
Yard Waste Recycling Rate	13.3%	13.8%	0.5%
Other Materials Recycling Rate**	1.5%	1.5%	0.0%
Total Recycling Rate	25.3%	25.7%	0.5%
Household Materials Recycling lbs. Per Household	281.26	281.03	-0.24
	Percent change 2017 to 2018:		**-0.1%**

Efficiency Measures - Household Recycling Only			
Residential Recycling Program Costs (State rpt. method)	**$ 10,070,853**	**$ 10,042,178**	**$ (28,675)**
State Cost Sharing/Grant Revenue	$ 2,312,199	$ 2,311,905	$ (294)
Recyclable Commodity Sales Revenue	$ 1,877,256	$ 1,336,225	$ (541,031)
Avoided Landfill Disposal Costs	$ 1,100,175	$ 1,112,475	$ 12,300
Subtotal of offsets	**$ 5,289,630**	**$ 4,760,605**	$ (529,025)
Net Costs - Residential Recycling Program	**$ 4,781,223**	**$ 5,281,573**	**$ 500,350**
Net Cost Per Ton - Res. Recycling Program	$ 188.05	$ 207.51	**$ 19.47**

*The Comptroller's Office method of computing Household Solid Waste Tons includes garbage tons from the City's >4 unit multi-family dwelling customers, a sector not serviced by the City with recycling collection. Since the City does not have recycling tonnage figures for these customers serviced with recycling by the private sector, the resulting recycling rate is artificially low.

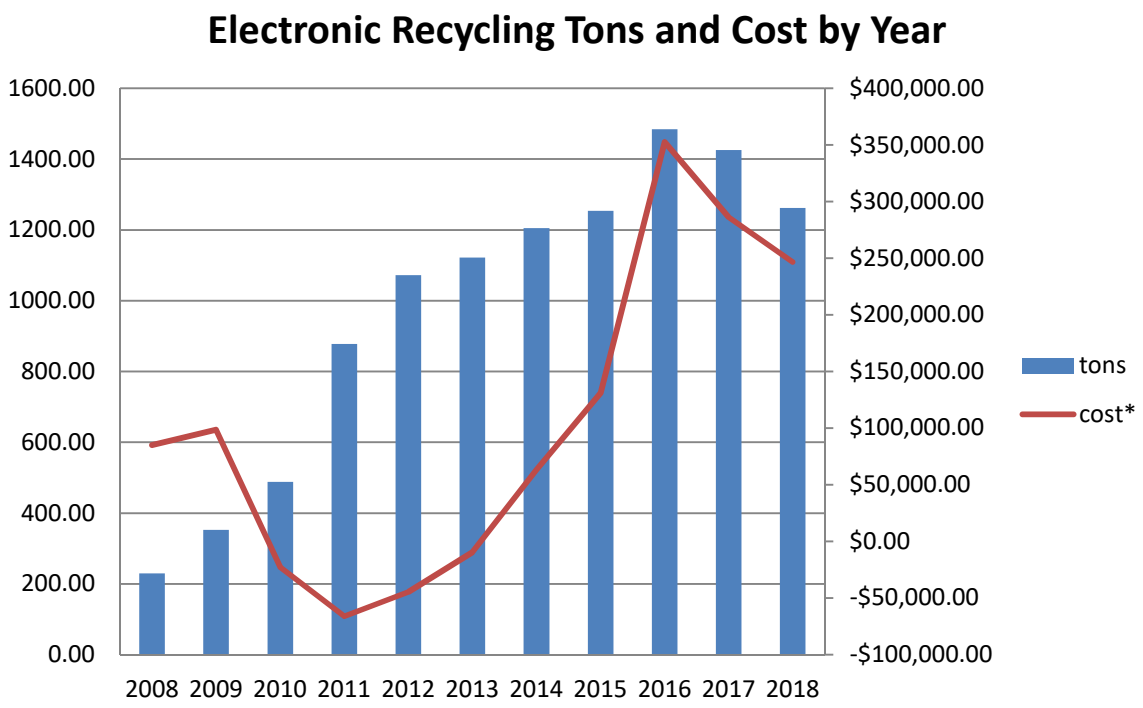
**Does not include 1,385 tons of concrete and 556 tons of asphalt shingles recycled in 2018 through the Drop Off Centers. The State of Wisconsin does not include these categories as residential in annual reporting.

Table 3: Recyclables Processing Financials

This table relates to processing of residential recyclables after collection.
It does not include collection costs or recycling grant revenues.

	2017	2018	Change	% Change
Commodity Sales Revenue				
Revenue/Ton (Market Value)	$ 109.96	$ 78.49	$ (31.47)	-28.6%
City's Share (Rev/T Received from Contractor)	76.64	$ 52.49	$ (24.15)	-31.5%
Total revenue to City	**$ 1,877,256**	**$ 1,336,225**	$ (541,031)	**-28.8%**
Processing Costs				
Processing per ton rate	$ 36.06	$ 38.20	$ 2.14	5.9%
Processing tons	25,435.19	25,454.58	19.39	0.1%
Processing costs	**$ 917,088**	**$ 972,316**	$ 55,227	6.0%
Net Revenue				
Net revenue (received after processing)	$ 960,168	$ 363,909	$ (596,259)	-62.1%
Net revenue per ton	**$ 37.75**	**$ 14.30**	**$ (23.45)**	**-62.1%**
Avoided Disposal Costs				
Landfill costs per ton	$ 43.25	$ 43.70	$ 0.45	1.0%
Landfill costs avoided	**$ 1,100,175**	**$ 1,112,473**	**$ 12,298**	1.1%
Total Benefit				
Total Net benefit	**$ 2,060,343**	**$ 1,476,382**	**$ (583,961)**	-28.3%
Total Net benefit per ton	**$ 81.00**	**$ 58.00**	**$ (23.00)**	**-28.4%**

Table 4: Electronics Recycling - Tons & Cost Per Year



*Negative numbers indicate revenues generated

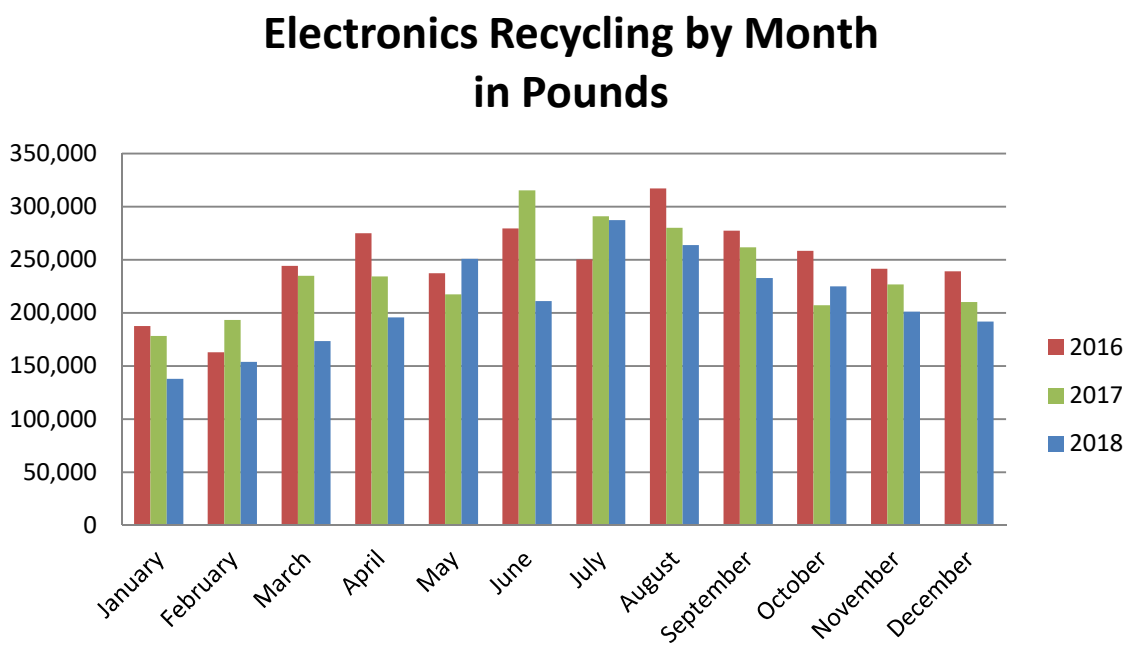



Table 5: Electronics Recycling – Pounds Per Month