



E-Cycle Wisconsin 2017 report

Wisconsin DNR annual report to the Legislature and governor under s. 287.17(10), Wis. Stats.

December 2017

Executive summary

Wisconsin's electronics recycling law has achieved many successes since it took effect in 2010, most notably recycling more than 250 million pounds of electronics and expanding electronics recycling access for Wisconsin residents. Wisconsin has been a leader among state electronics recycling programs for the number of available collection sites and weight of electronics collected per person, and many stakeholders have praised the structure and administration of the program by the Department of Natural Resources (DNR).

Since 2010, however, both the nature of electronics being sold and the markets for materials electronics contain have changed dramatically. Due to the popularity of smaller and lighter devices and manufacturers' design improvements to reduce product weight, the weight-based manufacturer recycling targets, which are set by a statutory formula, have declined by more than 10 million pounds (32 percent) over the last four years. While some manufacturers have continued to voluntarily exceed their targets, overall there were nearly 7.5 million pounds collected in program year 8 for which manufacturers did not pay. Dwindling markets for the leaded glass in cathode ray tubes (CRTs), along with lower commodity prices and lower commodity values in newer devices, have increased recyclers' per-pound costs, but manufacturer payments have not always risen to match.

As a result, unless manufacturer recycling targets are updated or more manufacturers voluntarily exceed their recycling targets, the collection and recycling system funded by manufacturers will continue to fall short of the electronics recycling demand of Wisconsin households and schools, particularly in rural areas. Since 2013, the number of registered electronics collection sites has dropped by 25 percent, and collectors are passing higher recycling costs on to consumers, meaning there are fewer convenient and low-cost recycling options throughout the state. The DNR has seen several cases in the last three years of irresponsible recycling. These cases threaten the environment and are driven in part

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by the higher costs for responsible recycling. These trends are increasing the costs shouldered by taxpayers to either collect electronics or clean up dumped devices.

In summary, the basic structure of the law is sound, and there are many successes to celebrate. However, changes will be needed to maintain Wisconsin residents' access to affordable electronics recycling—particularly in rural areas.

Successes for program year 8 (July 2016 to June 2017)

- Registered collectors took in 31.3 million pounds of electronics, or 5.4 pounds per Wisconsin resident. In total, between January 2010 and June 2017, Wisconsin households and schools recycled more than 250 million pounds of electronics through E-Cycle Wisconsin.
- More than 99 percent of the electronics collected under E-Cycle Wisconsin were processed initially in Wisconsin or other Midwest states, contributing to continued growth in the region's electronics recycling industry. Wisconsin recyclers accounted for 71 percent of the weight processed.
- Despite some of the economic challenges discussed later in this report, E-Cycle Wisconsin has helped provide a steady stream of material that has led to more business opportunities and jobs in Wisconsin and nearby states.
- While the number of registered collection sites has declined, residents in 66 of Wisconsin's 72 counties, representing 99 percent of the state's population, had access to at least one registered electronics collection site or event.
- Nearly all manufacturers met or exceeded their recycling targets.
- The vast majority of manufacturers, recyclers and collectors are complying with the law, and the DNR continues to work to ensure a level playing field for program participants.

Recommendations per s. 287.17(10), Wis. Stats.

The electronics recycling law directs the DNR to examine several aspects of the law within the annual report and make suggestions for possible changes. The following is a list of relatively minor changes, based on both formal and informal stakeholder input that could be made to improve administration of the electronics recycling law and ensure its continued effectiveness, for the Legislature's consideration.

- To better match the budget cycles of many manufacturers, recyclers and collectors, consider changing the annual program year so that it corresponds to the calendar year (Jan. 1 to Dec. 31), rather than the state fiscal year, and adjusting reporting dates accordingly.
- To better meet the electronics recycling needs of Wisconsin residents and schools, consider changing the manufacturer target formula so that the aggregate target is based on the total weight of electronics received for recycling under the program during previous years.
- To ensure access to electronics collection in rural areas of the state, consider replacing the current rural collection incentive with an alternative method to ensure that, regardless of the overall manufacturer target, manufacturers and recyclers would provide attention to rural areas.
- Consider assisting small businesses by reducing or eliminating registration fees very small electronics manufacturers pay to the state under s. 287.17(4)(b).
- Consider modifying the definition of "school" under s. 287.17(1)(np) to allow all K-12 schools in Wisconsin to recycle electronics through E-Cycle Wisconsin.
- Consider updating and clarifying device definitions so they better fit the changing nature of electronics.

Introduction

Wisconsin's electronics recycling law, 2009 Wisconsin Act 50, establishes a statewide program to collect and recycle certain electronics. Under this product stewardship-based law, manufacturers of TVs, computers, monitors and desktop printers must register with the Department of Natural Resources (DNR) the brands they sell to Wisconsin households and schools. Those manufacturers also must recycle a target weight of electronics each year based on their sales. Manufacturers contract with state-registered recyclers and collectors to meet their targets. This manufacturer-funded recycling program is called E-Cycle Wisconsin.

This report fulfills the annual reporting obligation in s. 287.17(10), Wis. Stats., which specifies several metrics on which the DNR must report to the Legislature and governor. These include the weight of electronics collected under the program and other information provided by program participants, an outline of electronics recycling outside of E-Cycle Wisconsin, a summary of compliance and enforcement actions related to the electronics disposal ban, and suggestions for changes needed.

To help evaluate the law and the DNR's administration of it, the DNR also examines whether the law is meeting these six general criteria:

- Keeping electronics out of landfills and the environment.
- Using a market-based approach to manage e-waste in the most efficient and cost-effective manner possible, with minimal government intervention.
- Reducing electronics recycling costs and improving recycling convenience for consumers.
- Reducing the financial and administrative burden on local and state governments of managing e-waste.
- Ensuring a level playing field for all participants in the electronics recycling program, including accountability for environmental and worker safety, along with other standards.
- Encouraging and supporting a strong electronics recycling industry in Wisconsin and the Midwest.

Wisconsin's electronics recycling law has produced many successes. Over the last few program years, however, changing market conditions and other challenges have made it difficult for E-Cycle Wisconsin and the disposal ban to fulfill the first four of the above criteria. The biggest obstacles to meeting these goals have been declining manufacturer recycling target weights—driven by a steady reduction in pounds per unit sold—and increasingly tight and expensive markets for recycling cathode ray tube (CRT) glass, which makes up nearly half the weight of material collected under E-Cycle Wisconsin. The commodity value of many other eligible electronics has also been decreasing, and some newer devices, like flat-panel TVs and monitors with mercury-containing bulbs, are either cost-neutral or a negative cost for recyclers.

E-Cycle Wisconsin program years

Program years run from July 1 to June 30. The first program “year” lasted just six months, to get the program on this calendar. Here are the dates for program years referenced in this report.

Program year 1

January 1 to June 30, 2010

Program year 2

July 1, 2010, to June 30, 2011

Program year 3

July 1, 2011, to June 30, 2012

Program year 4

July 1, 2012, to June 30, 2013

Program year 5

July 1, 2013, to June 30, 2014

Program year 6

July 1, 2014, to June 30, 2015

Program year 7

July 1, 2015, to June 30, 2016

Program year 8

July 1, 2016, to June 30, 2017

Program year 9

July 1, 2017, to June 30, 2018

Table 1: Program year 8 registration and participation

Category	Registered	Active
Collectors	136	126 (93%)
Recyclers	19	15 (79%)
Manufacturers	175	n/a
Brands	255	n/a

“Active” means a collector that sent electronics to a registered recycler or a recycler that received electronics from registered collectors.

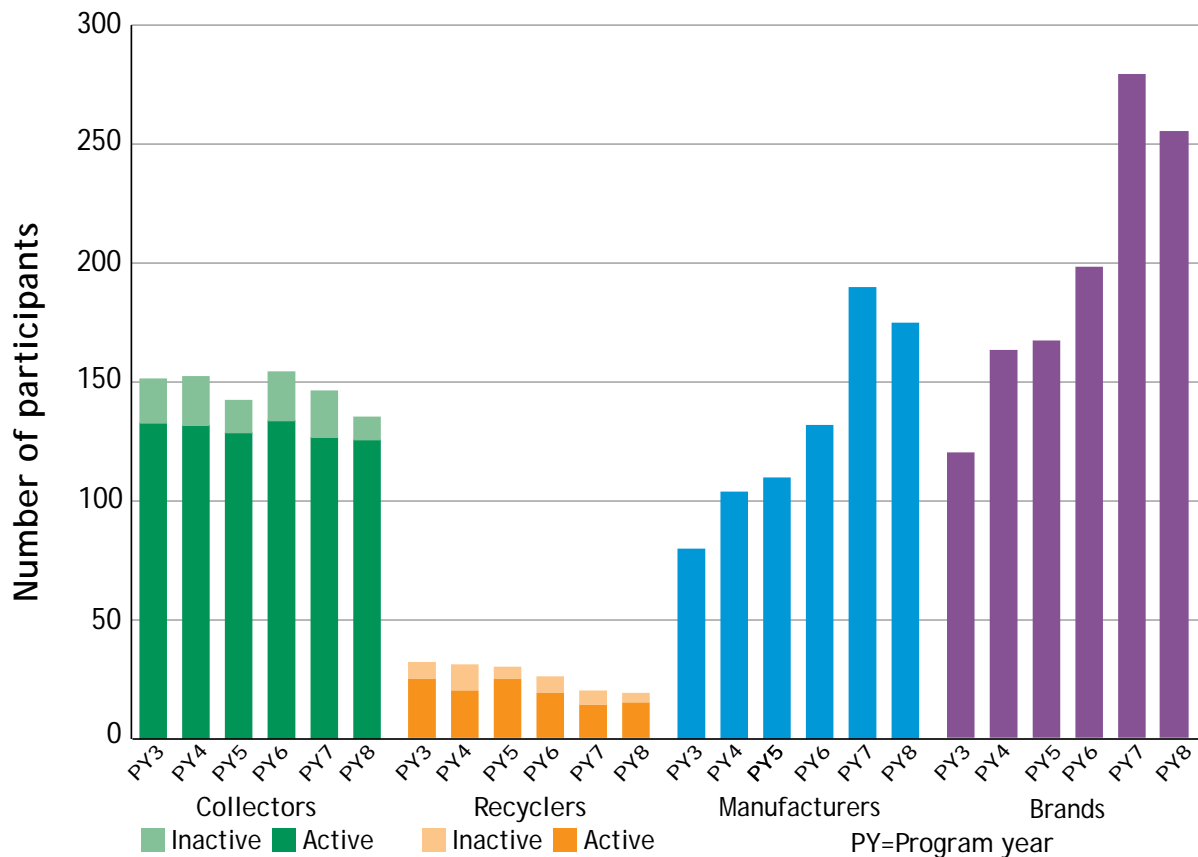
The fundamental structure of the law remains sound. However, these changing conditions should continue to be monitored and require attention to ensure continued widespread public access to affordable electronics recycling. Stakeholders are continuously providing input and want to work toward a solution. Further discussion of these issues and policy recommendations are included at the end of this report.

Program participation

In program year 8, E-Cycle Wisconsin collector registrations fell to their lowest level, perhaps reflecting the more challenging economics for electronics recycling. Registered collectors include local governments, electronics retailers, other for-profit businesses and non-profits. The mix of collectors has remained relatively steady over the past few program years.

For-profit collectors registered the highest number of collection sites (245, or just under half of the 499 total), though many of these were at government locations, as shown in Figure 2. The percentage of sites hosted by local governments (either alone or in partnership with a busi-

Figure 1: Summary of E-Cycle Wisconsin registration and participation



ness) has jumped from 30 percent in program years 4 and 5 to 44 percent in program year 8 (a similar share to program year 7).

Program year 8 recycler registrations were also down slightly, continuing a trend, to a total of 19. The number of registered recyclers has dropped more than 40 percent from the high of 32 in program year 3, due to several companies going out of business or discontinuing their recycler registrations because of economic challenges.

The numbers of registered manufacturers and brands were down slightly in program year 8, following a sharp increase in program year 7 due to DNR compliance and enforcement efforts.

Table 1 shows program year 8 registrations, and Figure 1 illustrates registration trends over the six most recent program years.

Collection and recycling totals and analysis

Wisconsin households and schools have participated enthusiastically in E-Cycle Wisconsin, recycling more than 250 million pounds of electronics since 2010. From July 2016 through June 2017 (program year 8), registered collectors took in 31.3 million pounds of electronics from Wisconsin households and schools (see Table 2). This was equivalent to 5.4 pounds per capita.

As shown in Figure 3, collection of eligible electronics during program year 8 declined slightly (about 4 percent) from program year 7, but was still higher than the total from program year 6. The collection total in program year 6 was likely artificially low due to compliance and reporting problems with some recyclers and collectors, but the overall trend has been a steady decrease in the weight collected under E-Cycle Wisconsin over the last few years. The program year 8 collection total was down about 20 percent from the peak of 39.1 million pounds in program year 3 (2011-2012).

Figure 2: Program year 8 collection sites, by type

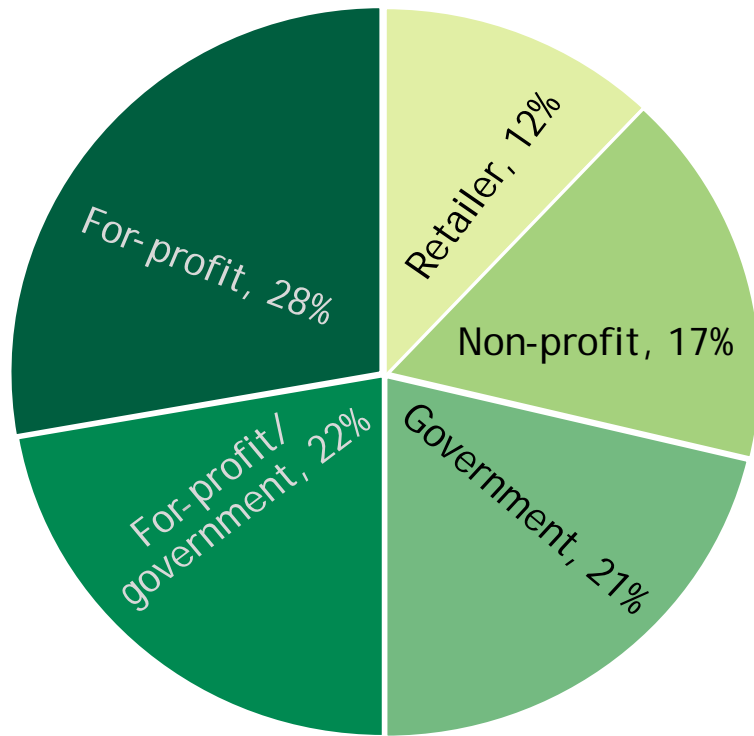


Table 2: Eligible electronics collected by registered collectors, program year 8

Type	Pounds
Urban	27,039,499
Rural	2,597,361
Not sent to registered recyclers	1,627,736
Total collected	31,264,597

Table 3: Pounds collected, by collector type

Type	PY7	PY8
Retailer	8,835,454	6,315,054
Non-profit	3,639,192	3,009,558
Gov't	9,291,810	8,932,771
For-profit	10,640,299	13,007,214
Total	32,406,755	31,264,597

PY = program year

Figure 3: Pounds collected by registered collectors

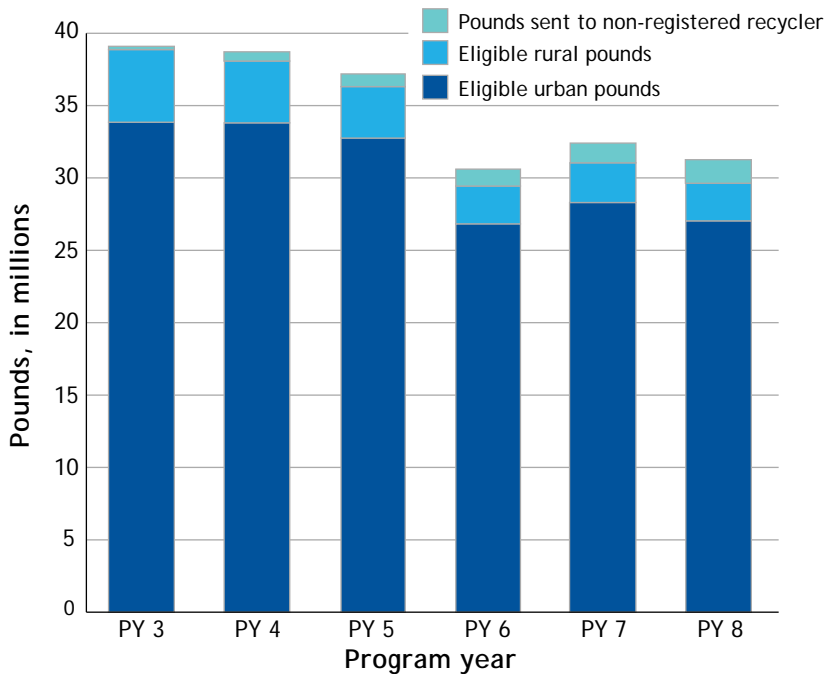
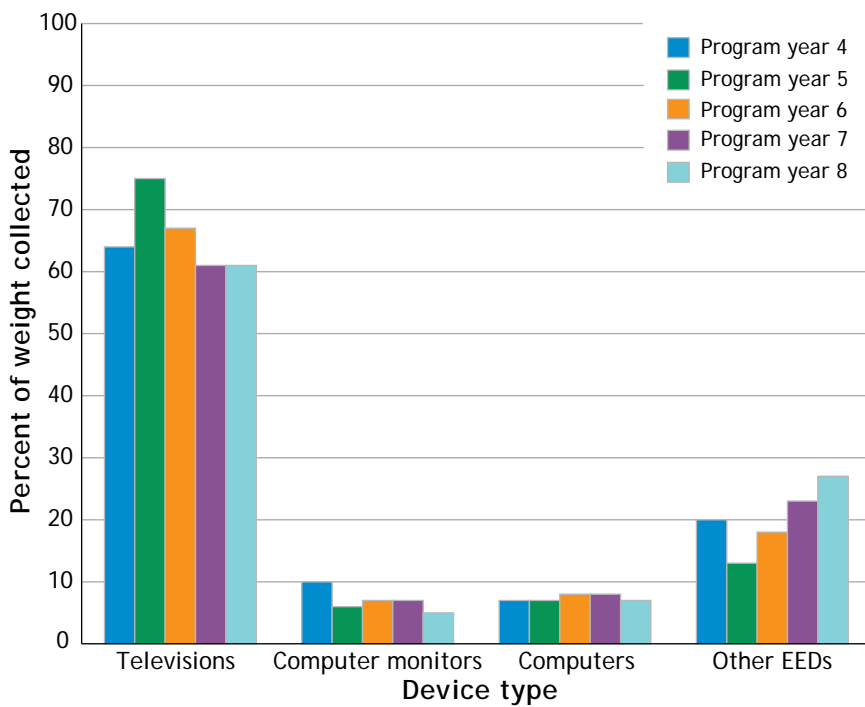


Figure 4: E-Cycle Wisconsin collection, by product type



change, with more flat-panel displays coming in and a slight decline in CRTs.

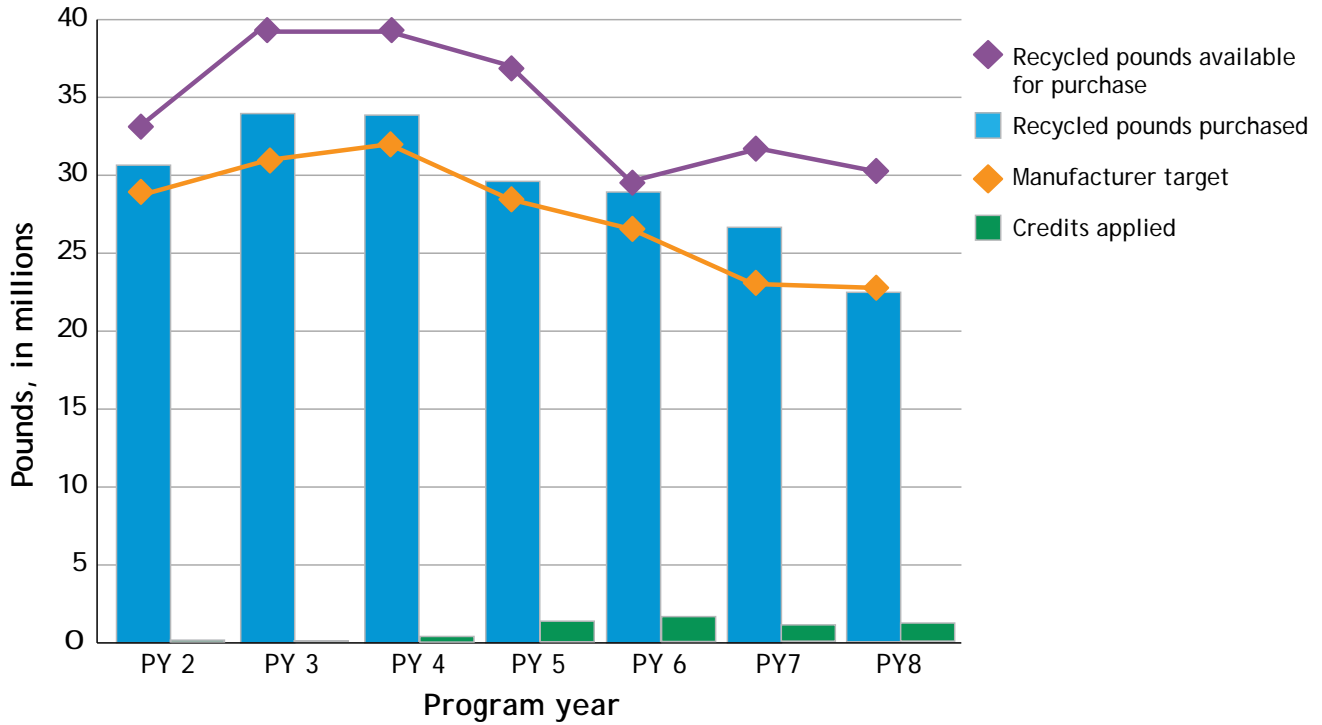
With the rural credit (1.25 pounds counted for each pound collected in a rural county) factored in and non-recycled pounds subtracted out, Table 5 shows that registered recyclers had 30.1 million eligible pounds available for purchase by manufacturers in program year 8, and sold 22.8 million pounds. There was once again a significant gap (nearly 7.4 million pounds,

As shown in Table 3, collection totals increased from program year 7 to 8 among for-profit collectors, but decreased among government, non-profit and retailer collectors. (Note that the “for-profit” total includes collection from many sites or events hosted by the other groups, so the actual total from the for-profit category is likely lower, while the actual totals for the other categories, particularly local governments, are likely higher.)

The overall trend has been toward more reliance on government collection programs, with the local government share of weight collection increasing from 18 percent in program years 2 and 3 to 29 percent in program years 6, 7 and 8. Collection by non-profits dropped off sharply in program year 7, as many smaller non-profits stopped collecting and Goodwill stores in southeastern Wisconsin stopped accepting TVs.

The overall decline in weight collected could be due in part to residents having fewer heavy devices (like large TVs with cathode ray tubes) to recycle, though TVs continue to dominate the weight collected, accounting for 61 percent of the total in program year 8 (see Figure 4). Registered recyclers report that nearly all of the TVs received, by weight, are still CRTs, but some have started to notice a

Figure 5: Comparison of weight recycled and manufacturer targets, by program year



the largest since the program began) between what recyclers received and what manufacturers purchased.

The overall manufacturer target for program year 8 was down just slightly from program year 7 to 22.8 million pounds, but the overall trend in the last few years has been sharply down, due primarily to consumers buying smaller and lighter products, and manufacturers finding ways to reduce the weight of larger devices, such as TVs. The estimated manufacturer target for program year 9 is 21.8 million pounds, down about 32 percent from the peak target of 32 million pounds in program year 4.

Figure 5 shows the manufacturer recycling targets, weight purchased and credits applied by manufacturers, by program year. It also illustrates the gap between the pounds recycled and the pounds paid for by manufacturers. Significantly, in program year 8, the pounds purchased by manufacturers overall was less than the overall recycling target, though some manufacturers did earn credits (others applied credits to meet their targets). Recyclers processed nearly 7.5 million more pounds than manufacturers purchased, the largest such gap since E-Cycle Wisconsin began.

Economic benefits of E-Cycle Wisconsin

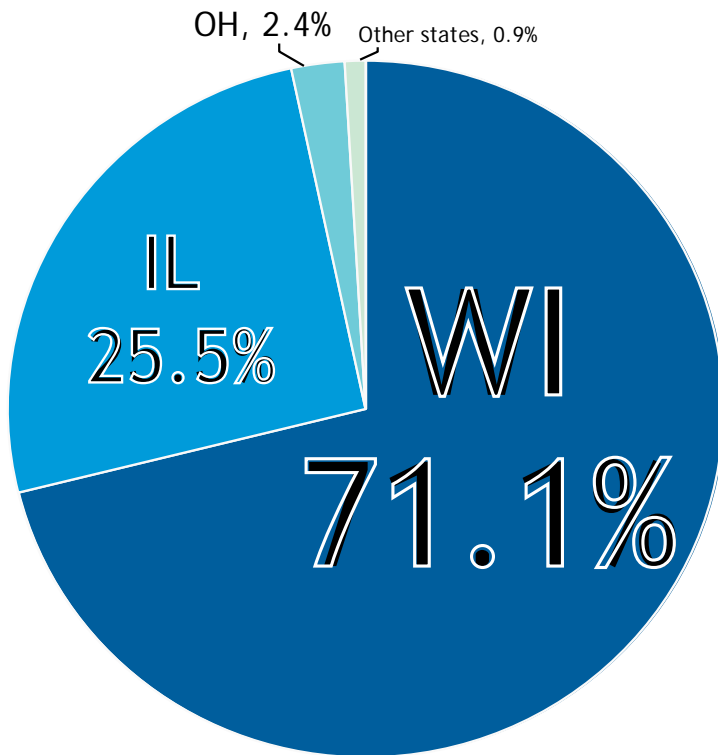
As the electronics recycling industry has consolidated, a growing share of electronics collected under E-Cycle Wisconsin have been staying within the state for initial processing. During program year 8, Wisconsin recyclers processed 71 percent of the total, up from 62 percent in

Table 4: Program year 8 collection, by product type

Product type	% of total weight
TVs	61%
Monitors	5%
Computers	7%
Other EEDs	27%

EEDs are eligible electronic devices. Other EEDs include printers, computer accessories, DVD players, VCRs and fax machines.

Figure 6: Percent of program year 8 pounds received by registered recyclers, by state



program year 7 and 42 percent in program year 3. Essentially all of the pounds in program year 8 were processed in the Midwest, as shown in Figure 6 (nearly all of the “other” weight was processed in Indiana).

Despite some of the economic challenges discussed later in this report, E-Cycle Wisconsin has helped provide a steady stream of material that has led to more business opportunities and jobs in Wisconsin and nearby states. In an August 2017 DNR survey of active registered recyclers, nearly all said E-Cycle Wisconsin had “increased or otherwise helped our business” (the others were unsure of the program’s effect on their business). Five recyclers (four of which are located in Wisconsin) reported specific positive impacts since January 2013,

Table 5: Eligible pounds received and recycled, program year 8

Type	Pounds
Urban received	27,126,370
Rural received	2,508,681
Rural credit	627,215
Non-eligible glass	(120,035)
Available for manufacturers	30,142,412
Sold to manufacturers	22,669,658

Rural credit is 1.25 pounds per pound collected. For a map of urban and rural counties, see Appendix C.

Urban and rural pounds differ slightly from Table 2 because of how collectors and recyclers report pounds collected before a program year end but not received by a recycler until the next year, and because some recyclers choose to count all pounds as urban.

Non-eligible glass is CRT glass the recycler received but that was not recycled, under the definitions in s. 287.17, Wis. Stats.

with four hiring additional workers and installing new equipment, three expanding recycling facilities and two increasing the number of shifts operating at their facilities. One Wisconsin recycler had added a new recycling facility, and also planned to add another in the coming year, along with installing more equipment, expanding existing facilities and hiring more workers.

Ensuring a level playing field within E-Cycle Wisconsin

Much of the DNR’s administration of the electronics recycling law focuses on maintaining a level playing field for E-Cycle Wisconsin participants and identifying problems at collection sites or recycling facilities that might endanger human health or environmental quality. Many stakeholders have cited Wisconsin as a national leader in these efforts, particularly in online registration and reporting, an effective use of modern technology to efficiently address compliance, and careful accounting of collection and recycling transactions among program participants.

Compliance among registered manufacturers

Manufacturers of all major brands have complied with Wisconsin’s elec-

tronics recycling law by registering their covered electronics and paying applicable registration and shortfall fees.

During program year 8, a large number of manufacturers initially failed to re-register. The DNR revoked the registrations of 27 manufacturers for failure to submit required forms or payments, and followed up with nine notices of noncompliance (NONs) and six notices of violation (NOVs). Fifteen of the manufacturers returned to compliance. The remaining 12 had either stopped selling covered electronics, or the DNR could not find current contact information for them.

Based on a September 2017 DNR survey of registered manufacturers and discussions with stakeholders, it appears that most manufacturers rely on the recyclers they contract with to find and/or set up collection networks (only 18 percent of survey respondents said they had been involved in setting up sites or events). Prominent exceptions include the Dell Reconnect program, in which Dell works with several networks of Goodwill stores; Best Buy’s in-store collection program (Best Buy is also a manufacturer); a partnership between Hewlett Packard and Staples; and Apple’s recycling program for schools. All of these manufacturers have generally exceeded their recycling targets each year.

During program year 8, 36 registered manufacturers participated in a manufacturer collective or brokering arrangement that contracts with recyclers for a large total sum of pounds and distributes the recycled pounds among its members. The two collectives during program year 8 were MRM (22 manufacturers), and Reverse Logistics Group America (14). These collectives were responsible for about 30 percent of pounds purchased by manufacturers during program year 8.

Most manufacturers continued to meet or exceed their sales weight-based recycling targets in program year 8. Eighteen manufacturers recycled more than their targets and earned one pound or more in credits that can be used during the next three program years. In total, manufacturers earned just over 700,000 credits (see Table 6). Five manufacturers used just under 1.2 million credits earned in a previous year to meet their targets. At the end of program year 8, just over 2.2 million pounds of credits were available to manufacturers for future use.

Each year, the DNR works with manufacturers to help them purchase eligible recycled pounds rather than pay a shortfall fee, but several with very small targets have said it is more convenient for them to pay the fee than to go through the process of contracting with a recycler. For program year 8, 43 manufacturers paid or owed a shortfall fee as of November 2017. The amounts ranged from \$1 to \$926.50.

Table 7 summarizes the registration and shortfall fees paid during the first eight E-Cycle Wisconsin program years.

Registration lists

The DNR keeps updated lists of registered and unregistered manufacturers and brands, registered recyclers and collectors, and registered collection sites on its website. Lists are available at <http://dnr.wi.gov/topic/Ecycle/wisconsin.html>.

Table 6: Program year 8 manufacturer credit transactions

	Credits
Beginning balance	2,995,603
Credits applied	(1,165,316)
Credits expired	(352,035)
New credits earned	731,785
Total available for future use	2,210,037

Table 7: Manufacturer registration and shortfall fees

Program year	Registration fees	Shortfall fees
1	\$261,250	n/a
2	\$270,000	\$8,453
3	\$275,000	\$19,210
4	\$310,000	\$10,105
5	\$310,000	\$9,467
6	\$328,750	\$12,379
7	\$408,750	\$8,812
8	\$375,000	\$6,445

Shortfall fees for program year 8 as of November 2017. The law did not assess shortfall fees for program year 1.

Manufacturer registration compliance efforts

The DNR continued its effort in 2016 and 2017 to bring manufacturers of unregistered brands into compliance to ensure that all manufacturers selling covered electronics participate with electronics recycling in Wisconsin. As of October 2017, there were 99 unregistered brands and 247 registered brands tracked by the DNR.

The DNR uses multiple approaches to gain compliance, including engaging retailers to help contact manufacturers, direct communication with manufacturers reminding them of their obligation to register, and communication with other state programs. The DNR maintains current lists of registered and unregistered brands on its website to help retailers and manufacturers stay up-to-date with brand registration status. As mentioned earlier, the number of registered manufacturers and brands has increased dramatically over the last few years due to these tracking and compliance efforts.

Electronics retailer compliance

Retailer compliance focuses on whether retailers are selling only registered brands, informing their customers that electronics may not go into the trash, and providing educational materials about how to recycle old electronics. This is accomplished by reviewing electronics retailer inventory online and in stores, as well as checking stores and websites for educational materials.

In program year 8, the DNR conducted three rounds of online brand checks, checking online stores of 20 electronics retailers and 12 online manufacturer stores for unregistered brands. Staff also checked inventory in brick-and-mortar stores during 24 in-store inspections. Unregistered brands are almost always found online, where inventory changes quickly, and because there are several large, exclusively online retailers with many products and sellers. The DNR notified retailers of the results of these checks, with a reminder that they may not sell unregistered brands to Wisconsin households and schools, and re-checked online stores to determine if brands were removed or blocked from sale to Wisconsin households and schools.

Figure 7: Electronics retailer unregistered brand violations, 2014-2017

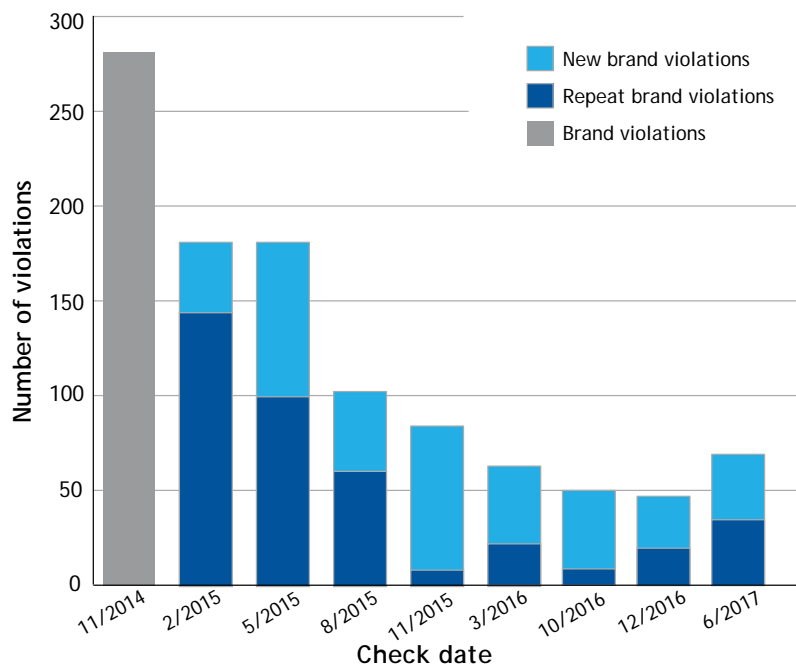


Figure 7 highlights the results of these checks over the last few years. In June 2017, there was an uptick in the number of brand violations, due primarily to a few unregistered brands being sold by many retailers, and the DNR followed up with both retailers and manufacturers.

Retailer compliance with the law's educational requirements remains a challenge. Nearly all brick-and-mortar stores now have an online store, meaning they must provide information to both in-person and online purchasers. Several retailers have created in-store signage or online educational materials, but rarely do they provide both. Re-

tailers that provide electronics recycling inform customers of their program, but frequently do not provide Wisconsin-specific information. Some electronics retailers do not provide any educational materials to their customers.

During program year 9, the DNR plans to focus on retailer compliance efforts through a combination of outreach, inspections and the stepped enforcement process.

Further evaluation of the barriers to compliance may help the DNR understand why retailers fail to provide educational materials to customers or help the DNR provide better outreach, handouts or training material to retailers.

Table 8: DNR inspections conducted, by program year

Time period	Recyclers	Collection sites
July 1, 2010, to June 30, 2011	8	20
July 1, 2011, to June 30, 2012	8	29
July 1, 2012, to June 30, 2013	10	65
July 1, 2013, to June 30, 2014	10	116
July 1, 2014, to June 30, 2015	18	28
July 1, 2015, to June 30, 2016	7	37
July 1, 2016, to June 30, 2017	8	73

Compliance assistance efforts and inspections of registered recyclers and collectors

All electronics recyclers in Wisconsin must comply with state solid and hazardous waste regulations. Registered E-Cycle Wisconsin recyclers, whether located in-state or not, must meet several additional requirements. They must carry adequate owner financial responsibility for facility closure and at least \$1 million in pollution liability insurance. They are also required to report to the DNR twice a year and provide information on amounts of materials recycled, the sources of those materials and downstream vendors.

The DNR conducts on-site inspections to fully understand how a recycler is operating. Inspections include a visual inspection of facilities, and DNR staff examine documents that the law requires recyclers to provide to the DNR. During program year 8, DNR E-Cycle Wisconsin staff inspected all six in-state recyclers. Travel considerations make it difficult to visit out-of-state facilities other than those in Illinois (currently the only neighboring state with registered recyclers). The program typically inspects one out-of-state recycler each year and assesses compliance for all other out-of-state recyclers through annual reports and through phone and email conversations. During the past program year, DNR staff inspected two facilities associated with one Illinois-based recycler. DNR staff also work with counterparts at agencies in other states to verify the environmental compliance of recyclers in their states.

Collectors registered with E-Cycle Wisconsin are also subject to DNR inspections. Registered collectors can be local governments, retailers, cooperatives, large and small businesses and recyclers. There are over 400 registered collection sites, so it is difficult to inspect them all on a regular basis. Staff set priorities to meet with new collection site operators and collectors that manage multiple collection sites. In addition to determining whether collection sites are following the requirements and best management practices, inspections provide an opportunity to receive feedback and to learn how different collection sites operate. During the 2016-2017 program year (program year 8), E-Cycle Wisconsin staff inspected 73 collection sites.

Table 8 lists the number of inspections the DNR has conducted each program year.

DNR staff have also used other methods to provide information to collectors, including mailing information packets and holding collector workshops. Workshops provide technical assistance on best management practices and an opportunity for collectors to network with other e-cycling professionals. In program year 8, the DNR held a successful collector workshop in Fitchburg, with more than 50 attendees plus another 40 attending via webinar. Participants gave positive feedback, and the DNR will continue offering these opportunities

around the state, including a November 2017 workshop in Green Bay.

DNR staff continue to track electronics and components from collection to end markets by working with collectors and recyclers to verify weights of materials received and shipped out by recyclers. Staff also review documentation and contact downstream recyclers to verify weights of materials received and pounds eligible for manufacturer credit.

One issue identified in recent years is the challenge of tracking materials through the first steps in the recycling process. As the number of registered recyclers has decreased and recycling costs have increased, more collectors have started working with larger collectors that can consolidate the materials and ship full loads to recyclers. These arrangements can make recordkeeping difficult and created room for error, since sometimes both collectors would report the materials on their annual reports. In these situations, DNR staff find it difficult to verify the weights received by first-line collectors, since the recyclers may not know who actually collected the materials. To ensure that electronics are counted accurately, in 2017 the E-Cycle Wisconsin program updated and finalized a guidance document that clarifies recordkeeping and reporting requirements for registered recyclers and collectors.

Compliance among registered collectors and recyclers

Since E-Cycle Wisconsin began, several recyclers and collectors have been removed from the program through suspension or revocation of their registrations. In all cases, the DNR gave collectors and recyclers extra time (several weeks or more) to submit paperwork and offered assistance to help them comply.

The most common reason for recycler removal has been failure to maintain adequate owner financial responsibility. Other reasons for removal of recyclers and collectors include failure to submit registration forms or meet reporting requirements. Many recyclers and collectors have voluntarily left the program because it no longer fit with their business plans or other activities.

During program year 8, the DNR revoked one collector's registration for issues with how it was managing material, which are now being addressed through the hazardous waste program. The DNR issued the facility a notice of noncompliance (NON) and a notice of violation (NOV) for hazardous waste violations.

The DNR also issued one registered recycler an NON during program year 8 for failure to maintain adequate owner financial responsibility and speculative accumulation of CRTs. The facility did not reregister for program year 9 and has been issued an NOV for the hazardous waste violations.

Electronics recycling separate from E-Cycle Wisconsin

Currently, collectors and recyclers that perform basic disassembly of electronics are treated as exempt from most solid and hazardous waste requirements, as long as the materials are handled appropriately. Consequently, only recyclers participating in E-Cycle Wisconsin are operating under DNR regulatory oversight. Monitoring recycling activities that occur outside of E-Cycle Wisconsin has been challenging; often these activities only come to the DNR's attention when a problem occurs.

Inquiries from aspiring recyclers

Electronics recycling has appealed to some as a business opportunity. Many people believe that recycling electronics is simple, but fail to understand the consequences of mismanaging some of the materials involved, such as lead and mercury. DNR staff continue to receive inquiries each year from people who are interested

in becoming a recycler, and staff are usually successful in explaining the rules and the economics of managing the materials, especially CRTs. However, DNR staff have no systematic way to know who might be engaging in small-scale “backyard recycling” activities. Staff try to reach these people by encouraging others who may have contact with them—such as local government recycling programs, other recyclers and collectors, and salvage yard operators—to help advise backyard scrappers about the proper way to recycle electronics before problems arise.

Illegal disposal and irresponsible electronics processing

The number of DNR enforcement cases resulting from irresponsible recyclers or “scrappers” removing high-value metals from electronics while leaving hazardous materials behind is increasing. Based on DNR environmental enforcement records, there were two electronics recycling-related enforcement cases between 2007 and 2011, and 15 cases from 2012 through early 2017. Three of these cases involve cleanups with a cost of more than \$100,000 each that have been or will be paid by either taxpayers or private landowners who were not the ones handling the electronics. These cases require a significant investment of DNR staff resources to address.

The DNR received approximately 20 electronics-related complaints during the 2016-2017 program year. Most involved CRT TVs, which is understandable considering they are one of the most expensive items to properly recycle and the metals they contain are relatively easy to recover and sell to salvage yards. Examples of these cases included:

- Complaints from property owners who found electronics dumped in their ditches or in buildings they owned.
- A repeat offender who has rented storage lockers on numerous occasions, filled them with CRTs, and then abandoned them. DNR staff requested assistance from law enforcement, but the individual responsible had left the state. The storage locker owner ended up cleaning up the facility.
- Complaints from solid waste professionals who found materials improperly dumped at their facilities, including CRT glass that was dumped in the receptacle for container glass and contaminated the load.

DNR waste and enforcement staff continue to work on ongoing enforcement cases as well. The DNR estimates more than 5 million pounds of CRTs and CRT glass were dumped and stockpiled in the six largest enforcement cases since 2015, and cleanup is underway or has yet to begin at some sites.

DNR staff continue to be concerned about collectors turning to irresponsible recyclers because of the high cost of recycling electronics responsibly. Staff continue to reach out to collectors to educate them about the importance of working with responsible recyclers and the potential consequences if their electronics are mismanaged. This topic is addressed during the DNR’s collector best management workshops and during site inspections.

Disposal ban awareness and compliance

E-Cycle Wisconsin’s 2016 household survey indicated awareness of the disposal ban has declined from 58 percent of Wisconsin residents in 2013 to 50 percent in 2016. However, the survey showed 45 percent of residents know where to take electronics for recycling, up from 28 percent in 2013. Storing unused electronics was the most common method of managing old or unused computers, TVs, and cell phones. Recycling was the second most common choice for computers and TVs. For cell phones, returning them to a retailer was the second most common choice, which would typically result in those devices going into retailer refurbishing or recycling channels. Very few survey respondents reported putting electronics in the trash.

In addition to the cases of irresponsible recycling discussed above, the DNR continues to receive reports of electronics being dumped on public lands, in ditches and in vacant lots, along with reports of electronics put in the trash. Often, these are cases of an individual dumping one or two items, most commonly TVs. The 2014 E-Cycle Wisconsin report discusses the results from 2014 surveys of landfills, transfer stations and public lands managers about electronics dumping on their properties and the 2013 E-Cycle Wisconsin report discusses dumping seen by local governments.

DNR public awareness efforts and awareness trends

The electronics recycling law requires the DNR to promote public participation in electronics recycling and facilitate communication among local governments and electronics collectors, recyclers and manufacturers. This helps ensure households and schools are aware of the statewide disposal ban on electronic devices, and that collectors and recyclers are able to supply manufacturers with sufficient recyclable material to meet their recycling targets each year.

The DNR fulfilled its obligation to provide compliance assistance to the general public in program year 8 through several methods, including a very successful holiday 2016 advertising campaign and exhibits at events. The holiday ad campaign used advertising on internet radio and digital advertising. Traffic to the DNR website increased substantially during the campaign, with a 66 percent increase over the baseline traffic during the peak of the campaign. A post-holiday digital advertising campaign continually promoted awareness of E-Cycle Wisconsin and referred Wisconsin residents to the program's list of registered collection sites. Overall in 2016, the DNR's electronics recycling webpages received more than 100,000 visits, and the list of registered collection sites received more than 40,000 views.

E-Cycle Wisconsin staff also partnered with DNR recycling staff to provide a mailing to more than 1,000 local government recycling programs throughout Wisconsin. The mailing included publications and an order form for future publications to aid them in their outreach to the public. Several dozen local governments ordered publications or contacted the DNR with questions in response to the mailing.

Program challenges

In evaluating whether changes might be needed to make the electronics recycling law function better, the DNR has gathered input through surveys and conversations with program participants, other stakeholders and the public. Stakeholder meetings (2014, 2015 and 2016) and collector workshops (2015, 2016 and 2017) provided particularly valuable input, along with 2017 online surveys of registered collectors, recyclers and manufacturers.

Wisconsin's law is designed to operate on free-market principles, with collectors, recyclers and manufacturers conducting private negotiations to set recycling prices. However, decreasing manufacturer targets, combined with low commodity prices and steady collection of mainly CRT devices, is distorting the market. In recent years, the program has faced increased consumer costs for recycling, decreased economic benefit for recyclers, decreased recycling opportunities and more illegal disposal and dumping.

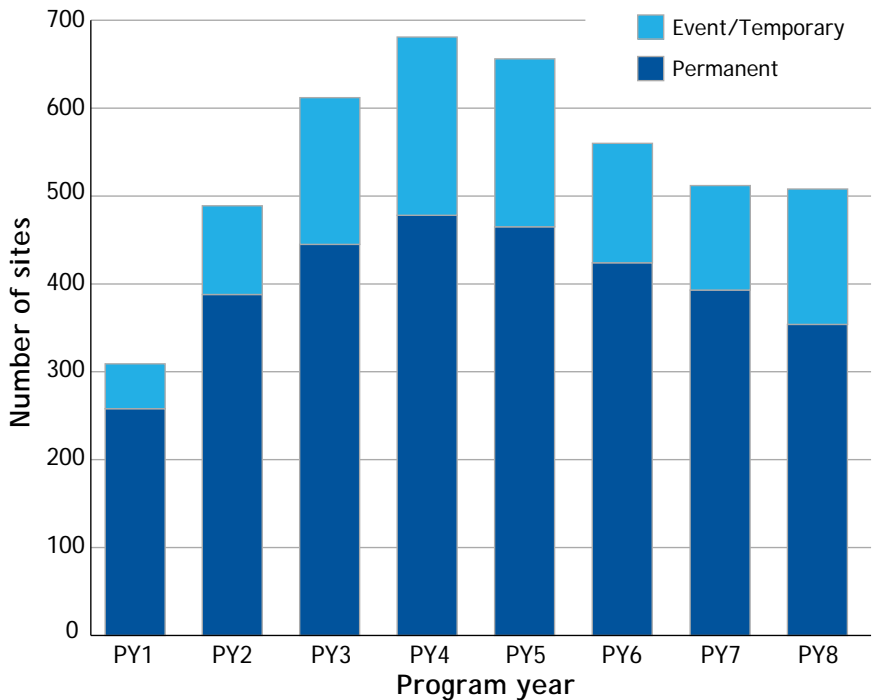
Barriers to e-cycling: declining access and rising costs

Over the past few years, economic challenges have affected Wisconsin residents' access to electronics recycling. According to program participants, decreasing manufacturer targets, low commodity prices and increasing CRT recycling costs have been the primary reasons for recyclers dropping collection sites and increasing

charges to collectors. This is leading some collectors to drop out of the program, stop TV collection or increase fees to consumers. Frequent fee increases have put additional pressure on some collectors, especially local governments, whose budgets are set for a calendar year and therefore have trouble accommodating a rise in costs.

As shown in Figure 8, the number of collection sites registered with E-Cycle Wisconsin increased through program year 4, but then began to decline. In program year 8, there were 354 permanent and 154 temporary or event collection sites registered with E-Cycle Wisconsin for at least part of the year, a total of 508 (down 25 percent from the program year 4 high of 681).

Figure 8: Registered collection sites over time



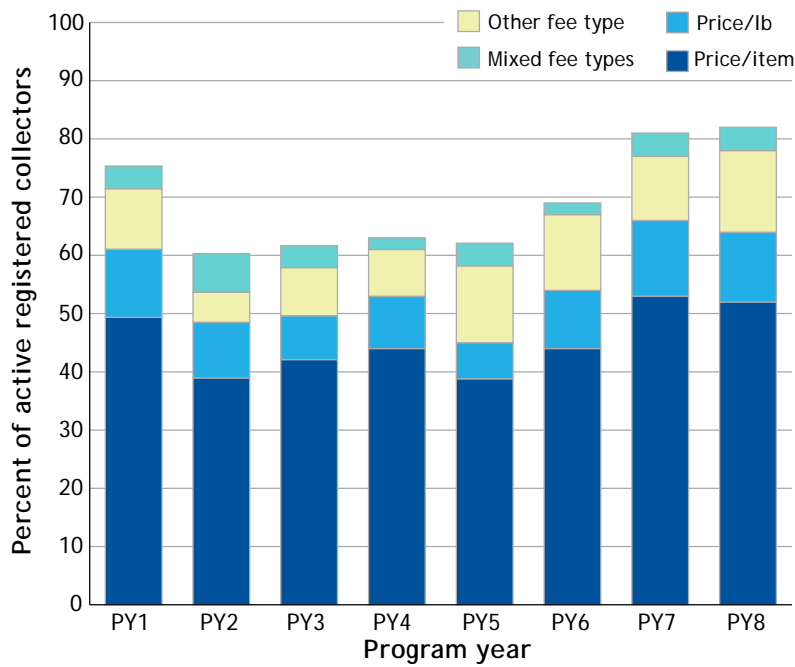
The reduction in collection opportunities has affected residents in rural areas most. All of Wisconsin’s 72 counties except Florence have had at least one permanent collection site or collection event since the program began in 2010. In many of the state’s more rural areas, though, these opportunities have remained few and far between. During program year 8, there were E-Cycle Wisconsin collection opportunities in 66 of Wisconsin’s 72 counties (up from 63 in program year 7), covering 99 percent of the state’s population. While this means that only a small portion of the state’s population lived in counties without registered collection sites, there are parts of the state where residents would have to drive a very long distance to properly recycle electronics, increasing the likelihood of illegal dumping or disposal.

The map in Appendix A shows permanent and temporary collection sites registered during program year 8. Each site is surrounded by shading in a radius of 10 miles in the southern half of the state and 15 miles in the northern half, reflecting the average distance respondents reported they were willing to drive to recycle electronics on a 2010 DNR statewide household survey. This helps to illustrate parts of the state lacking access to convenient collection sites.

The map in Appendix B is similar but shows just permanent collection sites that accepted TVs. This illustrates the significant portion of the state without regular convenient access to TV recycling. TVs are by far the most likely electronic device to be illegally dumped if consumers cannot find an affordable, convenient recycling location.

August 2017 surveys of registered collectors and recyclers reinforced the fact that the current rural incentive (giving 1.25 pounds of credit for every 1 pound collected in rural counties) is not fueling collection in these areas. Only two of 68 responding collectors and two of 11 responding recyclers reported that the incentive encouraged them to collect in rural counties.

Figure 9: Fees charged by registered collectors, by program year and fee type



In areas with collection sites, stakeholders have cited a lack of free or low-cost recycling options as a cause of illegal electronics dumping. As shown in Figure 9, there has been a substantial increase in the percentage of collectors charging consumers fees to accept electronics. In program year 8, 82 percent of active E-Cycle Wisconsin collectors charged consumers a collection fee of some sort, a large increase from 62 percent in program year 5 (July 2013 to June 2014). The percentage of active collectors taking at least some items for free fell from 72 percent in program year 5 to 60 percent in program year 8.

Most collectors charged a per-item fee, with a smaller portion charging a per-pound fee or using a combination of fee types. Nearly all sites that charged a fee did so for TVs, and some also restricted the size or type of TVs they accepted. The average consumer charge for recycling a TV increased from \$14.35 in program year 5 to \$23.02 in program year 8, with a range in program year 8 from a flat \$5 per TV fee to \$70-\$100 for the largest CRT or projection TVs. The average charge for monitors increased from \$9.82 to \$13.24 during the same period. Best Buy’s February 2016 decision to begin charging \$25 each for all TVs and monitors has influenced some other collectors to increase prices to avoid being inundated with these devices.

Most collectors charged a per-item fee, with a smaller portion

The fees collectors charge reflect charges recyclers pass on to collectors. Based on August 2017 DNR surveys of registered collectors and recyclers, virtually all E-Cycle Wisconsin collectors are paying for packaging, transportation and/or recycling of eligible electronics under the program. The only exceptions to this appear to be Goodwill collection funded by Dell, retailers’ in-house collection programs, and cases where the collector is also doing recycling.

The most common charges were for recycling CRT and flat-panel TVs and monitors (see Figure 10). More than 90 percent of collectors that reported paying something for recycling paid their recyclers for these items, which helps explain why there are few free recycling options for TVs and monitors around the state. More than half also reported paying recycling costs for other eligible electronics. More than two-thirds of these collectors were paying transportation costs. About 42 percent did report receiving a credit from their recycler for some items, most likely computer equipment. The majority of collectors reported that their recycling costs had increased since 2014.

Getting electronics to registered recyclers

Besides illegal dumping or disposal, one consequence of having fewer registered collection sites and more fees—both for registered collectors and for consumers—is that individuals or collectors look for cheaper,

local alternatives. Evidence from the last few years suggests this is indeed happening in some cases.

As shown in Figure 3, the amount of material collected by registered collectors but going to non-registered recyclers has increased significantly, from about 231,000 pounds in program year 3 (less than 1 percent of the collection total that year) to nearly 1.6 million pounds in program year 8 (5 percent of the collection total). Much of this can be attributed to registered collectors that divert some portion of what they collect—usually the more valuable IT equipment—to their own dismantling and recycling operations. In most cases, the material is still being managed properly, but because the law does not require collectors to meet the same standards as registered recyclers, experience from the past several years suggests that there is greater potential for some collectors to stockpile material, and/or send it to non-legitimate downstream vendors, which can lead to costly cleanups if these businesses abandon the material.

The diversion of more valuable materials also affects costs for recyclers and manufacturers. If the bulk of what is coming to registered E-Cycle Wisconsin recyclers is CRTs, flat-panel displays and low-grade electronics with minimal commodity value, it means recycling costs for program-eligible materials are higher than if the true mix of electronics, including computers, were reaching registered recyclers.

These examples point to the need to improve the economics of E-Cycle Wisconsin in order to ensure that registered recyclers are the first choice for registered collectors and consumers, along with the need for more uniform regulations for all facilities in Wisconsin that are dismantling electronics.

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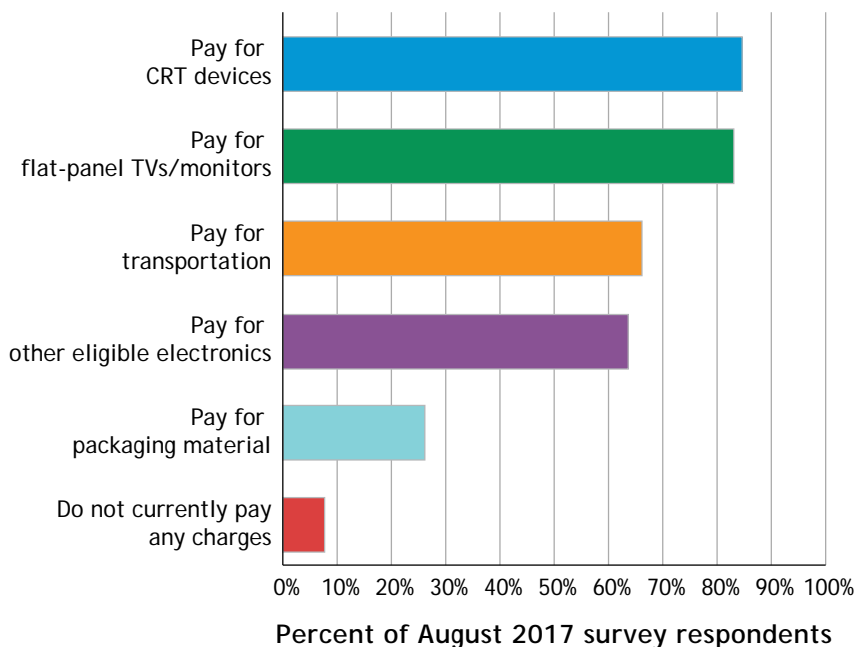
Problem materials and program economics

As discussed above, higher net recycling costs that are passed on to registered collectors are a primary driver behind the decline in consumer access to collection sites and free collection. Changes in recycling markets for electronics that dominate the waste stream are major contributors to these higher costs, and manufacturer payments have not necessarily kept pace with these market shifts.

Cathode ray tubes

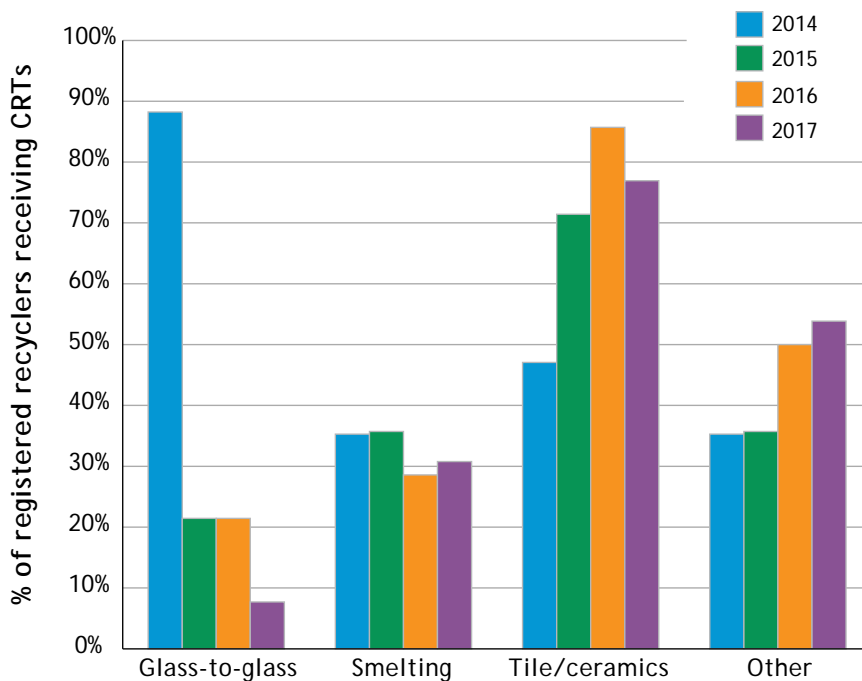
CRT-containing devices (TVs and monitors) make up the majority of weight collected under E-Cycle Wisconsin (see Figure 4). They are also the most difficult and expensive devices to recycle. Historically, primary options for recycling the leaded portion of the glass have been the manufacture of new CRTs (called glass-to-glass) or smelting. These existing end markets have raised prices and/or reduced the amount of glass they take. In 2015, the remaining glass-to-glass furnace shut down for several months for maintenance, leading recyclers to seek

Figure 10: Costs paid by registered collectors for eligible electronics, 2017



Based on responses from 66 registered collectors to an online DNR survey.

Figure 11: End-market destinations for E-Cycle Wisconsin CRT glass, 2014-2017



CRTs from E-Cycle Wisconsin. In 2017, about half reported sending at least a portion of the glass to other downstream options, such as an Ohio firm that incorporates glass into materials used in a variety of applications and a firm in the Netherlands that incorporates glass into construction materials. Non-lead CRT glass is often used in applications such as aggregate.

The high cost of CRT recycling has also led several recyclers—including some involved in E-Cycle Wisconsin as registered recyclers or CRT downstream markets—to mismanage or abandon stockpiles of glass. The DNR has spent considerable time during the past few years following up on these cases and making sure glass that is not properly recycled is not counted for manufacturer credit under E-Cycle Wisconsin.

Flat-panel displays

As mentioned in the E-Cycle Wisconsin 2015 report, LCD monitors and TVs, which were sold primarily between 2001 and 2014 and contain up to 20 thin, mercury-containing fluorescent tubes, represent another problematic portion of the waste stream. Manual disassembly of the displays is time-consuming (and thus expensive) because of the high number of screws in the devices and the risk of lamps breaking. One recycler in Wisconsin is now using automated processing technology, but for the most part, flat-panels represent a cost in the waste stream (the value of commodities is less than the cost of processing and handling the mercury).

Low-grade electronics and China's import ban

Recyclers have traditionally relied on some of the non-hazardous and more valuable materials in electronics—including steel, aluminum, precious metals and plastics—to offset the costs for recycling materials like CRT glass. However, the commodity value of newer devices has been dropping as manufacturers find ways to make products lighter and to use fewer precious metals, and as commodity markets for plastics in particular have remained low. This means there is less value in the e-waste stream to offset recycling costs.

China, one of the largest importers of recycled material from the United States, announced in summer 2017

other outlets, and the volume of material the furnace accepts has not returned to its previous level. Many recyclers began sending glass to Spain and Brazil for use in tile and other ceramics. Others have been pursuing construction of furnaces to extract lead from the glass.

Most recyclers have multiple outlets for CRT glass. In 2014, nearly all registered E-Cycle Wisconsin recyclers sent at least a portion to the glass-to-glass furnace. Since the 2015 shutdown, however, very few have reported sending glass to this downstream market, and most have instead switched to ceramics processors (see Figure 11). Smelting has remained a limited but steady end market for

an import ban on many types of materials, including plastics, beginning in January 2018. There is still a great deal of uncertainty in the industry about the final details of the import ban, but this uncertainty is likely to make it difficult for recyclers to market some commodity streams at least for the short term, which could further affect the economics of E-Cycle Wisconsin.

Manufacturer share of recycling costs

By design, contracts and pricing among collectors, recyclers and manufacturers under E-Cycle Wisconsin is privately negotiated, and the law doesn't require parties to report pricing details to the DNR. This is based on the ideas that a free-market approach will reward the most efficient and cost-effective collection and recycling, and that the government would have a difficult time setting a fair price that could be adjusted as market conditions change.

In practice, recyclers have said the consistent oversupply of eligible pounds, rising manufacturer compliance costs across all state programs and strong competition among recyclers has led many manufacturers to push for lower per-pound payments in Wisconsin and other states with similar programs. This means more of the cost of recycling is passed on to collectors and, ultimately, consumers. In the DNR's 2017 survey of registered recyclers, only recyclers directly supporting manufacturers' own collection programs reported that manufacturer payments covered all their recycling costs. Other recyclers reported that the manufacturer payments covered just a portion of their costs under E-Cycle Wisconsin.

Manufacturers could help improve the economics of E-Cycle Wisconsin by increasing the amount per pound they pay recyclers to ensure it covers the true full cost of transportation and responsible recycling.

Declining manufacturer targets and collection gap

As mentioned above, additional economic pressure has come from collection significantly outpacing the overall manufacturer recycling target in four of the last five program years (see Figure 6). During program year 8, recyclers processed nearly 7.5 million more pounds than manufacturers purchased, the largest such gap in the program's history. This problem is likely to continue because of trends in the electronics market. Consumers have been switching from larger, heavier desktop computers to laptops, tablets and smartphones, and manufacturers have found ways to make products such as TVs and laptops lighter. Overall sales of some electronics have also declined in recent years, according to the Consumer Technology Association.

As a result of these downward trends in new device weights, the estimated overall manufacturer target for program year 9 is 21.8 million pounds, down more than 10 million pounds from the peak target of nearly 32 million pounds for program year 4. The DNR expects the weight of electronics collected for recycling to exceed manufacturer targets under the current formula for at least the next few years, due mainly to the persistence of CRTs in the recycling stream. The Consumer Technology Association's 2017 estimate, based on a consumer survey, is that 27 percent of U.S. households still have a CRT TV (down from 41 percent in 2014) and 17 percent have a CRT monitor (down from 21 percent in 2014). The DNR's 2016 household survey estimated that Wisconsin households have about 1.7 million unused TVs, the bulk of which are likely CRTs.

Since E-Cycle Wisconsin began, a handful of manufacturers have gone well beyond the electronics recycling requirements in Wisconsin's law, sponsoring robust collection efforts and consistently collecting more than their recycling targets—sometimes even exceeding the amount they can carry over as credits for future use. However, fewer manufacturers did this in program years 7 and 8, and absent more of this voluntary action, a legislative change to the target formula is needed to ensure convenient, affordable consumer access to responsible electronics recycling.

Recommendations per s. 287.17(10), Wis. Stats.

Based on the first eight years of implementation and continued positive feedback from stakeholders, most of the fundamental elements of Wisconsin's electronics recycling law are sound. The changing nature of electronics and the electronics recycling industry, however, are producing the challenges discussed above and risk reducing access to electronics recycling. These ideas for the Legislature's consideration are based on extensive conversations with stakeholders over the last several years, including at face-to-face meetings the DNR hosted in May 2015 and June 2016 that were attended by representatives from all major stakeholder groups.

Consider updating the manufacturer target formula

As discussed above, the overall manufacturer recycling target has declined significantly, from a high of 32 million pounds in program year 4 to an estimated 22.8 million pounds in program year 8. To better balance the weight of electronics that need to be recycled with manufacturer target weights, the manufacturer target formula could be adjusted to be based on weight received for recycling under the program during previous years.

Consider changing the method for encouraging rural collection

The current rural incentive allows manufacturers to count 1.25 pounds for every pound collected in a county designated as rural under the law. Since the overall weight collected has consistently exceeded manufacturer targets, however, this incentive appears to have done little to encourage collection in rural areas.

One way to ensure residents in rural Wisconsin have access to electronics recycling opportunities could be to replace the current rural incentive with an alternative method to ensure that, regardless of the overall manufacturer target, manufacturers and recyclers would provide attention to rural areas. For a map of urban and rural counties under s. 287.17(1), Wis. Stats., see Appendix C.

Another option would be to allow the DNR to award grants to create more electronics recycling opportunities in underserved areas of the state, using money received from manufacturer shortfall fees. While the amount of money available each year would be relatively small (around \$10,000), it could be used to defray expenses for improvements at permanent collection sites or planning and executing collection events.

Consider changing program year dates

The current program year runs from July 1 through June 30. In many cases, contracts and pricing agreements among collectors, recyclers and manufacturers change at the beginning of a new program year. Since many of them—especially local governments and manufacturers—budget on a calendar year basis, this makes it hard for them to anticipate and manage pricing changes that happen in the middle of the calendar year.

To better match the budget cycles of program participants, the annual program year could be changed so it corresponds to a calendar year (Jan. 1 to Dec. 31), rather than the state fiscal year. This would require switching the annual report/re-registration deadline for collectors and recyclers to Feb. 1 and for manufacturers to March 1, switching the recycler mid-year report deadline to Aug. 1, and changing the due date of this report to June 1. One way to accomplish the transition would be to have program year 10 run from July 1, 2018, through Dec. 31, 2019, with manufacturer targets adjusted accordingly.

Consider reducing manufacturer registration fees

The graduated fee system (\$0 if fewer than 25 covered devices sold in Wisconsin; \$1,250 if 25 to 249 devices sold; and \$5,000 if 250 or more devices sold) has generally worked well. Some small manufacturers, however, have commented that paying these registration fees across many states can be difficult. If the threshold for not

paying a registration fee and the reduced fee level were raised, it could encourage compliance among smaller manufacturers and make the per-unit costs more equitable.

To help make the fees more equitable, registration fee levels in s. 287.17(4)(b) could be changed to the following:

- \$5,000 if the manufacturer sold 500 or more covered electronic devices in this state during the last program year.
- \$1,250 if the manufacturer sold 250 to 499 covered electronic devices.
- \$0 if the manufacturer sold fewer than 250 covered electronic devices.

Consider updating device definitions

As technology changes, it can be difficult for the DNR to determine whether devices are covered by the definitions in s. 287.17(1). Examples of these “gray area” products include smartphones, digital picture frames, photo printers, portable DVD players and video game consoles. The following adjustments could help make these definitions easier to consistently apply:

Update the definition of consumer computer so that it is easier to determine whether new or updated products with video displays smaller than 7 inches, such as smartphones, are included, and add video game consoles to the list of covered electronics.

Update the definition of consumer printer to explicitly include new types, such as small photo printers.

Broaden the definition of video display device so that it includes items, such as portable DVD players, that are very similar to TVs and monitors but not currently included.

In addition, to make the collection and recycling process easier for consumers and recyclers, the DNR suggests broadening the definition of “peripheral” in s. 287.17(1) to include items used with video display devices, not just computers. This would allow items such as coaxial cables and digital converter boxes to count toward a manufacturer’s recycling target, making the recycling program clearer for consumers and requiring less sorting by recyclers.

Consider adding covered schools

Currently, E-Cycle Wisconsin includes only K-12 public schools and private schools participating in the Parental School Choice Program. Making all K-12 schools eligible under E-Cycle Wisconsin would be a more consistent approach, make outreach simpler and provide recyclers with another source of potentially higher-value material (more IT equipment than in the residential mix, which could help lower overall recycling costs). To accomplish this, the definition of “school” under s. 287.17(1)(np) could be modified to allow all K-12 schools in Wisconsin to recycle electronics through E-Cycle Wisconsin.

Recommendations for non-legislative actions to improve electronics recycling in Wisconsin

Through conversations with and surveys of stakeholders over the past few years, the DNR has also identified some areas where collaboration or voluntary actions could improve consumer access to electronics recycling, reduce costs for consumers or collectors, or make consumers more willing to recycle electronics through E-Cycle Wisconsin. The suggestions below are in addition to the DNR’s own efforts to improve compliance and enhance public outreach.

Collection site consolidation and collaboration

One thing registered recyclers have consistently said, including at E-Cycle Wisconsin stakeholder meetings,

is that being able to pick up full semi loads of well-packaged and packed electronics reduces costs. There is a tradeoff, however, in ensuring convenient consumer access to collection sites. Especially in rural areas, collecting full semi loads at a municipal drop-off site is not feasible. Collectors (with support from recyclers and/or manufacturers) could look more closely at forming voluntary partnerships and doing some local consolidation of materials before sending to a registered recycler. For example, rather than having several drop-off sites in a county that only residents of each individual town or village can access, the county could help coordinate one or two permanent sites or a series of one-day collection events open to all county residents, with the collected materials consolidated locally.

Addressing underserved areas

Registered manufacturers and/or the DNR could reach out to parts of the state that have had few collection sites or events and try to work with local governments, nonprofits or businesses to organize collection events or permanent sites. In some cases, there may already be collection efforts taking place outside of E-Cycle Wisconsin, and helping these join the program would ensure materials are being sent to responsible recyclers and improve public awareness of these sites through the DNR's online list of registered collections sites.

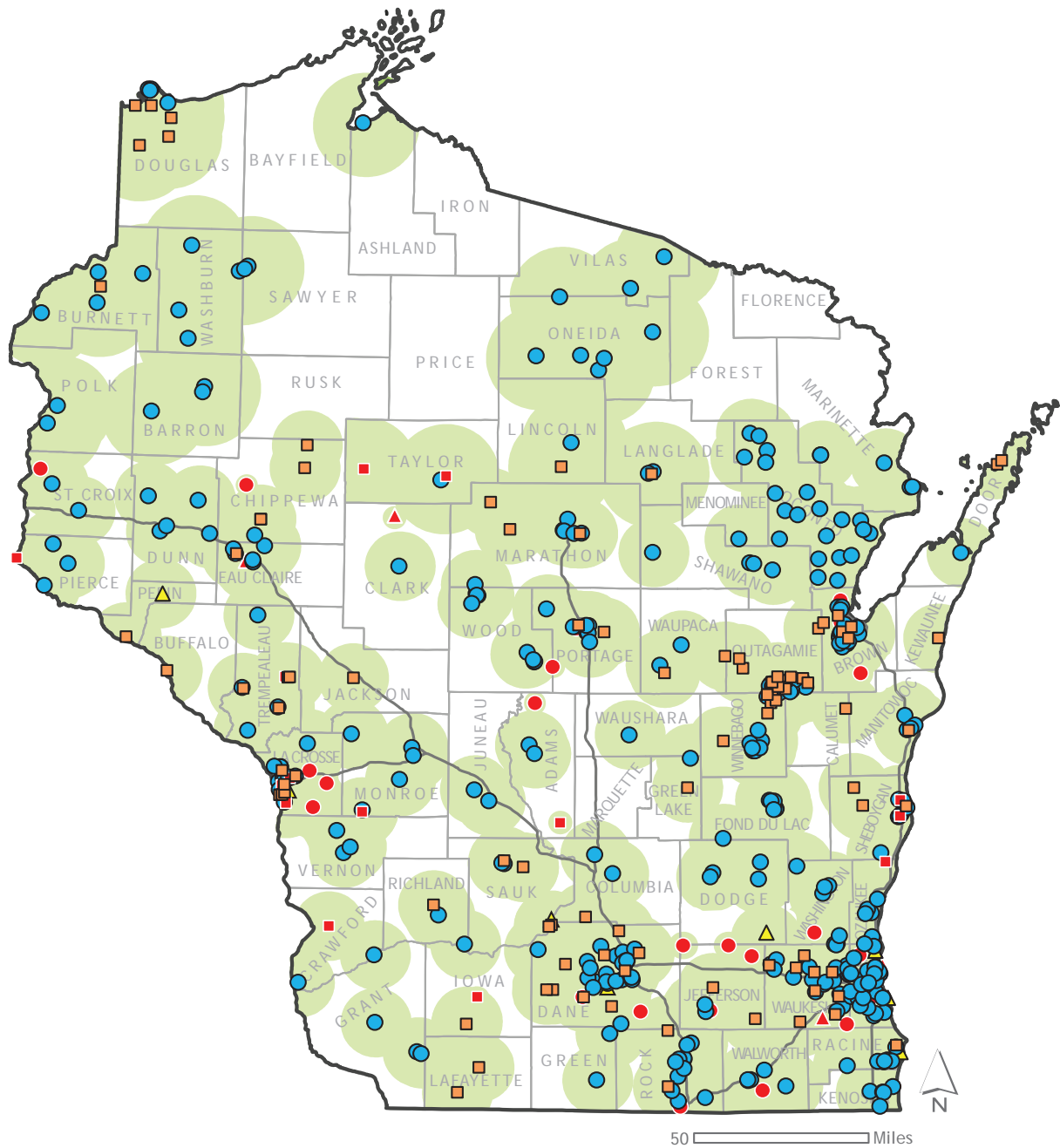
More value for consumers










On its statewide household surveys, the DNR has asked residents about the amount they are willing to pay to recycle electronics, and also about reasons residents were unable to recycle electronics. The answers to these questions point to some steps collectors and recyclers could take to make consumers more willing to pay recycling fees, and also to encourage consumers to recycle more valuable items like computers and other data-containing devices, which could help reduce overall recycling costs.

On the DNR's 2016 survey, concern about data security was one of the top barriers to recycling electronics, and earlier surveys found that many residents were willing to pay more to recycle electronics with a guarantee of safe data destruction. Collectors can look at their operations to ensure they are securely handling data-containing devices, and work with recyclers to provide information on how data are kept secure and destroyed. Collectors and recyclers could also explore options like hosting events with on-site hard drive shredding.

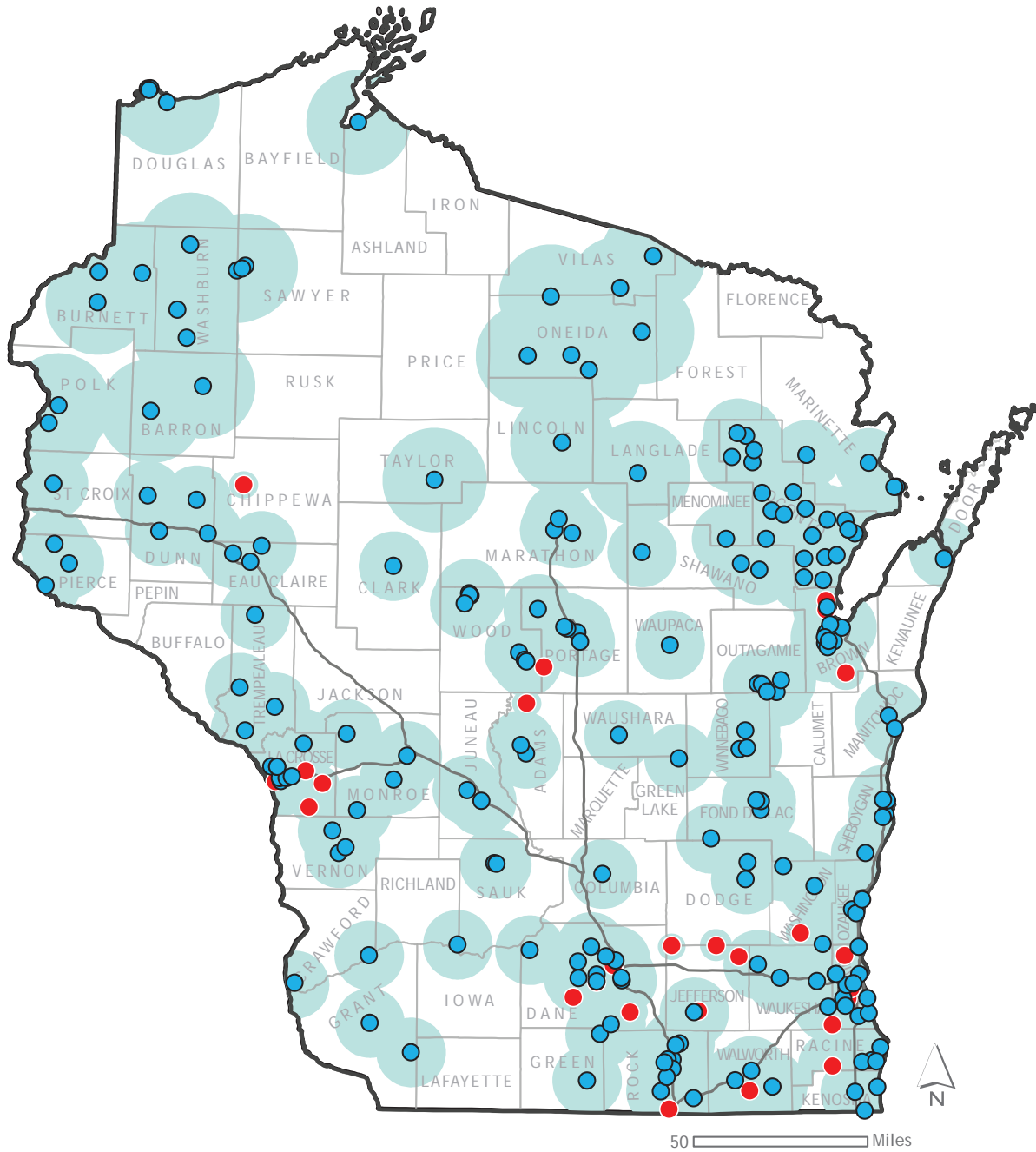
Other services/incentives that survey respondents have said would make them willing to pay more include receiving a gift card or coupon, or having electronics picked up from their homes. Collectors, recyclers, community organizations or manufacturers could consider sponsoring some special incentives to encourage recycling, even if consumers are still paying some fees.






Appendix A: Map of collection sites registered under E-Cycle Wisconsin during program year 8



	10-mile coverage area of collection sites*		Permanent collection sites		Interstate Highways
	15-mile coverage area of collection sites*		Temporary collection sites		One-day collection sites
<p>*Based on the 2010 WDNR Household Survey question, "How far would you be willing to travel to recycle electronics?"</p>					
			Collection sites available only to employees of a company or residents of a town, city or county		

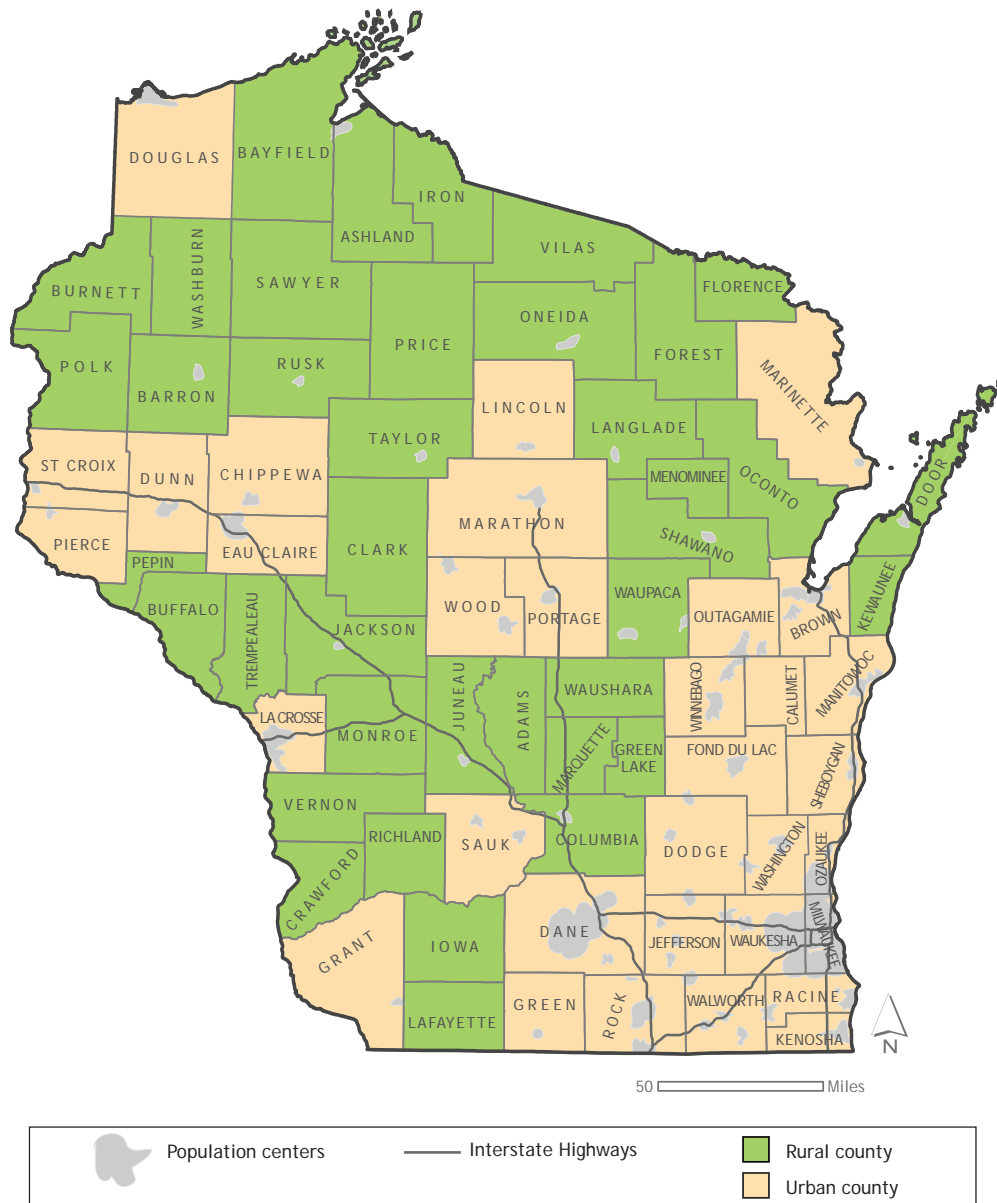
Appendix B: Map of permanent collection sites accepting TVs under E-Cycle Wisconsin during program year 8



	10-mile coverage area of collection sites*		Permanent collection sites		Interstate Highways
	15-mile coverage area of collection sites*		Collection sites available only to employees of a company or residents of a town, city or county		

*Based on the 2010 WDNR Household Survey question, "How far would you be willing to travel to recycle electronics?"

Appendix B: Map of urban and rural counties under E-Cycle Wisconsin



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