October 23, 2012

Chippewa County
Recyclable Materials Volume Analysis Report

Report

SEH

Resource Recycling Systems
Sustainable Systems for a Waste-Free Future

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SEH

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INTRODUCTION

The Chippewa County Land Conservation and Forest Management (LCFM) Materials Recovery Facility (MRF) Study represents multiple communities in Chippewa County – each with its own characteristics and goals – yet bound by common duties to maintain a cost-effective recycling collection system. Chippewa County and the municipalities in the County also need to comply with state recycling laws and satisfies effective recycling criteria. Many cities and solid waste districts throughout the nation are setting new, ambitious goals for higher recycling, waste recovery rates and even targeting zero waste as an attainable goal.

State cuts have reduced recycling grants to counties and municipalities. Tax levy caps have removed the capacity of local municipalities to raise revenue through increases in property taxes. Recycling costs to municipalities and landowners are expected to continue to rise. In response to these circumstances, the Recycling Division conducted this study to assess where changes could be made to gain efficiencies in municipal programs. Recognizing the roles and responsibilities as currently delegated to the County and to the municipalities under the Chippewa County Responsible Unit (RU) Intergovernmental Agreement, the scope of the study comprised three primary deliverables including: 1) a Market Analysis Report, 2) a Recyclable Materials Market Analysis, and 3) a MRF Options Analysis Report.

The Recyclable Materials Volume Analysis included an evaluation of the current recyclable waste stream as well as an estimate of potential recyclable material volumes that could be achieved if household recycling collection methods followed “best practices.” This report includes a discussion of best practices including changes in collection systems, container set out options, processing options, and recycling incentive programs.

REGIONAL AND LOCAL RECYCLING TRENDS

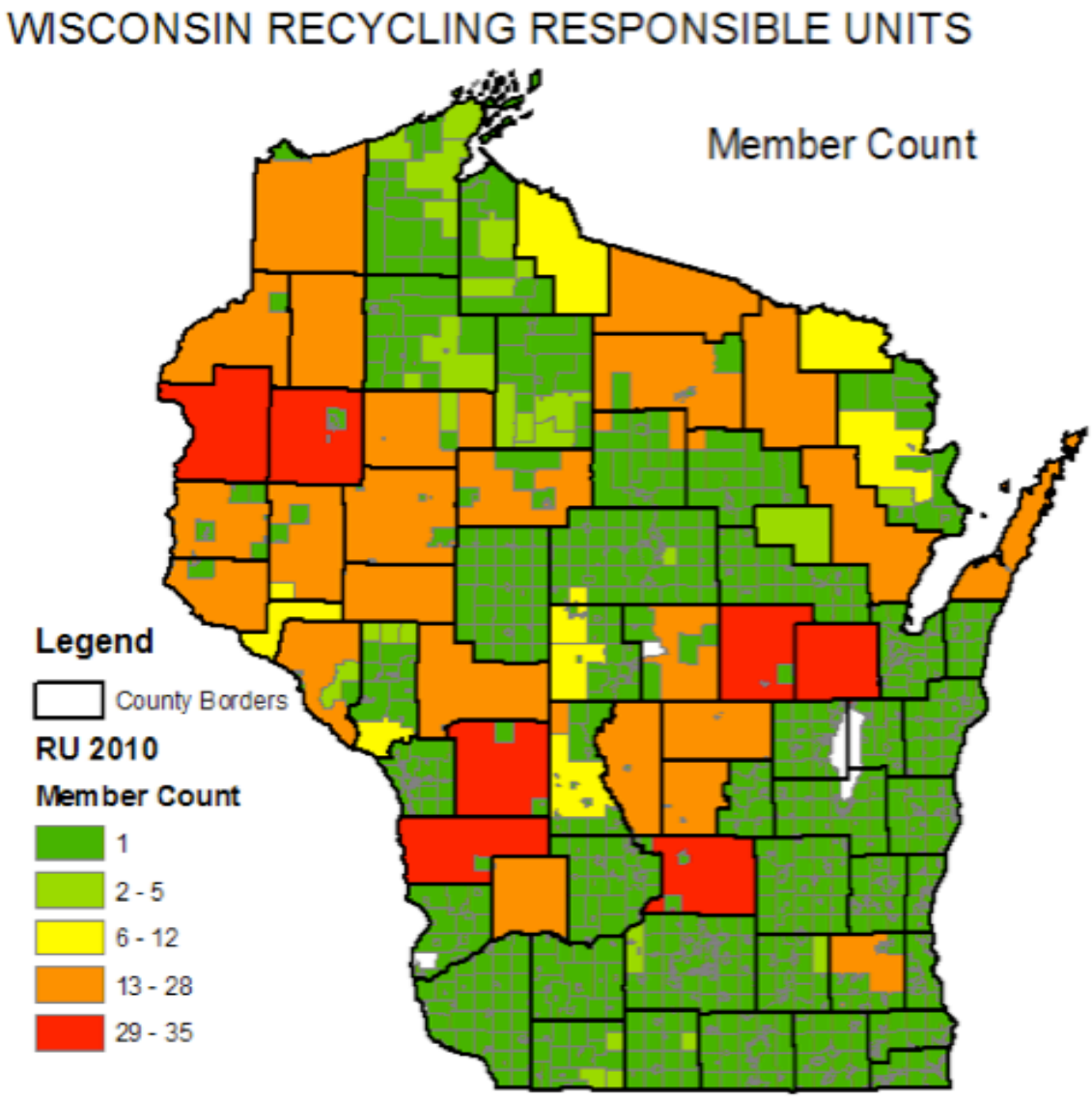
Wisconsin law mandates that all municipalities offer recycling services if they use Wisconsin’s public or private waste disposal facilities. This law has resulted in a patchwork of more than 1,000 units responsible for managing recycling services. Wisconsin law requires that every local governmental unit be part of a state- approved responsible unit to use public or private waste disposal facilities. *Responsible units* are the local units of government charged with creating and implementing state-mandated recycling programs (Wisconsin Statute §287.09 (2009-10)). A city, village, town, or tribal body (collectively referred to as a municipality in this report) serves as the responsible unit of a geographic area unless the municipality delegates that authority to another governmental entity (Wis. Stat. §287.01(9)).

Each responsible unit is required to provide a minimum range of services to its residents, including collection of recyclables and education about recycling services. More than 60 percent of the state’s 1,061 responsible units serve populations smaller than 2,000 people (Wisconsin Department of Natural Resources [WDNR], 2011). DNR considers a responsible unit to be an effective recycling program if it meets the criteria outlined in Administrative Rule NR 544. Responsible units with effective recycling programs are eligible for state grants, and in 2010 more than 96 percent of responsible units received these grants.

RECYCLING IN WISCONSIN

The figures below show the geographic distribution of the Responsible Units in Wisconsin, as well as the member counts for each of the Responsible Units. It can be seen that some Responsible Units have as many as 35 members, which is more typical when the county serves as the Responsible Unit. However, it should be noted that Responsible Units are not required by law to provide all of the services themselves.

Figure 1: Responsible Units Member Count



For 2010, the distribution of RUs among community types was:

- Town = 59%
- Village = 24%
- City = 12%
- County = 3%
- Other = 1%
- Tribe = 1%

Recycling in Wisconsin has remained relatively consistent since the implementation of the recycling law in 1991. The table below summarizes the number of Responsible Units from the early 1990s, as well as the most recent period where data was readily available. It can be seen that the cost/ton has decreased since the early 1990s, although the eligible costs and cost per capita has nearly doubled.

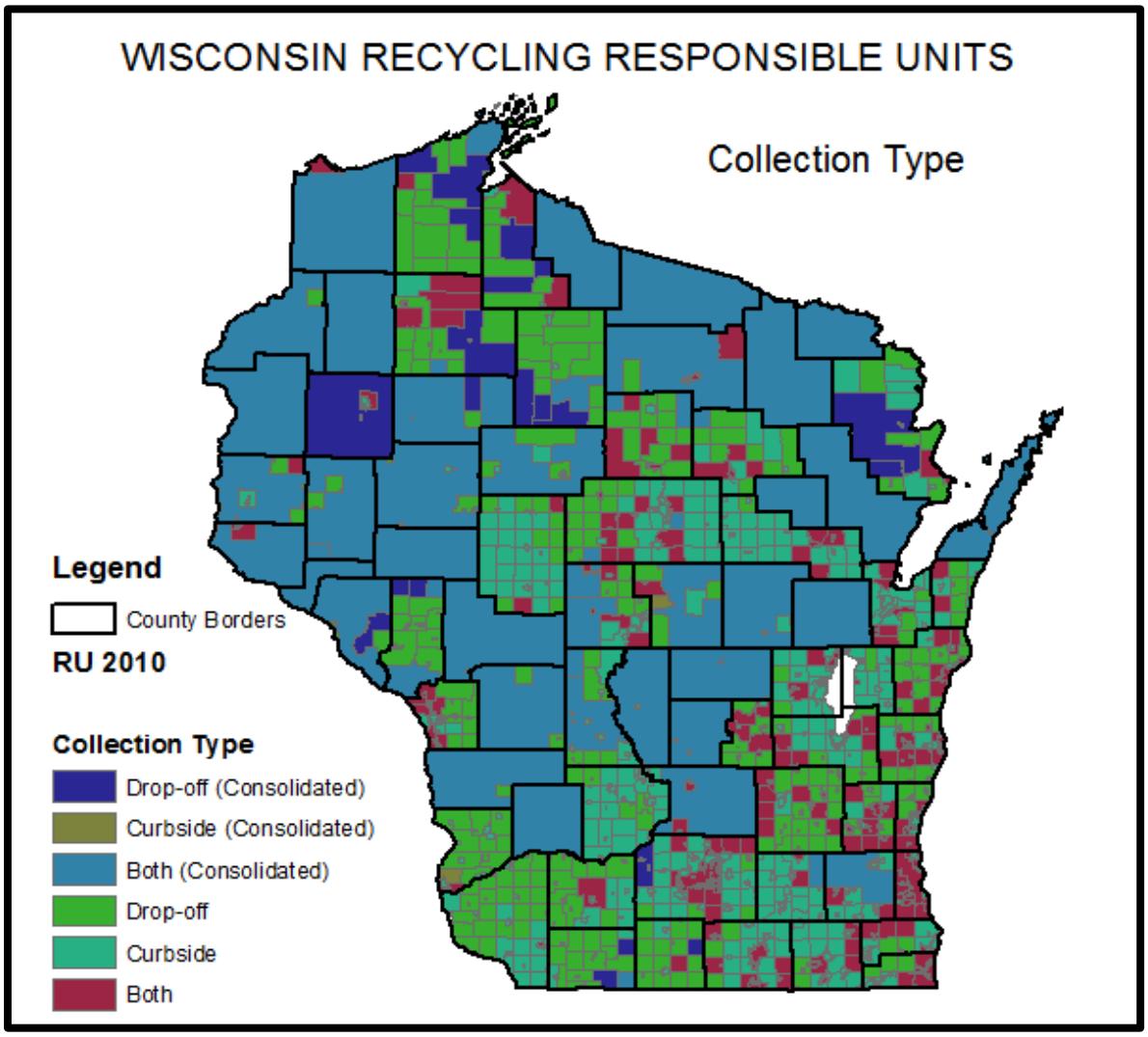
Table 1: Wisconsin Recycling Costs

	Then		Now			
Year	1991-92	1992-93	2007	2008	2009	2010
Number of RUs	875	946	1058	1055	1058	1058
Cost/Ton	$295.00		$242.46			
Cost/Capita	$8.50		$14.75			
Total Tons	186,268	220,000	405,393	404,734	386,412	393,467
Eligible Costs (millions)	37.4	41.7	69.4	66.3	76	71.6

RECYCLING COLLECTION PROGRAMS IN WISCONSIN

Recycling collection programs in Wisconsin are generally classified as drop-off, curbside, or a combination of both. These collection programs can be further categorized as being done by a single Responsible Unit or being part of a consolidated program. The distribution of these programs can be seen in the figure provided.

Figure 2: Responsible Units Collection Type



CHIPPEWA PROGRAM BACKGROUND

The drop-off programs in Chippewa County consist of a site selected by the municipality. Residents of the municipality haul their recyclables to the drop-off center on the designated days and hours. The municipality contracts for service with a recycling hauler to pick up the dumpsters containing recyclables at their recycling center or the municipality hauls the recyclables to a recycling processing facility or end market. The curbside recycling program provides recycling service to the residents of the municipality at their residence. The municipality contracts with a recycling hauler to pick-up recyclables at each residence. The hauler usually provides the residents with an 18-gallon recycling bin to place the recyclables in.

Each municipality obtains the tonnage reports from the recycling haulers in order to monitor the tonnage of recyclable materials collected, which is an estimate of what was picked up at each municipality. The individual categories of recyclables are not actual but rather figured by applying a formula to the total tonnage collected. Table 1: Type of Municipal Recycling Program, shows the type of recycling program for each municipality and the current recycling hauler. The Bloomer Area includes the City of Bloomer, Town of Bloomer, Town of Auburn, Town of Sampson, and the Town of Woodmohr. The Hallie Area includes the Village of Lake Hallie and the Town of Hallie.

Table 2: Type of Municipal Recycling Program

Municipality	Curbside Program	Drop-off Program	Independent RU's
Anson	Express Disposal		
Arthur		Express Disposal	
Birch Creek		Waste Management	
Bloomer Area		Markets recyclables	
Boyd	Waste Management		
Cadott	Veolia Environmental Services		
Chippewa Falls	Normacycle		
Cleveland		Express Disposal	
Colburn		Express Disposal	
Cooks Valley		Waste Management	
Cornell			Waste Management
Delmar			Waste Management
Eagle Point		Waste Management	
Edson		Express Disposal	
Estella		Waste Management	
Goetz		Express Disposal	
Hallie Area		Waste Management	
Howard		Waste Management	
Lafayette		Waste Management	
Lake Holcombe		Express Disposal	
New Auburn			Waste Management
Ruby		Waste Management	
Sigel		Express Disposal	
Stanley	Express Disposal		
Tilden		Waste Management	
Wheaton		Veolia Environmental Services	
Total	5	18	3

Of the 26 RUs that provide recycling programs there are 5 RU that utilize curbside collection provided by the private sector. The following table provides information that is provided by each RU to the County as part of its obligation to report information on the quantity of recycling materials collected. The tonnage data was calculated on a per capita basis and a household basis. The costs for each municipality were also calculated on a per ton basis and a per household basis. The per household approach to evaluating costs and comparisons is the standard approach for cost allocation as the actual fees, taxes or other charges on levied on a per household basis. This approach also allows for the comparison of Chippewa County performance to best practices data from across the state and country.

Table 3: Chippewa County Current Recycling Tonnage and Costs (2011)

Municipal Recycling Programs	Participating Population	Occupied Households	Type of Recycling Program	Tons of Recyclables	Lbs. per person (Recycling)	Cost per person (Recycling)	**Lbs. per Household (Recycling)**	Cost per Household (Recycling)
Anson	2,084	849	CURBSIDE	114.8	110.2	$15.29	**270.4**	$37.54
Arthur	761	265	DROP-OFF	28.7	75.4	$1.96	**216.6**	$5.64
Birch Creek	518	210	DROP-OFF	29.0	112.0	$3.36	**276.2**	$8.29
Bloomer Area	7,116	2,708	DROP-OFF	414.0	116.4	$6.07	**305.8**	$15.95
Boyd	551	226	CURBSIDE	51.5	186.9	$13.12	**455.8**	$31.99
Cadott	1,437	624	CURBSIDE	95.0	132.2	$10.96	**304.5**	$25.24
Chippewa Falls	13,688	6,030	CURBSIDE	674.4	98.5	$10.92	**223.7**	$24.79
Cleveland	866	329	DROP-OFF	50.3	116.2	$9.51	**305.8**	$25.03
Colburn	862	346	DROP-OFF	15.1	35.0	$5.01	**87.3**	$12.49
Cooks Valley	818	264	DROP-OFF	18.8	46.0	$9.77	**142.4**	$30.27
Eagle Point	3,066	1,089	DROP-OFF	220.3	143.7	$6.21	**404.6**	$17.48
Edson	1,088	353	DROP-OFF	42.3	77.8	$5.48	**239.7**	$16.90
Estella	430	150	DROP-OFF	9.3	43.3	$8.76	**124.0**	$25.11
Goetz	765	264	DROP-OFF	35.9	93.9	$7.63	**272.0**	$22.11
Hallie Area	6,697	2376	DROP-OFF	633.8	189.3	$1.74	**533.5**	$4.90
Howard	797	260	DROP-OFF	23.0	57.7	$3.77	**176.9**	$11.57
Lafayette	5,778	2,194	DROP-OFF	451.4	156.2	$1.74	**411.5**	$4.58
L. Holcombe	1,031	445	DROP-OFF	39.8	77.2	$5.60	**178.9**	$12.98
Ruby	489	187	DROP-OFF	17.7	72.4	$9.05	**189.3**	$23.67
Sigel	1,043	353	DROP-OFF	53.3	102.2	$3.53	**302.0**	$10.42
Stanley	3,612	1,389	CURBSIDE	115.0	63.7	$4.97	**165.6**	$12.93
Tilden	1,493	440	DROP-OFF	58.0	77.7	$4.58	**263.6**	$15.53
Wheaton	2,707	983	DROP-OFF	244.8	180.9	$4.74	**498.1**	$13.05
TOTAL	57,697	22,334		3,436.2	119.1	$7.58	**307.7**	$19.58
AVERAGE					102.8	$6.69	**276.0**	$17.76
TOTAL CURBSIDE	21,372	9,118		1,050.7				
TOTAL DROP-OFF	36,325	13,216		2,385.5				
AVERAGE CURBSIDE					98.3	$11.05	**230.5**	$26.50
AVERAGE DROP-OFF					131.3	$5.47	**361.0**	$15.33

The average quantity of material collected per household in Chippewa County is 276 pounds per year. The average for the State of Wisconsin is 514.3 pounds per household per year based on the reported quantities of material processed at Material Recovery Facilities (MRF) in the State of Wisconsin. There is very little difference in the pounds per household collected through curbside programs versus drop-off programs. There is a 73%

higher cost per household for the curbside programs. It is not possible to distinguish the quantity of material that is collected from commercial sources, which may create higher averages then actually achieved from the residential sector.

There are certain communities in Chippewa County that exhibit higher recovery rates on a pounds per household basis, the overall recovery for the curbside program is lower then the recovery for the drop-off system. Multi-family and commercial collection impacts are not included in the quantities that are currently collected. As is discussed in the following section on Best Practices, the curbside programs are underperforming when compared to state of the art recycling programs.

COMPARATIVE COUNTY WIDE PROGRAMS IN WISCONSIN

A study was conducted in 2012 with the objective to analyze the performance and effectiveness of Responsible Unit (RU) recycling programs in Wisconsin[1]. The data for this project was provided by the Wisconsin Department of Natural Resources (WDNR) and consists of information submitted by RUs in the 2007-10 Annual Recycling Program Accomplishments and Actual Costs Reports. Many countywide programs often offer autonomy to member municipalities in making collection decisions. The following are short descriptions of some of those programs

Table 4: Comparative Regional Recycling Recovery

Community	Tons	Population	Occupied Households	Net eligible Costs	Awarded Amount	Lbs./ Capita/ Yr.	Lbs./ HHD/ Yr.	Cost per HHD	Cost per Ton	Cost per Capita
Chippewa County	3,272	57,558	24,223	$976,821	$593,313	113.7	270.2	$40.33	$298.52	$16.97
Dunn County	2,457	41,172	16,257	$548,395	$226,034	119.3	302.2	$33.73	$223.23	$13.32
Eau Claire County	4,293	101,324	39,272	$1,087,915	$710,802	84.7	218.6	$27.70	$253.42	$10.74
St. Croix County	5,715	70,388	31,986	$27,171	$9,612	162.4	357.3	$0.85	$4.75	$0.39

The counties that are in the region exhibit recovery similar to Chippewa County and have a similar number of RUs in the County. St. Croix County has the highest per capita and household recovery volumes while Eau Claire, which includes the City of Eau Claire immediately south of Chippewa Falls, has the lowest recovery volumes. This illustrates that the entire region is not performing relative to communities that have implemented "best practices" as discussed in a following section of this report.

St. Croix County RUs do not dictate to its 26 municipalities what type of program they need to provide to their residents. They have a variety of haulers with different program features offered. St. Croix County is not an outlier in terms of performance criteria.

Other counties in the region provide a variety of recycling programs. The County of Waupaca RU offers a combination drop-off and curbside program. The manner in which material is sorted (e.g. comingled, dual stream) depends on the program utilized by the resident. Oconto County RUs offer curbside collection in its cities and drop off sites in its towns. Adams County RUs has municipalities with both drop off and curbside collections. The various programs offer different collection frequency and different types of service. Vernon County RUs serve 33 municipalities with a "wide variety of collection approaches and schedules". The

[1] Analyzing the Effectiveness of Recycling For Wisconsin Responsible Units, A report prepared for the Solid Waste Research Council, Solid Waste Management and Research Program, University of Wisconsin System, July 1, 2012

comingling policy, collection frequency, scope of materials collected and additional services offered, have broad variations from program to program.

OUTAGAMIE COUNTY

The Outagamie County RU, unlike previously mentioned countywide programs, contracts directly with a private hauler for collection services in its area. They offer single stream, curbside collection, every other week with a basic scope of materials collected (paper, glass, aluminum, plastics 1&2). Materials are collected on the same day as municipal solid waste with a minimal exception due to scheduling conflicts. This program requires three full time positions to manage but is also associated with the MRF that serves Outagamie, Winnebago and Brown counties.

The contractor was selected after a national request for bid (RFB) process. The county was divided into 3 districts and bids were accepted for 1 or more areas per contractor. The contractor that was ultimately hired successfully bid for all 3 districts. This contractor utilizes semi-automatic trucks as the individual communities have the choice to use carts or bins. It is believed that the program is successful and supported by residents. The educational program consists of handouts provided to communities, fliers left by the hauler as notices of non-compliance and information available on websites. Member communities may have independent educational offerings.

FUTURE FUNDING FOR RECYCLING

Discussions have taken place in Wisconsin in terms of how to better collect and manage data on recycling. This is a particularly significant issue as Responsible Units attempt to determine the potential benefits associated with single stream collection or isolate the costs of organics recycling. The Wisconsin Department of Natural Resources has also discussed creating a subset of Responsible Units, where this data would be tracked more thoroughly, which is important in terms of addressing the previous questions. This would also be valuable information to have available if there are further scrutiny of state support for recycling.

State and local budgets were significantly impacted by the global recession that began in 2008. With the decrease in tax revenue, funding for recycling became a very contentious issue, particularly in Wisconsin. Although funding for recycling was continued for the 2011-13 biennium, it is likely that the funding mechanism for recycling will again be an issue for the next biennium. This discussion was further compounded by the fact the program revenue from the sale of recyclables was also adversely impacted by the lack of demand during the recession. Recycling markets and revenue did recover somewhat, but have more recently started to exhibit market variability as discussed in the Markets Assessment report.

RECYCLING BEST PRACTICES

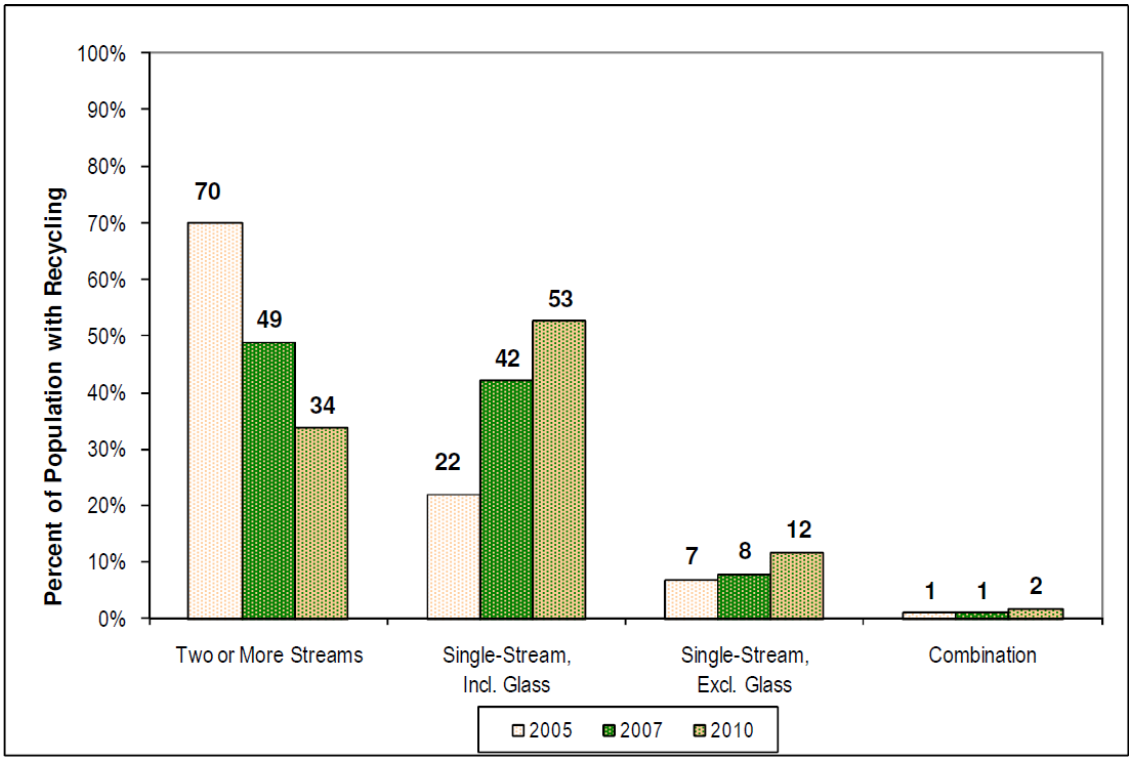
The challenge facing the County is how to gain recycling program efficiencies, providing a cost-effective program that can be embraced by its residents and businesses. The project team conducted a comparative analysis of communities recycling collection and processing programs to identify the quantity of material collected through the implementation of “best practices”. The intention of this analysis was to gather data from communities that have converted their programs from multi and dual sort to single stream or to dual sort to provide an overview of possible options that can be incorporated into Chippewa County’s program. The cities of Cincinnati, Ann Arbor, St. Paul, Minneapolis, Kansas City, Portland, and Madison have all converted their collection programs

from long-term, curbside multi-sort collection programs to variations of dual-stream or single stream collection at the curb, and weekly or bi-weekly frequency. Keeping glass separate from the remainder of the recyclable materials modifies Kansas City's single sort collection.

NATIONAL CHANGES IN COLLECTION SYSTEMS

Single-sort recycling – where all fiber grades and recyclable containers are collected commingled together in one compartment on the recycling collection vehicle – has been a growing trend for the past fifteen years and is now considered to be the "best practice" for high volume recovery of recyclables. The prevalence of single-sort collection was first evaluated in a 2000 Survey for the Paper Industry Association Council (PIAC), and has continued to be evaluated in the subsequent surveys. As shown in Figure 2, the growth in single-sort recycling has steadily increased. In 2005, only 29 percent of the population with recycling had access to a single-sort program. By 2010, that number had increased to 64 percent. Although the PIAC has not attempted to correlate the trend to single-sort collection with the expansion in fiber products collected in programs, anecdotal evidence suggests such a relationship exists.

Figure 3: 2007 vs. 2010 Comparison: Percentage of Communities by collection method [2]



* "Combination" means different haulers in some communities may use different collection techniques for recycling collection

BEST PRACTICES INFORMATION

The project team evaluated both dual sort and single sort collection options based on the assessments of other cities, reports on collection and processing efficiencies, truck vendor information, and an evaluation of the constraints to collection imposed by the collection of recyclables. Communities that have converted to dual sort or single sort collection experience an immediate, significant increase in the volumes collected. Residents do not have to provide as much space for sorting and storing materials in preparation for their collection day, and find

[2] Copyright © 2012 Paper Industry Association Council

it easier to carry materials to the curb in fewer containers. Further, the routes can be expanded to serve a larger number of stops, which saves in truck usage, labor and travel time on the street. It has been demonstrated throughout the country that cart based systems increases the amount of recyclable material that can be collected in a bi-weekly or weekly program.

Table 5: Best Practices Recycling Quantity

Program Area	Ann Arbor	St. Paul	Kansas City	Cincinnati	Portland
Recycling Collection	Single Sort Weekly	Dual Sort Weekly	Single Sort Weekly	Single Sort Biweekly	Single Sort Weekly
Container	Cart	Bin	Bin	Cart	Cart
Lbs./HH/Yr.	726	477	302	386	659

The five cities offer a variety of service combinations to consider that illustrate best practices. Each has its own success story. Each has adapted to its own program, so additional review would be beneficial in evaluating which options would be the most applicable in Chippewa County.

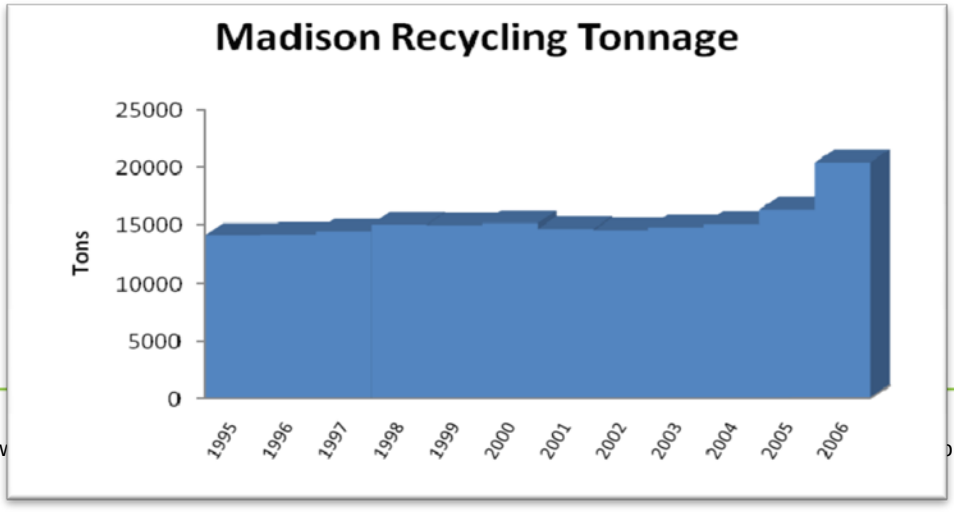
Table 6: Best Practices Recycling Changes

Ann Arbor	Saw 15% increase in tonnage with switch from weekly dual sort bins to single sort carts
St. Paul	Saw 15% increase in tonnage with switch from source separated biweekly bins to dual sort weekly bins
Cincinnati	Saw participation increase from 40% to 71% with switch from weekly bins to biweekly carts
	Switch saved city $900,000 per year
	Tonnage increased by over 50% in same time period

CITY OF MADISON, WISCONSIN SINGLE STREAM PROGRAM

The City of Madison implemented single stream recycling with automated collection in September, 2005, following two years of planning. The time was right for this changeover, since recycling trucks needed to be replaced; the transfer station needed redesign, and the recycling contract was up for renewal. Despite a significant capital cost, political support was strong to develop additional capacity due to population growth projections and a history of high recycling rates.

2006 was the first full year of implementation of single stream recycling and Madison experienced a significant increase in tonnages. The City increased overall recycling by 25% from 2005 levels. Additionally, the City achieved over $103,000 in landfill tipping fees savings in 2006 as compared to 2005. Finally, net cost per household was projected to only slightly more expensive than the previous system, as is illustrated in the chart below.



MULTI-SORT COLLECTION PROGRAMS

Collection vehicles used in a multi-sort system are designed with multiple compartments. If two or more items are combined in a compartment, the multi-sort is a variation, which requires some level of sorting at the MRF. Collection quantities are limited in multi-sort programs by complex sorting requirements for residents. In the early years of curbside recycling, the number of compartments on a collection truck was adequate for the materials included in the program: steel cans, newspaper, cardboard, aluminum cans, glass sorted by clear and color, and sometimes #1 and #2 plastic bottles.

Multi Sort Recycling Collection Truck

As recycling markets and resident demand for more recycling increased, multi-sort programs were challenged to adapt and provide additional recycling opportunities. The marketplace addressed these challenges with first dual sort (or dual stream) and then single sort (or single stream) approaches to recycling collection and processing were developed.

A key limitation to the multi-sort programs is the amount of materials that are collected on the route. When one of the compartments is full, the truck must return to the MRF to empty the load, even though other compartments have remaining capacity. This requires a greater number of trips to and from the MRF. The route cannot serve the full potential of stops, which makes the vehicle and the collection route inefficient, and subsequently increases labor and travel costs.

Multi-sorted programs require the most costly labor to collect the materials. Emptying the containers/bags of recyclable materials into the respective compartments is a repetitive motion, requiring more time (labor hours) at each stop than other systems. In terms of labor costs, truck drivers are paid at a higher rate than laborers working at a MRF. The time consumed by the driver to collect the recyclables is an additional cost to the program.

DUAL-SORT COLLECTION PROGRAM

In a dual-sort system, paper (fiber) is collected separately from containers (cans, bottles, plastics). Trucks are equipped with a split body or two compartments, so that fiber is placed in one of the two compartments and containers are placed in the second compartment. The dual-sort collection is a more efficient system than the multi-sort collection in terms of time and costs. Filling the truck requires two repetitive motions to collect the materials. This saves collection time at the curb. The disadvantage of dual sort collection remains, though less problematic, as the multi-sort system; when one side of the truck is filled, the truck must return to the MRF to

empty the load and return to the route. Saint Paul, MN employs a dual-sort recycling collection and processing system.

SINGLE-SORT COLLECTION PROGRAM

An increasing number of communities have shifted to a single sort collection system. In a single sort system, all materials are collected and placed in a single compartment truck. Each collection vehicle can remain on route until the truck is completely full or the route is complete. Even in that case, dispatchers may send a less than full truck to another route to help complete collection, based upon proximity and capacity of the truck.

The trucks can be dual-purpose, i.e., collect recyclables and then designated to return to assist in waste or other materials collection. The driver makes a one motion pass at each stop, saving time and labor costs. If the truck is equipped with a mechanical loading hopper or mechanical arm, the driver can save additional time in the collection process. (See photos below)

Semi-Automated Collection Truck

Automated Recycling Collection Truck

CURB CONTAINER SET OUT OPTIONS

There are two container options communities can offer residents to set out materials for dual and single sort curbside collection. The first option is to provide one or more recycling bins, i.e., plastic boxes of varying size, typically ranging from 13 gallon to 25 gallon While recycling bins can be equipped with lids, the disadvantage to bin programs with lids is that the lightweight lid can be damaged if it falls or blows into the street, or completely disappear if weather conditions are amply strong. In a dual collection system, residents either have two bins, one for fiber and one for containers, or are asked to place all fiber into a paper bag to isolate from the containers and place everything into the single container.

The second option for curbside set outs is a wheeled cart, equipped with an attached lid. Wheeled carts have been the most accepted and growing option for single and dual sort collection programs over the past 10 years. The wheeled cart encourages residents to recycle more materials and provides the convenience of storage of materials and for hauling to the curb. The most expressed reservation from residents concerning multi-sort programs, the number of containers and the difficulty of moving all of them to the curb without spillage, is also one of the advantages of the cart.

There are circumstances where some residents are concerned that the cart is too big or heavy to move to the curb, especially for the elderly. Operational experience has shown that although cart size can at first be somewhat intimidating, the resident adapts to the cart and its transport and storage options. Optional programs

that allow for residents to request a different size cart can also be implemented as part of a switch to cart based programs. Dual sort systems can also use carts, either split 96-gal or two 64-gal for biweekly collection.

Photo: Typical Recycling Carts and Bins

Communities can allay these concerns by first, displaying the carts in a prominent location so residents can "check them out" prior to the onset of a program or by offering an optional smaller sized cart. It can also be pointed out that communities seem to have no problem providing a trash cart of the same size or to offering smaller carts for the elderly.

Some cleanliness improvement has been identified with the implementation of carts. A larger container with a cover prevents much of the litter and blowing of paper and plastic that is associated with lidless bin containers. In addition, some residents have indicated that storing recyclables outside in a cart is preferable to keeping bins indoors. This is especially helpful in areas providing alley collection.

FACTORS THAT INFLUENCE COLLECTION PROGRAMS

Carts versus bins: Carts have consistently shown an increase in the volume of recycling collected. Carts offer greater capacity, more stability and decreased risk of materials becoming wind-strewn or placed in trash when the bin is full before collection. There are concerns, as noted in the later section entitled 'Curb Set Out Options', about the size of the carts and difficulty in handling to the curb. However, with consistent, user-friendly education and if carts are offered in size options, carts yield greater participation and volumes.

Waste versus recycling: The combination of waste and recycling collection remains a factor in recovery rates. If unlimited waste disposal, at a low rate of cost is offered to a community, it is very easy to put everything into a waste container. Successful programs focus on discouraging waste disposal and encouraging recycling, composting and source reduction as the better alternatives. This can be accomplished through education and encouraging participating in the recycling programs and through the variable pricing of waste disposal. Where these factors are present, recycling programs tend to be much more successful in both recovering material and generating revenue.

Frequency: Many communities have resorted to bi-weekly recycling collection as a cost savings. Communities attaining high recycling rates in the compared cities provide weekly collection. Weekly collection provides residents with a simpler "everything out to the curb" model. Bi-weekly as an option in the interests of cost savings must be balanced by providing adequate containers and reminders of the collection schedule to avoid recyclables being disposed in the garbage because the resident "ran out of room" in the recycling bin.

Cost: Converting to a dual or single sort collection system requires some capital investment in equipment, program modifications and public education. Changes in processing fees will be dependent upon the arrangement with the MRF and the revenue sharing arrangement established with the County. These

investment factors are balanced against the increase in recycling resulting from a simpler method of setout and collection for the community, and the savings realized from reduced waste disposal fees and collection costs.

RECYCLING – LEVELS OF SERVICE

Several studies have been completed regarding the service quality and benchmarking of municipal services. One study identified the following issues that are key to successful recycling programs:

- Categorized of programs by level of service
- Measured by convenience to residents
    - Collection frequency (none, monthly, biweekly, weekly)
    - Material commingling policy (segregated, single stream)
    - Collection day schedule (same as solid waste collection: yes/no)
    - Point of collection (drop off, curbside)
- Measured by scope of materials collected
    - Basic (glass, aluminum, newspaper)
    - Expanded (basic plus plastics, mixed paper, cardboard, yard trimmings)

The results of this study indicated that by considering first what citizens want, need, or prefer local officials can focus on high performers at the service-quality level that best matches the community's preferences, aspirations and circumstances. It was also found that cities with higher service quality have higher mean participation and diversion. Finally, higher recycling diversion was attained by cities that had higher population densities, but it is possible to achieve a high level of performance at any particular density and level of service.

PROCESSING OPTIONS

Choices pertaining to sorting technologies and overall processing choices are predominantly driven by curbside collection systems. Substantial improvement in processing capability and efficiency has been experienced in the past 5-10 years. Beyond the initial use of magnets to capture ferrous metals at an efficient rate, and eddy currents to separate and capture aluminum from the sort, more sophisticated equipment and reconfiguration of the sorting systems has resulted in higher recovery rates, greater throughput, and less contamination to meet market standards.

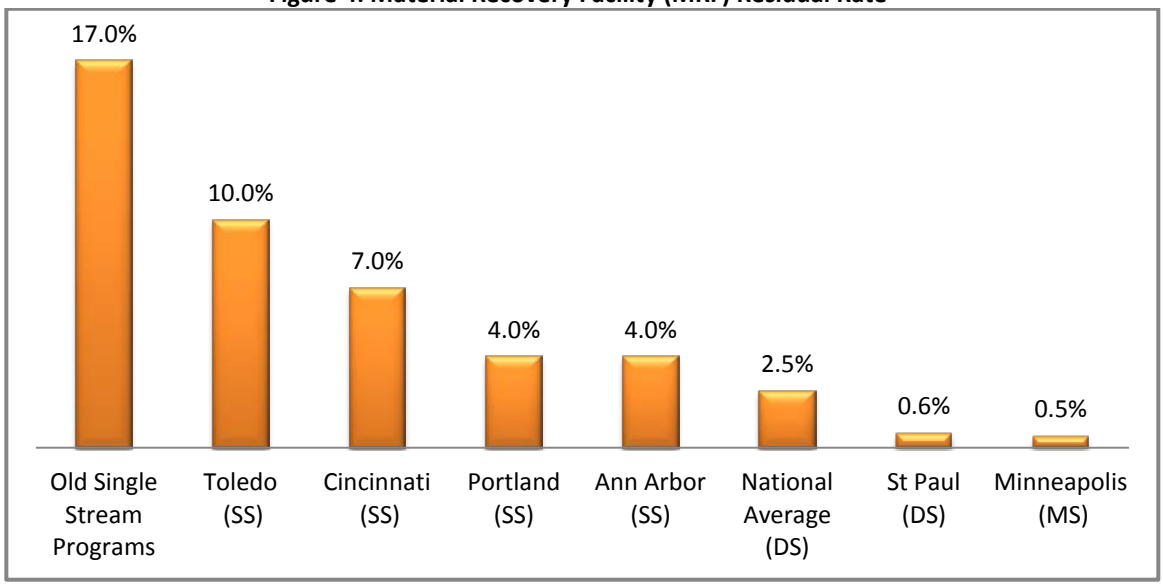
The number of recyclable materials has increased as the ability of secondary and manufacturing industries to convert post-consumer packaging into marketable products has grown. Subsequently, the market demand for the greater variety and volume of materials has driven MRF's to seek equipment that enable them to efficiently recover an increased array of post-consumer plastics and fiber. The processes must also be designed to increase the volumes or tons per day, to justify the investment in such equipment or systems.

MRF's and equipment manufacturers, to remain competitive and derive the greatest value from the collected material, continue to improve the ability of the sorting methodology and performance standards. Systems are configured to provide screening of non-recyclable materials and contaminants from a particular recyclable material to yield a higher value end-of-sort product. Optical sorting technologies have advanced to enable efficient and broader range of sorting plastics and fiber cartons that results in an increased variety of accepted materials for recycling at a higher marketable value.

Residual rates are an indicator of the success of the sorting systems and the recycling collection program. Residual rates in both dual sort and single sort sorting systems have declined over the years, as evidenced in the

Figure 2. Whether dual sort or single sort, the ability to recover everything that is recyclable or marketable and to remove waste that cannot be recycled is a key factor in determining the type of recycling program provided. It is also a key measurable in determining overall recycling program success or failure.

Figure 4: Material Recovery Facility (MRF) Residual Rate*



* SS - Single Sort, DS - Dual Sort, MS - Multi Sort

Quality control remains a critical element in MRF recovery. At various points in the recovery process, testing or checking of the commodity destined for markets can result in increased value to the commodity. The community can also play a role in helping to increase the value of materials collected. To ensure quality standards, communities can require contracted MRF's to report volumes and percentages of recovered materials by type, including residue rates; set minimum standards of recovery and residue, and the volume of materials sold as various grades in the recycling markets. A certification process should be applied to MRFs. MRFs that requires them to report certain operational data for monitoring purposes. This information should include at a minimum:

- Amounts and types of recyclables delivered to the facility;
- Amounts and composition of processing residuals;
- Amounts and types of materials processed and marketed on an annual basis; and
- Amounts and types of materials downgraded or rejected by markets.

Residual rates at the MRF can also be improved by education. As recycling participation increases, it is important to provide direct, simple and positive education about what can be recycled. Consistent, accessible, user-friendly education about what can be recycled makes an impact on the participants' participation to place the materials that are accepted in the recycling container. Even with the most efficient system for sorting materials, if an item that is not included in the recycling program is incorrectly placed in a recycling bin, it must be treated as residual at the MRF.

RECYCLING INCENTIVE PROGRAMS

We are all familiar with the old adage "one mans trash another mans treasure." New companies are trying to change that. They say your trash is your own treasure, because you're going to pay you for it. The concept, called Incentive Based Recycling, is to increase recycling rates by providing a direct financial incentive for people

to go through the trouble of sorting their garbage. Participating customers receive a 35, 64, or 96-gallon container that has a barcode that identifies their home. As the truck collects the recycling it scans the barcode on the container and translates the value of the recycled items into a dollar amount - that can be redeemed though shopping coupons at participating businesses. The two major programs are: Recyclebank and *Rewards for Recycling*.

Participants use an online interface to choose which coupons suit them best, order the coupons and receive them by mail. Alternatively participants can choose to donate their Recyclebank Dollars to charity. Recyclebank serves both residential and retail customers. Many paper, plastic, metal and glass recyclables are collected and the company supports a single sort recycling system that allows all types of recyclables to be deposited in one single container. Home collection of e-waste is coming soon but in the meantime customers can send in cell phones for recycling by printing a envelope label including stamp directly from the website.

Recyclebank trades the actions a customer makes that have a positive impact on your home by saving energy, community by recycling and the environment by conserving natural resources for points that you can use for rewards you choose. Those rewards come in a variety of options: Products, discounts and coupons from the world's leading brands (think: Kashi, Footlocker, Dunkin Donuts), or by donating your points to support environmental education in schools.

Because Recyclebank offers coupons and other economic incentives to recycle, the RecycleBank model is particularly attractive to lower-income communities. By rewarding households with coupons for groceries or services, RecycleBank is having a direct positive impact on family budgets. Therefore, recycling becomes something households participate in for financial assistance, rather than altruistic reasons. This is not meant to suggest that the only people participating in RecycleBank are those on the lower end of the income spectrum, only that the incentives inherent in the RecycleBank model become increasingly attractive the lower on the spectrum a household lays.

Rewards for Recycling was founded in late 2008 with the express intent to provide a better recycling affinity program option for municipalities and waste haulers. The Recycle Bank program was closely studied and evaluated, and R4R was designed to be uniquely different, addressing all of the challenges we found in the alternate system. The R4R program founders identified multiple challenges in the alternate system, specifically a lack of understanding of basic marketing and consumer behavior patterns.

Rewards for Recycling is a community based Recycling program. R4R partners with the municipality, the residents, the community and the local businesses. *Rewards for Recycling* rewards frequency and loyalty for building recycling as a household habit. The program is open and available to all members within the community. *Rewards for Recycling* provides rewards to every household immediately upon start-up, and continues to provide smaller value rewards to all households regardless of recycling activity. This methodology provides the opportunity to continuously convert non-recyclers by showing them the rewards of significantly higher value that will be available to them as soon as they begin recycling.

Local Business participation is a key component of the *Rewards for Recycling* program. The R4R Program features rewards that come from the businesses located within each community. Restaurants, Pharmacies, Dry-cleaners, Oil Changes and other retail products and services. The majority of them are locally owned and operated, and employ local people.

The revenue generated by these businesses stays home and supports the local economy. R4R gives each business an opportunity to offer valuable savings to residents free of charge. These offers can drive traffic to

local business. In addition, *Rewards for Recycling* has multiple promotional options available for local businesses that can get them exposure in Direct mail, E-newsletter marketing and even television.

INCENTIVE SYSTEM PROS AND CONS

Demographics are probably the most important factor to look at when considering an incentive system partnership. An incentive system model is particularly attractive to lower-income communities because it offers coupons and other economic incentives to recycle. By rewarding households with coupons for groceries or services, an incentive system is having a direct positive impact on family budgets. Therefore, recycling becomes something households participate in for financial assistance, rather than altruistic reasons. The following is a partial listing of the pros and cons of incentive systems.[3]

Pros

- Incentive-based program rewards recycling participation and builds good recycling habits
- Public awareness and participation in recycling rises
- Substantial rise in material volumes
- Data on the effectiveness of existing and proposed waste collection routes and strategies is collected
- Opportunity to modernize or upgrade the waste collection and recycling infrastructure

Cons

- System rewards consumption, not waste reduction
- Program may be a poor fit in communities with already high recycling participation
- Success relies on the participation of national and local businesses and retailers
- Upgrade costs could be prohibitively expensive for communities and smaller haulers if not adequately negotiated with Service Provider
- Program not cost effective in areas with low-cost disposal

[3] *Resource Recycling Magazine*, October, 2009

POTENTIAL INCREASES IN MATERIAL COLLECTION FOR CHIPPEWA COUNTY

Estimates of the potential increase in quantities collected, for both medium and high volume scenarios, are based on emerging best practices for collection (single sort collection, larger carts, automated collection) and for state-of-the-art communication and recovery incentive systems (e.g. social media, Pay As You Throw (PAYT) and RecycleBank style incentives) – all of which have demonstrated capability to increase household recovery well beyond the rate of the current system.

Table 7: Chippewa County Estimated Recycling Tonnages

Municipal Recycling Programs	Occupied Households	Single Sort (SS) Semi Auto Biweekly	Dual Sort (DS) Semi Auto Biweekly	High Performing SS Side Automated Weekly	High Performing DS Side Automated Weekly	Dual Sort Bins	Multi Sort Bins	Drop Off
Pounds per Household		**600**	550	750	650	450	370	300
Anson	849	**255**	233	318	276	191	157	127
Arthur	265	**80**	73	99	86	60	49	40
Birch Creek	210	**63**	58	79	68	47	39	32
Bloomer Area	2,708	**812**	745	1,016	880	609	501	406
Boyd	226	**68**	62	85	73	51	42	34
Cadott	624	**187**	172	234	203	140	115	94
Chippewa Falls	6,030	**1,809**	1,658	2,261	1,960	1,357	1,116	905
Cleveland	329	**99**	90	123	107	74	61	49
Colburn	346	**104**	95	130	112	78	64	52
Cooks Valley	264	**79**	73	99	86	59	49	40
Eagle Point	1,089	**327**	299	408	354	245	201	163
Edson	353	**106**	97	132	115	79	65	53
Estella	150	**45**	41	56	49	34	28	23
Goetz	264	**79**	73	99	86	59	49	40
Hallie Area	2376	**713**	653	891	772	535	440	356
Howard	260	**78**	72	98	85	59	48	39
Lafayette	2,194	**658**	603	823	713	494	406	329
L. Holcombe	445	**134**	122	167	145	100	82	67
Ruby	187	**56**	51	70	61	42	35	28
Sigel	353	**106**	97	132	115	79	65	53
Stanley	1,389	**417**	382	521	451	313	257	208
Tilden	440	**132**	121	165	143	99	81	66
Wheaton	983	**295**	270	369	319	221	182	147
TOTAL	22,334	**6,700**	6,142	8,375	7,259	5,025	4,132	3,350

The estimate of the potential increase in the quantity of material that could be recovered in Chippewa County indicates that if the overall performance could be increased to 600 pounds per household per year then Chippewa County could double the amount of recyclable material that is recovered to 6.700 tons per year. This level of recovery is achievable if communities implement well-designed curbside collection programs utilizing best practices that make recycling as convenient as possible with appropriate incentives and pricing. The larger

communities may need to achieve somewhat higher recovery rates to achieve this recovery level on a countywide basis.